PROPOSED MINING RIGHT OVER A PORTION OF PORTION 3 OF THE FARM THE ORCHARDS NO 223, ALBANY MAGISTERIAL DISTRICT, EASTERN CAPE

FINAL SCOPING REPORT

DEPARTMENTAL REFERENCE NUMBER:

EC 30/5/1/2/2/10069 MR

NOVEMBER 2023

PREPARED FOR:

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EXECUTIVE SUMMARY

The Applicant, Makhanda Mining (Pty) Ltd, applied for environmental- and mining authorisation to mine ball clay, clay (general), gravel, kaolin, and aggregate from 43.4688 ha of Portion 3 of the farm The Orchards No 233 within the Albany District of the Eastern Cape Province.

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at 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. All activities will be contained within the approved boundaries of the site.

The proposed project triggers listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment 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) when considering the environmental authorisation. This report, the Final Scoping Report, forms part of the departmental requirements, and presents the first report of the EIA process.

Should the MR be issued, and the mining of the listed minerals be allowed, the proposed project will comprise of activities that can be divided into three key phases namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the site boundaries. Site establishment will further necessitate the clearing of vegetation, stripping and stockpiling of topsoil, and establishment of the ablutions hut.

(2) *Operational phase* that will entail opencast mining. The clay will be excavated and loaded onto trucks that will transport it to the Makana Brick Factory (off-site) where it will be used to manufacture clay bricks. Unwanted overburden will be sold as aggregate. Minor processing/screening may be needed to reduce the aggregate to various sized stockpiles.

(3) *Decommissioning phase* which will involve the rehabilitation, sloping and rehabilitation of all affected areas, the replacement of topsoil, and the removal of all infrastructure no longer needed by the landowners. The right holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining right holder will be required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA,

2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

Need and Desirability:

Makhanda has the largest known deposit of good quality clay in South Africa. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

Considering this, and the lapse of the Makana Brick mining permit the Applicant saw a business opportunity to secure the significant clay resource and supply the desired clay to the Makana Brick Factory. Parts of the earmarked footprint has been mined for many years and has very little, if any, other (than mining) economic function left.

Alternative Considered:

a) The property on which, or location where, it is proposed to undertake the activity

Presently, the project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233. Applicants can only apply for mining rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the mining activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed mining operations is to exploit the economically viable clay deposits (and overburden as aggregate) on the earmarked farm, an area known to contain these resources needs to be selected. The proposed footprint of the MR application was based on the available geological information. No further location/site alternatives are considered in the Scoping and EIA process.

b) Type of activity to be undertaken

The Applicant intends to extract the clay from the mining area using opencast methods as discussed above. The nature of the operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate).

c) Design and layout of the activity

The Applicant will not establish any permanent infrastructure and/or buildings on site. The crushing plant and ablution hut will both be of temporary nature and can be moved as mining progress. Haul roads will also be developed as mining progress. The design and layout of the proposed footprint were based on the available clay resources and colour variants. No further design/layout alternatives are considered in the Scoping and EIA process.

d) Technology to be used in the activity.

During the winning process heavy earth–moving equipment will be used to extract clay from the quarry. Similarly, the aggregate will be recovered through direct stripping, processing (when needed) and loading. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. The processing infrastructure will be of temporary and mobile nature, moving to the stockpiled material as needed. This project does not require complex technology to allow the winning of the intended minerals, and therefore no further technology alternatives are considered in the Scoping and EIA process.

e) Operational aspects of the activity

The operational aspects of the activity was based on the historic mining activities that has been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The Applicant already holds water rights that can supply the project with water, no electricity connection is needed, no servicing of mining equipment will be required on site, and the mining sub-contractor will transport the material from the mine to Makana Brick along existing roads. The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation.

f) Option of not implementing the activity (No-go Alternative)

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. If the no-go alternative is implemented the land use of the earmarked footprint will remain that of agriculture, and livestock farming with the clay (and aggregate) resource unmined. The no-go option will further entail a loss of employment opportunities, as well as socio-economic benefits and growth development opportunities. Given the high levels of unemployment and poverty in the Makana Magisterial Districts the loss of such opportunities is considered significant. The positive implications of the no-go alternative are that there will be no impact on the bio- and geophysical environment of the earmarked area.

Public Participation Process:

The relevant stakeholders and I&AP's were informed of the mining right application by means of an advertisement in Daily Dispatch, and on-site notices that were placed at the entrance to the farm and the Makana Library. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 24 November 2023) 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 DSR were incorporated into the final Scoping Report (FSR) to be submitted to the DMRE for consideration.

Scoping Report:

The scoping report identifies the potential positive and negative impacts that the proposed project may 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.

Plan of Study for the Environmental Impact Assessment Process:

The aspects to be assessed as part of the environmental impact assessment process will include, but not be limited to, the following:

1. The need and desirability of the proposed activity will be discussed in detail and weighed against the no-go option of upholding the status quo at the study area.
2. The inputs received during the public participation process (first- and second phase) will be assessed and considered by the project team during the EIA process.
3. The findings, recommendations and management measure proposed in the specialist studies will be assessed during the EIA process and incorporated into the DEIAR.
4. The impact of the proposed project on the physical-, biological-, and human environments will be assessed.
5. Mitigation measures will be proposed to control, modify, remedy, or stop the impacts associated with the proposed activity on the surrounding environment.
6. Any additional requirements submitted by the DMRE will be incorporated into the DEIAR and treated accordingly.

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LIST OF ACRONYMS

ASTM	American Society for Testing and Materials
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DEIAR	Draft Environmental Impact Assessment Report
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
ESA	Ecological Support Areas
FEIAR	Final Environmental Impact Assessment Report
FEPA	Freshwater Ecosystem Priority Area
FSR	Final Scoping Report
GDP	Gross Domestic Product
GPS	Global Positioning System
GVA	Gross Value Added
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan

LED	Local Economic Development
MHSA	Mine Health and Safety Act, 1996 (Act No 29 of 1996)
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)
MR	Mining Right
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No 25 of 1999)
NWA	National Water Act, 1998 (Act No 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No 85 of 1993)
PCB's	Polychlorinated Biphenyls
PCO	Pest Control Officer
PIA	Palaeontological Impact Assessment
PPE	Personal Protection Equipment
PSM	Palaeontological Sensitivity Map
SAHRA	South African Heritage Resources Agency
SAMBF	South African Mining and Biodiversity Forum
SAMRAD	South African Mining Mineral Resources Administration System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SLP	Social and Labour Plan
TBCS	Terrestrial Biodiversity Compliance Statement
WMA	Water Management Area

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT

AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING

IN CASES OF ALLUVIAL DIAMOND PROSPECTING

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

NAME OF APPLICANT: Makhanda Mining (Pty) Ltd

TEL NO: 046 603 6300

FAX NO: 086 729 4076

POSTAL ADDRESS: Brakkefontein Farm, 243 Cemetery Road, Makhanda, 6139

PHYSICAL ADDRESS: Same as above

FILE REFERENCE NUMBER SAMRAD: EC 30/5/1/2/2/10069 MR

IMPORTANT NOTICE

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

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

In terms of section 16(3)(b) of the EIA 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 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 requirements of the Regulation and will lead to the Environmental Authorisation being refused.

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

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process-

(a) identify the relevant policies and legislation relevant to the activity;
(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
(e) identify the key issues to be addressed in the assessment phase;
(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site, and
(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SCOPING REPORT

2. 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/applicant must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the aforementioned Act. Makhanda Mining (Pty) Ltd (hereinafter the "Applicant") appointed Greenmined Environmental (Pty) Ltd (hereinafter "Greenmined") to undertake the study needed. Greenmined has no vested interest in Makhanda Mining (Pty) Ltd or the proposed project and hereby declares its independence as required by the EIA Regulations, 2014 (as amended).

i) The EAP who prepared the report

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

Tel No: 021 851 2673 / 082 811 8514

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 attached as **Appendix 1**)

Ms Fouché has a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology. Full CV with proof of expertise is attached as Appendix 1.

(2) Summary of the EAP's past experience
(Attach the EAP's curriculum vitae as **Appendix 2**)

Ms Fouché has eighteen years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. Ms Fouché is a registered Environmental Assessment Practitioner (registration no: 2019/1003) with EAPASA (Environmental Assessment Practitioners Association of South Africa) since 2019. See a list of past project attached as Appendix 2.

b) Description of the property

Table 1: Property description

Farm Name:	Portion 3 of the farm The Orchards No 233
Application area (Ha)	43.4688 ha
Magisterial district	Albany (Makana Local Municipality)
Distance and direction from nearest town	The property is located ±4 km northeast of the King Flats residents of Makhanda, between the N2 national road (south) and the Botha's River (north).
21 digit Surveyor General Code for each farm portion	C00200000000023300003

c) Locality map

(show nearest town, scale not smaller that 1:250000 as **Appendix 5**)

The requested map is attached as Appendix 5.

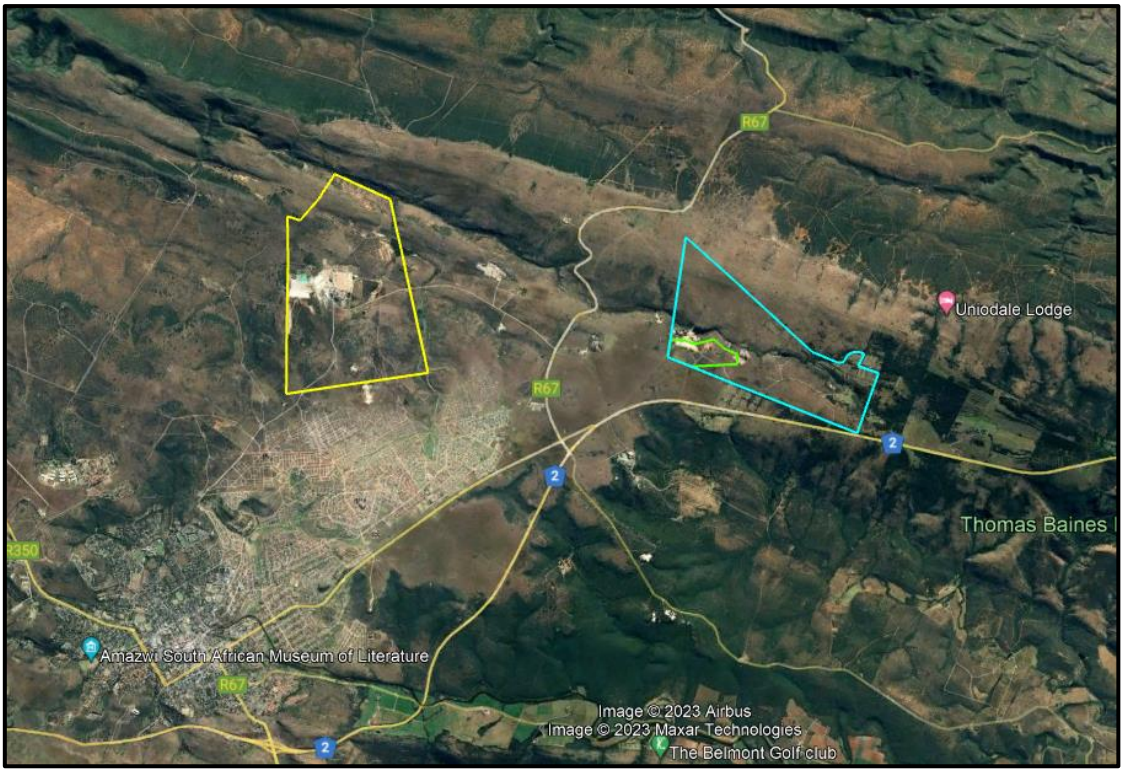

Figure 1: Locality of the proposed mining footprint (green polygon) in relation to the surrounding area, where the blue polygon indicates the farm boundary, and the yellow polygon shows the Makana Brick Factory and Mining area (Image obtained from Google Earth).

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**

The Applicant, Makhanda Mining (Pty) Ltd, applied for a mining right (MR), and environmental authorisation (EA) to mine ball clay, clay (general), gravel, kaolin, and aggregate from 43.4688 ha that extends over Portion 3 of the farm The Orchards No 233 in the Albany District of the Eastern Cape.

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at 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. All activities will be contained within the approved boundaries of the site.

The proposed project will therefore entail the following:

- δ Introduction of mining equipment, stripping and stockpiling of topsoil and overburden;
- δ Excavation of the mining area;
- δ Screening and processing of aggregates (when needed);
- δ Stockpile of mined minerals until it is transported to Makana Brick, alternatively collected by clients;
- δ Slope, landscape and rehabilitate the affected areas upon closure of the mine.

The proposed processing infrastructure will be of temporary and mobile nature, and only an ablution hut needs to be placed to allow the proposed project. The Applicant will make use of the existing roads, no electricity is needed as the crusher plant (when needed) will be powered with generators, and water will be obtained from Makana Brick and transported to site.

The proposed project triggers listed activities (see following table) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment (EIA) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures in cooperation with specialists, to ultimately culminate in an environmental management programme (EMPR) that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation.

Mining will be >100 m from the adjacent Botha's River and associated and dam and the project therefore does not trigger regulated activities in terms of the National Water Act, 1998.

The preliminary site layout plan and schematic representation of the proposed mining activities are attached as Appendix 4 to this report.

Table 2: Listed and specified activities triggered by the proposed mining activities.

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	AERIAL EXTENT OF THE ACTIVITY Ha or m^2	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 OR GNR 546)/NOT LISTED
Demarcation of the site with visible beacons.	43.4688 ha	N/A	Not listed.
Introduction of mining equipment, stripping and stockpiling of topsoil and overburden.	±43.5 ha (Progressively opened as mining proceed)	X	GNR 517 Listing Notice 2 Activity 17 (as amended)
Excavation of mining area.		X	
Screening and processing of aggregates (when needed).	±1 ha	X	
Stockpile of mined materials until it is transported to Makana Brick, alternatively collected by clients.		X	
Slope, landscape and rehabilitate the affected areas upon closure of the mine.	43.5 ha	X	
NEMA: GNR 517 Listing Notice 2 Activity 17 (as amended): *Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.*			

ii) Description of the activities to be undertaken

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

BACKGROUND INFORMATION

Grahamstown Brick (Pty) Ltd t/a Makana Brick (hereafter referred to as Makana Brick) held a mining permit with reference number EC 30/5/1/3/2/10397 MP over 4.95 ha of Portion 3 of the farm The Orchards No 233 in the Makhanda area. The mining permit allowed the mining of Ball

Clay, Clay (General), Gravel and Kaolin from the approved area. This permit lapsed on 22 July 2023 and can no longer be renewed as the first, second and third renewals were already granted.

PROJECT PROPOSAL:

The Applicant applied for environmental authorisation, and a mining right to win ball clay, clay (general), gravel, kaolin, and aggregate from the above mentioned property. The following table lists the GPS coordinates of the proposed mining area as shown on the Regulation 42 Mine Plan (Appendix 3).

Table 3: GPS Coordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	33º15'51.67"	26º36'49.99"	-33.264353º	26.613886º
B	33º15'51.30"	26º36'57.95"	-33.264250º	26.616097º
C	33º15'53.55"	26º37'05.77"	-33.264875º	26.618269º
D	33º15'52.36"	26º37'11.89"	-33.264544º	26.619969º
E	33º15'50.94"	26º37'17.94"	-33.264150º	26.621650º
F	33º15'55.99"	26º37'24.40"	-33.265553°	26.623444º
G	33º15'59.15"	26º37'32.99"	-33.266431º	26.625831º
H	33º16'02.99"	26º37'40.21"	-33.267497º	26.627836º
J	33º16'05.79"	26º37'39.89"	-33.268275º	26.627747º
K	33º16'05.83"	26º37'03.56"	-33.268286º	26.617656º
L	33º16'00.72"	26º36'48.26"	-33.266867º	26.613406º

The satellite image below shows the location of the proposed mining area in relation to the surrounding landscape.

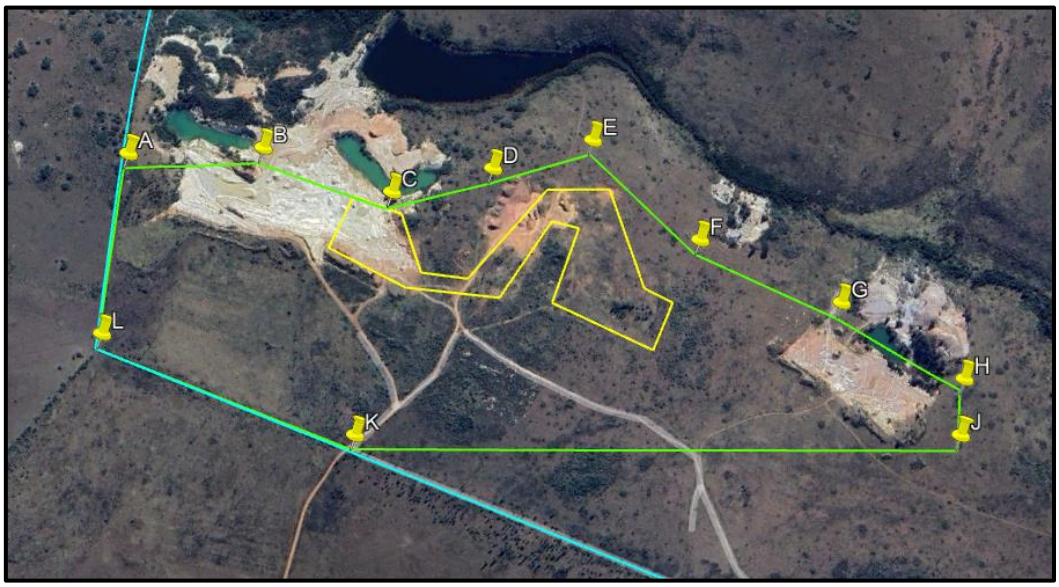

Figure 2: Satellite view showing the location of the proposed mining area (green polygon) in relation to the surrounding landscape where the yellow polygon indicates the Makana Brick mining permit area, and the blue lines show the boundary of Portion 3 of The Orchards No 233. (Image obtained from Google Earth)

Should the relevant authorisations be granted, and the proposed mining be allowed, the project will comprise of activities that can be divided into three key phases (discussed in more detail below) namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the site boundaries. Site establishment will further necessitate the clearing of vegetation, stripping and stockpiling of topsoil, and placement of the ablutions hut.

(2) *Operational phase* that will entail opencast mining. The clay will be excavated and loaded onto trucks that will transport it to the Makana Brick Factory (off-site) where it will be used to manufacture clay bricks. Unwanted overburden will be sold as aggregate. Minor processing/screening may be needed to reduce the aggregate to various sized stockpiles.

(3) *Decommissioning phase* which will involve the rehabilitation, sloping and rehabilitation of all affected areas, the replacement of topsoil, and the removal of all infrastructure no longer needed by the landowners. The right holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining right holder will be required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

PHASES OF THE PROJECT

(1) Site Establishment Phase:

Site establishment will entail the demarcation of the mining boundaries, clearance of vegetation (where necessary), and the stripping and stockpiling of topsoil and overburden to allow access to the clay as detailed below:

- **Demarcation of Mining Boundaries:**

  Pursuant to receipt of an Environmental Authorisation (EA) and Mining Right (MR), and prior to mining, the boundary of the mining footprint will be demarcated. Project specific areas to be demarcated within the boundary of the mining footprint may include, but not be limited to, stockpile and processing areas, and the excavation.

- **Clearing of Vegetation:**

  The proposed mining area extends across remnants of the Bisho Thornveld (SVs70) and Grahamstown Grassland Thicket (AT38). Approximately 8 ha of the earmarked footprint

has been altered by clay mining. Most of the earmarked area consists of Grahamstown Grassland Thicket that has a mixture of grassland and more woody Albany thicket vegetation types. In this circumstance the removal of vegetation will be necessary to expand the mining footprint and access the resource. The intention is to minimize the removal of natural vegetation, and to in the end restore the footprint area (through re-seeding) to land suitable for agricultural purposes upon closure, and ultimately the lapse of the mining right.

The draft environmental impact assessment report (DEIAR) will assess and elaborate on the floral component of the study area as part of the EIA process. The assessment will consider the various plant communities, identify areas of concern to be excluded from the mining footprint (if any), instruct on the management of red data/protected species that may be identified, determine the impact that the proposed mining activity will have on the conservation status of natural vegetation in the mining area, and propose management and mitigation measures for identified impacts.

- **Topsoil Stripping:**

It is proposed that topsoil removal will be restricted to the exact footprint of areas to be mined during the operational phase of the activity. The topsoil will be stockpiled at a designated signposted area to be replaced during the rehabilitation of the area. It will be part of the obligations of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon (the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped.

- **Access Roads:**

The Applicant will use the existing gravel farm road, that provides access to the mining area. This road turns off the N2 national road via a formal access. Haul roads will be extended into the mining area as mining progresses. Should haul roads be needed where no farm roads exist the footprint of the haul roads will be contained to the approved mining area, specifically to areas where mining still needs to be done. No haul roads will be allowed over rehabilitated areas and upon closure of the site all haul roads will be ripped and rehabilitated if no longer needed by the landowners.

- **Establishment of Site Infrastructure:**

  Mining of the clay does not require any permanent plant or infrastructure other than an ablutions hut. A temporary crushing and screening plant may (from time to time) be needed to reduce the overburden to the desired aggregate sizes of the clients. The processing infrastructure will be mobile, moving to the stockpiled material as needed. The plant will be powered by generators. No other infrastructure is needed as the Applicant will make use of the existing buildings, storerooms, and workshops at Makana Brick when needed.

  Mining machinery that will operate at the clay quarry consist of the following:

  - Dumper trucks;
  - Earthmoving machinery;
  - Excavation equipment; and
  - Water car/s.

(2) Operational Phase

Clay Mining:

Experience, mainly related to color variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. It has also been found that some layers have high levels of silica and result in extrusion problems, and therefore slope mining is proposed to counter these problems. During the winning process heavy earth–moving equipment will be used to extract clay from the quarry, as follows:

- Topsoil and overburden will be removed by bulldozer and stockpiled separately for future rehabilitation purposes.
- A bulldozer will be used to move clay material along the benches or down the slopes at an incline of between 15 and 22°.
- Mechanical shovels i.e., front-end-loaders load the stockpiled clay onto dump trucks that transport it to the Makana Brick Factory (off-site) where it is stockpiled.
- The clay brick factory collects the clay with front-end-loaders and utilizes it in the brickmaking process.

Aggregate Mining:

A bulldozer will be used to strip the overburden from the clay layer. The overburden will then be loaded onto dumper trucks that will transport it to the stockpile area. It may be necessary (from time to time) to make use of a mobile crushing and screening plant to reduce the

overburden to the sizes desired by the clients. The processing infrastructure will be of temporary and mobile nature, moving to the stockpiled material as needed.

At the primary crusher the aggregate will be fed through a grizzly into the crusher. From the primary crusher the material will be 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.

δ **Water Use:**

The Applicant will obtain water from the already authorised source at Makana Brick and transport it in a water cart to the Orchards mining area when needed. Water will only be needed for dust suppression purposes, as the mining activities do not require process water. To be discussed in more detail in the DEIAR.

δ **Waste Handling:**

The general waste to be generated during the operational phase of the project will be removed from the site to a recognised waste handling facility, while the hazardous waste will be collected from the site by a registered hazardous waste handling contractor. The Applicant will place an ablutions hut at the mine that can be used by the employees. These ablutions will weekly be serviced by a registered sewerage handling contractor.

δ **Electricity:**

When needed the processing infrastructure (for the aggregates) will be powered by generators.

(3) Decommissioning phase:

The closure objectives will be detailed in the Environmental Impact Assessment Report and Environmental Management Programme (EMPR), to be submitted as part of the application process for approval by the Department of Mineral Resources and Energy.

At this stage the following baseline rehabilitation actions are proposed from which a detailed Closure Plan will be developed (to be approved as part of the EIA process):

δ Rehabilitation of all the disturbed surface areas shall entail landscaping, levelling, sloping, top dressing, land preparation, seeding (if required), and weed / alien clearing.

δ All unwanted infrastructures, equipment, and other items used during the mining period will be removed from the site in accordance with section 44 of the MPRDA, 2002.

- δ Waste material of any description, including receptacles, scrap, rubble, and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- δ The rehabilitation area will be cleared of weeds and invader plant species. Priority will be given to 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).
- δ Final rehabilitation shall be completed within a period specified by the Regional Manager.

Once the full mining area was rehabilitated the MR 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.

e) Policy and Legislative Context

Table 4: Applicable legislation and guidelines used to compile the report.

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**
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970).	Assessment of biophysical environment and current land use.
Guideline on Need and Desirability	The need and desirability of the project was assessed in accordance with these guidelines.
Hazardous Substances Act, 1973 (Act 15 of 1973)	The mitigation measures proposed for the project consider the HAS, 1973.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Makana Municipality Final Integrated Development Plan (IDP) 2021-2022	The IDP was used in the assessment of the socio economic profile of the receiving community.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	The mitigation measures proposed for the site consider the MHSA, 1996.
Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) read together with applicable amendments and regulations thereto.	Application for a mining right. Reference number: EC 30/5/1/2/2/10069 MR
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended): δ GNR 517 Listing Notice 2 Activity 17	Application for environmental authorisation. Reference number: EC 30/5/1/2/2/10069 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 R827.	The mitigation measures proposed for the project consider the NEM:AQA, 2004 and the National Dust Control Regulations.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Assessment of biophysical environment.
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 9260).	The mitigation measures proposed for the site consider the NEM:WA, 2008.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Assessment of the cultural and heritage environment.
National Road Traffic Act, 1996 (Act No. 93 of 1996)	The mitigation measures proposed for the project consider the NRTA, 1996.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
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).	The proposed project does not trigger an application in terms of the NWA as the development footprint will be >100 m from the Botha's River.
Public Participation Guideline in terms of the NEMA EIA Regulations.	The guidelines were used during the public participation process.
The South African Constitution.	To be upheld throughout the EIA assessment, planning-, construction-, operational- and decommissioning phases.

f) Need and desirability of the proposed activities.

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

Makhanda has the largest known deposit of good quality clay in South Africa. Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

Considering this, and the lapse of the Makana Brick mining permit the Applicant saw a business opportunity to secure the significant clay resource and supply the desired clay to the Makana Brick Factory. The mining permit footprint of Makana Brick will be incorporated into the proposed mining right footprint, and Makana Brick and the Applicant has therefore entered into an agreement in this regard (see Appendix 9). Should the mining right be granted, the Applicant proposes to take over the rehabilitation liability of Makana Brick for the permit footprint, and therefore the mining right application was accompanied by a Transfer of Environmental Liabilities Application.

Parts of the earmarked footprint has been mined for many years and has very little, if any, other (than mining) economic function left. The proposed development will generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the Social and Labour Plan (SLP), to

be approved as part of the proposed mining right application, the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

The need and desirability of the proposed operation 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		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How were ecological integrity considerations considered? How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?	As discussed under Heading *2(h)(iv)(1)(a) Type of environment affected by the proposed activity*, the Mining and Biodiversity Map shows that the proposed mining footprint does enter areas deemed to be of highest biodiversity importance. According to the DFFE Screening Tool Report the earmarked footprint extends across areas characterised as Critical Biodiversity Area (CBA) 1 & 2, Ecological Support Area 1 (ESA1), and a FEPA sub catchment. The vegetation type of the study area is known as Bisho Thornveld (SVs7) and Grahamstown Grassland Thicket (AT38) that are both characterised as Least Concern in terms of conservation status. The DFFE Screening Report for Environmental Authorisations as required by the 2014 EIA Regulations highlighted the following environmental sensitivities: δ Agricultural Theme: Low & Medium δ Animal Species Theme: Medium & High δ Aquatic Biodiversity Theme: Low & Very High δ Archaeological and Cultural Heritage Theme: Low & Very High δ Civil Aviation Theme: High δ Defence Theme: Low δ Palaeontology Theme: Low & Very High δ Plant Species Theme: Medium δ Terrestrial Biodiversity Theme: Low & Very High The Biodiversity Company was appointed to undertake a terrestrial biodiversity baseline assessment of the earmarked mining area. The specialists concluded that the project area is predominantly comprised of modified, degraded habitat units attributed to the ongoing mining activities recorded. Although the project area falls within CBA 1 & CBA 2 ecosystems, and an ESA 1 ecosystem, ongoing disturbances and impacts associated with the activity will impede on the long-term recovery of the site to a more natural state. Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The earmarked area was instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.	Desirable based on the disturbed nature of the area.

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 pollute and/or degrade the biophysical environment?	Due to the small scale and nature of the proposed mining activities the pollution potential is of low significance. The mining method proposes progressive rehabilitation thereby keeping the impact on the receiving environment as low as possible. As mentioned earlier, due to the disturbed nature of the study area the potential of the proposed project impacting the biophysical environment is unlikely.	
What waste will be generated by this development?	Due to the nature of the project, very little general waste is expected to be generated as a direct result of the mining activities. The general waste will mainly consist of paper, plastic, glass, metal and potentially tin that will be contained in sealable refuse bins that will be removed to the Makhanda landfill site when the capacity of the containers is reached. Likewise, very little generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages/breakdowns. The hazardous waste to be generated will be kept in designated hazardous waste containers to be removed from the site by a registered hazardous waste handling contractor. Chemical ablution facilities will be available to the employees that will be serviced at least weekly by a registered sewerage handling contractor. No waste will be disposed of or treated on the mining area/farm.	Highly Desirable
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	Makana Brick has been mining clay from Portion 3 of The Orchards No 233 for the past 5 years. Dr J Binneman did a letter for recommendation for exemption of a full phase 1 Archaeological Impact Assessment (AIA) in 2017 as part of the mining permit application (4.9 ha). Dr Binneman did not observe any sites/materials during his site assessment, and recommended exemption from an AIA as the area is of low cultural sensitivity and it is unlikely that any archaeological remains will be found on the property. Further to this, the DFFE screening tool shows most of the area is of low significance. Therefore, an AIA/HIA will not be done as the project is unlikely to impact on any areas of cultural and/or archaeological importance.	Highly desirable based on the disturbed nature of the area and the site specific geology.

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**
	Dr Robert Gess was appointed to do a Palaeontological Heritage Impact Assessment (PIA) of the proposed mining area. Dr Gess concluded that almost the entire area is deeply underlain by strata of the Witpoort Formation, which are variably overlain by silcrete of the Grahamstown Formation. In places small outcrops of Witpoort Formation quartzite were observed to the south of historic diggings. Historic diggings in the north of the proposed mining right have targeted a thick bed of kaolin clay derived from an (originally black) mudstone layer. Due to its proximity to surface the shale was subsequently reduced to kaolin by deep leaching during and following the Cretaceous period – the silica and metallic elements having crystalised out near surface to produce the silcrete capping. As a result of the kaolinization of the strata their probable original palaeontological interest has been destroyed. It remains possible, however, that as the fold dives down in a southerly direction it may, in places still be capped by southwardly dipping sheets of quartzitic strata. If this is the case, it may be that there are areas which have not been entirely kaolonised and where fossils may still be discernible in the strata. The specialist recommended that should more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess them for palaeontological potential. ECPHRA (Eastern Cape Provincial Heritage Authority) commented on 20 November 2023 that this project was tabled at the Archaeology, Palaeontology and Meteorites Committee meeting on 16 November 2023, and the outcome of the meeting was that the proposed development may proceed as proposed, provided that the recommendations of the heritage specialists are adhered to including the chance find protocol.	
How will this development use and/or impact on non-renewable natural resources?	The Applicant proposes to sell the clay mined from the earmarked footprint to the Makana Brick Factory, and the aggregate will be sold to the local market in and around the mine. Presently, it is believed that the proposed area may have a probable clay reserve of ±630 000 m^3. Based on the proposed production rate, the clay resource shows a potential life of mine of ±79 years. The probable aggregate reserve of the area was estimated to be ±600 000 m^3 with a life of mine of ±80 years. Considering this, the Applicant will responsibly consume the clay and aggregate resources of the study area.	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?	The proposed mine will make use of generators to power the site infrastructure and use water from the already authorised source (dam) at Makana Brick (off-site). Water will only be used for dust suppression purposes as the mining activities do not require any processing water.	Highly Desirable
How were a risk-averse and cautious approach applied in terms of ecological impacts?	The specialists (TBIA & PIA) proposed mitigation measures to be implemented by the proposed mine to lessen the impact of the proposed activities on the ecological aspects of the site. Both specialists concluded that should these mitigation measures be implemented the proposed project can be authorised.	Highly Desirable
How will the ecological impacts resulting from this development impact on people's environmental right?	The mine will be managed in accordance with the agricultural practices of the farm. As mentioned in Heading *3(j)(1) Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be assessed during the following EIA phase. By nature these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project.	Desirability to be assessed during the EIA phase; however presently the project is not expected to impact on people's environmental rights.
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.	The Applicant entered into a usage agreement with the landowner as well as Makana Brick that is a lawful occupier. As mentioned earlier, the potential impact of the proposed activity on the receiving environment, as well as any other impacts to be identified will be fully assessed during the EIA phase. Clay mining on this property is already well known in the surrounding community and to date no serious environmental or socio-economic impacts were identified. Further to this, the revenue to be generated by the mine will be an additional source of income (rental) to the landowner. The mine will sub-contract the mining of the clay to a local contractor and contribute to the community as part of its SLP obligations.	
Based on all of the above, how will this development positively or negatively impact on ecological integrity	The findings of the specialists did not identify any fatal flaw or red flag issue regarding the development of the proposed mine. As mentioned above, should the mitigation measures proposed by the specialists be implemented the proposed project can be authorised.	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**
objectives/targets/considerations of the area?	The mine must be rehabilitated in accordance with the EMPR and Closure Plan, to be approved for this project, upon closure to reinstate all disturbed areas and minimise residual impacts.	
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		

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 Heading 2(h)(iv)(1)(a) 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?	As mentioned in Heading *3(j)(1) Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be fully assessed during the following EIA phase.	

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
	If approved, the Orchards Mine proposes to be a highly regarded supplier of clay and/aggregate in the Makhanda community. The mine will further contribute directly to the greater society through the employment of a local mining contractor as well as the Local Economic Development (LED) commitments of the mine (stipulated in the SLP). Indirectly, the mine will contribute to local industry development (clay for brick making), and the spending of wages in the Makana area.	
How will this development address the specific physical, psychological, developmental, cultural, and social needs and interests of the relevant communities?	The mine intends to supply clay to the Makana Brick Factory and aggregate to the building industry in the Makana and greater Sarah Baartman District. In addition, the mine will be committed to Human Resources Development, Local Economic Development as prescribed in the SLP. The potential impact of the proposed activity on the physical, psychological, cultural, or social needs of the community will be fully assessed as part of the following EIA phase. Also refer to the discussion under Heading 2(k) *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.*	Highly Desirable
Will the development result in equitable impact distribution, in the short- and long-term?	The Orchards Mine intends to sub-contract the mining activities to a local contractor for the duration of the mining right (±30 years). This is of crucial importance in the MLM with an unemployment rate of 32.5%. Further to this, the mine will operate in accordance with the provisions of the Mining Charter, 2018 as well as the Employment Equity Act, 1998 giving preference to historically disadvantaged employees from within the local area in terms of employment.	Highly Desirable
In terms of location, describe how the placement of the proposed development will contribute to the area.	The clay resource on Portion 3 of The Orchards No 233 has been mined since the 1980's, and the mine is a well-known clay supplier in the area. The proposed expansion of the mining activities from the mining permit footprint (4.9 ha) will increase the production capacity of the mine, as well as prolong the validity of mining on the property, extending it from the allowable 5 years (maximum) for a mining permit, to ±30 years allowed for a mining right.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
	The landowner can also enjoy the continued benefits of a diversified property income through agriculture and small scale mining.	
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	The mitigation measures proposed in this report, but more importantly those of the final EIAR and EMPR (to be drafted), are compiled in consultation with the specialists to reduce the potential impact that the proposed activity may have on the receiving environment. Once approved, the management outcomes are legally binding, and to be implemented by site management for the duration of the site establishment-, operational- and decommissioning phases.	Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	As mentioned in Heading *3(j)(1) Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be fully assessed during the following EIAR phase. By nature these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project. However, the project is not expected to impact on the surrounding people's environmental rights.	Desirability to be assessed during the EIA phase; however presently the project is not expected to impact on people's environmental rights.
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?	The Applicant entered into a usage agreement with the landowner as well as Makana Brick that is a lawful occupier of Portion 3 of The Orchards No 233. As mentioned earlier, the potential impact of the proposed activity on the receiving environment, as well as any other impacts to be identified will be assessed during the EIA phase. Clay mining on this property is already well known in the surrounding community and to date no serious environmental or socio-economic impacts were identified. Further to this, the revenue to be generated by the mine will be an additional source of income (rental) to the landowner. The mine will also sub-contract the clay mining to a local mining contractor and contribute to the community as part of its SLP obligations.	
What measures were taken to pursue the selection of the "best practicable		

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
environmental option" in terms of socio-economic considerations?	The findings of the specialists did not identify any fatal flaw or red flag issue regarding the development of the proposed mine. As mentioned above, should the mitigation measures proposed by the specialists be implemented the proposed project can be authorised. The mine must be rehabilitated in accordance with the EMPR and Closure Plan, to be approved for this project, upon closure to reinstate all disturbed areas and minimise residual impacts.	
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?		
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?	The mine will have to be operated 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; Should the proposed application be approved the mining area will also be subject to compliance with the above listed.	Highly Desirable
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?		
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for	The mine intends to supply clay to the Makana Brick Factory and aggregate to the building industry in the Makana and greater Sarah Baartman District. In addition, the mine must meet the commitments of the SLP regarding	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
opportunities for all the segments of the community that is consistent with the priority needs of the local area.	Human Resources Development, Local Economic Development, and the process pertaining to management of downscaling and retrenchment.	
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 must operate in accordance with the specifications of the Mine Health and Safety Act, 1996 (MHSA). Site management will have daily discussions with the staff regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the daily site meetings. The MHSA further requires the submission of quarterly occupational hygiene reports that record site specific occupational hygiene exposure assessments.	Highly Desirable
Describe how the development will impact on job creation in terms of, amongst other aspects?	The Applicant intends to sub-contract the mining of the clay to a local contractor. The employees of the sub-contractor will be sourced from the local community.	Highly Desirable
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 proposed mine will operate under a valid environmental authorisation and mining right to be issued by the DMRE-EC. Compliance of the site with the approved EMPR and EA conditions will be reported on as per departmental specification. Considering 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 preliminary list of mitigation measures proposed in this document is realistic and can be implemented (when needed) by the mine. Should the mined areas be rehabilitated successfully, no long-term management burden will be left behind.	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 costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for by those responsible for harming the environment.	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. Upon approval of this application, Makhanda Mining (Pty) Ltd will lodge a financial guarantee with the DMRE that will be 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
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	The findings of the specialists will be assessed and if needed various layout alternatives will be proposed to minimise the impact of the mining activity on biophysical sensitive areas. These findings will be collated in the draft EIAR that will be distributed for public perusal and commenting. Following the commenting period, the project proposal will be finalised.	Need and desirability to be determined during the following EIAR phase.
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.		

g) Period for which the environmental authorization is required

The Applicant requests that the Environmental Authorisation (EA) be valid for at least the duration of the mining right.

h) Description of the process followed to reach the proposed preferred site.

NB!! This section is not about the impact assessment itself, It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

i) Details of all 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

a) <u>The property on which, or location where, it is proposed to undertake the activity</u>

Presently, the project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3 and depicted in Figure 2.

Applicants can only apply for mining rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the mining activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed mining operations is to exploit the economically viable clay deposits (and overburden as aggregate) on the earmarked farm, an area known to contain these resources needs to be selected.

The earmarked property encompasses the Grahamstown Formation of the Cenozoic Deposits of the interior, immediately adjacent to the Witpoort Formation of the Witteberg Group of the Cape Supergroup. The Grahamstown Formation comprises of silcrete and kaolinite, with the former overlying the latter. A distinct variance in the colour of the clay/kaolin can be observed on site. The study area is located on the northern aspects of a slope decreasing in elevation towards the north, terminating in the Both's River, near the origin. The Botha's River marks the contact zone between the Grahamstown Formation and the Witpoort Formation. The presence of constant mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting.

The property and location of the proposed mining area were identified during the planning phase by the Applicant and project team, as the preferred site alternative based on the following:

- Various parts of the proposed footprint was previously mined, and the footprint is highly transformed. Thus the mining area will be situated within a disturbed area.

- The proposed mining right footprint is an extension of the existing Makana Brick mining permit area (4.9 ha) that has already proven the excellent quality and ample quantity of the clay resource. The proposed footprint was therefore placed over the most desirable part of the farm.
- The Applicant entered into an access agreement with the landowner, as well as Makana Brick (as lawful occupier of the property) who in principal support the proposed project;

The proposed footprint of the MR application was based on the available geological information. No further location/site alternatives are considered in the Scoping and EIA process.

b) Type of activity to be undertaken

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at 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. All activities will be contained within the approved boundaries of the site.

The nature of the operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate).

c) Design and layout of the activity

The Applicant will not establish any permanent infrastructure and/or buildings on site. The crushing plant and ablution hut will both be of temporary nature and can be moved as mining progress. Haul roads will also be developed as mining progress.

The Applicant requires the following materials from the proposed mine:

1. Kaolin clay;
2. Naartjie red clay;
3. Yellow clay; and
4. Aggregates.

The highest set kaolin is a cream coloured friable type of clay with a low grit content, not very plastic, most of which is still evident in the old mining area (mining permit) to the east near the top of the mine. The second kaolin is a light grey plastic, grit free clay. The third type of kaolin,

the deepest of the three, is a dark grey clay which is very plastic (found just above dam level below the slope).

The Naartjie Red Clay, normally the first clay found beneath the overburden, has deposits which vary in depth between 1 m and 4 m. This high iron content clay provides the colour and unique reduction flashes to both Makana Brick's Ironspot and Cathcart Travertine bricks, which over the years have become synonymous with Makana Brick.

Although the seams of different clays in this mine are difficult to predict due to the undulating nature of their deposits, between 1 m and 5 m deep seams of Yellow Clay can normally be found below or sometimes adjacent to the Naartjie Red. This Yellow clay does sometimes reappear between seams of white Kaolin further down as experienced on the slope of the mining permit area, as well as a deep deposit below the Kaolin towards the base of the overall clay deposit. However, sometimes Naartjie Red goes straight into White Kaolin with no Yellow between, as found at the top of the slope in front of the silcrete capping.

The design and layout of the proposed footprint were based on the available clay resources and colour variants as depicted in the following figure. No further design/layout alternatives are considered in the Scoping and EIA process.

Figure 3: Plan showing the aggregate (silcrete) and clay sources within the earmarked area. Note white, and yellow kaolin in blocks A & H, and Naartjie Red Clay in blocks C & D.

d) Technology to be used in the activity.

As mentioned earlier, experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. It has also been found that some layers have high levels of silica and result in extrusion problems, and therefore slope mining is proposed to counter these problems. During the winning process heavy earth–moving equipment will be used to extract clay from the quarry, as described in Section 2(d)(ii) *Description of the activities to be undertaken – Operational Phase*. Similarly, the aggregate will be recovered through direct stripping, processing (when needed) and loading.

The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. The processing infrastructure will be of temporary and mobile nature, moving to the stockpiled material as needed.

This project does not require complex technology to allow the winning of the intended minerals, and therefore no further technology alternatives are considered in the Scoping and EIA process.

e) Operational aspects of the activity

The operational aspects of the activity was based on the historic mining activities that has been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The Applicant already holds water rights that can supply the project with water, no electricity connection is needed, no servicing of mining equipment will be required on site, and the mining sub-contractor will transport the material from the mine to Makana Brick along existing roads.

The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation.

f) Option of not implementing the activity (No-go Alternative)

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. If the no-go alternative is implemented the land use of the earmarked footprint will remain that of agriculture, and livestock farming with the clay (and aggregate) resource unmined.

The no-go option will further entail a loss of employment opportunities, as well as socio-economic benefits and growth development opportunities. Given the high levels of unemployment and poverty in the Makana Magisterial Districts the loss of such opportunities is considered significant.

The positive implications of the no-go alternative are that there will be no impact on the bio- and geophysical environment of the earmarked area.

ii) Details of the Public Participation Process Followed

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

The relevant stakeholders and I&AP's were informed of the mining right application by means of an advertisement in the Daily Dispatch, and on-site notices that were placed at the entrance to the farm and the Makana Library. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 24 November 2023) was also sent to the landowner, neighbouring landowners, stakeholders, and I&AP that may be interested in the project. The comments received on the DSR were incorporated into this report the final Scoping Report (FSR) to be submitted to the DMRE for consideration. The following table provides a list of the I&AP's and stakeholders that were informed of the project. Thus far, comments were only received from ECPHRA and the Commission on Restitution of Land Rights. Also refer to Appendix 11 for the proof of public participation conducted thus far.

Upon approval of the Final Scoping Report the Draft Environmental Impact Assessment Report will be compiled and circulated for public comment for a 30-day commenting period. The comments received on the draft EIA & EMPR will be incorporated into the final EIA & EMPR to be submitted for decision making to DMRE.

Table 6: List of the landowners, I&AP's and stakeholders that were informed of the project and availability of the DSR.

LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: δ Mr AM Moss Portion 3 of The Orchards No 233 **Surrounding Landowners and I&AP's:** δ Amaraka Inv No 6 (Pty) Ltd The Orchards No 233 Orchards Lodge δ Meadow View Trading 116 CC Farm No 599 δ Mr AJ Diedericks Portion 4 of Grobbelers Kloof No 334 δ Makana Municipality Erf No 4807 Portion 7 of Tempe No 240 Portion 11 of Tempe No 240 Portion 12 of Tempe No 240 δ SANRAL Portion 2 of Grobbelers Kloof No 334	δ Department of Economic Development, Environmental Affairs and Tourism – East London; δ Department of Economic Development, Environmental Affairs and Tourism – Queenstown; δ Department of Labour; δ Department of Public Works; δ Department of Rural Development and Agrarian Reform; δ Department of Rural Development and Land Reform; δ Department of Transport; δ Department of Water and Sanitation; δ Eastern Cape Provincial Heritage Resources Authority; δ Eskom; δ Makana Local Municipality – Ward 13; δ SANRAL; δ Sarah Baartman District Municipality.
COMMENTS RECEIVED ON THE DSR	
δ ECPHRA, and δ Commission of Restitution of Land Rights.	

iii) Summary of issues raised by I&Aps

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

Table 7: Summary of issues raised by I&AP's and stakeholders.

Interested and Affected Parties **List the names of persons consulted in this column, and** **Mark with an X where those must be consulted were in fact consulted**		**Date Comments Received**	**Issues raised**	**EAP's response to issues raised by the Applicant**
AFFECTED PARTIES		**-**	**-**	**-**
Landowner/s	**X**	**-**	**-**	**-**
Mr AM Moss δ Portion 3 of The Orchards No 223 δ Portion 3 of Grobbelers Kloof No 334	X	The landowner is aware of, and supports, the application in principle. Refer to Appendix 10 for a copy of the landowner agreement.		
Lawful occupier/s of the land	**N/A**	-		
-	**-**	-		
Landowners or lawful on adjacent properties	**X**	**-**	**-**	**-**
Amaraka Inv No 6 (Pty) Ltd δ The Orchards No 233 δ Orchards Lodge	X	No comments were received on the DSR that could be incorporated into the FSR.		
Meadow View Trading 116 CC δ Farm No 599	X	No comments were received on the DSR that could be incorporated into the FSR.		
Mr AJ Diedericks δ Portion 4 of Grobbelers Kloof No 334	X	No comments were received on the DSR that could be incorporated into the FSR.		
Makana Municipality δ Erf No 4807 δ Portion 7 of Tempe No 240 δ Portion 11 of Tempe No 240 δ Portion 12 of Tempe No 240	X	No comments were received on the DSR that could be incorporated into the FSR.		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted		Date Comments Received	Issues raised	EAP's response to issues raised by the Applicant
SANRAL δ Portion 2 of Grobbelers Kloof No 334	X	No comments were received on the DSR that could be incorporated into the FSR.		
Municipal councillor Ward 13	**X**	No comments were received on the DSR that could be incorporated into the FSR.		
Municipality Makana Local Municipality (MLM)	**X**	No comments were received on the DSR that could be incorporated into the FSR.		
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA etc	**X**	**-**	**-**	**-**
Department of Transport	X	No comments were received on the DSR that could be incorporated into the FSR.		
Department of Water and Sanitation	X	No comments were received on the DSR that could be incorporated into the FSR.		
Department of Public Works	X	No comments were received on the DSR that could be incorporated into the FSR.		
Eskom	X	No comments were received on the DSR that could be incorporated into the FSR.		
SANRAL	X	No comments were received on the DSR that could be incorporated into the FSR.		
Communities		No communities border the mining area or were identified within 100 m from the site.		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted		Date Comments Received	Issues raised	EAP's response to issues raised by the Applicant
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
Dept. Land Affairs	-	23/10/2023	The Commission on Restitution of Land Rights responded that the Commission is not currently aware of a land claim registered on Portion 3 of the farm The Orchards No 233.	-
-	-	-	-	-
Traditional Leaders		No tradition leaders borders the mining area or were identified within 100 m from the site.		
-	-	-	-	-
Dept. Environmental Affairs	**X**	-		
Department of Economic Development, Environmental Affairs, and Tourism (DEDEAT)	X	No comments were received on the DSR that could be incorporated into the FSR.		
Other Competent Authorities affected		-	-	-
Department of Rural Development and Agrarian Reform (DRDAR)	X	No comments were received on the DSR that could be incorporated into the FSR.		
Department of Rural Development and Land Reform (DRDLR)	X	No comments were received on the DSR that could be incorporated into the FSR.		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted		Date Comments Received	Issues raised	EAP's response to issues raised by the Applicant
Department of Labour	X	No comments were received on the DSR that could be incorporated into the FSR.		
Sarah Baartman District Municipality	X	No comments were received on the DSR that could be incorporated into the FSR.		
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	X	20/11/2023	ECPHRA provided the following final comments in terms of Section 38(4/8) of the NHRA, 1999: "The matter was tabled at the Archaeology, Palaeontology and Meteorites Committee meeting held on 16 November 2023. The proposed development may proceed as proposed, provided that the recommendations by the heritage specialists are adhered to including the chance finds protocol. ECPHRA further requests: • Monitoring reports for this development, and • Details of the specialist to conduct training for the ECO."	The requirements of ECPHRA will be incorporated into the EIAR and EMPR to be implemented upon approval.
OTHER AFFECTED PARTIES		-	-	-
-		-	-	-
INTERESTED PARTIES		-	-	-

iv) The Environmental attributes associated with the sites.

(1) Baseline Environment

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

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

(Information extracted from the Basic Assessment Report for the Makana Brick Mining Permit compiled by Stellenryck Environmental Solutions, 2017)

This section describes the general biophysical, cultural, and socio-economic environment as well as baseline conditions that may be affected by the proposed project. The information provided here was obtained from desktop studies and must be treated as preliminary. More detailed information based on site specific conditions, obtained during site assessments, and focussed investigations will be collected during the EIA process and elaborated on in the DEIAR.

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.

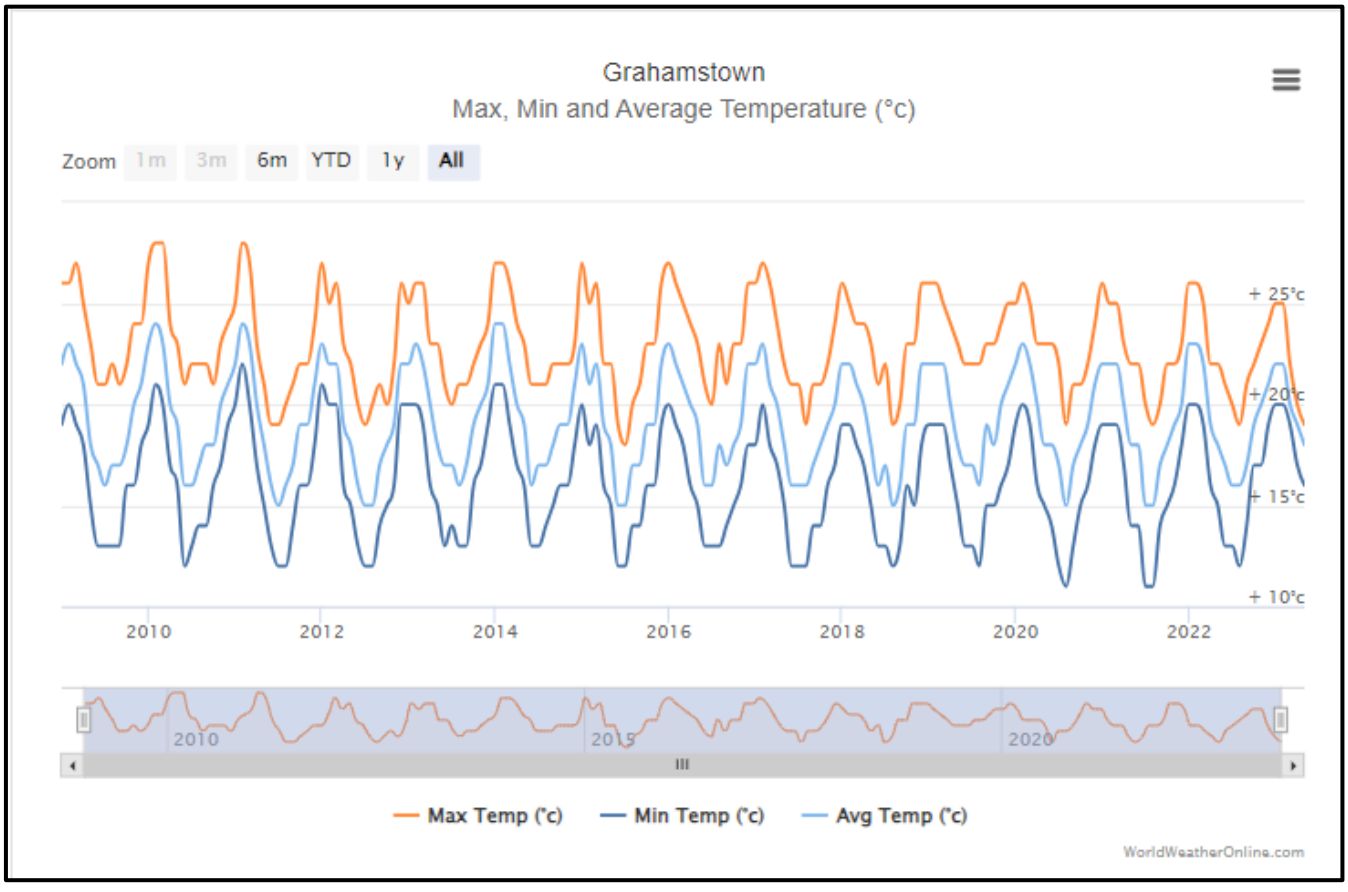

Figure 4: Chart showing the maximum, minimum, and average temperatures of the Makhanda region over a period of 12 years (chart obtained from http://www.worldweatheronline.com)

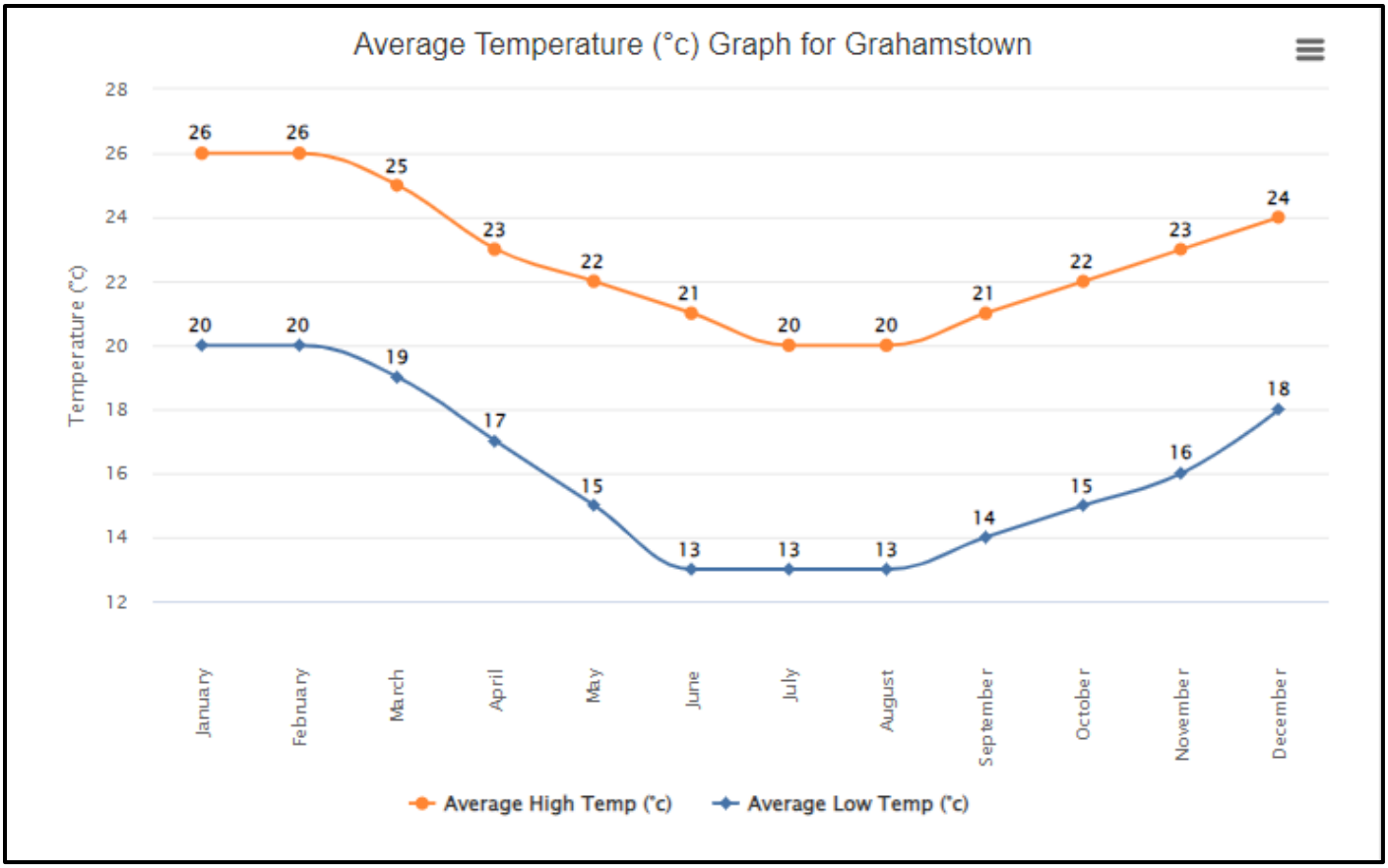

Figure 5: Chart showing the monthly average temperature of the Makhanda region (chart obtained from http://www.worldweatheronline.com)

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 May 2022 to May 2023 was ±477 mm, while the area received the lowest rainfall during March 2023 and the highest in May 2023.

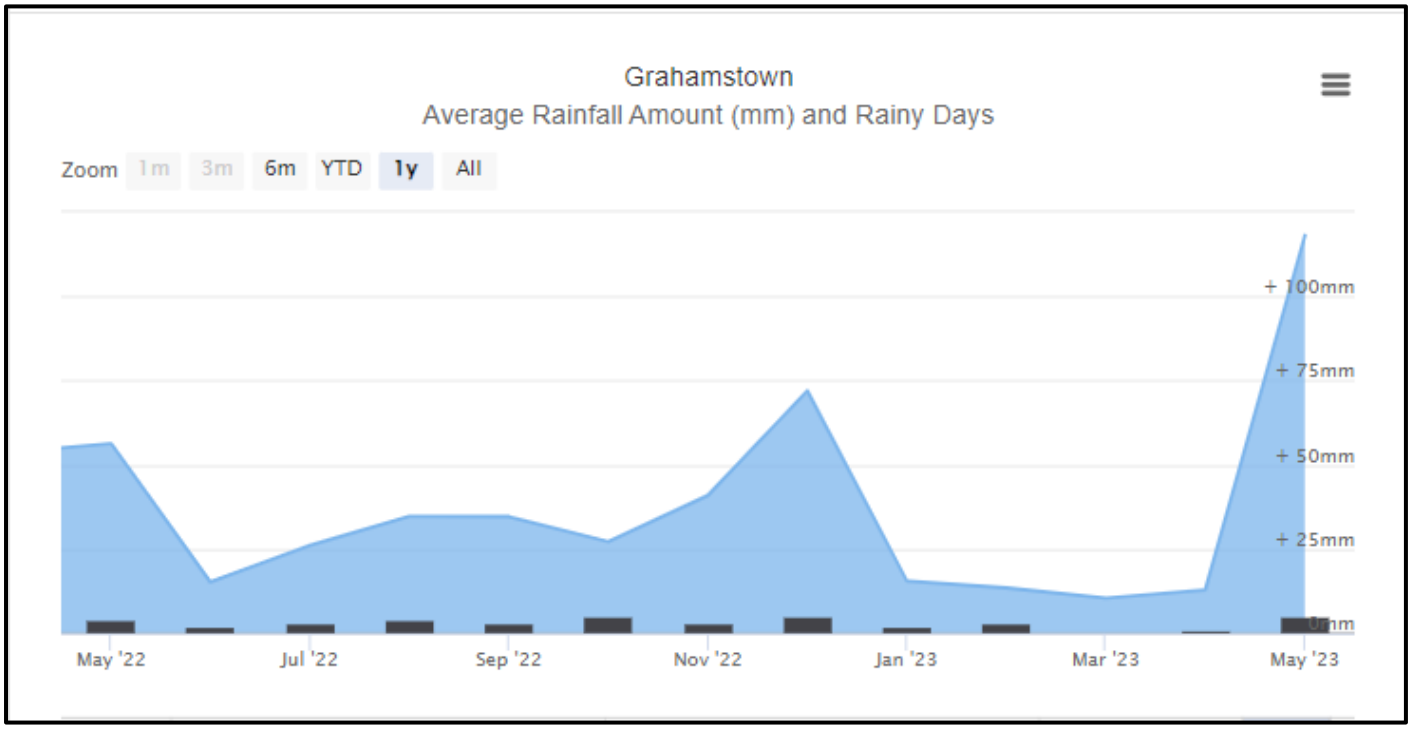

Figure 6: Chart showing the rainfall amount and rainy days for the Makhanda region (chart obtained from http://www.worldweatheronline.com)

The prevailing 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.

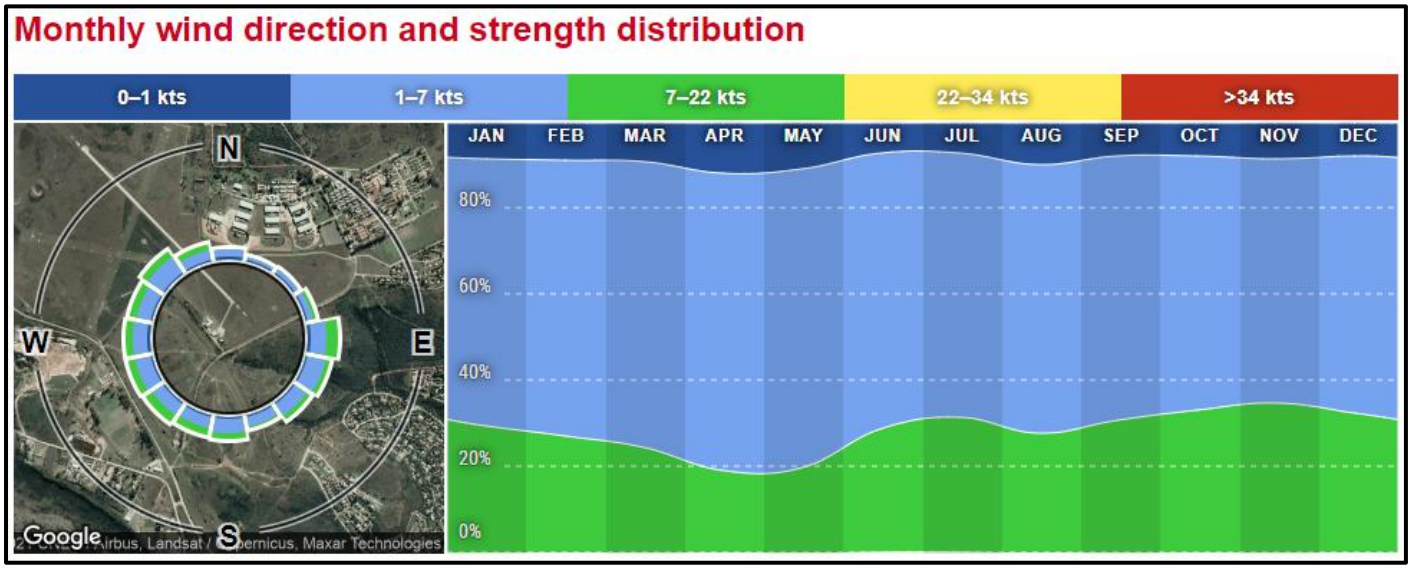

Figure 7: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Makhanda area (image obtained from http://www.windfinder.com/windstatistics/grahamstown).

TOPOGRAPHY

The topography of the greater study area is highly undulating as shown in the figure below. The area has elevations ranging between ±534 – ±663 mamsl. The study area is generally described as level plains with some relief, varying to open high hills or ridges (SES, 2017).

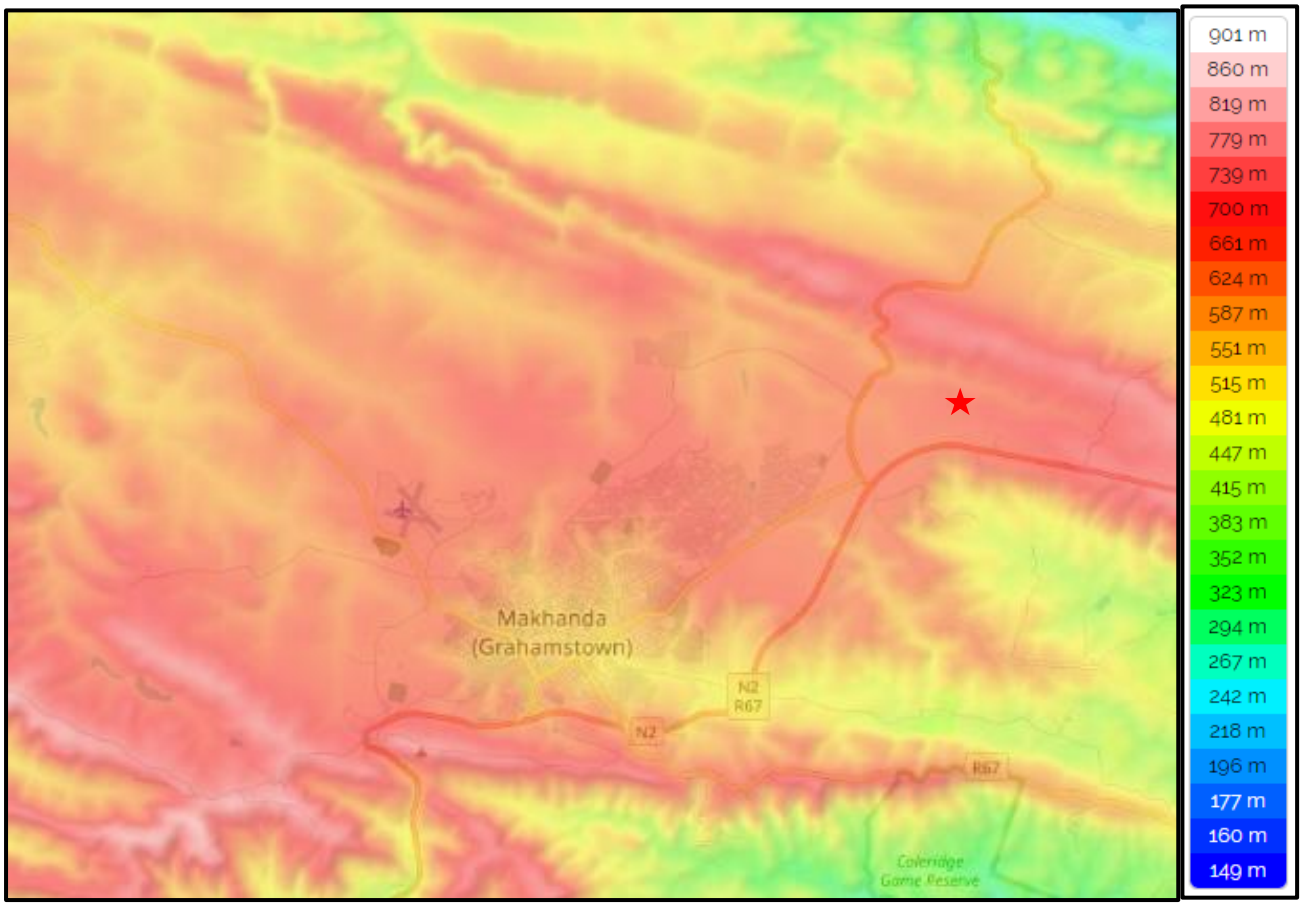

Figure 8: Map showing the topography of the greater Makhanda area (image obtained from http://www.en-za.topographic-map.com/maps/gwpq/South-Africa/).

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Topography.*

VISUAL CHARACTERISTICS

The aesthetic value of the study area is deemed to be of low-attractive and of moderate-low aesthetic value as the farm has been extensively mined over the years. The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by road- and electricity infrastructure, and transformed by township developments.

Owing to the elevation of the site, most of the farm is visible from the immediate surroundings. Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Visual Characteristics.*

GEOLOGY AND SOILS

(Information extracted from the Geological Report for Grahamstown Brick (Pty) Ltd t/a Makana Brick situated on Portion 3 of the farm The Orchards 233, Division of Grahamstown, Eastern Cape Region, Stellenryck Environmental Solutions, 2017)

The study area is situated in a locality encompassing lithological units of the Grahamstown Formation of the interior Cenozoic Deposits. However, immediately north of the study area, lithological units of the Witteberg Group of the Cape Supergroup were also present and for this reason, the regional description of the geology of the immediate area, will include descriptions of both the Grahamstown Formation and Witteberg Group.

Witteberg Group

The total thickness of the strata of the Witteberg Group decreases from about 1 700 m to 1 200 m, from east to south-west, lessening swiftly towards the north along the western boundary of the basin. Generally micaceous mudrock and quartzitic sandstone are present in approximately equal quantities.

The Witteberg Group comprises of various Subgroups and Formations, which include the Weltevrede Formation, which becomes the Weltevrede Subgroup west of 21°E, the Witpoort Formation, the Lake Mentz Subgroup, and the Kommadagga Subgroup only found east of 23°E. The thickness of the various formations and subgroups varies significantly, with the Witpoort Formation and the Weltevrede Formation having the highest thickness of 850 m each.

Cenozoic Deposits of the Interior

In the Early Miocene an epeirogenic uplift of modest proportion took place, which is considered the earliest Cenozoic event which possess sufficient largely available evidence. The most significant amplitude is belived to have been in the woutheastern hinterland of southern Africa, while in the west it resulted in a rejuvenation of the slow-paced drainages extending across the African Surface, of which the net result was renewed incisions along the previously created valleys. Minor uplift along some interior axis of warping may have occurred simultaneously. Studies focusing on the sizes of clast within coastal deposits suggests that this escarpment may have retreated by up to 100 km from the coast, by mid-Cretaceous.

Upliftment of about 700 – 900 mm took place along an axis approximately 80km from the coast in the south-east along a range between Port Elizabeth and Swaziland, between 3 – 5 Ma in the Pliocene. This resulted in the steepening of the Lebombo monocline, although the coastal plain to the east was left largely unaffected, where propagation

persisted through the Late Neogene and subsequently produced successive rows of longshore dunes.

Surviving Africa Surface remnants are virtually universally capped by mature pedocretes (superficial materials that were originally weathering residues or sedimentary layers in soil profiles and have undergone cementation by minerals precipitated by groundwater), which primarily underlain by deeply kaolinized weathering profiles which may be up to 50 cm thick and formed during the Cretaceous climate. Silcretes dominates in the areas west of 29°E which has a drier climate, as well as in the Limpopo Valley, however Griqualand West where dolomitic rocks of the Transvaal Supergroup underlies, widespread calcrete duricrusts are present.

The silcretes of the Eastern Cape have been referred to as the Grahamstown Formation and displays a wide range of compositions, varying from cemented scree deposits to sand and pebbles cemented in hard, secondary siliceous matrix, all in which fossils are rarely present. In areas surrounding Grahamstown (Makhanda), the thickness of these deposits consists of multiple layered sequences, reflecting inconsistent soil moisture regimes, whereas the general thickness varies from a couple of centimetres up to 2 m or more.

Cape Fold Belt

The site is situated in the structural domain known as the Cape Fold Belt. This is an orogenic range that extends ±1 000 km east from the city of Cape Town, and about 100 km north from Cape Town. The deformation of the Cape Supergroup during the Cape Fold Belt orogeny was directly related to the deposition of parts of the Karoo Supergroup.

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Geology.*

HYDROLOGY

The study 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 falls within a NFEPA in terms of wetlands and/or rivers. The proposed mining footprint does not extend into any strategic water management area.

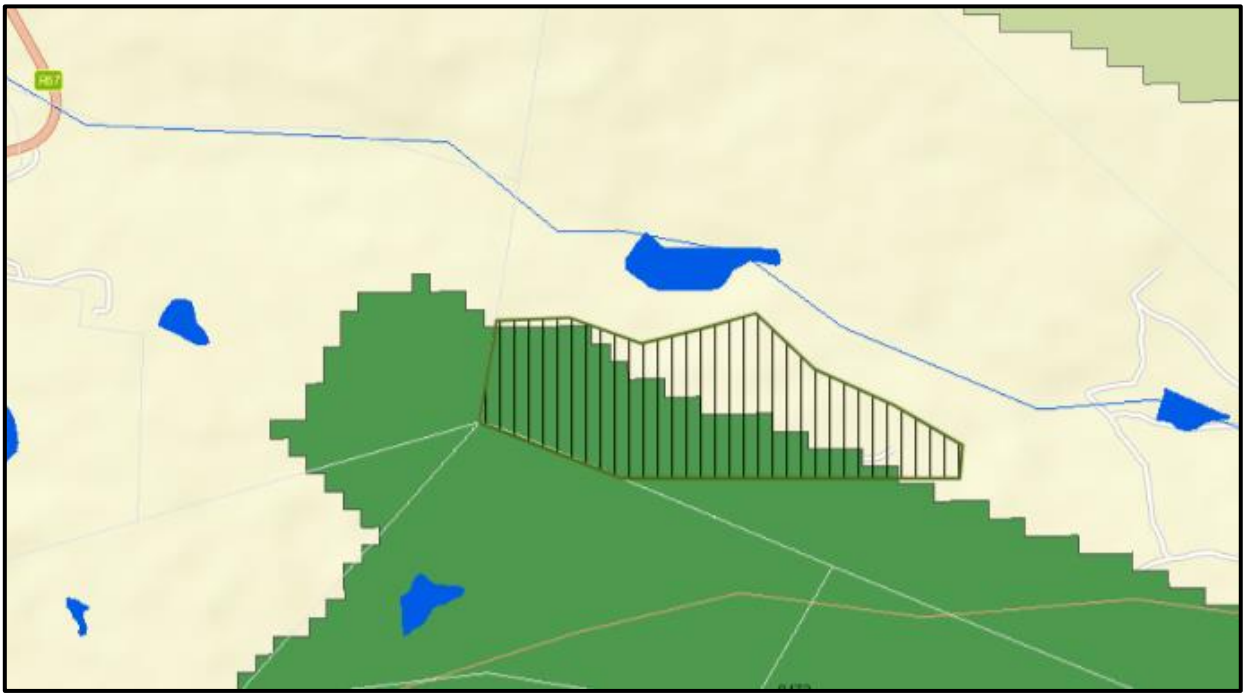

Figure 9: NFEPA BGIS Map Viewer showing the extent of the NFEPA (green shading) that the study area extends into. The blue line north of the proposed mining footprint (blue polygon) represents the Botha's River (image obtained from the BGIS Map Viewer – National Wetlands and NFEPA).

The study area falls within the Botha's River catchment area and this small river is more than 100 m away from the mine boundary. The Botha's River is a tributary of the Great Fish River and feeds two large man-made dams, which together with several smaller dams and numerous seasonal pans provide important water sources to animals (SES, 2017). The 2017 EMPR of Makana Brick notes that the Botha's River ecological status is classified as AB condition, which is considered intact and able to contribute towards river ecosystem biodiversity targets. SES reported in 2017 that an assessment of the Botha's River revealed three man-made dams/weirs within 2.5 km from each other, alien vegetation along the riverbanks and cultivation lands on the riverbanks. The AB classification for the river might be applicable to the lower reaches of the river, but not for the upper reach.

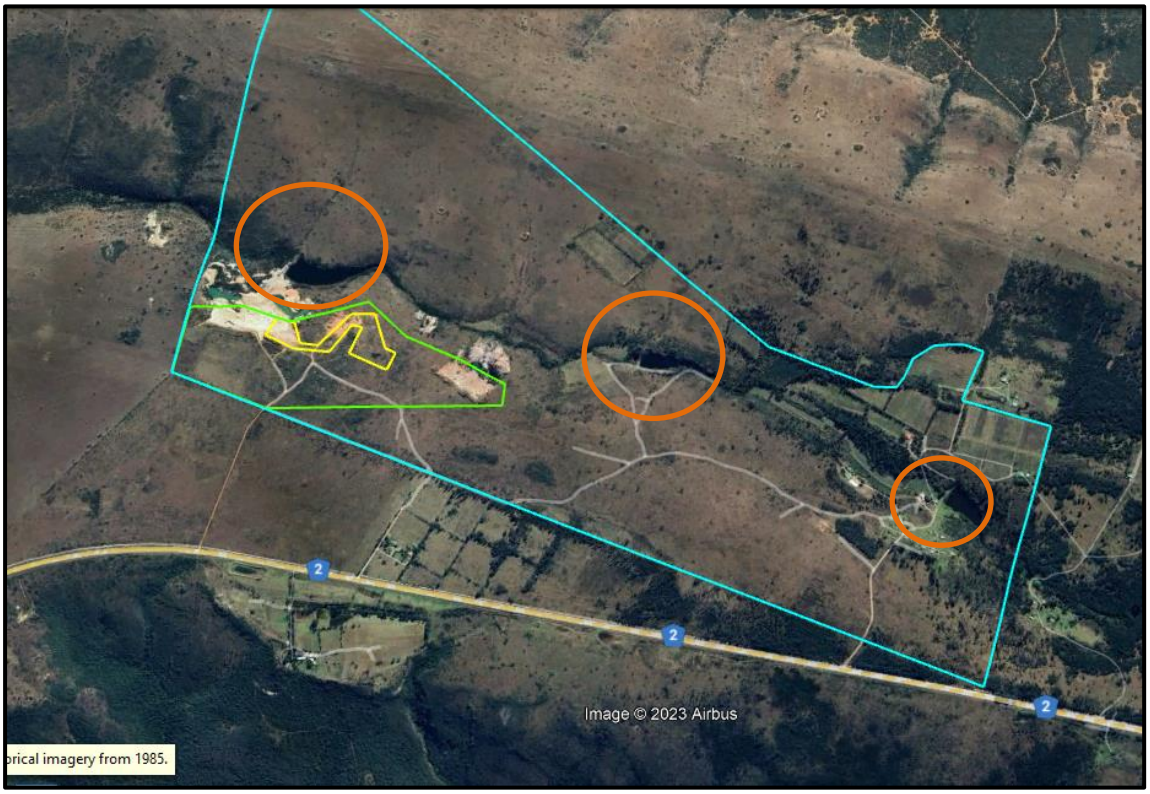

Figure 10: Satellite view of the Botha's River where the orange circles show the man-made dams/weirs. The green polygon shows the mining right application area, the yellow polygon indicates the mining permit area, and the blue polygon shows the farm boundary (image obtained from Google Earth).

The Albany Coast south and east of Grahamstown (Makhanda) has an elevated borehole concentration, with most boreholes situated in the fractured Witteberg Aquifer, and to a lesser degree, within the primary intergranular Algoa Aquifer and coastal dune belt. Groundwater is under-utilized in the Albany Coastal sub-area. Groundwater depth also varies in this area between 70 -120 m (SES, 2017).

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Hydrology.*

AIR QUALITY AND NOISE AMBIANCE

The air and noise ambiance of the study area is representative of an agricultural environment in which farming equipment operates with occasional dust emissions from denuded areas. The small scale mining at the permit area and surroundings contributes to the emissions (air & noise) to a slight degree through the movement of excavation- and earthmoving equipment, and delivery of clay to clients. Although the above mentioned developmental changes affect the ambiance of the receiving environment, the study area is still deemed representative of a rural landscape.

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Air Quality and Noise Ambiance.*

BIOLOGICAL ENVIRONMENT

MINING AND BIODIVERSITY

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 position of the study area is placed on the Mining and Biodiversity Map, as shown in the figure below, almost the whole farm is classified as an area of highest biodiversity importance with highest risk for mining as shown in the following figure.

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.

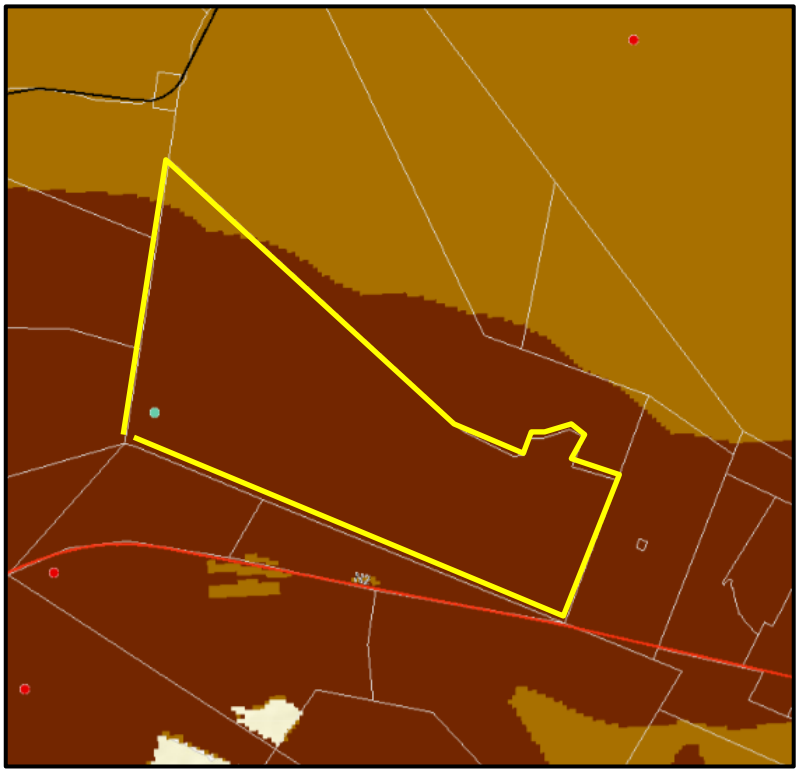

Figure 11: The Mining and Biodiversity importance map where the yellow polygon shows the farm boundary. Dark brown – highest biodiversity importance. (Image obtained from the BGIS Map Viewer: Mining Guidelines)

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna.*

BIODIVERSITY CONSERVATION AREAS

According to the DFFE Screening Tool the earmarked footprint extends across areas characterised as CBA1, CBA2, and ESA1 as shown in the following figure. The Lexicon of Biodiversity Planning in South Africa provides the following definition for a CBA and ESA:

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

- Ecological Support Area (ESA): *"An area that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem*

services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or not necessary to meet them in natural or near-natural areas."

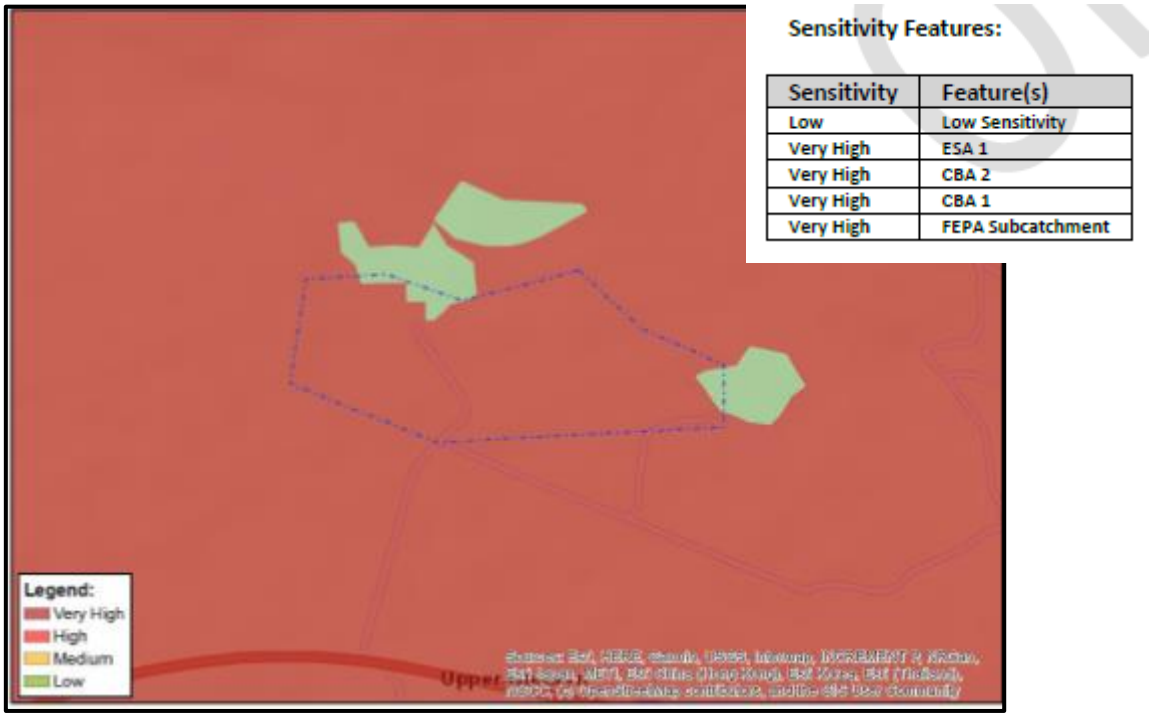

Figure 12: DFFE screening tool report showing the earmarked area (blue polygon), in relation to the CBA and ESA areas (red shading). (Image obtained from the DFFE Screening Tool Report).

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover and Fauna.*

GROUNDCOVER

According to Mucina and Rutherford (2012) the natural vegetation type of the greater study area is classified as Bisho Thornveld (SVs70) as shown in the following figure.

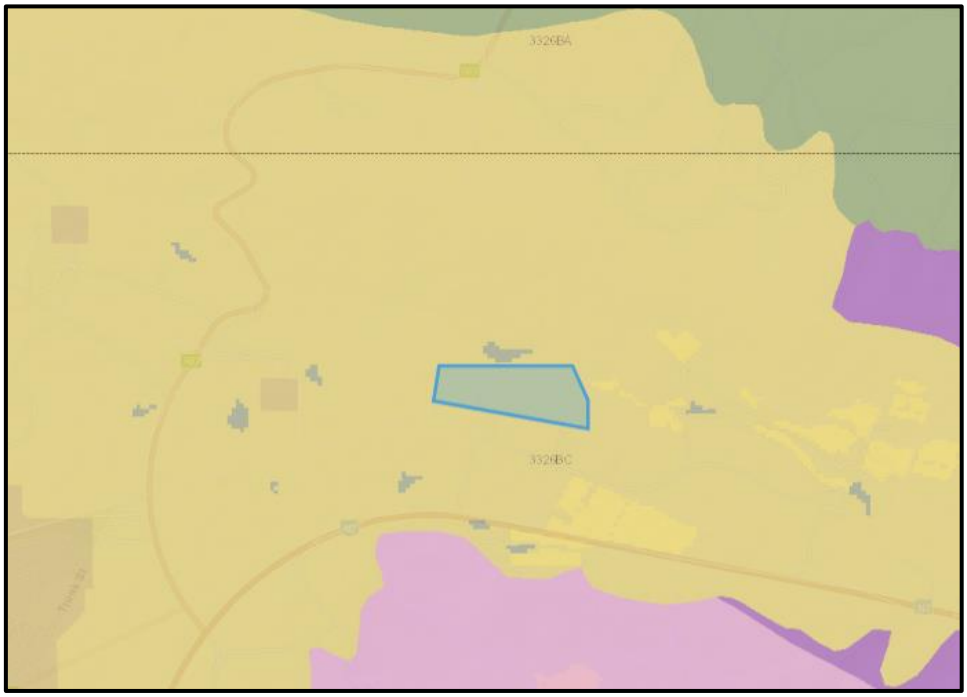

Figure 13: BGIS National Vegetation Map showing the vegetation type of the study area, where the brown shading indicates the Bisho Thornveld (SVs7). (Image obtained from the BGIS Map Viewers website).

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.

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 (see following figure). Within the new SANBI map, the Bisho Thornveld (SVs7) was split into the Grahamstown Grassland Thicket, and the Saltaire Karroid Thicket. 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.

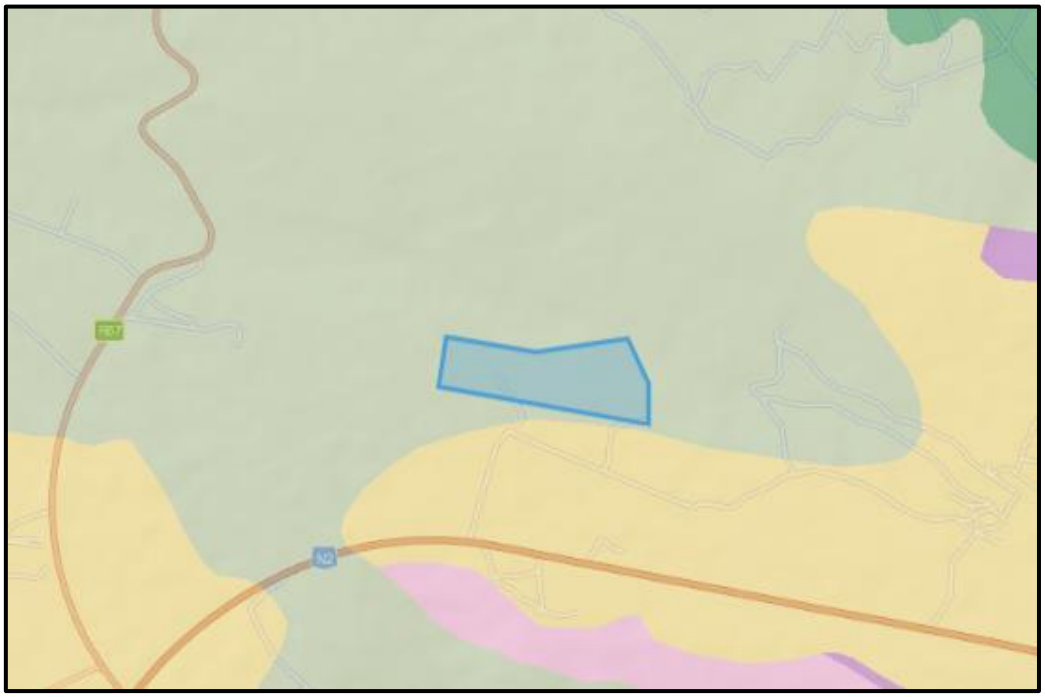

Figure 14: BGIS 2018 National Vegetation Map showing the vegetation type extending into the study area, where the grey shading indicates the Grahamstown Grassland Thicket. (Image obtained from the BGIS Map Viewers website).

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover, and Fauna.*

FAUNA

The 2017 EMPR of Makana Brick notes that a few large mammals do still occur in the region, along with small and medium sized animals. Reptiles and amphibians occurring in the area include many species of frogs, tortoises and terrapins, lizards, and snakes.

According to the EMPR (2017) important species occurring in the study area may include the following:

- Albany Dwarf Adder (*Bitisal banica*) (EN);
- Leopard or Mountain Tortoise (*Geochelone pardalis*);
- Parrot-beaked Tortoise (*Homopus areolatus*);
- Yellow-bellied House Snake (*Lamprophis fuscus*);
- Black-footed Cat (*Felis nigripes*);
- Duthie's Golden Mole (*Chlorotalpa duthie*);
- Straw-coloured Fruit Bat (*Eidolon helvum*);
- Schreiber's Long-fingered Bat (*Miniopterus schreibersi*);
- Mountain Zebra (*Equus zebra*);
- Mountain Leopard (*Panthera pardus*)

Also refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Terrestrial Biodiversity, Conservation Areas, Groundcover, and Fauna.*

HUMAN ENVIRONMENT

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Letter of recommendation for the exemption of full phase 1 archaeological impact assessment for the proposed mining of gravel on Portion 3 of the farm The Orchards No 233 in the district of Grahamstown, Makana Local Municipality, of the Eastern Cape province, Binneman, May 2017)

In 2017, Dr Binneman was appointed for a Phase 1 Archaeological Impact Assessment (AIA) for the mining permit application of Makana Brick. No archaeological sites, -materials, graves, or buildings of more than 60 years were observed and the report recommended that the development (4.9 ha) may proceed.

The 2017 EMPR of the Makana Brick mining permit application notes that fossils and trace fossils found in the Witteberg Group include marine invertebrates (such as molluscs, trilobites, and brachiopods), *Zoophycos, Spirophyton* and *Skolithos*, as well as plant fragments such as psilophyte and lycopod stems. The most important fossils and trace fossils from the Witteberg Group is Lycopods from the Witpoort Formation, *Zoophycus* (Spirophyton) feeding traces in the Wagen Drift Formation of the Weltevrede Subgroup and the Mentzichthys jubbi (palaeo-fish species) from the Lake Mentz Subgroup.

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 proposed mining area is placed on the PSM, it shows the study area to extend over areas of low (blue) and Very High (red) concern as presented in the figure below. Considering this, a palaeontological field assessment and study is required.

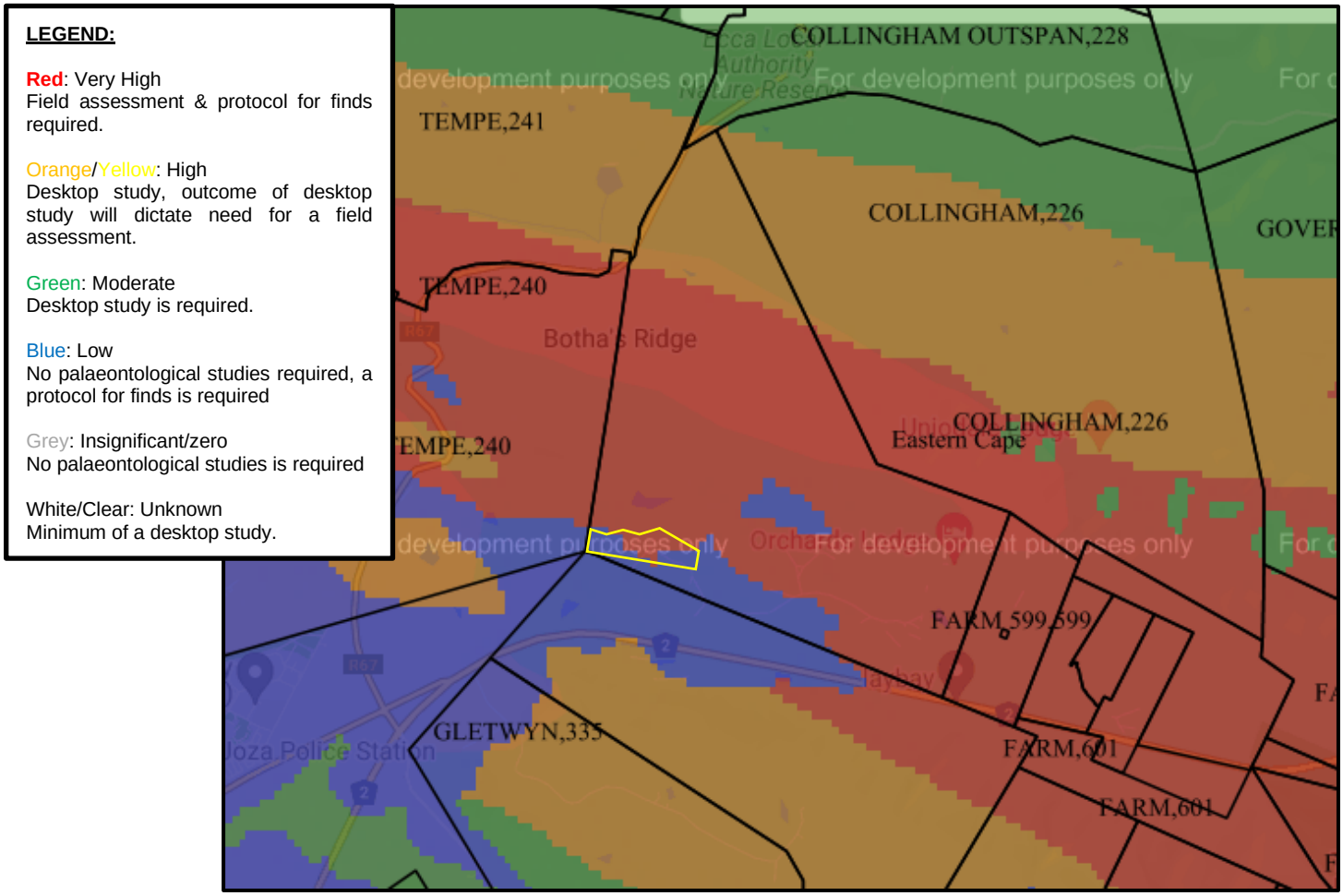

Figure 15: The SAHRA palaeontological sensitivity map shows that the proposed mining footprint (yellow polygon) extends over an area of low (blue) and very high (red) concern (image obtained from the PalaeoSensitivity Map on SAHRIS).

A palaeontologist was appointed to investigate the palaeo sensitivity of the study area. Refer to Section 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Cultural and Heritage Environment.*

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Social and Labour Plan of Makhanda Mining (Pty) Ltd, 2023 attached as Appendix 6)

Portion 3 of the farm The Orchards No 233 is situated within the Makana Local Municipality (MLM) that forms part of the Sarah Baartman District. The MLM 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. The following section provides a summarised look at the demographics of the municipal area.

Total Population:

The Makana Municipality had a population size of 86 068 people in 2016. The total population for the Sarah Baartman Municipality is estimated to increase to 98 356 by 2026, growing at an average annual rate of 0.39%.

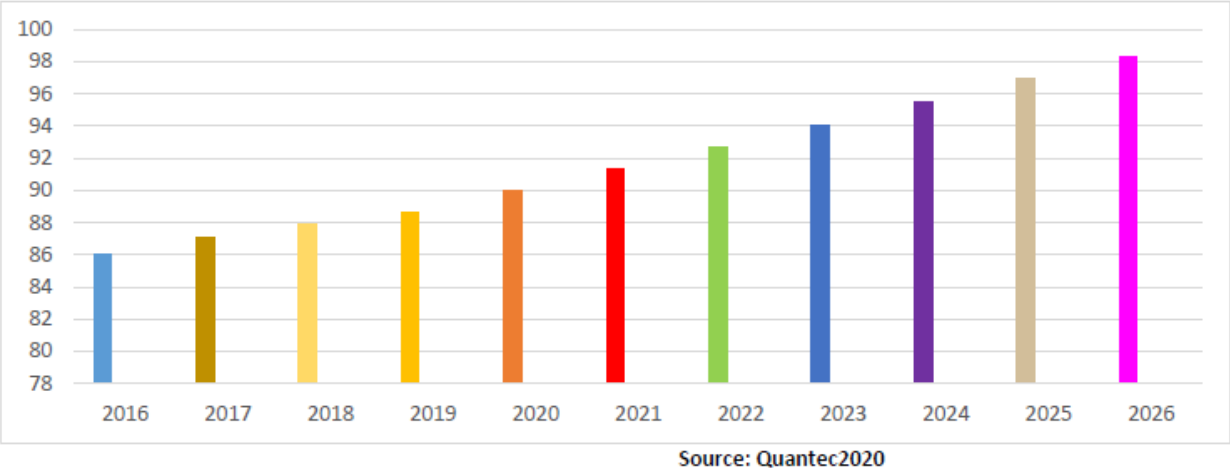

Figure 16: Makana Population 2016 – 2026 (image obtained from the SLP).

Population Projections:

Based on the present age-gender structure and the present fertility, mortality, and migration rates, Makana's population is projected to grow at an average annual rate of 1.0% from 91 400 in 2020 to 96 000 in 2025.

Table 8: Population projections – Makana, Sarah Baartman, Eastern Cape, and National Total 2020 – 2025 (information obtained from the SLP).

Year	Makana	Sarah Baartman	Eastern Cape	National Total	Makana as % of District	Makana as % of Province	Makana as % of National
2021	91,200	536,000	7,400,000	60,300,000	*17.0%*	*1.23%*	*0.15%*
2022	92,100	543,000	7,470,000	61,100,000	*17.0%*	*1.23%*	*0.15%*
2023	93,100	549,000	7,550,000	61,900,000	*17.0%*	*1.23%*	*0.15%*
2024	94,200	556,000	7,630,000	62,700,000	*16.9%*	*1.24%*	*0.15%*
2025	95,400	563,000	7,710,000	63,500,000	*17.0%*	*1.24%*	*0.15%*
2026	96,600	570,000	7,780,000	64,300,000	*17.0%*	*1.24%*	*0.15%*
AVERAGE ANNUAL GROWTH							
2021-2026	***1.17%***	***1.21%***	***1.02%***	***1.29%***			

The population projection of Makana Local Municipality shows an estimated average annual growth rate of 1.2% between 2021 and 2026. The average annual growth rate in the population over the projection period for Sarah Baartman District Municipality, Eastern Cape Province and South Africa is 1.2%, 1.0% and 1.3% respectively. The Eastern Cape Province is estimated to have an average growth rate of 1.0% which is very similar than that of the Makana Local Municipality. The South Africa as a whole is estimated to have an average annual growth rate of 1.3% which is very similar than that of Makana's projected growth rate.

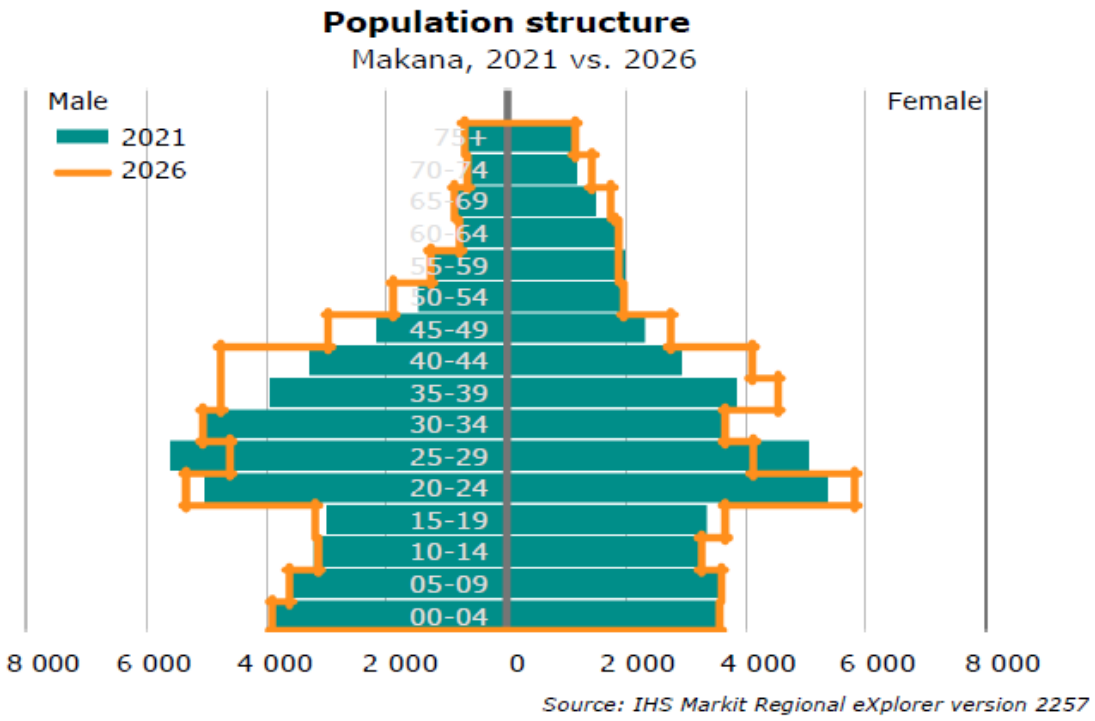

Figure 17: Population pyramid – Makana Local Municipality, 2020 vs. 2025 (image obtained from the SLP).

The population pyramid reflects a projected change in the structure of the population from 2021 and 2026. The differences can be explained as follows:

- δ In 2021, there is a significantly larger share of young working age people between 20 and 34 (32.7%), compared to what is estimated in 2026 (29.6%). This age category of young working age population will decrease over time.
- δ The fertility rate in 2026 is estimated to be slightly higher compared to that experienced in 2021.
- δ The share of children between the ages of 0 to 14 years is projected to be significant smaller (21.8%) in 2026 when compared to 2021 (23.2%).

In 2021, the female population for the 20 to 34 years age group amounts to 15.6% of the total female population while the male population group for the same age amounts to 17.2% of the total male population. In 2026, the male working age population at 15.5% still exceeds that of the female population working age population at 14.1%, although both are at a lower level compared to 2021.

Economic Profile:

The Makana Local Municipality does not function in isolation from Sarah Baartman, Eastern Cape Province, South Africa, and the world and now, more than ever, it is crucial to have reliable information on its economy for effective planning. Information is needed that will empower the municipality to plan and implement policies that will encourage the social development and economic growth of the people and industries in the municipality respectively.

The Gross Domestic Product (GDP), an important indicator of economic performance, is used to compare economies and economic states. GDP-R can be measured using either current or constant prices, where the current prices measure the economy in actual Rand, and constant prices measures the economy by removing the effect of inflation, and therefore captures the real growth in volumes, as if prices were fixed in a given base year.

With a GDP of R 8.52 billion in 2021 (up from R 4.59 billion in 2011), the Makana Local Municipality contributed 17.57% to the Sarah Baartman District Municipality GDP of R 48.5 billion in 2021 increasing in the share of the Sarah Baartman from 17.84% in 2011. The Makana Local Municipality contributes 1.80% to the GDP of Eastern Cape Province and 0.14% the GDP of South Africa which had a total GDP of R 6.23 trillion in 2021 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2011 when it contributed 0.14% to South Africa, but it is lower than the peak of 0.14% in 2015.

In 2021, the Makana Local Municipality achieved an annual growth rate of 5.13% which is a significant lower GDP growth than the Eastern Cape Province's 5.79%, but is higher than that of South Africa, where the 2021 GDP growth rate was 4.91%. Contrary to the short-term growth rate of 2021, the longer-term average growth rate for Makana (0.85%) is very similar than that of South Africa (0.95%).

The construction sector is expected to grow fastest at an average of 2.92% annually from R 129 million in Makana Local Municipality to R 149 million in 2026. The community services sector is estimated to be the largest sector within the Makana Local Municipality in 2026, with a total share of 44.8% of the total GVA (as measured in current prices), growing at an average annual rate of 0.7%. The sector that is estimated to grow the slowest is the mining sector with an average annual growth rate of -3.16%. The Primary sector is expected to grow at an average annual rate of 0.69% between 2021 and 2026, with the Secondary sector growing at 2.02% on average annually. The Tertiary sector is expected to grow at an average annual rate of 1.34% for the same period.

Employment Profile:

There are 28 494 economically active (employed or unemployed but looking for work) people, and of these 32.5% are unemployed. Of the 7 777 economically active youth (15–34 years) in the area, 42.2% are unemployed.

The majority household income is between R 19 601 to R 38 200 at 20.5%, followed by 19.5% at R 9 601 to R 19 600. 12.7% of the population has no income. The minority of the economically active population falls within the higher income bracket, with 0.3% earning more than R 2 457 601, with 0.4% earning between R 1 228 801 – R 2 457 600.

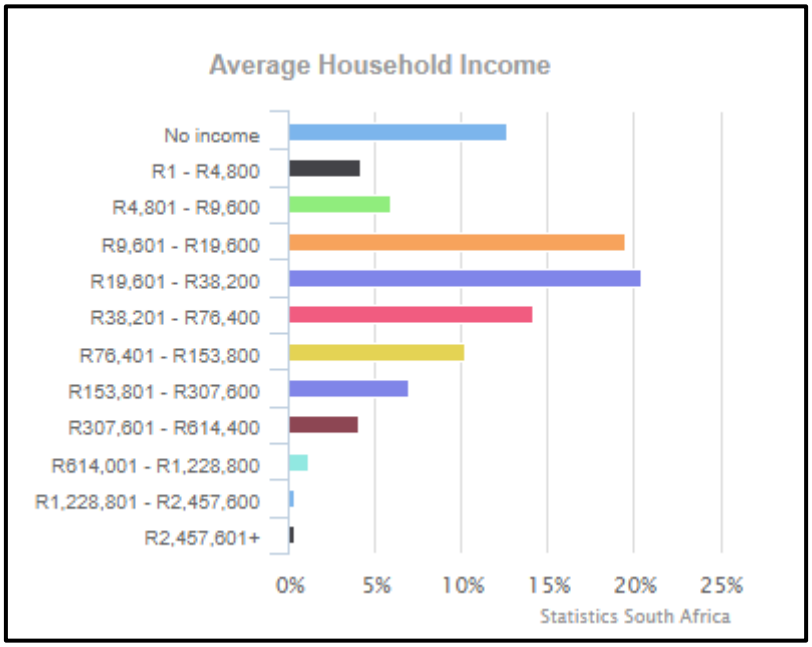

Figure 18: Average household income of the MLM (image obtained from the Statistics South Africa).

(b) Description of the current land uses

Portion 3 of the farm The Orchards No 233 is situated in a rural setting within proximity to the N2 national road. Municipal land borders the property to the west and the nearest housing development is that of Extension 7 ±2.9 km to the south-west. The farm is mainly used for grazing and clay mining, with the surrounding farms mainly grazed. The Botha's River borders the property to the north.

The DFFE Screening Report classifies the Agricultural Theme Sensitivity of the area as depicted in the following figure, where the green areas represent land of low capability, while the yellow areas show land of low-moderate to moderate capability. Sections of the earmarked footprint has been mined for many years and the Applicant entered into land use agreement with the landowner regarding this application.

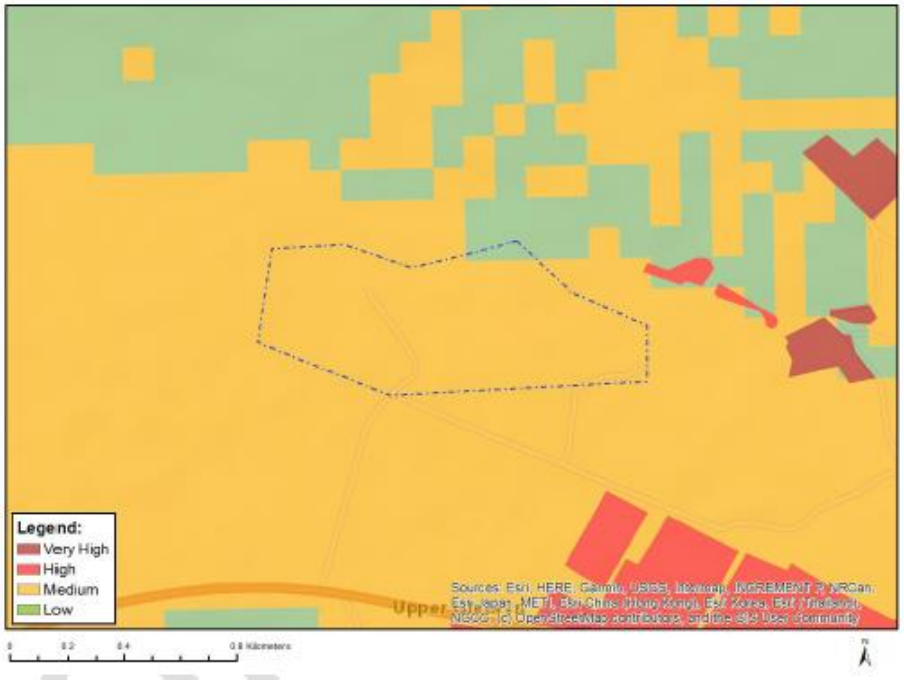

Figure 19: Agricultural theme sensitivity according to the DFFE screening report (2023).

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 9: 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 proposed footprint is surrounded by natural areas used for grazing.
Low density residential	-	**NO**	-
Medium density residential	-	**NO**	-
High density residential	-	**NO**	-
Informal residential	-	**NO**	-
Retail commercial & warehousing	-	**NO**	-
Light industrial	-	**NO**	-
Medium industrial	-	**NO**	-
Heavy industrial	-	**NO**	-
Power station	-	**NO**	-
High voltage power line	-	**NO**	Low voltage power lines do cross through the mining footprint but will not be affected by the proposed activity.
Office/consulting room	-	**NO**	-
Military or police base / station / compound	-	**NO**	-
Spoil heap or slimes dam	-	**NO**	-
Quarry, sand or borrow pit	**YES**	-	The proposed footprint extends across the 4.9 ha Makana Brick mining permit area.
Dam or reservoir	**YES**	-	Three man-made dams border the mining area to the north.
Hospital/medical centre	-	**NO**	-

LAND USE CHARACTER	YES	NO	DESCRIPTION
School/ crèche	-	**NO**	-
Tertiary education facility	-	**NO**	-
Church	-	**NO**	-
Old age home	-	**NO**	-
Sewage treatment plant	-	**NO**	-
Train station or shunting yard	-	**NO**	-
Railway line	-	**NO**	-
Major road (4 lanes or more)	-	**NO**	-
Airport	-	**NO**	-
Harbour	-	**NO**	-
Sport facilities	-	**NO**	-
Golf course	-	**NO**	-
Polo fields	-	**NO**	-
Filling station	-	**NO**	-
Landfill or waste treatment site	-	**NO**	-
Plantation	-	**NO**	-
Agriculture	**YES**	-	The earmarked property is used for agricultural purposes.
River, stream, or wetland	**YES**	-	The Botha's River borders the mining area to the north. The mining footprint was kept >100 m from the river.
Nature conservation area	-	**NO**	-
Mountain, hill, or ridge	**YES**	-	Botha's Ridge borders the study area to the north opposite the Botha's River.
Museum	-	**NO**	-
Historical building	-	**NO**	-
Protected Area	-	**NO**	-
Graveyard	-	**NO**	-
Archaeological site	-	**NO**	-
Other land uses (describe)	-	**NO**	-

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

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC TOPOGRAPHY

The proposed mining area is situated on a fairly flat slope with a gradient decreasing from south to north, towards the Botha's River and very slight upslope from west to east. Further north the topography rises more prominently from Botha's Ridge and further south are more defined ridges and valleys.

The proposed mining area extends across three mined areas, to the west is the mining area of the landowner Mr Moss, and to the east the mining permit area of Makana Brick. The proposed mine is situated on an area with an average slope of 3.9% (-4.8%), and a max slope of 25.4% (-42.0%) over 1.6 km as presented in the following image.

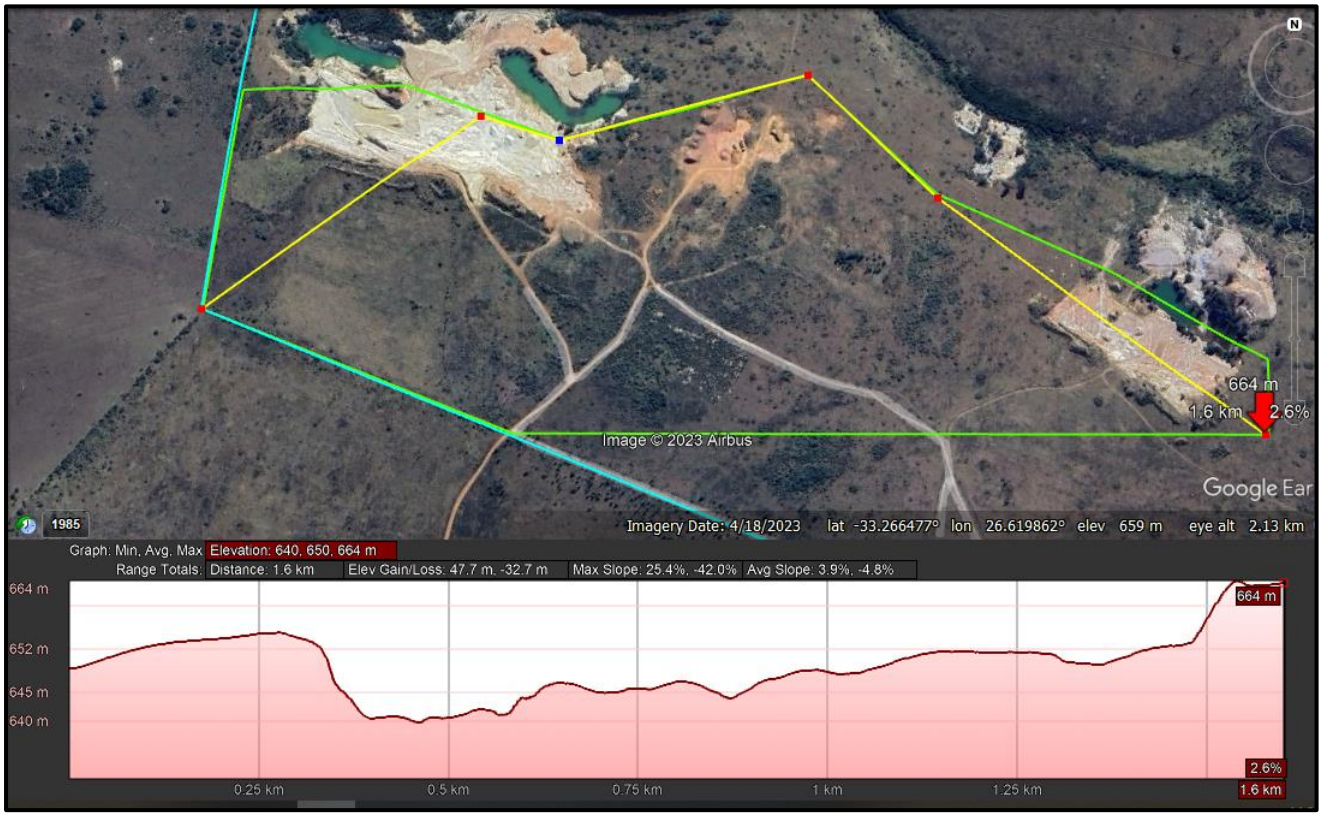

Figure 20: Elevation profile of the proposed mining area (Image obtained from Google Earth).

The impact on the topography and geology is considered of low-medium significance if depth of the exaction and extent of disturbance is considered and of low-medium significance if the cumulative impact is considered. Change in topography and geology of the mining area is unavoidable considering the nature of the project and will be irreversibly altered since a portion the land will be permanently removed. Through profiling the faces and stabilizing it with proper vegetation cover, the potential impact can be mitigated.

SITE SPECIFIC VISUAL CHARACTERISTICS

Due to the topography of the area, the proposed footprint will mainly be visible from immediate surrounding areas. The figure below shows the viewshed analysis for the proposed footprint within a ±10 km radius. The green shaded areas show the positions from where the mining area will be visible. From this analysis it is shown that the visual impact of the earmarked footprint will be of medium significance without mitigation. The small scale of the proposed operation, and the proposed progressive rehabilitation, will however assist in mitigating the visual impact of the proposed development on the surrounding environment. No residual visual impact is expected upon closure of the mine.

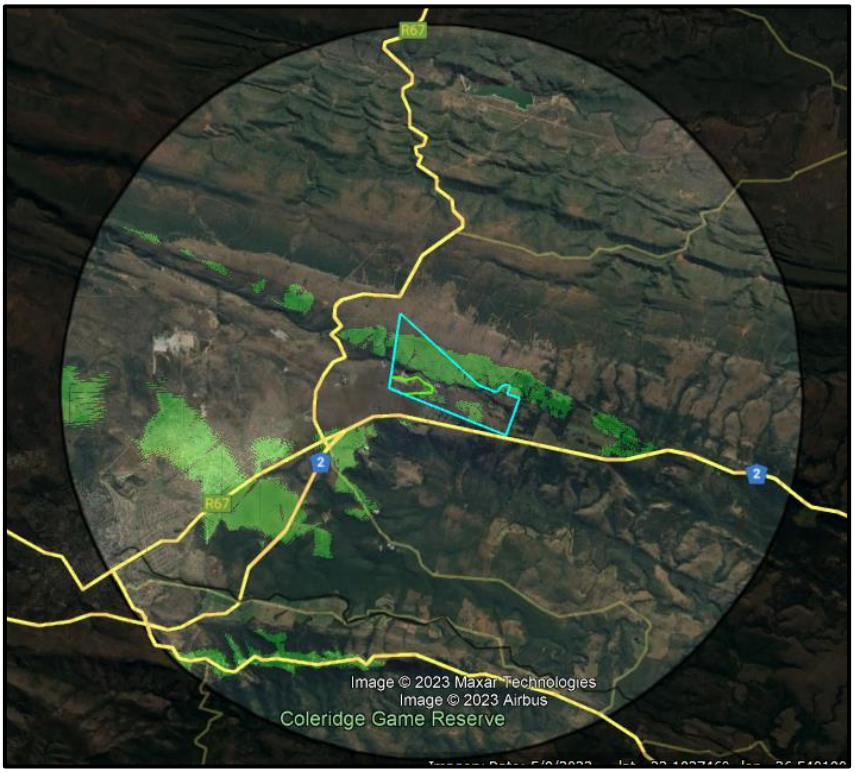

Figure 21: Viewshed analysis of the proposed footprint where the green shaded areas show the positions from where the highest part of the mine will be visible (within 10 km radius) (image obtained from Google Earth).

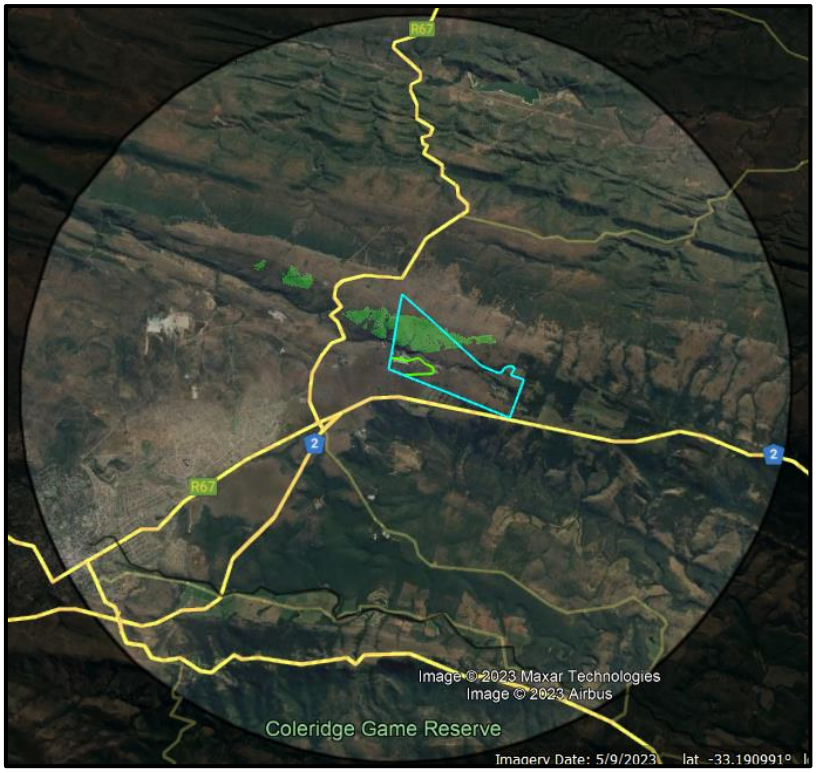

Figure 22: Viewshed analysis of the proposed footprint where the green shaded areas show the positions from where the lowest part of the mine will be visible (within 10 km radius) (image obtained from Google Earth).

SITE SPECIFIC GEOLOGY

The site encompasses the Grahamstown Formation of the Cenozoic Deposits of the interior, immediately adjacent to the Witpoort Formation of the Witteberg Group of the Cape Supergroup.

The Grahamstown Formation comprises of silcrete and kaolinite, with the former overlying the latter. Kaolinite is a common clay mineral formed by the weathering of hydrothermal alteration of feldspar and other aluminous silicate minerals.

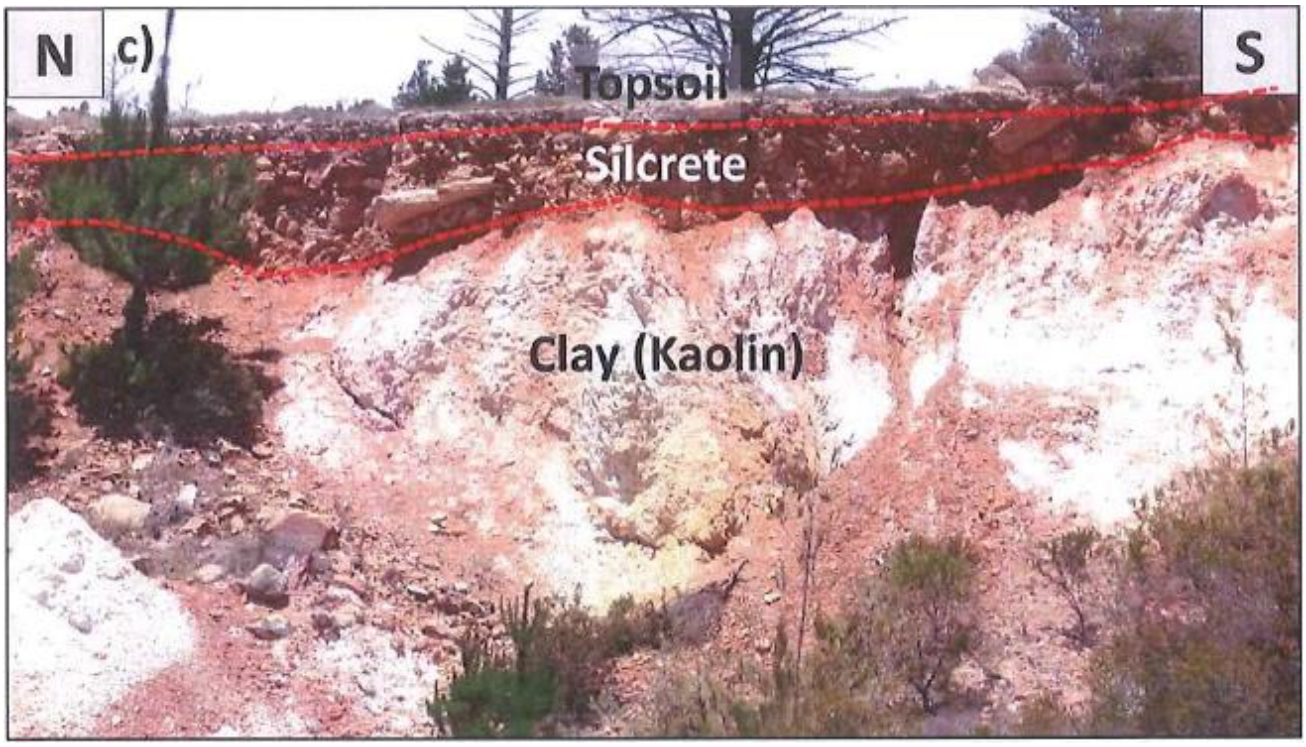

Figure 23: Lithologies observed in the existing excavations. (Image obtained from SES Geology Report, 2017)

Although Grahamstown (Makhanda) is well-known for its surrounding kaolin deposits, kaolin is not the single alteration produce present in the Grahamstown (Makhanda) area, as many other clays are also present. Clay refers to a naturally occurring material comprising predominantly of fine-grained minerals, which is generally plastic at suitable water contents and will harden when dried or fired. Silicates are the main constituent of clay and is generally less than 2 microns in size.

The study area hosts a relatively limited topsoil layer of ±10 – 15 cm thick. The ancient pedogenic horizon which form across the peneplain surface, comprising of a broad slight concave folded rock sequence, is clearly visible in the form of the characteristic silcrete layer overlying the kaolin deposit on site. The silcrete overlying the kaolin acted as a weathering resistant capping, which protected the kaolin against erosion.

A distinct variance in the color of the clay/kaolin can be observed on site. This color variance is observed in a horizontal and vertical expanse of mere single meters. The change in color may be due to a mineralogical difference attributed to dissimilarities throughout the corresponding extent of the parent material – e.g. Dwyka tillite (kaolin) or shale (clay).

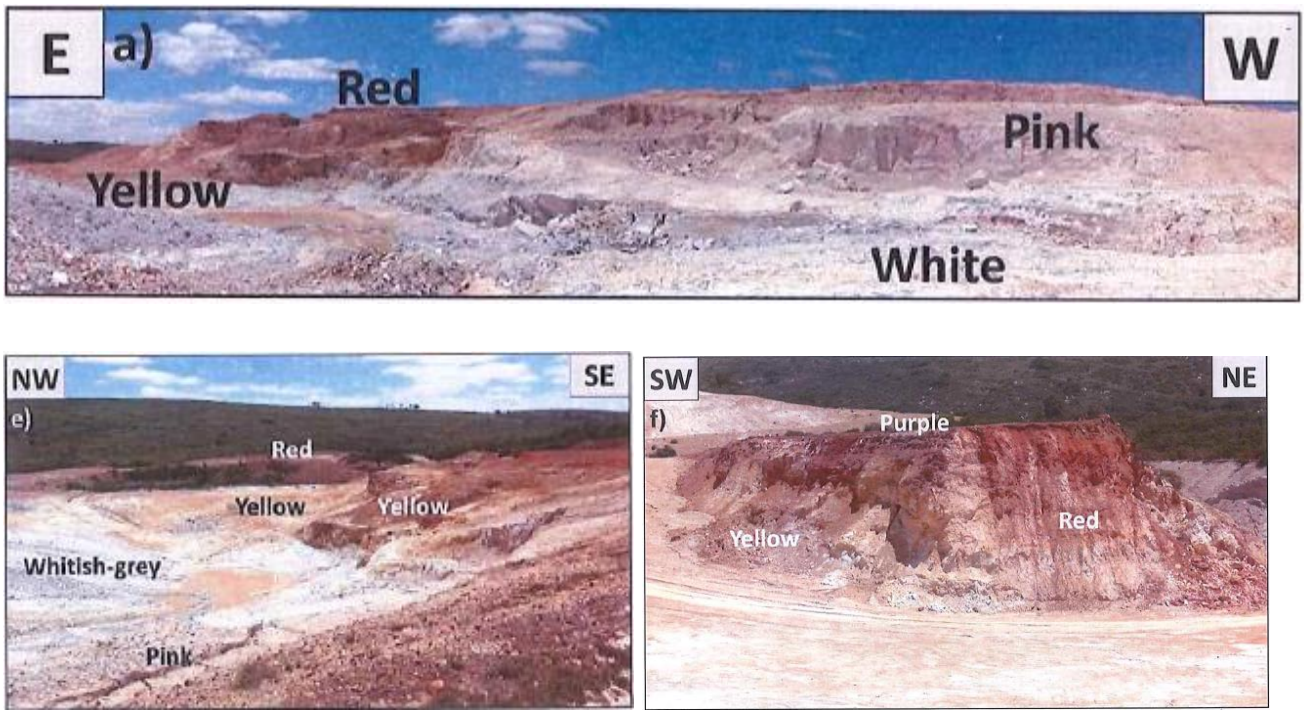

Figure 24: Pictures showing the colour variations in the existing western excavation. (Image obtained from SES Geology Report, 2017)

Additionally, the kaolin comprises of a very fine-grained material, which becomes apparent on closer inspection. The fine-grained kaolin has a very characteristic chalky feel to it. The shale-derived clay consists of a visibly more coarse-grained composition, as well as a colour difference as discussed above.

The kaolin and clay found in the Grahamstown (Makhanda) area and surrounds are alteration/weathering products of parent material such as tillite and shale respectively. As part of the Cape Supergroup sequence of strata, sandstone, and shale/mudstone are generally present in alternating layers throughout the stratigraphy. Due to the chemical composition and physical properties of shale and mudstone, these lithologies are significantly more susceptible to alteration/weathering when compared to , for instance, sandstone.

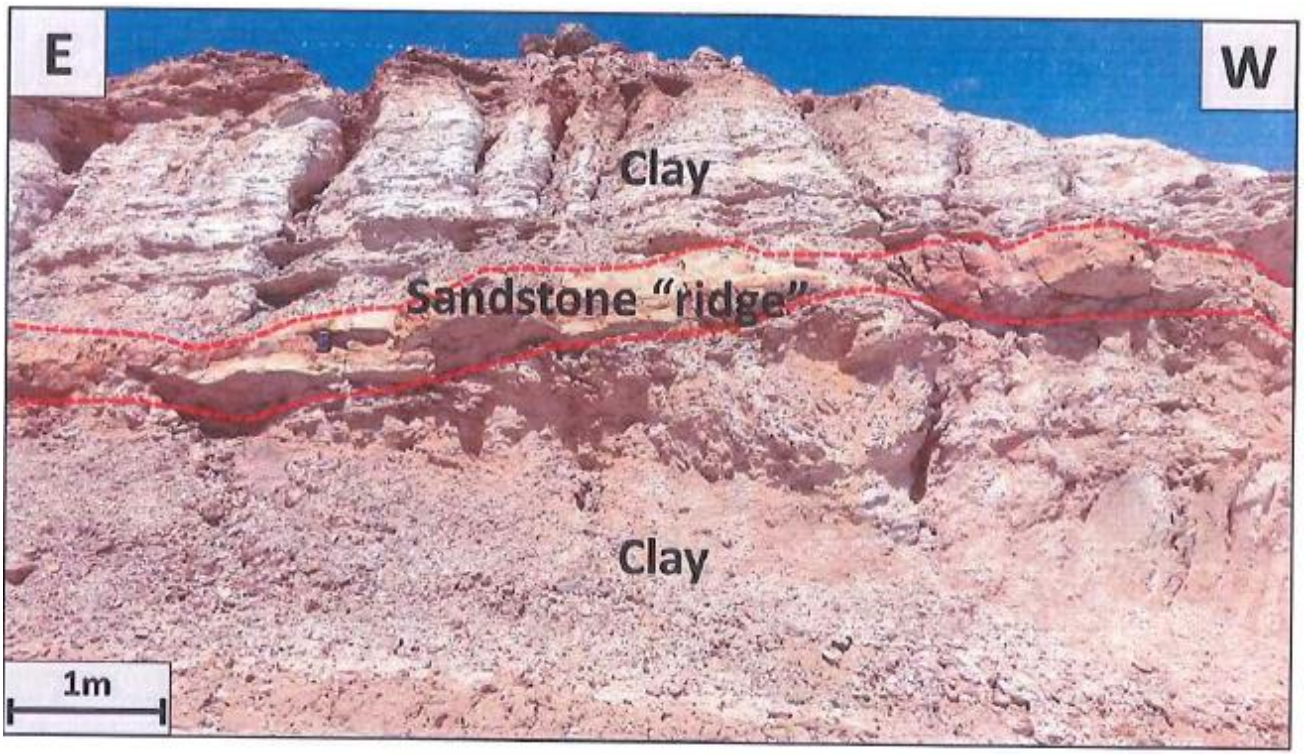

Figure 25: Sandstone layer observed in the existing excavation. (Image obtained from SES Geology Report, 2017)

The study area is located on the northern aspects of a slope decreasing in elevation towards the north, terminating in the Both's River, near the origin. North of the Botha's River, there is a significant hill, comprising of quartzitic sandstone of the Witpoort Formation of the Witteberg Group. Outcrops of the quarzitic sandstone are clearly visible. The Botha's River marks the contact zone between the Grahamstown Formation and the Witpoort Formation. The presence of constant mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting.

As mentioned earlier, the clay generally occurs under a silcrete cover but is found close to the surface on the slopes below the peneplain. Generally, the overburden consists of unwanted material such as smectite, silcrete, lime and contaminated clay that the Applicant desires to process and sell as aggregate for commercial purposes.

SITE SPECIFIC HYDROLOGY

The site specific hydrology of the proposed mining footprint is representative of the regional hydrology described for the study area earlier in this report.

The DFFE Screening Report notes that the area is of Very High aquatic biodiversity sensitivity as depicted in the following figure due to the area crossing into an ESA1 and FEPA sub catchment.

Figure 26: Aquatic biodiversity theme sensitivity according to the DFFE screening report (2023).

As mentioned earlier, the mining area will be more than 100 m from the Botha's River and there are no drainage lines that cross the mine.

Currently any silt run-off is transported into the abutting mining area's retention ponds where it settles. Presently it is proposed that the relative far distance from the Botha's River and vegetation screen between the site and the river will filter out any possible silt transported into the retention pond and effectively mitigate the small possible impact on the stream. This matter will be expanded upon in the DEIAR to be circulated for public participation in due course.

SITE SPECIFIC AIR QUALITY AND NOISE AMBIANCE

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The proposed operation will not trigger an application in terms of the said act. Emissions to be generated at the mine will mainly consist of occasional dust due to the displacement of soil, screening (aggregate), and transport of the material from the farm. Due to the small scale of the operation the noise levels generated at the mine will be low and will mainly stem from the operation of the mining equipment and processing plant (when needed). Noise and dust generation will resemble that of the current mining activities on site.

The impact of the proposed activity on the air quality and noise ambiance of the receiving environmental will be assessed during the EIA process but is expected to be of low

significance. The DEIAR report will further propose mitigation and management measures to address/minimise identified impacts.

SITE SPECIFIC TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA

(Information extracted from the Terrestrial Biodiversity Compliance Statement for the proposed Makhanda Mining Project attached as Appendix 7)

As mentioned earlier, when the footprint of the farm is layered over the Mining and Biodiversity Map, it extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining. The DFFE screening tool notes that there are CBA1 & 2 and ESA1 registered over the property and therefore the earmarked area is of Very High terrestrial biodiversity sensitivity as depicted in the following figure.

Figure 27: Terrestrial biodiversity theme sensitivity according to the DFFE screening report (2023).

The DFFE Screening Report notes that the Plant Species Theme of the area is of Medium sensitivity as depicted in the following figure.

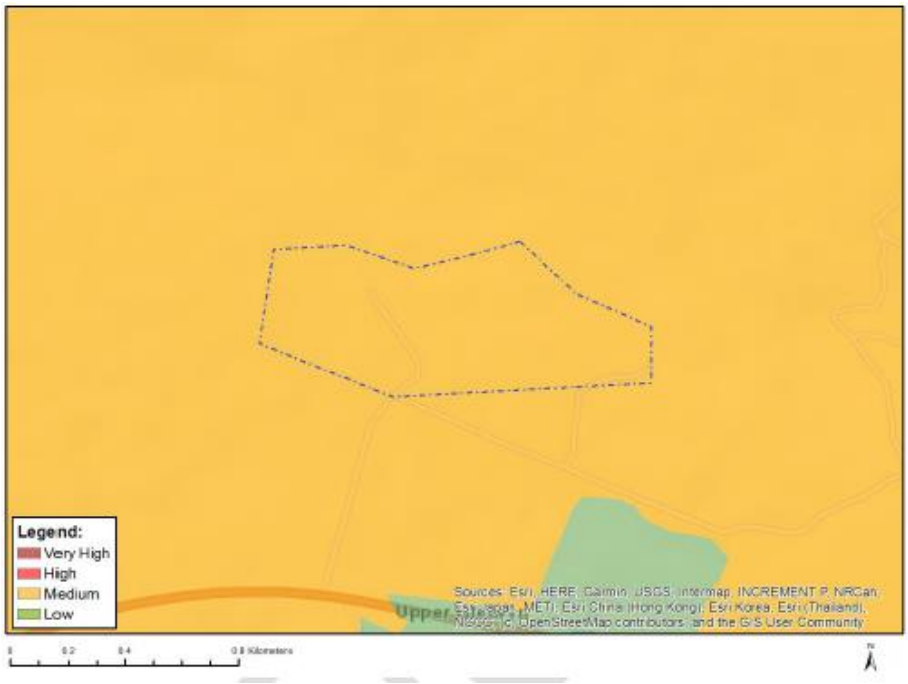

Figure 28: Plant species theme sensitivity according to the DFFE screening report (2023).

The DFFE screening report classifies the Animal Species Theme Sensitivity of the area as depicted in the following figure.

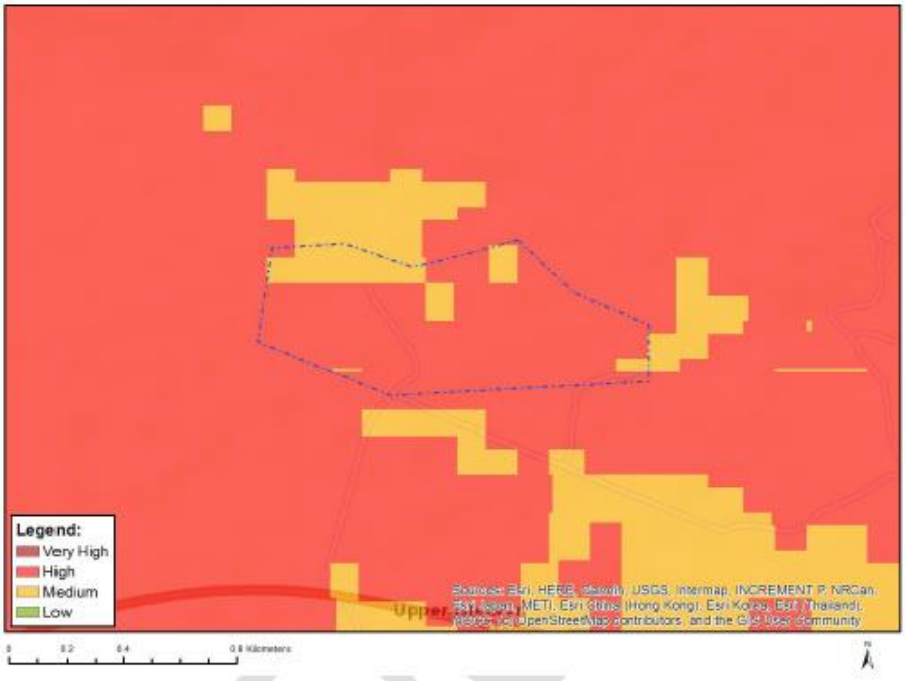

Figure 29: Animal species theme sensitivity according to the DFFE screening report (2023).

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in

terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" – section 3, subsection 1:

- δ An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however;
- δ Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey (by The Biodiversity Company), confirmed that the proposed footprint area is of a 'Low' sensitivity. Therefore, a Terrestrial Biodiversity Compliance Statement (TBCS) was compiled (see Appendix 7).

The specific findings of the TBCS will be incorporated into the DEIAR, however, the specialists concluded that the project area is predominantly comprised of modified, degraded habitat units attributed to the ongoing mining activities. Although the project area falls within CBA 1 & CBA 2 ecosystems, and an ESA 1 ecosystem, ongoing disturbances and impacts associated with the activity will impede on the long-term recovery of the site to a more natural state. Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The earmarked area was instead assigned an overall 'Low' sensitivity rating owing to the long-term, historical mining activity that has been conducted. The location, state and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost because of the impacts arising from the proposed activities.

Figure 30: Map depicting the specialist assigned sensitivity ratings of habitats within the earmarked footprint. (Image obtained from TBCS)

It is the opinion of the specialists that the project may be favourably considered, provided that the proposed mitigation measures be implemented correctly, along with the specialist recommendations.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Palaeontological Heritage Impact Assessment for Quarry Extension at the Orchards, East of Makhanda/Grahamstown attached as Appendix 8)

The DFFE Screening Report notes the Archaeological and Cultural Heritage sensitivity of the area as Low with only the eastern side extending into a Very High sensitivity, while the northern half of the application area extends into a Very High Palaeontological sensitive area.

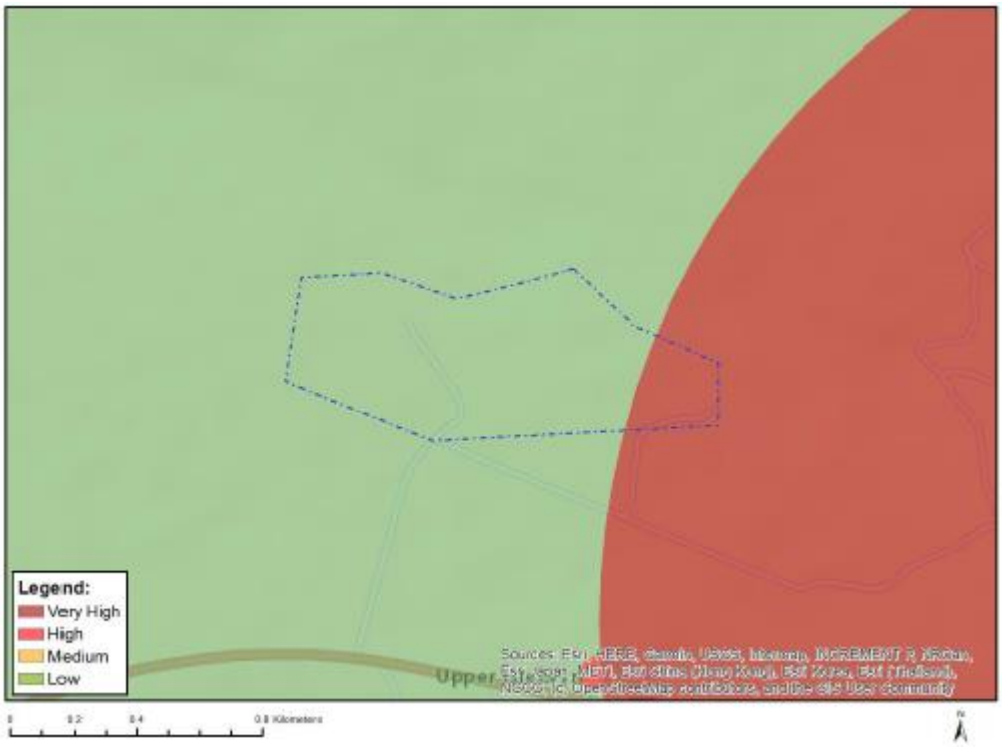

Figure 31: Archaeological theme sensitivity of the proposed area according to the DFFE screening report (2023).

Figure 32: Palaeontological theme sensitivity of the proposed area according to the DFFE screening report (2023).

Dr Robert Gess was appointed to do a Palaeontological Heritage Impact Assessment (PIA) of the proposed mining area.

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 Tristichopterids. 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, as yet, been discovered, but may be expected.

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 3.2 kilometres north northwest of the orchards site (along the same horizon). 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 as 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. Here several layers of rock covered in fossil fish of many species have been discovered. In strong contrast to the fish of the Waterloo Farm site, the fish from near Darlington Dam are all ray-finned fish, the group of fish that dominates our seas, lakes and rivers today. Some shark and acanthodian remains have also been recovered from the Lake Mentz Subgroup. These fish rich layers are generally associated with the middle portion of the Lake Mentz subgroup (the Waaipoort Formation) which will not be impacted by the quarry.

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 and shales 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.

The specific findings of the PIA will be incorporated into the DEIAR, however, the specialists concluded that almost the entire area is deeply underlain by strata of the Witpoort Formation, which are variably overlain by silcrete of the Grahamstown Formation. In places small outcrops of Witpoort Formation quartzite were observed to the south of historic diggings. Historic diggings in the north of the proposed mining right have targeted a thick bed of kaolin clay derived from an (originally black) mudstone layer. Due to its proximity to surface the shale was subsequently reduced to kaolin by deep leaching during and following the Cretaceous period – the silica and metallic elements having crystalised out near surface to produce the silcrete capping. As a result of the kaolinization of the strata their probable original palaeontological interest has been destroyed. It remains possible, however, that as the fold dives down in a southerly direction it may, in places still be capped by southwardly dipping sheets of quartzitic strata. If this is the case, it may be that there are areas which have not been entirely kaolonised and where fossils may still be discernible in the strata. The specialist recommended that should more shaly material of a grey to black colour be encountered to the south, a palaeontologist should be contacted to assess them for palaeontological potential.

SITE SPECIFIC SOCIO-ECONOMIC ENVIRONMENT

A Social and Labour Plan (SLP) (Appendix 6) was submitted as part of the MR application and will be further discussed in the DEIAR. The SLP forms the basis for the implementation of programmes and projects as key activity drivers of the development and operation of the mining activity in the Makana area. It offers the building blocks for future economic development and growth of the local area. The scope of the document offers the Applicant a platform to engage in the development of the local economy and community through a basis of human resource development, economic delivery, business development and community participation. The nature of the document is therefore aimed at the widest possible comprehension and stimulation for inputs.

The SLP notes that the Orchards Mine will appoint a local sub-contractor to conduct the proposed mining. Since all the employees will reside within the Makana area, it is fair to presume that most monthly earned salaries will be spend in the local area. Indirectly, through the payment for services and suppliers, the mine also supports employment of the procurement partners.

As mentioned earlier, kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region. Market demand has shown a preference for bricks produced with the red/orange clay. This red/orange clay is a localised occurrence, since the region is mostly known for the kaolin deposits, which is

white in appearance. The proposed mining area has various coloured clay that is highly advantageous to the Applicant and Makana Brick Factory.

The proposed development will generate income to the landowner (in the form of compensation) for the life of the mine. In terms of the Social and Labour Plan (SLP), to be approved as part of the proposed mining right application, the Applicant will contribute to Human Resource Development and Local Economic Development (LED) that will further support the development of the local socio-economic environment.

SITE SPECIFIC EXISTING INFRASTRUCTURE

Apart from the farm road infrastructure and low voltage power line, no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

(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 5.

i) Impacts Identified

(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 consultants with affected parties together with the significance, probability and duration of the impacts)

The following potential impacts were identified of each main activity in each phase of the proposed project. The listed impacts must be treated as preliminary, to be expanded upon proper assessment of the study area during the EIA process. The significance rating was determined using the methodology as explained under *j) Methodology used in determining and ranking the significance of environmental impacts*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

SITE ESTABLISHMENT

Loss of grazing for duration of mining

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Preferred Project Proposal**		**Degree of Mitigation: Partial**		
1	5	1	2.3	5	5	5	**11.5**

Visual intrusion because of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium - High			**Preferred Project Proposal**		**Degree of Mitigation: Partial**		
2	5	2	3	5	5	5	**15**

Direct loss and disturbance of floral species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Partial**		
1	5	1	2.3	5	3	4	**9.2**

Loss of topsoil and fertility during site establishment

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

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

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	5	4	4	4	2	3	**12**

Dust nuisance because of the site establishment activities

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

Noise nuisance because of the site establishment activities

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

Work opportunities due to continued mining **(Positive Impact)**

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

EXCAVATION OF MINING AREA

Potential soil contamination from hydrocarbon spills

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

Noise nuisance because of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Partial**		
2	4	2	2.7	3	4	3.5	**9.5**

Potential impact on areas of palaeontological concern

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	5	5	4.6	2	1	1.5	**6.9**

Direct loss and disturbance of fauna species and communities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	5	4	4	2	1	1.5	**6**

Runoff from mining area having a potential impact on the Botha's River

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	3	4	3.6	2	1	1.5	**5.4**

Potential damage to the Eskom power line

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	3	5	4	2	1	1.5	**6**

PROCESSING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

Loss of stockpiled material due to ineffective stormwater control

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

Dust nuisance because of the mining activities

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 because of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Partial**		
2	4	2	2.6	2	5	3.5	**9.1**

Potential impact associated with littering and hydrocarbon spills.

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

Infestation of denuded areas with invader plant species

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

Overloading of trucks having an impact on the public roads

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
4	4	5	4.3	3	3	3	**12.9**

SLOPING AND LANDSCAPING (MEDIUM- & LONG TERM)

Erosion of returned topsoil after rehabilitation

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**

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	5	2	3.5	**10.5**

Noise nuisance because of the decommissioning activities

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

Potential impact associated with litter/hydrocarbon spills left at the mining area

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

Return of the mined areas to grazing **(Positive Impact)**

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

CUMULATIVE IMPACTS

Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	4	5	4.7	2	1	1.5	**7.1**

Fragmentation of ecosystems affecting safe movement of fauna species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	4	4	4	2	1	1.5	**6**

j) Methodology used in determining the significance of environmental impacts

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

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

DEFINITIONS AND CONCEPTS:

Environmental Significance:

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

- Environmental significance is a value judgment
- 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.

Table 10: 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/	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible

TYPE OF CRITERIA	RATING				
	1	2	3	4	5
	Easily reversible		Potential to reverse impact		
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 11: 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 12: 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 13: 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.

Determination of Frequency

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

Table 14: 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 15: 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 summarized below, and then dividing the sum by 2.

Table 16: 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 17: Determination of overall environmental significance.

SIGNIFICANCE OR RISK	LOW	LOW-MEDIUM	MEDIUM	MEDIUM-HIGH	HIGH
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

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

Table 18: 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.	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.

SIGNIFICANCE	LOW	LOW-MEDIUM	MEDIUM	MEDIUM-HIGH	HIGH
		Where possible improve			

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.

k) 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)

PRELIMINARY LIST OF POSITIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL:

- δ Kaolin mining is limited to the Makhanda region and presents employment opportunities and economic income to the region,
- δ The red/orange clay is a localized occurrence that is highly sought after in the brick making industry, to be exploited by this mine,
- δ Work opportunities due to continued mining,
- δ The landowner will generate income from the mining footprint in the form of compensation,
- δ The Applicant will contribute to Human Resources Development and LED projects that will support the development of the local socio-economic environment,
- δ Return of the mined areas to agricultural use post mining.

PRELIMINARY LIST OF NEGATIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL:

The following table lists the potential negative impacts associated with the present project proposal:

Table 19: List of potential negative impacts associated with the present project proposal.

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION)
δ Site establishment.	δ Loss of grazing for duration of mining.	δ Medium
δ Site establishment.	δ Visual intrusion because of site establishment.	δ Medium-High
δ Site establishment. δ Cumulative Impact	δ Direct loss and disturbance of floral species. δ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	δ Low-Medium δ Low-Medium
δ Site establishment	δ Loss of topsoil and fertility during site establishment.	δ Low-Medium
δ Site establishment δ Processing, stockpiling and transporting of material from site.	δ Infestation of the topsiol heaps and mining area with invader plant species. δ Infestation of denuded areas with invader plant species.	δ Medium δ Medium δ Medium

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION)
δ Sloping and landscaping.	δ Infestation of the reinstated area with invader plant species.	
δ Site establishment δ Processing, stockpiling and transporting of material from site.	δ Dust nuisance because of site establishment activities. δ Dust nuisance because of the mining activities.	δ Low-Medium δ Medium
δ Site establishment δ Excavation of mining area δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Noise nuisance because of the site establishment activities. δ Noise nuisance because of mining activities. δ Noise nuisance because of mining activities. δ Noise nuisance because of the decommissioning activities.	δ Low-Medium δ Low-Medium δ Low-Medium δ Low
δ Excavation of mining area δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Potential soil contamination from hydrocarbon spills. δ Potential impact associated with littering and hydrocarbon spills. δ Potential impact assocaited with litter/hydrocarbon spills left at the mining area.	δ Medium δ Medium δ Medium
δ Excavation of mining area	δ Potential impact on areas of palaeo concern.	δ Low-Medium
δ Excavation of mining area δ Cumulative Impact	δ Direct loss and disturbance of fauna species and communities. δ Fragmentation of ecosystems affecting safe movement of fauna species.	δ Low-Medium δ Low-Medium
δ Excavation of mining area	δ Potential damage to the Eskom power line.	δ Low-Medium
δ Excavation of mining area	δ Runoff from mining area having a potential impact on the Botha's River.	δ Low-Medium
δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Loss of stockpiled material due to ineffective stormwater control. δ Erosion of returned topsoil after rehabilitation.	δ Low-Medium δ Low-Medium

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE (BEFORE MITIGATION)
δ Processing, stockpiling and transporting of material from site.	δ Deterioration of the access road to the mining area. δ Overloading of trucks having an impact on the public roads.	δ Low-Medium δ Medium

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

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

Considering the above listed impacts that may have a negative impact on the study area, the following preliminary mitigation measures are proposed to address/minimize the resulting impacts. It must be noted that the following list should be treated as initial mitigation measures that will be expanded upon should the scoping report be approved and the EIAR be drafted.

VISUAL CHARACTERISTICS

Visual Mitigation:

- δ The site must have a neat appearance and always be kept in good condition.
- δ Mining equipment must be stored neatly in a dedicated area when not in use.
- δ Concurrent rehabilitation must be done as mining progress to limit the visual impact on the aesthetic value of the area.
- δ The MR holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area.
- δ Upon closure the faces must be profiled and stabilised with proper vegetation cover to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.

GEOLOGY AND SOIL

Topsoil Management:

- δ The upper 300 mm of soil must be stripped and stockpiled before mining.
- δ Topsoil is a valuable and essential resource for rehabilitation, and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- δ Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The mining plan must be such that topsoil is stockpiled for the minimum possible time.
- δ The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.

- δ Topsoil stockpiles must be protected against losses by water- and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.
- δ Topsoil heaps may not exceed 2 m to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- δ The temporary topsoil stockpiles must be kept free of invasive plant species.
- δ Storm- and runoff water must be diverted around the stockpile area to prevent erosion.
- δ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.
- δ The Applicant 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.
- δ A cover crop must be planted, irrigated, and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil (if deemed necessary). 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.
- δ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Mitigating the potential impact on the Botha's River and downstream users:

- δ No activities may take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan.
- δ All mining activities must be contained in the approved footprint, and the vegetation layer between the River and the northern boundary of the mine must be preserved.
- δ The 100 m between the River and the mine must be treated as a no-go area and all employees must be educated accordingly.
- δ Proper stormwater control measures must be implemented for the life of the mine.

Erosion Mitigation / Storm Water Control:

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

AIR AND NOISE AMBIANCE

Fugitive Dust Emission Mitigation:

- δ 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).
- δ The site manager must ensure continuous assessment of the dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- δ Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust.
- δ Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining.
- δ Loads must be flattened to prevent spillage of clay and/or aggregate during transportation, also minimising windblown dust.

- δ 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.
- δ 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).
- δ Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the products from site to minimize potential dust impacts.
- δ Dust allaying structures such as water sprayers must be fitted to the crushing plant.
- δ The processing equipment must daily be cleaned of excess material and dust.

Noise Handling:

- δ The Applicant must ensure that the employees and visitors to the site conduct themselves in an acceptable manner while on site.
- δ No loud music may be permitted at the mining area.
- δ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).
- δ Best practice measures shall be implemented to minimize potential noise impacts.
- δ 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.

TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA

Impacts on floral species, and fragmentation of vegetation communities within the CBA and ESA ecosystems:

- δ The mining boundaries must be clearly demarcated, and all operations must be contained to the approved mining area.
- δ The area outside the mining boundaries must be declared a no-go area, and all employees must be educated accordingly.
- δ An invasive plant species management plan must be implemented on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.

Mitigation measures to be expanded upon in the EIAR & EMPR.

Management of Invasive Plant Species:

- δ An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms

of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.

- δ All stockpiles must be kept free of invasive plant species.
- δ 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.

Impacts on faunal species, and fragmentation of ecosystems affecting safe movement of species:

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

Mitigation measures to be expanded upon in the EIAR & EMPR.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- δ All mining must be confined to the development footprint area.
- δ 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.
- δ 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.
- δ 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.
- δ Work may only continue once the go-ahead was issued by SAHRA.
- δ Monitoring reports must be submitted to the ECPHRA.
- δ The details of the specialist to conduct training for the ECO must be submitted to the ECPHRA.

Mitigation measures to be expanded upon in the EIAR & EMPR.

LAND USE

Loss of grazing for duration of mining:

- The temporary loss of agricultural land for the duration of the mining period is acceptable to the landowner. If needed, mined/rehabilitated areas will revert to agricultural use once the cover crop stabilised.

EXISTING INFRASTRUCTURE

Access Road Mitigation:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access roads 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 Applicant.
- Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes.

Power Line Management:

- An adequate no-go buffer (minimum 10 m) must be maintained around the power line as per Eskom standard.
- Should the line be damaged, Eskom must immediately (within the first hour of occurrence) be informed.

GENERAL

Waste Management:

- Vehicle maintenance, repairs and services may only take place at the off-site 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.
- Ablution facilities must be provided to all employees. The toilet must be placed outside the 1:100 year floodline of the river.

- δ The ablution 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. Any pollution problems arising from the above are to be addressed immediately by the Applicant.
- δ If a diesel bowser is used on site, it must always be equipped with a drip tray. Drip trays must be used during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- δ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- δ Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- δ Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed to the hazardous waste storage area of the workshop, either for resale or for appropriate disposal at a recognized facility. Proof must be filed.
- δ A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA.
- δ General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to a recognised general waste landfill site.
- δ No waste may be buried or burned on the site.
- δ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.

Management of Health and Safety Risks:

- δ Adequate ablution facilities and water for human consumption must daily be available on site.
- δ Worker(s) must have access to the correct personal protection equipment (PPE) as required by law.
- δ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).

m) The outcome of the site selection Matrix Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

The most current site activities map was compiled upon assessment of the site specific conditions and is attached as Appendix 4 to this document.

n) Motivation where no alternative sites were considered.

Refer to Section 2(h)(i) *Description of the process followed to reach the proposed preferred site* above, and Section 2(O) *Statement motivating the preferred site* below.

o) Statement motivating the preferred site.

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

Presently, the project proposal entails the mining of ±43.5 ha over Portion 3 of the farm The Orchards No 233, within the boundaries of the GPS coordinates listed in Table 3 and depicted in Figure 2. The mining taking place in an around the study area indicates that the clay deposit is significant and of adequate quality for the intended purpose, which negates the need for additional prospecting. The proposed footprint of the MR application was therefore based on the available geological information. The footprint was also chosen to include the areas that were previously altered by mining activities, which from an environmental perspective is the preferred option to prevent transformation of intact areas.

The Applicant intends to extract the clay from the mining area using opencast methods. The nature of the operation does not allow alternative activities. It is a small scale mining operation where there is no alternative other than to excavate, load and haul the clay (and aggregate).

The Applicant will not establish any permanent infrastructure and/or buildings on site. The design and layout of the proposed footprint were based on the available clay resources and colour variants.

As mentioned earlier, experience, mainly related to colour variation in bricks, showed that slope mining is preferable to improve blending across sediment layers. The only technology applicable to this project is the occasional use of a mobile crushing and screening plant to reduce the overburden to the sizes desired by the clients. This project does not require complex technology to allow the winning of the intended minerals.

The operational aspects of the activity was based on the historic mining activities that has been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation.

3. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

a) Description of alternatives to be considered including the option of not going ahead with the activity.

Refer to Section 2(h)(i) *Description of the process followed to reach the proposed preferred site*, and Section 2(O) *Statement motivating the preferred site* above.

b) Description of the aspects to be assessed as part of the environmental impact assessment process.

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc....etc.)

The aspects to be assessed as part of the environmental impact assessment process that will follow upon approval of the Scoping Report by the DMRE will include, but not be limited to, the following:

1. The need and desirability of the proposed activity will be discussed in detail and weighed against the no-go option of upholding the *status quo* at the study area.

2. The inputs received during the public participation process (first- and second phase) will be assessed and considered by the project team during the EIA process.

3. The findings, recommendations and management measure proposed in the Palaeontological Impact Assessment, and the Terrestrial Biodiversity Compliance Statement will be assessed during the EIA process and incorporated into the DEIAR.

4. The impact of the proposed project on the physical-, biological-, and human environments will be assessed. The nature, probability and significance of the potential impacts associated with the project will be determined using the above mentioned methodology.

5. Mitigation measures will be proposed to control, modify, remedy, or stop the impacts associated with the proposed activity on the surrounding environment.

6. Any additional requirements submitted by the DMRE will be incorporated into the DEIAR and treated accordingly.

c) Description of aspects to be assessed by specialists

The following specialist studies have been commissioned as part of the EIA process:

Palaeontological Impact Assessment:

- δ The palaeontologist will conduct a desktop study and site visit to determine the sensitivity of the palaeontological environment within the study area.
- δ Identify any areas of concern and propose recommendations thereof.
- δ Proposed management and mitigation measure for the proposed project.

Terrestrial Biodiversity Compliance Statement:

- δ Describe the legislative framework and motivate why only a TBCS is required;
- δ Elaborate on the assessment methods;
- δ Discuss the desktop and site findings;
- δ Assess the findings in relation to the screening tool allocated sensitivities;
- δ Propose an impact management and mitigation plan;
- δ Impact statement including specialist recommendations.

d) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

The impact assessment component of the EIA is subdivided into several environmental aspects to be studied as listed below (preliminary list):

- δ Topography;
- δ Visual Characteristics;
- δ Geology and Soils;
- δ Hydrology;
- δ Air Quality and Noise Ambiance;
- δ Mining, Biodiversity and Groundcover;
- δ Fauna;
- δ Cultural and Heritage Environment;
- δ Socio-economic Environment / Land Use;
- δ Existing Infrastructure; and
- δ Preferred project proposal including the No-go Option.

Greenmined will use in-house specialists to review the environmental aspects which will be assessed as part of the environmental impact assessment process. The environmental aspects briefly described in the Scoping Report will be updated, and mitigation recommendations will be made and be reviewed by the project team, registered stakeholders and I&AP's, and competent authority (DMRE).

The significance of the impacts will be assessed in terms of the methodology described in *Section 2 j) Methodology Used in Determining and Ranking the Significance.*

e) The proposed method of assessing duration significance.

The significance of the identified impacts will be determined using the approach outlined in *Section 2 j) Methodology Used in Determining and Ranking the Significance*. The environmental significance assessment methodology is based on the Overall Consequence x Overall Likelihood.

Consequence analysis is a mixture of quantitative and qualitative information, and the outcome can be positive or negative. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: Severity/Intensity, Duration and Extent/Spatial Scale.

The determination of likelihood is a combination of Frequency and Probability.

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.

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

Assessing duration significance forms part of the environmental significance determination of the impacts and will be assessed accordingly.

f) The stages at which the competent authority will be consulted.

The environmental authorization- and mining right application in terms of the NEMA: EIA Regulations, 2014 (as amended) and the MPRDA, 2002 were simultaneously submitted to the DMRE on 02 October 2023 for which acceptance was received from the DMRE on 18 October 2023. As competent authority the DMRE was invited to comment on the Draft Scoping Report (DSR); thus far no comments were received that could be incorporated into the FSR.

Should the DMRE approve the Final Scoping Report, the draft EIA report, including all investigations, assessments, and the specialist studies, will be circulated for a 30-day commenting period. Any additional requirements received from the DMRE will be added to the Final EIA report to be submitted for approval.

As stipulated in the NEMA EIA Regulations, 2014 (as amended) read with the MPRDA, 2002, the EIA process will comprise of the following:

1. Application for Environmental Authorization and a Mining Right filed with accompanying documentation to the online SAMRAD system;
2. The DMRE responds with reference number and accepts the application;
3. Draft Scoping Report circulated for perusal by I&AP's and stakeholders (including the DMRE);
4. Final Scoping Report (FSR) submitted to the DMRE;
5. The DMRE decision on FSR;
6. If the FSR is approved, the Draft EIA report is circulated for perusal by I&AP's and stakeholders (including the DMRE);
7. Final EIA report submitted to DMRE;
8. DMRE decision on Final EIA report;
9. Submission of the Financial Provision amount need for Rehabilitation;
10. If the FEAR is approved, the DMRE issues the Environmental Authorizations;
11. Appeal period;
12. Approval of supporting documentation including, but not limited to, the Mine Works Programme, and Social and Labour Plan; and
13. Decision on the Mining Right Application.

g) Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

i) Steps to be taken to notify interested and affected parties.

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).

The aspects to be assessed as part of the environmental impact assessment process were added to the Scoping Report that was distributed to all I&AP's and stakeholders for a 30-day commenting period.

The I&AP’s and stakeholders were informed of the project and availability of the DSR for perusal and commenting through:

1. Email notifications, with a direct link to the electronic copy of the DSR and appendices, send to all persons with email access;
2. An advertisement placed in Daily Dispatch inviting the public to comment on the project.
3. On-site notices placed at the Makana Library and the farm entrance inviting the public to comment on the project.

The comments received on the Draft Scoping Report will be added to the Final Scoping Report to be submitted to the DMRE for consideration.

ii) Details of the engagement process to be followed

(Describe the process to be 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 and records of such consultation will be required in the EIA at a later stage).

Public participation during the impact assessment phase of the EIA will entail a review of the findings of the EIA, presented in the Scoping Report and Draft EIA and EMPr Reports. These reports has been/will be made available for public comment as described above.

I&APs and stakeholders have been/will be advised of the availability of these reports and how to obtain it. They will be encouraged to comment in writing (mail or email). Any issues, comments or suggestions raised during the comment period will be added to the Comments and Responses Report (CRR) that accompanies the Final Scoping Report (Appendix 11).

iii) Description of the information to be provided to Interested and Affected Parties.

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

Upon approval of the Final Scoping Report, the Draft EIA report will be compiled. The Draft EIA & EMPR report will be circulated to the registered I&AP's and stakeholders for their perusal over a 30-days period.

The Environmental Impact Assessment Report and Environmental Management Programme Report templates prescribed by the DMRE in terms of the National Environmental Management Act, 1998 in respect of listed activities that have been trigger by this application will be used to assess the information regarding the proposed project.

The research and analysis regarding the project will be processed and interpreted to compile the information required in the abovementioned template to be distributed for public comment.

h) Description of the tasks that will be undertaken during the environmental impact assessment process

The EIA process for the proposed project is depicted below:

1. Application for Environmental Authorization and Mining Right to the DMRE;
2. The DMRE responds with reference number and accepts the application;
3. Draft Scoping Report circulated for perusal by I&AP's and stakeholders;
4. Final Scoping Report (FSR) submitted to DMRE;
5. DMRE takes a decision on the FSR;

6. Impact Assessment Process:
   - δ Project description and site environmental baseline;
   - δ Impact assessment;
   - δ Mitigation measures and recommendations;
   - δ EMPr compilation;
7. Draft EIA report circulated for perusal by registered I&AP's and stakeholders;
8. Final EIA report submitted to DMRE;
9. DMRE takes a decision on the Final EIA report;
10. Submission of Financial Provision amount;
11. Announcement of Environmental Authorization and Appeal Procedure;
12. Opportunity to Appeal;
13. Execution of the Mining Right.

i) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

Table 20: Table listing the identified impacts, residual risks to be managed and monitored.

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 through rehabilitation.	POTENTIAL FOR RESIDUAL RISK
δ Demarcation of site with visible beacons.	δ No impact could be identified.	Control: Implementation of proper housekeeping and site management.	LOW
δ Site establishment	δ Loss of grazing for duration of mining.	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine. The impact could be controlled through progressive rehabilitation.	LOW
δ Site establishment	δ Visual intrusion because of site establishment.	Control: Proper housekeeping and implementation of progressive rehabilitation.	LOW
δ Site establishment. δ Cumulative Impact	δ Direct loss and disturbance of floral species. δ Loss and fragmentation of vegetation communities within the CBA and ESA ecosystems.	Control: Containing the mining activities to the proposed footprint will prevent the loss of undisturbed natural vegetated areas of conservation concern.	LOW

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
δ Site establishment	δ Loss of topsoil and fertility during site establishment.	Control & Remedy: Proper housekeeping and storm water management.	LOW
δ Site establishment δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Infestation of the topsiol heaps and mining area with invader plant species. δ Infestation of denuded areas with invader plant species. δ Infestation of the reinstated area with invader plant species.	Control: Implementing soil- and invader plant control/management.	LOW-MEDIUM
δ Site establishment δ Processing, stockpiling and transporting of material from site.	δ Dust nuisance because of site establishment activities. δ Dust nuisance because of the mining activities.	Control: Dust suppression methods and proper housekeeping.	LOW
δ Site establishment δ Excavation of mining area δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Noise nuisance because of the site establishment activities. δ Noise nuisance because of mining activities. δ Noise nuisance because of mining activities. δ Noise nuisance because of the decommissioning activities.	Control: Noise suppression methods and proper housekeeping.	LOW
δ Excavation of mining area δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Potential soil contamination from hydrocarbon spills. δ Potential impact associated with littering and hydrocarbon spills.	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	LOW

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	δ Potential impact assocaited with litter/hydrocarbon spills left at the mining area.		
δ Excavation of mining area	δ Potential impact on areas of palaeo concern.	Control & Stop: Implementing good management practices, as well as the chance-find protocol.	LOW
δ Excavation of mining area δ Cumulative Impact	δ Direct loss and disturbance of fauna species and communities. δ Fragmentation of ecosystems affecting safe movement of fauna species.	Control & Stop: Implementing good management practices.	LOW
δ Excavation of mining area	δ Runoff from mining area having a potential impact on the Botha's River.	Control & Stop: Implementing good management and stormwater handling practices.	LOW
δ Excavation of mining area	δ Potential damage to Eskom power line.	Control & Stop: Maintaining a 10 m buffer between the mining activities and the power line.	LOW
δ Processing, stockpiling and transporting of material from site. δ Sloping and landscaping.	δ Loss of stockpiled material due to ineffective stormwater control. δ Erosion of returned topsoil after rehabilitation.	Control & Stop: Implementing stormwater control measures on site.	LOW
δ Processing, stockpiling and transporting of material from site.	δ Deterioration of the access road to the mining area. δ Overloading of trucks having an impact on the public roads.	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.	LOW

j) Other Information required by the competent Authority

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

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein)

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

- **Visual intrusion associated with the mining:**

  The removal of the vegetation cover to access the clay will impact on the visual character of the study area. The significance of this impact must be fully assessed during the EIA process taking mitigation measures into consideration to reduce the impact as much as possible.

- **Impact on the air quality and noise ambiance of the study area:**

  The operation of the clay and aggregate mine potentially increases the possibility of dust and noise related impacts on the receiving environment. The degree of impact as well as the significance of dust and noise generation must be assessed during the EIA process. By nature, these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project.

- **Employment opportunities and socio-economic impact:**

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

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

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

The specialist did not identify the presence of national estate as referred to in Section 3(2) of the NHRA, 1999 within the earmarked footprint of the study area.

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

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

The alternatives to be considered during the impact assessment process will be done at the hand of information obtained during the site investigation, public participation process, desktop studies as well as the specialist studies conducted of the earmarked area. As discussed earlier the following alternatives may need to be assessed in the EIAR:

e) Operational aspects of the activity

The operational aspects of the activity was based on the historic mining activities that has been ongoing for several years. Due to the small scale of the proposed activity, the fact that the clay is mined through direct excavation and no processing (apart from occasional crushing of aggregate) is required the operational requirements of the mine is lenient. The project does consider mitigating impacts such as dust generation, traffic control, waste management, and rehabilitation. These mitigation measures will be elaborated on during the EIA process, the project team will heed the suggestions of the specialists and investigate the possibility of implementing it.

f) Option of not implementing the activity (No-go Alternative)

Amongst others, the impact of mining on current, and future land uses of the study area will be compared to the *status quo* and will be considered as part of the EIA process and discussed in the DEIAR.

l) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Christine Fouche **herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs form stakeholders and Interested and Affected parties has been correctly recorded in the report.**

Signature of the EAP
DATE: 27 November 2023

m) UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Christine Fouche **herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorder and reported herein.**

Signature of the EAP
DATE: 27 November 2023

- END -