TRANSKEI QUARRIES (PTY) LTD

A PORTION OF ERF RE/153 AND ERF RE/725

MNQUMA MAGISTERIAL DISTRICT

EASTERN CAPE PROVINCE

CLOSURE PLAN

FILE REF NO: EC 30/5/1/2/2/0183 MR – EC-00033-MR/102

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EXECUTIVE SUMMARY

Greenmined Environmental (Pty) Ltd is the consultants responsible for the Section 102 amendment application submitted by Transkei Quarries (Pty) Ltd over a portion of Erf RE/153 and Erf RE/725, and in support of this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was compiled.

The purpose of this document is to provide site management with an Annual Rehabilitation Plan as well as the Final Rehabilitation, Decommissioning and Closure Plan, compiled in terms of the NEMA Amendment Act, 2014 (Act No. 25 of 2014) read with the Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015 (GN 1228, Financial Provision Regulations 2015 (as amended)). The closure plan includes the following aspects:

1. Annual rehabilitation as reflected in the annual rehabilitation plan;
2. Final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in the final rehabilitation, decommissioning and mine closure plan;
3. Remediation of latent or residual environmental impacts which may become known in the future, as reflected in the environmental risk assessment report.

Annual Rehabilitation Plan:

Upon approval of the Section 102 amendment application and receipt of the EA, the Right Holder will annually report on the planned rehabilitation actions.

Rehabilitation, Decommissioning and Mine Closure Plan:

Upon approval of the Section 102 application, the mining area will be 30.1036 ha in extent. The Rehabilitation, Decommissioning and Mine Closure Plan details the closure objectives, -actions, relinquishment criteria, monitoring, auditing, and reporting commitments for the earmarked area. It is proposed that upon closure of the mining area all infrastructure, equipment, plant, and other items used during the mining period (and not required by the landowner) will be removed. The unexcavated area will be landscaped to rehabilitate the disturbance and will subsequently revert to municipal use. The excavation will be rendered safe and left as a landscape feature.

Environmental Risk Assessment Report:

At this stage no latent risks that will potentially arise during the closure phase of the mining area were identified. By reason of the fact that no latent risks regarding the management of the mining area were identified no additional monitoring, auditing or reporting requirements are required at this stage.

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LIST OF DEFINITIONS

Abandonment: The act of abandoning and relinquishment of a mining claim or intention to mine, a voluntary surrender of the claim or mine to the next party.

Appropriately qualified: A person who has training in the skills appropriate to the type of work to be done, and experience of the type of mine and of the size, complexity and safety classification of the deposit or the environmental conditions (or both) pertaining to the specific project.

Closure Plan: Annual Rehabilitation and Final Rehabilitation, Decommission and Closure Plan.

Biodiversity: Biodiversity is an abbreviation of “biological diversity”. It means the variety of living things – the different plants, animals and microorganisms, the genes they contain and the ecosystems of which they are a part.

Closure: The act of reinstating a redundant mine which is acceptable for final mine closure.

Context of an environmental impact: The overall environmental setting in which an environmental impact occurs. It includes all "natural" components and characteristics (or both) and all "human and social" components and characteristics (or both). It has both spatial and time dimensions.

Design: The documented result of a systematic process during which all relevant factors and criteria are considered. The design includes the design report, the working drawings and the operations manual.

Environmental impact: Any change in the state of a component of the environment, whether adverse or beneficial, that wholly or partially results from activities, projects or developments.

Environmental integrity: The reliability of performance of the environmental impact management measures associated with the facility, with respect to the environmental performance objectives.

Environmental management programme: A programme contemplated in the Mineral and Petroleum Resources Development Act, 2002 submitted to and approved by the Director: Mineral Development and detailing the plan to be adopted and implemented by a mine for managing the environmental effects of the operations of the mine.

Environmental objectives: Those objectives that represent the desired state of environmental components that have been adopted for the mine.

Intensity of an environmental impact: The severity of the consequences of an environmental impact, as judged by suitably qualified persons.

Manager of a mine (general manager): Any competent person appointed in terms of the Mine Health and Safety Act, 1996 (Act 29 of 1996), to be responsible for the control, management and direction of a mine.

Rehabilitated land: Is defined as land that has previously been mined through or areas, which have been disturbed by the mining process. These areas have been sloped, covered with topsoil (where possible), fertilized (if needed), seeded and can support a sustained long-term vegetation cover.

Redundant: No longer required for mining operation.

Reliability: The probability that a specified event will not occur in a specified time (usually expressed as a ratio, when measured in quantitative terms).

Risk: The probability that a specified event, such as failure, will occur in a specified time.

Scheduled closure: Planned closure of the mine

Significant environmental impact: An impact in respect of which consultation (with the relevant authorities and other interested and affected parties) on the context and intensity of its effects provides reasonable grounds for mitigating measures to be included in the environmental management programme. Significance is determined by the integration of the context and intensity of the effects of the impact, and the likelihood that the impact will occur.

Topsoil: means the layer of soil covering the earth which –
(a) provides a suitable environment for the germination of seed;
(b) allows for penetration of water; and
(c) Is a source of microorganisms, plant nutrients and in some cases seed.

Unscheduled closure: The closure cost associated with immediate closure and provision.

LIST OF ABBREVIATIONS

BAR	Basic Assessment Report
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment

EPA	Environmental Performance Assessment
EMPR	Environmental Management Program
I&AP's	Interested and Affected Parties
MPRDA	Mineral and Petroleum Resources Act, 2002 (Act No 28 of 2002)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
S102	Section 102 Amendment Application in terms of the MPRDA
WCMR	Waste Classification and Management Regulations
WWF	World Wildlife Fund

1. INTRODUCTION

Butterworth Quarry entails the mining of a hard rock quarry on municipal land that extends over a portion of Erf RE/153 and Erf RE/725, approximately 3 km east of the CBD of Butterworth. In 2023, the Right Holder applied for consent of the Minister to (amongst others) expand the mining footprint with 13.9402 ha in terms of Section 102 of the Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002).

Greenmined Environmental (Pty) Ltd ("Greenmined") is the consultants responsible for the Section 102 amendment application, and in support of this application, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was accordingly drafted. This report (the Closure Plan) stipulates the rehabilitation methods to be followed in the restoration of Butterworth Quarry. The report was compiled in line with Government Notice 940 of the National Environmental Management Act, 1998 [NEMA] (Act No. 107 of 1998) together with Regulation 62 of the Minerals and Petroleum Resources Development Act, 2002 [MPRDA] (Act No. 28 of 2002). The information used in this report was sourced during the EIA process.

The purpose of this document is to provide site management with an Annual Rehabilitation Plan as well as the Final Rehabilitation, Decommissioning and Closure Plan, compiled in terms of the NEMA Amendment Act, 2014 (Act No. 25 of 2014) read with the Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015 (GN 1228, Financial Provision Regulations 2015)(as amended).

1.1 BACKGROUND INFORMATION

Butterworth Quarry has seen its inception in 1971. Subsequently, Sunshine Enterprises (Pty) Ltd was granted a mining right for the area in November 2009 that is valid until 03 November 2039. Raumix Aggregates (Pty) Ltd procured the quarry in April 2018 and a Section 11 application was submitted to the DMRE that was granted in April 2021 ceding the mining right to Transkei Quarries (Pty) Ltd. The approved mining area is 16.1634 ha and falls within the GPS coordinates listed in the following Table.

Table 1: GPS Coordinates of the approved mining right area.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32º19'46.98"	28º10'49.94"	-32.329717º	28.180539º
B	32º19'45.97"	28º10'52.78"	-32.329436º	28.181328º
C	32º19'49.08"	28º10'59.12"	-32.330300º	28.183089º
D	32º19'50.83"	28º11'04.13"	-32.330786º	28.184481º
E	32º19'55.95"	28º11'01.66"	-32.332208º	28.183794º
F	32º20'00.75"	28º10'57.30"	-32.333542º	28.182583º
G	32º20'00.92"	28º10'46.82"	-32.333589º	28.179672º
H	32º20'01.39"	28º10'43.09"	-32.333719º	28.178636º

Figure 1: Satellite view of the approved footprint of Butterworth Quarry where the orange polygon shows the layout of Erf RE/725 and the blue polygon shows Erf RE/153 (image obtained from Google Earth)

1.2 PROJECT PROPOSAL

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

- ❖ align the mining documentation with the Section 11 approval,
- ❖ update the EMPR; and
- ❖ expand the mining footprint;

, in terms of Section 102 of the MPRDA, 2002 (S102).

Should the S102 application (including EA) be approved, the Right Holder intends to expand the mining footprint with 13.9402 ha within the GPS coordinates as listed in the following table and depicted in the subsequent figure.

Table 2: GPS Coordinates of the proposed expansion area.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A1	32º19'51.305"	28º11'05.984"	-32.330918º	28.184996º
A2	32º19'54.291"	28º11'04.447"	-32.331748º	28.184569º
A3	32º20'07.326"	28º11'01.991"	-32.335369º	28.183886º
A4	32º20'07.811"	28º10'58.562"	-32.335503º	28.182934º
A5	32º20'08.635"	28º10'56.388"	-32.335732º	28.182330º
A6	32º20'09.182"	28º10'54.468"	-32.335884º	28.181797º
A7	32º20'09.157"	28º10'51.770"	-32.335877º	28.181047º
A8	32º20'08.753"	28º10'48.012"	-32.335765º	28.180003º
A9	32º20'07.855"	28º10'46.021"	-32.335515º	28.179450º
A10	32º20'05.954"	28º10'43.812"	-32.334987º	28.178837º
A11	32º20'04.171"	28º10'42.936"	-32.334492º	28.178593º
A12	32º20'01.391"	28º10'43.089"	-32.333720º	28.178636º
A13	32º20'00.925"	28º10'46.817"	-32.333590º	28.179672º
A14	32º20'00.750"	28º10'57.303"	-32.333542º	28.182584º
A15	32º19'55.947"	28º11'01.659"	-32.332208º	28.183794º
A16	32º19'50.834"	28º11'04.129"	-32.330787º	28.184480º

Figure 2: Satellite view of the proposed expansion area (red polygon) in relation to the mining footprint (green polygon) and the property boundaries (blue and orange lines) (image obtained from Google Earth).

1.3 OBJECTIVES OF THE CLOSURE PLAN

The purpose of the Closure Plan is to describe the rehabilitation processes that need to take place so the mine reaches its full environmental potential upon closure.

The primary objective, at the end of the mine's life, is to obtain a closure certificate in as short a period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) [MPRDA]. To realise this, the following main objectives must be achieved:

- Remove all temporary infrastructure and waste from the site as per the requirements of the EMPR and of the Provincial Department Mineral Resources and Energy.
- Shape and contour all disturbed areas in compliance with the EMPR.
- Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the damming of surface water.

- ❖ Make all excavations safe.
- ❖ Use the topsoil effectively to promote the re-establishment of vegetation.
- ❖ Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.
- ❖ Eradicate all weeds/invader plant species by intensive management of the mine site.

2. DETAILS OF THE AUTHOR

Transkei Quarries (Pty) Ltd appointed Greenmined Environmental (Pty) Ltd to compile the Closure Plan for Butterworth Quarry. Ms Christine Fouché is the responsible consultant for the project and holds a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology with nineteen years' experience in doing environmental impact assessments and compliance monitoring in South Africa (see CV and proof of experience attached as Appendix I to the BAR & EMPR).

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

Declaration of Independence:

I, Christine Fouche, in my capacity as environmental control officer declare that–

- ❖ I act as independent environmental control officer in this compliance audit;
- ❖ I will perform the work relating to the audit in an objective manner, even if the results and findings are not favourable to the holder of the authorisation;
- ❖ I have expertise in conducting environmental compliance audits, including knowledge of the Act and regulations that have relevance to the activity;
- ❖ I will adhere to and comply with all responsibilities as indicated in the National Environmental Management Act and Environmental Impact Assessment Regulations.
- ❖ I do not have and will not have any vested interest in the activity other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

Christine Fouché Date: 17 July 2024

3. LEGAL BACKGROUND AND BEST PRACTICES

This section provides an overview of the legislative requirements applicable to the project, including the acts, guidelines and policies considered in the compilation of the Closure Plan.

3.1 THE CONSTITUTION OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996)

The legislative motivation for this project is underpinned by The Constitution of South Africa, 1996 (Act No. 108 of 1996), which states that:

The State must, in compliance with Section 7(2) of the Constitution, respect, protect, promote and fulfil the rights enshrined in the Bill of Rights, which is the cornerstone of democracy in South Africa. Section 24 of the Constitution:

24. Environment

-Everyone has the right-

(a) To an environment that is not harmful to their health or well-being; and

(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

(i) Prevent pollution and ecological degradation;

(ii) Promote conservation; and

(iii) Secure ecologically sustainable development and use of natural resources while promoting a justifiable economic and social development.

Section 24 of the Constitution of South Africa requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs or the relevant provincial Ministers to identify:

- New activities that require approval;
- Areas within which activities require approval; and
- Existing activities that should be assessed and reported on.

Section 28(1) of the Constitution of South Africa states that:

"Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".

If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation. These measures may include:

- Assessing the impact on the environment.

- ❖ Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- ❖ Ceasing, modifying or controlling actions which cause pollution/degradation;
- ❖ Containing pollutants or preventing movement of pollutants;
- ❖ Eliminating the source of pollution or degradation; and
- ❖ Remedying the effects of the pollution or degradation.

3.2 THE MINERALS AND PETROLEUM RESOURCES ACT, 2002 (ACT NO. 28 OF 2002) [MPRDA]

The table below summarises the relevant sections in terms of the MPRDA, 2002.

Table 3: Summary of the relevant rehabilitation sections of the MPRDA, 2002

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Environmental Management	Section 37	*Requires that the principles set out in section 2 of NEMA must apply to all prospecting and mining operations, and that the generally accepted principles of sustainable development must be applied by integrating social, economic and environmental factors during the planning and implementation phases of mining projects.*
	Section 38	*Requires the applicant to manage all environmental impacts in accordance with his or her environmental management plan (EMP) or the approved EMPR.*
	Section 39	*Deals with the requirements of an EMP/EMPR, whichever is applicable.*
Financial Provision	Section 41	*Financial provision needs to be provided and annually assess the environmental liability.*
Closure Certificate	Section 43	*Holder of a mining right is responsible for all environmental liabilities as may be identified in the EMP, application needs to be made to the regional manager for the closure certificate.*
Removal of Infrastructure	Section 44	*When the mining operation comes to an end the mine may not remove buildings, structures or objects which may not be demolished or removed in terms of any other law.*

3.2.1 Regulation 527 of the MPRDA, 2002

Government Notice No. R.527, as published in the Government Gazette, 23 April 2004 (GG No. 26275, Volume 466) of MPRDA stipulate that the following closure objectives must form part of the EMPR:

- ❖ Identify the key objectives for closure of the operation to guide the project design;
- ❖ Development and management of environmental impacts;
- ❖ Provide future land use objectives for the site; and
- ❖ Provide proposed closure costs.

Table 4: Requirements of Government Notice 527

AREA OF CONCERN	REGULATION	LEGAL REQUIREMENTS
The need to prevent and alleviate pollution arising from mining activities.	Regulation 42(1)	*Section 42(1) of the MPRDA stipulates that the closure process must start at the commencement of a mining operation and continue throughout the entire life of the mine. Furthermore, future closure and land use objectives must be included in the EMP Section 42(1) d stipulates that any environmental damage or residual impacts that are identified during the Environmental Risk Assessment (ERA) phase must be acceptable to all Interested and Affected Parties (I&AP's) in line with Section 24(a) of the National Constitution.*
Mine Closure	Regulation 43	*A closure plan contemplated in Section 43(3)(d) of the Act, forms part of the EMPR or EMP, as the case may be, and must include – a summary of the results of progressive rehabilitation undertaken.*
Part III of R 527 deals with environmental regulations for mineral development, petroleum exploration and production.	Regulation 56	*In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that –The land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concepts of suitable development.*

3.3 THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) [NWA]

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways, which take into account:

- ❖ Meeting the basic human needs of present and future generations;
- ❖ Promoting equitable access to water;
- ❖ Redressing the results of past racial discrimination;
- ❖ Promoting the efficient, sustainable and beneficial use of water in the public interest;

- ❖ Facilitating social and economic development;
- ❖ Providing for growing demand for water use;
- ❖ Protecting aquatic and associated ecosystems and their biological diversity;
- ❖ Reducing and preventing pollution and degradation of water resources;
- ❖ Meeting international obligations; and
- ❖ Managing floods and droughts.

The following sections of the NWA, 1998 are relevant.

Table 5: NWA, 1998 applicable sections

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Prevention and remedying effects of pollution.	Section 19	*Any situation exist or which may cause or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.*
Control of emergency incidents.	Section 20	*Incidences of pollution needs to be reported the Department and the relevant catchment agency*
General principles: Water uses	Section 21	*The water uses listed that requires water use authorisatoin.*

3.4 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998) [NEMA]

The National Environmental Management Act (NEMA) strives to regulate national environmental management policy and is focussed primarily on co-operative governance, public participation and sustainable development. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith.

The following sections are relevant.

Table 6: NEMA, 1998 applicable sections

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Principles that may significantly affect the environment.	Section 28	*General duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot*

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
		reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.
Control of emergency incidents.	Section 30	*Incidences of pollution needs to be reported the Department.*
Environmental Management Plan.	Section 34	*A draft EMP must include –* *information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –* *(iv) rehabilitation of the environment;* *as far as reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally acceptable principle of sustainable development, including where appropriate, concurrent or progressive rehabilitation measures.*

3.4.1 Regulation 1228 of NEMA, 1998

NEMA, GNR 1228 GG 41236, known as the NEMA Financial Provision Regulations, 2015 (as amended), was promulgated in November 2015, and in terms of these regulations holders of a mining right are allowed a transitional period of 39 months (19 February 2019) from the date of promulgation to comply. The compliance date was extended to February 2024.

As mentioned earlier the right holder must annually update the annual rehabilitation, final rehabilitation and remediation of latent environmental impacts and ensure it is compliant with the Financial Provision Regulations of 2015 (as amended). The reports need to be conducted in the format that was supplied in the regulations as per Appendix 5 and Appendix 6.

3.5 THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO 57 OF 2008) [NEM:WA]

The rehabilitation measures must be aligned with the objections of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) which includes:

(a) To protect health, well-being and the environment by providing reasonable measures for—
  (i) Minimising the consumption of natural resources;
  (ii) Avoiding and minimising the generation of waste;

(iii) Reducing, re-using, recycling and recovering waste;
(iv) Treating and safely disposing of waste as a last resort;
(v) Preventing pollution and ecological degradation;
(vi) Securing ecologically sustainable development while promoting justifiable economic and social development;
(vii) Promoting and ensuring the effective delivery of waste services;
(viii) Remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
(ix) Achieving integrated waste management reporting and planning;

(b) To ensure that people are aware of the impact of waste on their health, well-being and the environment;
(c) To provide for compliance with the measures; and
(d) Generally, to give effect to Section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being

3.5.1 Waste Classification and Management Regulations, 2013 (GNR 634)

Waste Classification and Management Regulations (WCMR) promulgated under the National Environmental Management: Waste Act, 2008 (NEM:WA) (effective 2013) provides mechanisms to:

- Facilitate the implementation of the waste hierarchy to move away from landfill;
- Reuse, recovery and treatment;
- Separate waste classification from the management of waste;
- Divert waste from landfill and into utilisation where possible; and
- Provide measures to monitor the progress

The Waste Classification and Management Regulations ultimately enables the improved and more efficient classification and management of waste; provide for safe and appropriate handling, storage, recovery, reuse, recycling, treatment and disposal of waste and will also enable accurate and relevant reporting on waste generation and management. All waste generators, excluding domestic generators, must ensure that the waste they generate is classified within 180 days of its generation.

All wastes that were classified in terms of the “Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste in terms of the Department of Water Affairs’’ (2nd Edition, 1998; Department of Water Affairs and Forestry) or alternative classifications that were approved prior to the WCMR taking effect, must be re-classified and assessed within three years from the commencement of these Regulations.

Reference is made to the NEM:WA, part 8 of Chapter 4 regarding contaminated land:

All owners of land that is significantly contaminated become obliged to report that contamination is occurring. Part 8 of Chapter 4 is concerned with the remediation of contaminated land. This new legal regime for identifying contaminated land, determining its status and the risk that it poses, and regulating the remediation process is introduced. This law imposes significant legal obligation on the owners of land and on those who cause contamination, with potentially serious financial consequences. Part 8 applies where the pollution only manifest sometime after the contamination occurred and also where the action of a person (for example, the excavation of land pursuant to a development) results in a change to pre-existing contamination. Along with the notice brining Part 8 into effect, norms and standards for the remediation of contaminated land and soil quality (list certain contaminants and specify soil screening values for human health and environmental protection). This act also has several important implications for the sale of and, sellers who know that their lands is contaminated can no longer keep silent and this is classified as an offence.

3.6 FURTHER ACTS RELEVANT TO MINE REHABILITATION

- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).
- The South African Mineral Resource Committee (SAMREC) Code. Of particular importance in this regard is the determination of whether the mine has made an adequate provision for environmental rehabilitation in terms of Section 41 of the MPRDA.

3.7 BEST PRACTICE AND INTERNATIONAL GUIDELINES

Mine closure is an international challenge. South Africa has produced various well-known and reputable guidelines on matters directly linked and or associated with mine closure. Such was the need for guidelines to manage mine closure provisions in a consistent manner provided for by the DMRE (2005).

These guidelines are the only official mine closure guideline as contemplated in Regulation 54(1) in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Of particular importance is that this guideline document governs the closure cost assessment process in South Africa and is applied by the DMRE through its respective regional managers in each province.

The Chamber of Mines (CoM) (2007) issued a guideline for the rehabilitation of mined land. This document is a result of scientific knowledge experts. It is an on the ground reference document which provides written guidelines on the best rehabilitation techniques. Of value is how the document distinguishes between the financing, the planning and the licensing components of a typical mining program.

The World Wildlife Fund (WWF) in 2012 published a discussion document named the "Financial provision for the rehabilitation and closure in South African Mining: Discussion Document on Challenges and recommended improvements". The document focuses on the adequacy of financial provisions and pulls a very strong link between insufficient financial allocations and that of derelict and abandoned mines in South Africa. The document further emphasizes the importance of establishing a dependency between the EMPR/EMP and financial provision which is updated and adequate

A released guideline from the Government of Western Australia (GWA 2011) provides insight to the importance of mine closure. The guidelines (GWA 2011) state that planning for mine closure is a critical component of environmental management in the mining industry. Notably is that this industry leading practice also requires that planning for mine closure should start before mining commence and should continue throughout the life of the mine until final closure and relinquishment. This approach enables better environmental outcomes. It is also good business practice, as it should avoid the need for costly remedial earthworks late in the project lifecycle.

4. ENVIRONMENTAL AND PROJECT CONTEXT

4.1 APPROVED OPERATIONAL ACTIVITIES

The Quarry footprint and land surrounding the mine between Ketani Road, and the Gcuwa River is municipal commonage owned by the Mnquma Local Municipality. In 2006 rural land use included grazing and the establishment of a few informal residential dwellings. The town's wastewater treatment works are located to the east of the quarry and a poorly managed soil waste refuse site developed to the south of the quarry. The Gcuwa River meanders around the western boundary of the quarry footprint and deflects eastwards around the southern limits of the previous waste site and the wastewater treatment works before deflecting southwards again *en route* to the coast. This drainage system, therefore, encloses the mining footprint, the proposed expansion area, and wastewater treatment works between the drainage channel to the south and Kentani Road to the north.

Residual dolerite of the Drakensberg Group is mined at Butterworth Quarry, where the cooled dolerite formed massive, sub-horizontal sheets. The 2006 mining application proposed the winning of the rock north and east of the then mining scar. Mining is undertaken in a benched open pit at elevations. The pit excavations are limited by the mine boundaries that stand in relation to the adjacent Gcuwa River and to the north by the processing plant and office buildings. The current depth of the quarry is approximately 50 m from the immediate ground level. Rock breaking is done initially by drilling and blasting using crawler mounted rigs and emulsion type bulk explosives. Oversized boulders are placed aside in the pit and large boulders are broken with explosives utilizing secondary blasting. The broken

rock is sorted and loaded onto articulated dump trucks that is hauled to the primary crushing plant, where various products are further conveyed to secondary-, tertiary- and quaternary crushing and screening processes to result in the desired products. Butterworth Quarry produces aggregates and road pavement layering products for the construction and building industry of mainly the Eastern Cape.

4.1.1 Site Infrastructure

Butterworth Quarry has well established buildings and infrastructure on site. The following main areas are defined at the mine:

1. Truck parking area (outside gate) & secured entrance gate;
2. Weighbridge and supporting infrastructure;
3. Office buildings;
4. Workshop, wash bay and stores;
5. Processing area with crushing and screening plant;
6. Various stockpile areas;
7. Area where remnants of the old processing plant (being decommissioned); and
8. Quarry pit.

Figure 3: Satellite view of the various developed areas at Butterworth Quarry (image obtained from Google Earth)

The Quarry is connected to the Eskom grid and access is gained directly from the surfaced Kentani Road to the north. There are no servitudes registered within the mine footprint, nor railways passing the Quarry.

4.1.2 Water Use

The potable water of the Quarry is obtained from the municipality, while process water is extracted from the sump in the quarry pit. The dolerite is fractured between the Gcuwa River and the western boundary of the mine and the open fractures in the bedrock therefor act as a conduit for sub-surface water seepage. Surface water from the adjacent river system seeps through these open fractures into the quarry excavation. The resultant quarry pit continuously fills with water seeping through the fractured bedrock, and the pit must continuously be pumped to afford personnel and opportunity to work in the floor of the excavation.

4.1.3 Waste Management

The mine generates limited amounts of general- and hazardous waste. The Right Holder has an integrated waste management policy, and the company strives to recycle where possible. Presently, waste is separated into waste that can be re-used, recycled, and those that must be removed from the site. General waste (that cannot be reused on site) is removed to the Mnquma municipal landfill site. Hazardous waste is removed from site by qualified hazardous waste handling contractors.

4.2 SECTION 102 APPLICATION

Should the expansion application be approved the mining method will remain unchanged. No additional infrastructure needs to be established in the expansion area as the motivation for the proposed extension is to expand only the quarry pit perimeter. The Right Holder will continue to use the existing offices, workshops, storerooms, plant etc. of the Quarry and therefore no construction/site establishment phase is applicable.

4.1.4 Operational Phase

The southern boundary of the quarry pit was historically (before 2007) extended beyond the authorised mine boundary. Should this S102 application be approved the Right Holder will continue with the expansion of the quarry pit in a southern/south-eastern direction. The mining method of the quarry will remain the same and bench mining will also be applicable in the expansion.

If the expansion is approved, the southernmost boundary of the quarry pit will extend up to the 1:100 year floodline of the Gcuwa River but stay more than 32 m from the bank of the river. No excavations will enter the floodline, and the Quarry will approach the Department of Water and Sanitation (DWS) regarding the need for a possible amendment of the current water use authorization of the mine.

Mining related equipment/machinery that will operate within this area will consist of at least the following:

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

4.3 REGIONAL SETTING AND LAND USE

The Quarry footprint and all surrounding land is municipal commonage owned by the Mnquma Local Municipality. Rural land use includes grazing and the establishment of residential dwellings. The town's wastewater treatment works is located to the east of the quarry. The registered mine boundary is exclusively used for quarrying activities. As mentioned earlier, the quarry excavation was historically (before 2003) mined across the southern mine boundary. The proposed expansion area that applies to this application includes the previously mined section as well as land that was previously used as a waste refuse site. As mentioned earlier, the refuse site has since been reinstated and presently the footprint comprise of unoccupied rural municipal land. The MR Holder leases a part of this land for stockpiling purposes from the municipality.

The surrounding land uses include the following:

- Kentani Road passes the Quarry to the north and serves as the main access road;
- The Mchubakazi residential area is located north, and north-west of the Quarry, while the Zizamele residential area developed to the north-east (north of Kentani Road);
- Amongst others a Santex factory, Tiki Plant Hire, and a brick yard developed to the north-west (south of Kentani Road);
- The municipal wastewater treatment works is east of the Quarry boundary; and
- South of the Quarry, opposite the Gcuwa River, there is poorly maintained rural land occasionally used for grazing by the community.

4.4 TOPOGRAPHY

Butterworth Quarry is located at the southern foothills of a significant west to east orientated ridge that has been eroded by fluvial forces. The N2 highway from Butterworth to Mthatha was constructed on this ridge. The landscape to the south of the ridge has been lowered by fluvial erosion and encouraged by the perennial river system that flows southwards to the west of the quarry and meanders towards the east, south of the quarry.

The Quarry footprint is generally characterised by gentle south-westerly and westerly sloping gradients in the northern part of the study area, becoming moderate in the western and southern parts of the quarry footprint. The quarry is isolated from the river channel environment to the south by stepped bedrock faces and constructed berms along the western boundary. The river channel generally occurs at a lower level to that of the quarry excavation floor, which has been excavated down to a depth of ±505 mamsl.

As shown in the following figure, the topography of the proposed expansion area gradually slopes from the highest point (545 mamsl) along Kentani Road towards the river reach in the south. The route

indicated below shows an average slope of 3.8% over 1 km, with a maximum elevation gain of 15.4 m (or -34.8 m elevation loss).

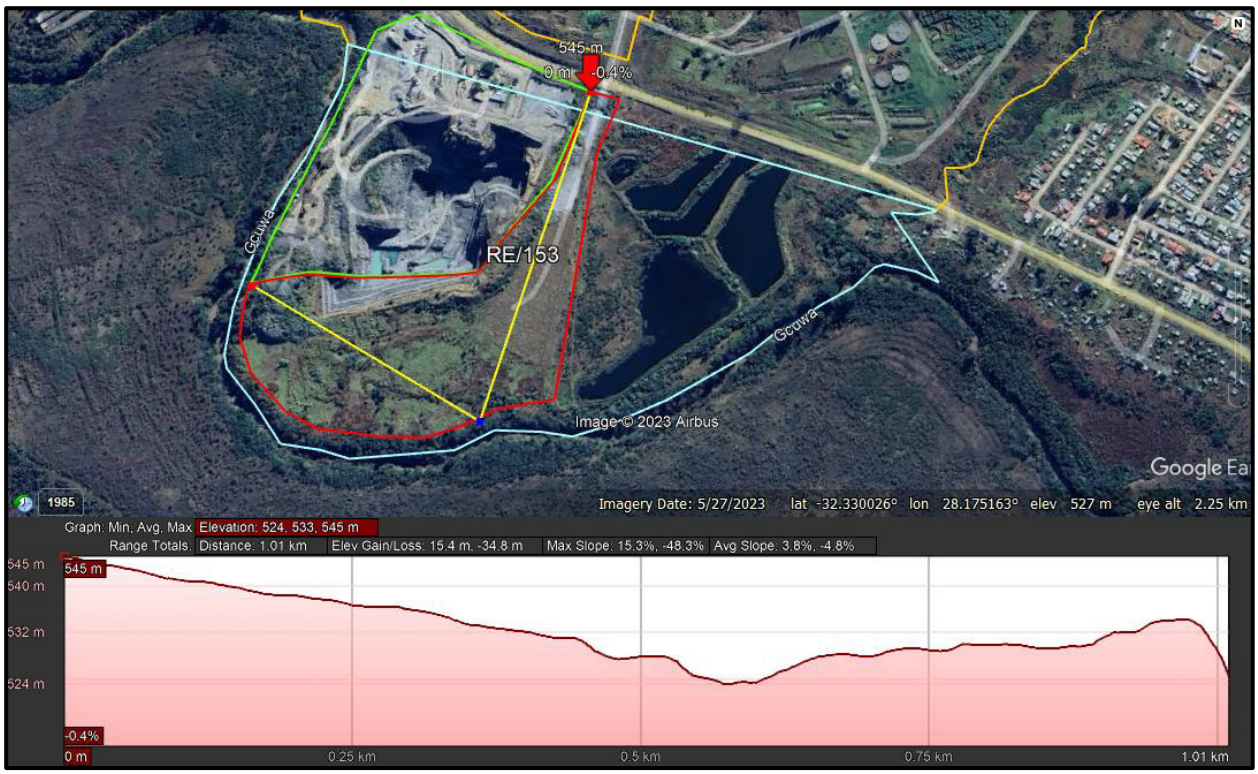

Figure 4: Elevation profile of the proposed expansion area (Image obtained from Google Earth).

4.5 VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of populated residential areas to the north; east the wastewater treatment works border the quarry, and the southern and western areas are undeveloped municipal land. Kentani Road passes the Quarry to the north.

4.6 AIR AND NOISE QUALITY

The air quality and noise ambiance of the study area was historically representative of a rural environment. The surrounding area has since been transformed with the development and expansion of the nearby residential areas such as Mchubakazi and Zizamele. Traffic along Kentani Road also contribute to the air and noise quality of the area. Butterworth Quarry has been contributing to the air and noise quality of the area through the following:

- Dust generated by wind over un-vegetated and denuded areas;
- Dust generated by vehicles and unsurfaced roads;
- Dust generated during topsoil and overburden removal and the loading of material onto trucks and tipping into the plant;
- Crushing and screening at the processing plant.

Fallout dust levels, at the Quarry, are monitored by an appropriately qualified service provider and dust suppression measures are implemented to prevent/minimise the nuisance to the nearby residents. Noise at the Quarry is generated by blasting, loading operations, crushing, and screening and vehicular traffic. The Quarry appoints an occupation hygienist to monitor the noise levels and report on it to the DMRE.

The proposed expansion of the mining footprint is not expected to have a cumulative impact on the air quality and/or noise ambiance of the receiving environment as mining will gradually move into the expansion area as the current footprint becomes depleted. Mining the excavation in a southern direction will take the operations further away from the residents (opposite Kentani Road) towards the undeveloped rural land where there are no resident human receptors.

4.7 GEOLOGY AND SOIL

(Information extracted from the *Butterworth Quarry - Transkei Quarries Mandatory CoP to Combat Rock Fall and Slope Instability Related Accidents in Surface Mines.)*

Although the Adelaide Subgroup consists mainly of sandstones and red mudstones, the quarry is found in a dolerite intrusion within the Middleton Formation. The targeted commodity of interest in the quarry is therefore the dolerite, which forms most of the rock mass of the quarry.

The dolerite deposit at Transkei Quarries is a competent rock mass deposit with a general trend of increased competence the deeper the working levels become. Above the competent intact dolerite is a weathered zone (varying in thickness) consisting of weathered dolerite and undulated mudstones and sandstones displaying the eroded dolerite boulders. The typical Karoo Dolerite, i.e. a medium to fine grained, hard igneous rock with the pyroxene and plagioclase crystals in the matrix exhibiting strong interlocking ophitic intergrowths has a small percentage of interstitial quartz grains that enhances the hardness of the rock. A few localized calcrete nodules were also found amidst this weathered zone that could pose a hazard when encountered in higher frequency in the vicinity of joints and slips within the rock mass.

In 2024, MLB Consulting (MLB) did geological modelling of the dolerite resource up to the 520 masl datum. The study found that the dolerite is uniformly emplaced up to the pit bottom. Pit mapping and site visits to the surrounding quarries confirmed the geological principle of lateral continuity into the expansion area and into the current mining right area. All established benches and stacks have been found to be within the targeted dolerite intrusive. No geoscientific evidence of resource discontinuity or the possibility thereof was noted on the lateral extents of the resource model boundaries. The Vertical extent of the resource model has been truncated and limited to the 520 masl datum; the Dolerite intrusives have been confirmed and mapped at this (lowest) elevation in the pit bottom. A total

inferred in-situ resource estimate of ±24 million m^3 was estimated based on the volumetric analysis done by MLB.

The 2022 Slope Instability Code of Practice (CoP) of the Quarry describes the general structural style of Butterworth Quarry as relatively simple. It is a rounded massive formation due to the cooling down of magma and lava that had formed the massive dolerite sill. No faults were encountered during the mining processes thus far. However, numerous joints occur in the dolerite naturally, as well as mining-induced due to blasting procedures. One distinct joint-sets occur at Butterworth Quarry and for all practical purposes these joints are near vertical in dip. Their strike directions' azimuths are on average 52° - 232° along the Eastern Highwall and on average 89° - 269° along the Southern Highwall. The joint spacing vary between 50 cm and 2 metres apart. The joints have rough surfaces and do not indicate any intrusive fill material; hence they are not slickensided. Preferably the bench face orientation needs to be perpendicular to a jointset's strike orientation, but it is impossible to intersect all the above described jointsets seeing that they all have different strike azimuths. Therefore the CoP recommends that the face orientation should be planned to intersect the joint strike orientations of these joints posing the highest risk at an angle between 30° to 60° in plan view. The steeply dipping joints (dipping into the highwalls) also cause flexural toppling. This is exaggerated at bullnoses induced by mining practice and mine planning. The creation of bullnoses must always be avoided. The CoP notes that bench widths vary from 2 m to up to 12 m. However a minimum of 8 m bench widths is required at a maximum bench height of 12 m (for un-weathered dolerite) and 10 m (for weathered dolerite) to ensure an overall slope angle of 54 degrees.

4.8 HYDROLOGY

The mining area is situated in the Kei sub-water management area that forms part of the Mzimvubu to Kies Kamma Water Management Area (ID 21). According to the SANBI National Freshwater Ecosystem Priority Areas (NFEPA) Map, the study area falls within an Upstream River FEPA. According to the Technical Report for the National Freshwater Ecosystem Priority Areas Project (Water Research Commission, 2011), Upstream Management Areas are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPA's and Fish Support Areas. Upstream Management Areas are like Ecological Support Areas (ESA).

The said SANBI sensitivity map further identifies a wetland cluster across the study area. The definition of a wetland cluster is a group of wetlands within 1 km of each other that are embedded in a relatively natural landscape. This allows for important ecological processes such as migration of frogs and insects between wetlands. However, in many areas of the country, wetland clusters no longer exist because the surrounding land has become too fragmented by human impacts.

Fish Sanctuaries are sub-quaternary catchments required to meet fish population targets. Fish sanctuaries in a good condition (A / B ecological category) are deemed FEPA's, and the remaining ones are deemed Fish Support Areas. Ideally the river condition of a Fish Support Area must be improved, and amongst others the alien invasive fish must be removed. Fish Support Area's must be maintained in a condition that supports the threatened fish population it contain (if any). Upstream Management Areas require management only to ensure that human activities do not degrade the condition of FEPAs and Fish Support Areas that occur downstream. The SANBI BGIS Map Viewer shows the study area to be within a Fish Sanctuary Classed CDEFZ confirming the highly modified ecological status of the Gcuwa River and it is therefore deemed a Fish Support Area instead of a FEPA.

The main watercourse of the study area is the Gcuwa River that borders the study area to the west, south, and east. The proposed footprint of the expansion area was chosen to stay >32 m from the banks of the river. It is also proposed that no excavations will extend into the 1:100 year floodline of the Gcuwa River. The Quarry will continue (until formal closure of the mine) to take biannual water quality samples of the Gcuwa River (upstream and downstream of the mine) and the water in the quarry pit to prevent the mine impacting the water quality of the river and possibly affecting downstream users.

The use of ingress water that cyphers into the excavation from the river will continue at the Quarry until formal closure of the mine. Mining the proposed expansion area will not impact the fish support status of the area as the proposed activities will remain outside the 1:100 year floodline and riparian vegetation layer of the Gcuwa River. As mentioned earlier, the earmarked footprint has been disturbed on numerous occasions during the past 10 years, and therefore no longer contribute to the wetland cluster that was previously identified by SANBI in the area.

4.9 TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, GROUNDCOVER AND FAUNA

When the mining right footprint is layered over the Mining and Biodiversity Map, the south/south-western part extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining. 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*". 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.

According to the 2019 Eastern Cape Biodiversity Conservation Plan there is a Terrestrial Ecological Support Area (ESA) defined along the western, southern, and eastern parts of the study area, with the river indicated as an Aquatic Critical Biodiversity Area (CBA).

According to Mucina and Rutherford (2012) the natural vegetation type of the study area is classified as 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 *Vachellia 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). 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.

Considering the above, ground-truthing however, showed that the proposed footprint has been highly disturbed in the past when it was used as dumping grounds. Although the area has since been reinstated, the vegetation cover is representative of pioneer species with alien invader plant species scattered throughout. The disturbed area is also subject to encroachment by *Vachellia* trees. No protected and/or sensitive plant species occur within the proposed expansion area.

The study area is significantly transformed and enclosed within an area that has experienced mining activities for more than 50 years. The faunal component of the study area is highly disturbed, and no resident species of conservation importance were identified within the study area.

4.10 CULTURAL AND HERITAGE ENVIRONMENT

No sites of cultural or archaeological interest occur in the study area.

4.11 SOCIO-ECONOMIC CONTEXT

The mining area is in Ward 03 of the Mnquma Local Municipality (MLM). The MLM is a category B Municipality located in the south-eastern part of the Eastern Cape Province and falls under the jurisdiction of the Amathole District Municipality. The main economic sectors of the MLM include community (government) services (±41%), wholesale and retail trade (±18.5%) and manufacturing (15.5%).

In 2011 the MLM ranked 31st by population size of South African municipalities. The Amathole District Municipality (ADM) IDP notes that the MLM exhibited a negative growth rate as population numbers

dropped from 254 000 in 2009 to 249 000 in 2019. This is supported by StatsSA showing a -1.17% growth rate between 2001 and 2011.

In 2019, the MLM contributed 28.30% of the ADM's GDP. StatsSA notes that 42 974 people of the MLM are economically active (employed or unemployed but looking for work), and of these 44.2% are unemployed. Of the 20 464 economically active youth (15 - 34 years) in the area, 55.7% are unemployed.

5. ANNUAL REHABILITATION PLAN

Appendix 3 to the Financial Provision Regulations, 2015 (as amended) states that the objective of the annual rehabilitation plan is to:

a) review concurrent rehabilitation and remediation activities already implemented;
b) establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months, which contribute to the gradual achievement of the post-mining land use, closure vision and objectives identified the holder's final rehabilitation, decommissioning and mine closure plan;
c) establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months;
d) identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
e) evaluate and update the cost of rehabilitation for the 12-month period and for closure, for purposes of supplementing the financial provision guarantee or other financial provision instrument.

5.1 IMPLEMENTATION AND REVIEW TIMEFRAMES

The annual rehabilitation plan will be applicable for a 12-month period commencing from the date of approval thereof by the Department of Mineral Resources and Energy. The document will be reviewed during the 11th month of the operative period to ensure the timeous submission of the subsequent annual review.

5.2 MONITORING RESULTS

5.2.1 Blast Monitoring

The ground vibrations of each blast event are monitored by the blaster and subsequently captured into a report stating its compliance with the USBM limits (RI 8507, 1980). The reports are kept for official use.

5.2.2 Fallout Dust Monitoring

Butterworth Quarry conducts monthly monitoring of fallout dust levels, and the results are compared with the dust fall rate determined in the Department of Labor Accredited laboratories of Ebenaeser Environmental Consultants CC Accreditation Certificate No. 0H0064 – CI048. The site has six dust monitoring units that are situated at the following locations:

1. 20 m from weighbridge.
2. East bank from quarry.
3. Nest to beam – opp Plant.
4. West bank next to gravel road.
5. Northwest near stockpile.

6. North side of exit road.

The following figure shows the monitoring results as stipulated in the compliance table published in the January 2021 – February 2024 Dust Fall Monitoring Report. The results of units 1, 4, 5, and 6 are compared to the residential limit of D<600 mg/m^2/30day average while units 2 and 3 are compared to the non-residential limit of D<1 200 mg/m^2/30day average.

Sample Number	Locality	Total Dust fall rate (D) (mg.m^{-2}.day^{-1}30-day average) Insoluble & Soluble Matter											
		2023											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	20m from weighbridge	294	190	194	256	170	NO samples were collected - flooded - full of rain water - discarded	NO SAMPLES COLLECTED - Rebuilding Roads - traffic Management Plan	294	Samples Contaminated		322	-
2	East bank from quarry	208	171	182	267	177			200			-	280
3	Next to beem - opp Plant	160	213	183	238	167			347			415	220
4	West bank next to gravel road	215	163	186	271	199			335			347	307
5	North west near stockpile	259	87	263	328	277			361			-	-
6	North side of exit road	227	231	205	265	197			234			313	259

Sample Number	Locality	Total Dust fall rate (D) (mg.m^{-2}.day^{-1}30-day average) Insoluble & Soluble Matter											
		2024											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	20m from weighbridge	-	-										
2	East bank from quarry	273	324										
3	Next to beem - opp Plant	214	361										
4	West bank next to gravel road	300	273										
5	North west near stockpile	-	-										
6	North side of exit road	252	272										

Figure 5: Dust fall monitoring results of January 2022 – February 2024.

5.2.3 Occupational Hygiene Monitoring

Ebenaeser Environmental Consultants conducts quarterly occupational hygiene surveys to monitor and report on matters such as the personal noise exposure of the employees working at the quarry. The consultant provides guidance on the appropriate PPE, is responsible for the submission of the monitoring results to DMRE, and the identification of noise zones to be demarcated on site.

5.2.4 Water Quality Monitoring

The quarry receives potable municipal water of credible quality standards. The mine also conducts biannual water quality testing of the water up- and downstream of the river, and the quarry pit.

5.2.5 Control of Invasive Alien Vegetation

The Right Holder continuously monitors the mining footprint for the invasion of alien vegetation in accordance with the Invader Plant Species Management Plan of the site (Appendix E of the BAR & EMPR). This practice will continue throughout the site establishment-, operational-, and decommissioning phases of the project.

5.2.6 Waste Monitoring

Site management is responsible to monitor the generation of all types of waste at the mining area, including general-, hazardous- and liquid waste. Solid (general) waste, generated during the operational phase, is contained in sealable refuse bins until the waste is transported to a recognised general waste landfill site. A recognized contractor service the septic tank.

Hazardous waste (such as spills) are immediately cleaned, and the contaminated soil is placed at the bioremediation are of the mine. Other hazardous wastes such as used oil, filters and rags are contained in designated hazardous waste containers that are kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility.

5.3 SHORTCOMINGS IDENTIFIED

This report presents the updated Annual Rehabilitation Plan in terms of the Financial Provision Regulations, 2015 (as amended) to be submitted to DMRE for approval. No shortcomings have been identified in the preceding 12 months.

5.4 REHABILITATION ACTIVITIES FOR FORTHCOMING 12 MONTHS

Although this Closure Plan must still be approved as part of the Section 102 amendment application to expand the footprint of the mine, the MR Holder did not identify any rehabilitation (of the operational area) that will be done in the forthcoming 12-month period.

5.5 REVIEW OF PREVIOUS YEAR'S REHABILITATION ACTIVITIES

Butterworth Quarry did not do progressive rehabilitation during the last 12 months and therefore no activities can be reviewed.

5.6 COSTING

To be determined once annual rehabilitation objectives are established.

In 2024, the mine indicated that although no annual rehabilitation of the mining area will take place, the monitoring plans listed below will continue.

Table 7: Annual rehabilitation and monitoring related cost.

PROPOSED ANNUAL MONITORING COST	
ITEM	**COST**
Blast Monitoring	No additional cost
Noise and Fallout Dust Monitoring	±R 86 496.00
Water Quality Monitoring	±R 15 900.00
TOTAL	±R 103 296.00

6. REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN

The objective of the final rehabilitation, decommissioning and mine closure plan (according to MPRDA) is to identify a post-mining land use that is feasible through:

a) providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
b) outlining the design principles for closure;
c) explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
d) detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
e) committing to a schedule, budget, roles, and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
f) identifying knowledge gaps and how these will be addressed and filled;
g) detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
h) outlining monitoring, auditing, and reporting requirements.
(Financial Provision Regulations, 2015 Appendix 4)

The following objectives are leading closure indicators, which need to be applied across all the domains, and read in conjunction with the principles, which embody the strategic objectives. The closure plan must address all the areas associated with closing the operations, of which rehabilitation and re-vegetation forms part of a component. The first step in developing the overall mine closure strategy is to identify potential post mining land use options and establish key objectives for closure to be incorporated in the project design.

The preferred post mining land use for this mine is to restore the unexcavated areas to municipal use while the excavation will remain as a landscape feature. In this context, the primary objectives for the closure of the mining operations are:

- Remove all infrastructure that will no longer be needed by the landowner as well as all waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources.
- Shape and contour disturbed areas in compliance with the EMPR.
- Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or a safety risk to the community.
- Make all excavations safe.
- Use the topsoil effectively to promote the re-establishment of vegetation.
- Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.

- Eradicate all weeds/invader plant species by intensive management of the mining area.

6.1 CLOSURE STRATEGY GUIDED BY ENVIRONMENTAL RISK ASSESSMENT

The objective of the closure plan is to minimize adverse environmental impacts associated with the quarrying activities whilst maximising the future utilisation of the property. The idea, therefore, is to leave the mined out quarry pit in a condition that reduces all negative impacts associated with a mined area. Significant aspects to be borne in mind in this regard is visibility of the mining scar, revegetation of the mining footprint, stability, and environmental risk in an old mine environment. The depression and immediate area of the working must also be free of weeds and alien vegetation.

The proposed quarrying and rehabilitation procedures was formulated to optimise the extraction of raw material while creating stable quarry sides that will not present an unreasonable safety risk once mine closure was approved. Mining operations will be conducted in stages, corresponding to the creation of precision blasted quarry sides and benches towards the base of the working.

The decommissioning phase and closure of the quarry will in addition to precision blasted quarry faces involve removal of all debris and rehabilitation of areas not rehabilitated during the operational phases of the project. This will comprise the scarification of compacted areas, reshaping of areas, topsoiling and regeneration of all prepared surfaces. The crusher and screening plants will be disassembled and all other infrastructural development such as haulage roads and stockpile areas will be rehabilitated.

6.2 DESIGN PRINCIPLES

Upon closure of the Quarry the Right Holder will contract the expertise of a rock engineer to guide the final design of the quarry pit. The rock engineer will be directed by the following rehabilitation objectives.

6.2.1 Land Forming

- Quarrying and rehabilitation operations, in the long term, must be aimed at creating a final work face secured at safe angles that can be revegetated, where practical, to reduce the visual impact associated with bedrock mining.
- All final quarry slopes will be profiled to suitable angles (not steeper than 85º) as negotiated with the DMRE in accordance with the rehabilitation requirements being imposed on similar quarries in the region.
- The cliff section must not exceed 10 m in height and the bench section may not be narrower than 8 m (or as indicated by the rock engineer at the time of closure).

- The mine must strive to achieve the following final land surface objectives:
  - An upper face precision blasted to a gradient of 1:3 down to a depth of about 6 m below surface.
  - A precision blasted face to a gradient of not steeper than 85º in 10 m high cliff sections.
  - 8 m wide bench levels between 10 m cliff face down to the floor of the quarry.
  - Post-quarrying landscape may not be prone to erosion at an unacceptable rate.

6.2.2 Rehabilitation of Offices, Vehicle Yard and Storage Areas

- On completion of mining the above areas shall be cleared of any contaminated soil, which must be dumped at a licenced hazardous waste disposal facility.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with Section 44 of the MPRDA.
- The buildings and roads at the property will most likely be retained for future use by the landowner and will therefore not be demolished unless required by the municipality.
- The surface shall be ripped or ploughed to a depth of at least 200 mm and the topsoil previously stored adjacent to the site shall be spread evenly to its original depth over the whole area.
- The site shall be seeded with a vegetation mix adapted to reflect the local grassy vegetation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects arising from the mining operation be corrected and the area be seeded with a mi to his/her specifications.

6.2.3 Rehabilitation of Processing Areas

- On completion of mining, the surface of the processing areas (especially if compacted due to hauling and dumping operations) shall be scarified to a depth of at least 200 mm and graded to an even surface condition, and the previously stored topsoil will be returned to its original depth over the area.
- The area shall be seeded with local indigenous seed mix. Fertilisers should be avoided as far as possible to avoid nutrient loading of the nearby drainage channel.

6.2.4 Revegetation

- Disturbed surfaces will be profiled so that re-laid topsoil / overburden can be keyed into position to minimise erosion.

- ❖ All prepared surfaces must be seeded with a suitable grass species to provide an initial ground cover and stabilise the soil surface.

6.2.5 Residual Impact after Closure

- ❖ Overburden will be reintroduced to the quarry excavation to soften sides and assist with shaping of the excavation during post-quarrying rehabilitation. Provided all final slopes are maintained at 1:3 batters (quarry rim and mine residue infill) and successfully revegetated, there will be no long term instability in the rehabilitated area. The quarry cliffs precision blasted to angles of not steeper than 85˚ also provide an element of stability to hard rock quarry cliffs.

- ❖ Once adequately rehabilitated, including vegetation regrowth, the risk of siltation of the river no longer exists. The mine excavation will, nevertheless, behave as a sump and collect surface run-off after wet periods. The floor of the quarry may, therefore, reveal fluctuating water levels depending on rainfall patterns. Considering this, it is important to adequately fence/wall the excavation off to prevent unauthorized access to humans (especially children) and domestic animals upon closure of the mine. It is important that the fencing of the excavation upon mine closure is conducted with very close participation and support of the local community, to ensure the fencing remains in place and is not stolen.

6.3 POST-MINING LAND USE

Should the excavation expand up to the 1:100 year floodline of the Gcuwa River in the south/south-east (upon approval of the S102 application), ±20 ha of the ±30 ha mining footprint will be excavated. This will leave an area of ±6 ha between the excavation and Ketani Road that can be returned to municipal use. Due to the impracticality of importing large volumes of fill to restore the excavation to its original topography, the rehabilitation option is to develop the quarry pit into a minor landscape feature.

A possible alternative post-mining land use that may be considered by the municipality (landowner) is the use of the pit as a landfill site. However, the potential impacts of this will need to be assessed if and/or when the need arises.

Figure 6: Satellite image of the mining area to be rehabilitated upon closure. The mining and processing related areas (green) will revert to agricultural/residential use upon rehabilitation, and the quarry pit (blue) will be rendered safe and left as a landscape feature. (Image obtained from Google Earth

6.4 CLOSURE ACTIONS

The closure goals and objectives are to ensure that post-use rehabilitation achieves a stable and functioning landform consistent with the surrounding landscape, other environmental values and agreed land use.

The following closure actions will be applicable to the study area:

- Removal of unwanted infrastructure;
- Benching and sloping of the quarry pit;
- Removal of stockpiled material and reinstatement of the processing area;

- Vegetating the area using an appropriate grass mix.

6.4.1 Rehabilitation of Offices, Vehicle Yard and Storage Areas

In summary the closure requirements will entail:

- Clear the above areas of any/all contaminated soil (remove to a licenced waste disposal facility).
- Deal with all buildings, structures or objects on the vehicle maintenance yard and secured storage areas in accordance with Section 44 of the MPRDA.
- Leave all buildings, equipment and/or infrastructure that will remain on the property after closure in a good and functional condition and obtain written transfer of liability of the structures to the landowner.
- Rip/plough the surface to a depth of at least 200 mm and spread the previously stockpiled topsoil evenly to its original depth over the whole area.
- Seed the area with a vegetation mix adapted to reflect the local grassy vegetation.

6.4.2 Rehabilitation of Processing Areas

In summary the closure requirements will entail:

- Scarify the surface of the processing area (especially if compacted due to hauling and dumping operations) to a depth of at least 200 mm and grade the area to an even surface condition.
- Return the previously stored topsoil to its original depth over the area.
- Seed the area with a local indigenous seed mix. Avoid fertilisers as far as possible to prevent nutrient loading of the nearby drainage channel.

6.4.3 Land Forming

In summary the closure requirements will entail:

- Blast an upper face to a gradient of 1:3 down to a depth of ±6 m below surface.
- Create a precision blasted face to a gradient of not steeper than 85º in 10 m high cliff sections.
- Create 8 m side bench levels between each 10 m cliff face down to the floor of the quarry (or as indicated by the rock engineer at the time of closure).
- Ensure rehabilitated quarry area is not prone to erosion.
- Fence/wall the rehabilitated quarry pit to prevent unauthorized access.

6.4.4 Final Rehabilitation

In summary the closure requirements will apply:

- Remove all infrastructure, equipment, plant and other items used during the mining period.
- Remove all waste materials entirely from the mining area and dispose of at a recognised landfill facility. Not to be buried or burned on the site.
- Clear the mining area of all weeds and/or alien plants regarded as Category 1a or b invasive species in terms of the National Environmental Management Act, 2004 (Act No 10 of 2004) and the Alien and Invasive Species list, 2014.
- Rehabilitation must be completed within a period specified by the Regional Manager.

6.4.5 Revegetation of Rehabilitated Areas

All reinstated areas must be revegetated to establish a stable grass layer that will tie-in with the end-use of the site. The use of a commercial seed mix is recommended, and for dryland areas, the seed mix should be less than half the standard sowing rate and include annuals (e.g. wheat or rye) and perennials e.g. Couch Grass (*Cynodon dactylon*). The seed mix can be augmented by Love Grass (*Eragrostis curvula*) and Finger Grass (*Digitaria eriantha*).

6.4.6 Maintenance and Monitoring

Rehabilitated areas need to be monitored and managed after the initial rehabilitation. The mines primary tool for maintenance of the rehabilitated area will be monitoring of the reinstated areas until the closure certificate is issued. If areas are identified that are considered unsatisfactory then maintenance may include, but not be limited to:

- Replanting failed or unsatisfactory areas;
- Repairing any erosion problems; and
- Pest and weed control.

6.4.7 Success Criteria and Monitoring

To assess when the rehabilitation and re-vegetation process is complete, the mine will develop a set of completion criteria. These criteria will be reviewed by senior management before being submitted to the regulatory authorities (DMRE) for approval and sign off.

The approved set of completion criteria will be used as a basis for assessing the closure of the mining operations, with the mine required to comply with the specified criteria before the land management can be relinquished. The completion criteria will be reviewed every two years

with the closure plan and updated to include findings of the mine rehabilitation research and development program as well as additional requirements of the regulatory authorities.

When selecting completion criteria, consideration must be given to the climatic conditions in the area. Using simple percentage species and percentage cover may not be appropriate, as this is dependent on when the samples are taken. If the baseline was established during a wet year and the assessment undertaken during drought, the criteria will not be met. The rehabilitated and re-vegetated areas will be monitored to determine the progress of the programme. Monitoring is likely to be a combination of methods and may include photographic monitoring, transects and standard plot areas.

6.4.8 Impact Specific Procedures

The table below provides a summary of the impact specific procedures associated with the closure of the mine.

Table 8: Summary of the impact specific procedures

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
SOCIO-ECONOMIC		
❖ The retrenchment process will be followed as per requirements of the applicable legal process; and ❖ All existing social investments will be phased out over an agreed period with beneficiaries.	❖ Progressive rehabilitation must be implemented if possible as mining progress.	❖ Any commitments made to I&AP'S will be attended to the relevant I&AP's satisfaction as agreed upon between the I&AP'S and the mine.
TOPOGRAPHY AND EROSION CONTROL		
❖ The area will have contours constructed to prevent soil erosion.	❖ All slopes which may incur erosion will be profiled in such a way that a preferential down drain can be installed; ❖ Erosion control measures such as contour banks and cut off berms should be constructed, and soil vegetated in rehabilitated areas. On gentle slopes, water will be encouraged to flow off the rehabilitated surface as surface flow, as quickly as possible without causing erosion.	❖ Should it be noted that designs are not being followed, rehabilitation activities will cease, and corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary; ❖ Any erosion will also be addressed utilising contour berms, gabion structures if necessary or a specialist will be consulted if necessary. Any eroded soils will be lifted and returned to the affected area; ❖ Any deficiencies will be corrected by placing material in these areas as per the closure plan; ❖ Any compacted soils will be ripped or disked and re-vegetated with indigenous flora. Vegetation will then be monitored in these areas; ❖ All recommendations made by the specialists will be implemented where deemed appropriate; ❖ An alien invasive management program will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised will be used responsibly. Where required DWS will be

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
		consulted with regards to the use of certain chemicals.
ECOLOGY		
❖ The rehabilitated area will be protected from surface disturbance to allow vegetation to establish and stabilise.	❖ Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems; ❖ The rehabilitated ecosystem will have equivalent functions and resilience as the target ecosystem; ❖ Soil properties will be appropriate to support the target ecosystem; ❖ The rehabilitated areas will provide appropriate habitat for fauna.	❖ Should it be noted that designs are not being followed, rehabilitation activities will be amended to ensure corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary; ❖ An alien invasive management programme will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised must be used responsibly.
LAND USE		
❖ To ensure that rehabilitation is done to such an extent that land use potential is regained for agricultural use and associated zoning.	❖ Only after the levelled areas have been inspected and approved by the Mine Manager/Site Manager will topsoil be placed to a depth of 0.3 m. The topsoil layer must be as even as possible, i.e. it must be smooth, and the depth must remain consistent throughout; ❖ Once the topsoil has been replaced, vehicle movement will be restricted to prevent compaction of the topsoil; ❖ Rehabilitated areas will be vegetated within the same growing season (at the end of the rainy season). A suitable seedbed will be prepared to enhance the penetration and absorption of water, thereby giving the seed the best possible chance to germinate. The seeding depth should be very shallow to provide better germination. For most grass species seeding depth is approximately 5-15 mm; ❖ Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible; and	❖ N/A

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
	❖ Once the seed mixture has been sown, the land must be rolled to ensure consolidation around the seeds and effective moisture retention.	

6.5 CLOSURE SCHEDULE

At this stage it is proposed that the rehabilitation of the mining area will take approximately twelve months to complete.

Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been completed in an area. Site management will implement an alien invasive plant management plan during the 12-month aftercare period to address germination of problem plants in the area. Final rehabilitation shall be completed within the period specified by the Regional Manager.

According to the MPRDA Section 43 (4) refers to the issues of a closure certificate and stipulates the following:

"Section 43(4) Issuing of a closure certificate -

(4) 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.

Table 9: Closure schedule.

CLOSURE SCHEDULE	
DECOMMISSIONING / CLOSURE ACTION	**TIMEFRAME**
QUARRY PIT AREA	
Quarry Pit: ❖ Blast an upper face to a gradient of 1:3 down to a depth of ±6 m below surface. ❖ Create a precision blasted face to a gradient of not steeper than 85º in 10 m high cliff sections. ❖ Create 8 m side bench levels between each 10 m cliff face down to the floor of the quarry (or as advised by the rock engineer). ❖ Ensure rehabilitated quarry area is not prone to erosion. ❖ Fence/wall the rehabilitated excavation to restrict unauthorised access.	Week 1 – 25
VEHICLE YARD & SECURED STORAGE AREA & PROCESSING AREAS	

CLOSURE SCHEDULE	
DECOMMISSIONING / CLOSURE ACTION	**TIMEFRAME**
Offices, Vehicle Yard and Storage Areas: ❖ Clear the above areas of any/all contaminated soil (remove to a licenced waste disposal facility). ❖ Deal with all buildings, structures or objects on the vehicle maintenance yard and secured storage areas in accordance with Section 44 of the MPRDA. ❖ Leave all buildings, equipment and/or infrastructure that will remain on the property after closure in a good and functional condition and obtain written transfer of liability of the structures to the landowner. ❖ Rip/plough the surface to a depth of at least 200 mm and spread the previously stockpiled topsoil evenly to its original depth over the whole area. ❖ Seed the area with a vegetation mix adapted to reflect the local grassy vegetation.	Week 26 – 38
Processing Areas: ❖ Remove all remaining stockpiled material. ❖ Remove the processing plant.	Week 39 – 44
Supporting infrastructure: ❖ Scarify the surface of the processing area (especially if compacted due to hauling and dumping operations) to a depth of at least 200 mm and grade the area to an even surface condition; ❖ Return the previously stored topsoil to its original depth over the area; ❖ Seed the area with a local indigenous seed mix. Avoid fertilisers as far as possible to prevent nutrient loading of the nearby drainage channel.	Week 45 – 52
MAINTENANCE AND AFTER CARE	
❖ Erosion Monitoring ❖ Weeds and Invader Plant Control	12 months duration after final closure of the mining area

6.6 IMPLEMENTATION AND RESPONSIBILITY OF CLOSURE PLAN

Implementation of the closure plan is ultimately the responsibility of the mining right holder. Upon commencement of the closure phase daily compliance monitoring will be the responsibility of the site manager. The site manager will be responsible for ensuring compliance with the guidelines as stipulated in the EMPR as well as the prevention and/or rectification of environmental incidents. The applicant will appoint an

Environmental Control Officer to oversee compliance of the rehabilitation/closure activities.

6.6.1 Site Management Responsibility List

- Inspect area for erosion, pooling and/or compaction;
- Floral surveys need to be conducted to monitor cover abundance, plant succession and community structure;
- Monitor any ecologically sensitive species should it be observed on site.

6.6.2 Management of Information and Data

The Closure Plan must include a description of the management strategies, and all information and data relevant to mine closures. These records are valuable during all phases of mining to provide:

- A history of closure and implementation at the site;
- A history of past developments;
- Information for incorporation into state and national natural resource databases; and
- The potential for improved future land use planning and/or site development.

6.7 IDENTIFIED GAPS IN THE PLAN

The assumptions made in this plan, which relate to the closure objectives and associated impact on the receiving environment, stem from site specific information gathered by the project team. No gaps in the Rehabilitation, Decommissioning and Mine Closure Plan could be identified.

6.8 RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES

The specific rehabilitation outcomes against which the effectiveness of rehabilitation must be measured are:

- that the topography has been sufficiently rehabilitated without unsafe excavation edges;
- that topsoil has been spread on the surface;
- that there is a potential rooting depth of at least 30 cm, of non-compacted soil material, which is suitable for root growth, across the mining area;
- that there is no visible erosion across the area, or down-slope of it because of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
- that a successful cover crop has been established across the area.

In addition to the above, the following relinquishment criteria is proposed for the closure activities of Butterworth Quarry.

Table 10: Relinquishment criteria for closure activities.

RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES			
CATEGORY	**RELINQUISHMENT CRITERIA**	**INDICATORS**	**REPORTING REQUIREMENTS**
Slope stability and safety	The site is safe for use by humans and animals for the foreseeable future.	Code of practice to combat rock fall and slope instability related accidents in surface mines.	Appropriate risk assessment undertaken, and control measures are in place that will continue to meet agreed requirements.
Decommissioning of all structures and haul roads	No visible man-made structures should remain. Haul roads should be removed and sloped to blend in with the natural landscape.	Close-out inspection by site management upon end of decommissioning phase.	Photographic evidence that infrastructure has been removed.
Soil erosion	Implementation of erosion control measures or the establishment of vegetation in denuded areas.	Engineered structures to control water flow	Proof in final closure report that required structures are in place and functional.
Vegetation	Seeding of a cover crop after topsoiling.	Biodiversity monitoring	Monitoring report
Invader plant management	Continuous management of invader plants until the establishment of the first cover crop.	Biodiversity monitoring	Monitoring report
Land Use	Land capability and productivity like that which existed prior to mining.	Land capability and productivity	Comparison to equivalent areas.

6.9 CLOSURE COST ESTIMATE

Financial provision (Regulation 54 of the MPRDA, 2002) is the amount needed for the rehabilitation of damage caused by the operation, both at sudden closure during the normal operation of the project and at final, planned closure. This amount reflects what it will cost the Department to rehabilitate the area disturbed in case of liquidation or abscondence. Financial provision for environmental rehabilitation and closure requirements of mining operations forms an integral part of the MPRDA. Section 41 of the MPRDA and Regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

Based on the extent of the current disturbance and by utilizing the Department of Mineral Resources and Energy guideline document for calculating financial provision the proposed dolerite mine needs to provide a financial provision value of R 7 229 820.00 (calculated July 2024). Refer to Part B(1)(f)(i)(e) *Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline* of the 2024 BAR & EMPR for an explanation as to how the financial provision amount was calculated.

6.10 MOTIVATION FOR AMENDMENTS MADE TO THE FINAL REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN

The Final Rehabilitation, Decommissioning and Mine Closure Plan of the Butterworth Quarry was amended to include the proposed expansion area and update the plan to comply with the latest rehabilitation objectives.

7. MONITORING, AUDITING AND REPORTING

In compliance with applicable legislation the mining right holder will conduct monitoring of the mining activities for the duration of the decommissioning phases. The compliance of the site will be audited, and reporting will be done to the relevant authorities. The table below stipulates the actions to be followed in this regard.

Table 11: Monitoring, auditing, and reporting requirements.

MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	**RESPONSIBLE PERSON**	**FREQUENCY OF AUDIT**	**CLOSE OUT APPROACH**
LEGISLATED AUDITING AND REPORTING			
Environmental Auditing	**Internal Review**		
	Site manager to ensure compliance with Environmental Authorization, Environmental Management Programme and Closure Plan.	Daily compliance monitoring.	Any non-conformance must immediately be addressed by site management and weekly reported on.
	External Auditing		
	Environmental Assessment Practitioner	Annual auditing and reporting to the Department of Mineral Resources and Energy	Depending on the significance of the findings site management has a maximum of four weeks to address and close out auditing results.
Financial Provision Review	Independent Competent Consultant	Annual review of the financial provision and reporting of the findings to the Department of Mineral Resources and Energy.	Should the review of the financial provision indicate a shortfall the holder of the right will increase the financial provision to meet the audited financial provision within 90 days from the date of approval received from DMRE.
Health and Safety Auditing	Health and Safety Manager	Monthly auditing of health and safety aspects on-site. Monthly reporting to the Mine Health and Safety division of the Department of Mineral Resources and Energy.	Depending on the significance of the findings site management has a maximum of 48 hours to address and close out auditing results.
MONITORING			

MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	**RESPONSIBLE PERSON**	**FREQUENCY OF AUDIT**	**CLOSE OUT APPROACH**
Blast Monitoring	Blaster	Monitoring done during each blasting event.	Should the study indicate results of concern, the blast design of the following blast needs to be adapted to prevent a reoccurrence. Any damage that results because of the blast needs to be repaired or compensated for by the mining right holder.
Fallout Dust Monitoring	Dust Monitoring Consultant	Monthly Fallout Dust Monitoring	Site management has a maximum of two weeks to develop and implement a dust management plan should the dust level standard (600mg/m²/day) be exceeded.
Invader Plant Monitoring	Independent Consultant	Annual Monitoring	Site management has a maximum of two weeks to review and implement the invader plant control plan should Category 1a & b plants in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 15 of 1973) and the Alien and Invasive Species Regulations, 2014 (amended 2016) germinate on-site.
Noise Monitoring	Occupational Hygienist	Quarterly Noise Monitoring	Site management has a maximum of one week to designate additional noise zones where applicable. Hearing protection equipment must always be available to employees.
Water Monitoring	Accredited Laboratory	Annual Quality Monitoring	Immediate action is required should the results of the water quality test exceed the SANS 241:2006 & 2015 levels.

7.1 Schedule of reporting requirements

The following table stipulates the reporting requirements and how document updating will be handled.

Table 12: Reporting requirements.

REPORTING REQUIREMENTS			
AUDIT	**LEGISLATION**	**REPORTING REQUIREMENTS**	**UPDATE DISCLOSURE**
Environmental Auditing	NEMA; EIA Regulations, 2014 (as amended)	Reporting on the environmental compliance of the mining area will be in accordance with Regulation 34 of the NEMA EIA Regulations, 2014 (as amended). The environmental audit report will contain the information set out in Appendix 7 of the said Regulation.	The environmental audit report will indicate the ability of the EMPR and Closure Plan to adequately manage the activity. Should the reports not be sufficient, amendment will be proposed.
Financial Provision Review	NEMA Amendment Act, 2014 (Act No 25 of 2014) Financial Provision Regulations, 2015 (as amended)	Reporting on the financial provision for closure of the mining area will be in accordance with Section 24P of the NEMA Amendment Act, 2014 (Act No 25 of 2014) read with the Financial Provision Regulations 2015 (as amended).	The auditor will annually report on the adequacy of the financial provision and any adjustments that need to be made to the financial provision.
Health and Safety Auditing	Occupational Health and Safety Act, 1993 Mine Health and Safety Act, 1996	Reporting on the health and safety compliance of the mining area will be in accordance with the Mine Health and Safety Act, 1996.	The safety manager will annually update the Code of Practices applicable to the site.

7.1.1 Monitoring Plan and Compliance Assessment

The following list presents the monitoring programmes to be implemented on site for the duration of the decommissioning phase:

Table 13: Monitoring plan and compliance assessment.

MONITORING PROGRAMMES	
MONITORING UNIT	**FREQUENCY**
DUST MONITORING	

MONITORING PROGRAMMES	
MONITORING UNIT	**FREQUENCY**
Fallout Dust Monitoring: Fallout dust monitoring is an effective method to identify priority control areas that result in excessive dust emissions. Fallout dust, also known as precipitating dust, is monitored to identify the fine dust particles that are liberated and can travel from the site to another location. The site already has six fallout dust units in place that will be used to monitor the dust levels during the decommissioning phase. The dust units are emptied monthly, and the collected matter weighed to determine the dustfall rate averaged over 30 days. The residential fallout dust standard allocation of 0 – 600 mg/m²/day is used for the dust units near the community.	Monthly until final closure of the site
Gravimetric Dust Monitoring: Gravimetric sampling of dust is the internationally acceptable method to determine respirable dust concentrations of a site. This monitoring is implemented to determine the level of exposure employees are subjected to during each shift as prolonged exposure to atmospheric dust can five rise to several lung disorders or diseases. Personal and/or static monitoring is done by a qualified Occupational Hygienist in accordance with the guidelines for gravimetric sampling published under the auspices of the Department of Mineral Resources and Energy – Guidelines for the Compilation of a Mandatory Code of Practice – No. 1 Personal Exposure to Airborne Pollutants.	Quarterly until final closure of the site
NOISE MONITORING	
Personal Noise Monitoring: Personal noise exposure monitoring is done to determine the noise levels employees are exposed to during an eight-hour shift. Excessive noise exposure can lead to hearing loss and therefore continuous monitoring and demarcation of noise zones are of the utmost importance. This monitoring is conducted by a qualified Occupational Hygienist who must submit his findings on Form 21.9(2)(e) prescribed by the Department of Mineral Resources and Energy in terms of the National Environmental Management: Air Quality Act, 2004 (Act No 39. of 2004).	Quarterly until final closure of the site
SOIL EROSION MONITORING	
Soil Erosion: The definition for erosion is defined in the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) as the loss of soil through the action of water, wind, or other	Weekly monitoring for the first 6 months or until the first cover crop has established

MONITORING PROGRAMMES	
MONITORING UNIT	**FREQUENCY**
agents including the subsidence of soil. Soil erosion monitoring must be implemented by site management to prevent the loss of exposed soil because of the mining activities. If the replaced topsoil stay exposed, it is especially vulnerable to soil erosion. It is therefore proposed that a cover crop be planted if vegetation does not establish within the first six months of topsoil spreading.	
WEEDS AND INVADER PLANT MONITORING	
Management of Weed or Invader Plants: All species listed in terms of the Alien and Invader Species (AIS) regulations published in terms of section 97(1) of NEM:BA as amended 2016, are deemed to be declared invasive species, and should be managed accordingly. When identifying weeds that need to be eradicated from the site the plants listed in the AIS regulations are used as guideline. Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area. Site management must implement an alien invasive plant management plan during the 12-months aftercare period to address germination of problem plants in the area.	Monthly monitoring for the duration of the decommissioning phase.
STORM WATER MONITORING	
Storm Water Monitoring: The risk of erosion or loss of topsoil due to uncontrolled storm water flowing through the decommissioning area can be reduced through proper monitoring and implementation of effective storm water infrastructure. Monitoring needs to continue during the 12 months aftercare period.	Monthly monitoring for the duration of the decommissioning phase.
HEALTH AND SAFETY MONITORING	
Management of Health and Safety Risks All operations must comply with the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) as well as the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Daily monitoring for the duration of the decommissioning phase.

8. ENVIRONMENTAL RISK ASSESSMENT REPORT

The objective of the environmental risk assessment report is to:

a) ensure timeous risk reduction through appropriate interventions;
b) identify and quantify the potential latent environmental risks related to post closure;
c) detail the approach to managing the risks;
d) quantity the potential liabilities associated with the management of the risks; and
e) outline monitoring, auditing, and reporting requirements.

(Financial Provision Regulations, 2015 Appendix 4)

8.1 ASSESSMENT PROCESS USED TO IDENTIFY AND QUANTIFY LATENT RISKS

8.1.1 Methodology

The methodology for the assessment of the potential latent risks entailed the use of the following:

DEFINITIONS AND CONCEPTS:

Environmental significance:

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

- Environmental significance is a value judgement.
- The degree of environmental significance depends on the nature of the risk.
- 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 risk magnitude and risk significance. Risk magnitude is the measurable change (i.e. intensity, duration and likelihood). Risk significance is the value placed on the change by different affected parties (i.e. level of acceptability)

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will be used

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

Environmental Significance = Overall Consequence x Overall Likelihood

Determination of Overall Consequence

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

Determination of Severity / Intensity

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

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

Table 14: Rating of severity used in the assessment of potential latent risks.

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

Determination of Duration

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

Table 15: Rating of duration used in the assessment of potential latent risks.

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 16: Rating of extent / spatial scale used in the assessment of potential latent risks.

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

Determination of Overall Consequence

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

Table 17: Example of calculating overall consequence in the assessment of potential latent risks.

CONSEQUENCE	RATING

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

Determination of Likelihood:

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

Determination of Frequency

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

Table 18: Rating of frequency used in the assessment of potential latent risks.

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 19: Rating of probability used in the assessment of potential latent risks.

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

Overall Likelihood

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

Table 20: Example of calculating overall likelihood in the assessment of potential latent risks.

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 significance of the risk, which is a number that will then fall into a range of **Insignificant risk, Uncertain risk** or **Significant Risk**, as shown in the table below.

Determination of Overall Environmental Significance

Table 21: Determination of overall environmental significance in the assessment of potential latent risks.

SIGNIFICANCE OR RISK	INSIGNIFICANT RISK (CC)	UNCERTAIN RISK (BB)	POTENTIAL SIGNIFICANT RISK (AA)
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 – 19.9

Qualitative description or magnitude of Environmental Significance

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

Table 22: Description of environmental significance and related action required in the assessment of potential latent risks.

SIGNIFICANCE	AN INSIGNIFICANT RISK (CC)	UNCERTAIN RISK (BB)	A POTENTIAL SIGNIFICANT RISK (AA)
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 substantial in relation to other impacts. Pose a risk to the company. Unacceptable
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	Improve management measures to reduce risk.

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

A potential Risk (aa)	Risks of a substantial order. Mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these.
An uncertain risk (bb)	Risk would be negligible. Almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple.
An insignificant risk (cc)	There would be very small to no risk.

8.1.2 Description of Latent Risks

At this stage no latent risks that will potentially arise during closure phase of the mining area were identified.

8.1.3 Results and Finding of Risk Assessment

Not applicable as no latent risks were identified.

8.1.4 Changes to the Risk Assessment Results

N/A

8.2 MANAGEMENT ACTIVITIES

No additional management activities are necessary as no latent risks were identified.

8.3 COST ESTIMATE

Not applicable as no latent risks were identified.

8.4 MONITORING, AUDITING AND REPORTING REQUIREMENTS

By reason of the fact that no latent risks regarding the management of the quarry were identified no additional monitoring, auditing or reporting requirements are required at this stage.

9. CONCLUSION

This Closure Plan needs to be followed together with the EMPR and its amendments when it is decided that the end of mining has been reached. This document gives the necessary information when planning the rehabilitation of the mine together with the cost associated with the rehabilitation.

Transkei Quarries (Pty) Ltd commits itself to providing all the necessary resources to ensure that the rehabilitation of the mine is done in such a way that will be acceptable to all parties involved.

10. SIGNATURE OF AUTHOR

NAME	SIGNATURE	DATE
Christine Fouché		17 July 2024

11. UNDERTAKING BY RIGHT HOLDER

I, David Vorster……., the undersigned and duly authorised thereto by .....Transkei Quarries (Pty) Ltd..... ……. undertake that Transkei Quarries (Pty) Ltd will comply with the provisions of the MPRDA and its Regulations as set out in Government Gazette no. 26275 (23 April 2004), as well as NEMA.

I have studied and understand the contents of this document and duly undertake to adhere to the conditions as set out therein, unless specifically or otherwise agreed to in writing.

Signed at Butterworth…….. on this 19 day of June……2024……

_____

Name: David Vorster

Designation: Regional Manager

12. REFERENCES

- Chamber of Mines of South Africa, 1981. Guidelines for the rehabilitation of land disturbed by surface product mining in South Africa, Johannesburg.
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- MLB Consulting, 2024. Transkei Quarries – Butterworth Resource-Reserve Estimation.