

**MINING RIGHT APPLICATION OVER PORTION 0 AND  
PORTION 1 (REMAINING EXTENT) OF THE FARM DE  
KLERKS KRAAL NO 231, THEUNISSEN DISTRICT,  
FREE STATE PROVINCE**

**CLOSURE PLAN**

**DEPARTMENTAL REFERENCE NUMBER:**

**FS 30/5/1/2/2/10071 MR**

**JUNE 2022**

**PREPARED FOR:**

Vengablox (Pty) Ltd  
28 Potgieter Street  
P.O. Box 202  
Theunissen  
9410  
Contact Person: Mr M du Plessis  
Tel: 057 733 1626  
E-mail: [machiel@wzbeta.co.za](mailto:machiel@wzbeta.co.za)



**PREPARED BY:**

Greenmined Environmental (Pty) Ltd  
Unit MO1, No 107 AECI Site  
Baker Square, Paardevlei  
De Beers Avenue  
Somerset West  
7130  
Contact Person: Ms C Fouché  
Tel: 021 851 2673  
Cell: 082 811 8514  
Fax: 086 546 0579  
E-mail: [Christine.f@greenmined.co.za](mailto:Christine.f@greenmined.co.za)



## **EXECUTIVE SUMMARY**

Greenmined Environmental (Pty) Ltd is the consultants responsible for the mining right application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was accordingly drafted for the proposed mine.

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, November 2017 (GN 1228, Financial Provision Regulations 2017). The amendment of the closure plan entails a review of 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 mining right application and receipt of the EA, the right holder will annually report on the planned rehabilitation actions.

### Rehabilitation, Decommissioning and Mine Closure Plan:

Rehabilitation will include activities to be divided into medium- and long term categories. In the medium term, rehabilitation will entail the continuous reinstatement and seeding of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve final landscaping of the site, the replacement of the topsoil on the final minor area and the reinstatement of the processing area prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The MR holder will further be responsible for the seeding of all rehabilitated areas.

### Environmental Risk Assessment Report:

At this stage, no latent risks that will potentially arise during 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.

## 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 Regional Manager: DMRE 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 levelled, covered with topsoil, fertilized, 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**

DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
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)
WCMR	Waste Classification and Management Regulations
WWF	World Wildlife Fund

## TABLE OF CONTENTS

1.	INTRODUCTION.....	9
1.1	BACKGROUND INFORMATION .....	9
1.2	PROJECT PROPOSAL.....	9
1.3	OBJECTIVE OF THE CLOSURE PLAN .....	11
2.	DETAILS OF THE AUTHOR.....	11
3.	LEGAL BACKGROUND AND BEST PRACTICES.....	13
3.1	THE CONSTITUTION OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996).....	13
3.2	THE MINERALS AND PETROLEUM RESOURCES ACT, 2002 (ACT NO. 28 OF 2002) [MPRDA] 14	
3.2.1	Regulation 527 of the MPRDA, 2002 .....	14
3.3	THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) [NWA].....	15
3.4	THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998) [NEMA] 16	
3.4.1	Regulation 1228 of NEMA, 1998 .....	17
3.5	THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO 57 OF 2008) [NEM:WA].....	18
3.5.1	Waste Classification and Management Regulations, 2013 (GNR 634).....	18
3.6	FURTHER ACTS RELEVANT TO MINE REHABILITATION.....	20
3.7	BEST PRACTICE AND INTERNATIONAL GUIDELINES .....	20
4.	ENVIRONMENTAL AND PROJECT CONTEXT .....	21
4.1	PROJECT LOCATION .....	21
4.2	PROPOSED MINING OPERATION.....	22
4.2.1	Site Establishment Phase.....	22
4.3	Operational Phase.....	25
4.4	TOPOGRAPHY .....	26
4.5	AIR AND NOISE QUALITY .....	27
4.6	GEOLOGY .....	27
4.7	HYDROLOGY, GEOHYDROLOGY AND GROUND COVER (INCLUDING WETLANDS) .....	27
4.8	TERRESTRIAL FAUNA .....	29
4.9	CULTURAL AND HERITAGE ENVIRONMENT.....	29
4.10	EXISTING INFRASTRUCTURE .....	29
5.	ANNUAL REHABILITATION PLAN .....	29
5.1	IMPLEMENTATION AND REVIEW OF TIMEFRAMES.....	30
5.2	MONITORING RESULTS .....	30
5.2.1	Control of Invasive Alien Vegetation.....	30
5.2.2	Noise Monitoring.....	30
5.2.3	Dust Monitoring.....	31

5.2.4	Waste Monitoring .....	31
5.2.5	Water Monitoring .....	31
5.3	SHORTCOMINGS IDENTIFIED .....	31
5.4	REHABILITATION ACTIVITIES FOR THE FORTHCOMING 12 MONTHS .....	32
5.5	REVIEW OF THE PREVIOUS YEAR'S REHABILITATION ACTIONS .....	32
5.6	COSTING .....	32
6.	REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN.....	32
6.1	CLOSURE STRATEGY GUIDED BY THE ENVIRONMENTAL RISK ASSESSMENT .....	33
6.2	DESIGN PRINCIPLES .....	34
6.3	POST-MINING LAND USE .....	35
6.4	CLOSURE ACTIONS .....	35
6.4.1	Medium Term Rehabilitation .....	35
6.4.2	Long Term / Final Rehabilitation.....	36
6.4.3	Revegetation of Rehabilitated Areas .....	38
6.4.4	Maintenance and Monitoring .....	38
6.4.5	Success Criteria and Monitoring.....	39
6.4.6	Impact Specific Procedures .....	40
6.5	CLOSURE SCHEDULE .....	43
6.6	IMPLEMENTATION AND RESPONSIBILITY OF CLOSURE PLAN .....	45
6.6.1	Site Management Responsibility List.....	45
6.6.2	Management of Information and Data .....	45
6.7	IDENTIFIED GAPS IN THE PLAN .....	45
6.8	RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES .....	45
6.9	CLOSURE COST ESTIMATE .....	46
6.10	MOTIVATION FOR AMENDMENTS MADE TO THE FINAL REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN.....	47
7.	MONITORING, AUDITING AND REPORTING .....	47
7.1	SCHEDULE FOR REPORTING REQUIREMENTS .....	49
8.	ENVIRONMENTAL RISK ASSESSMENT REPORT .....	51
8.1	ASSESSMENT PROCESS USED TO IDENTIFY AND QUANTIFY LATENT RISKS .....	51
8.1.1	Methodology .....	51
8.1.2	Description of Latent Risks .....	58
8.1.3	Results and Finding of Risk Assessment .....	58
8.1.4	Changes to the Risk Assessment Results.....	58
8.2	MANAGEMENT ACTIVITIES.....	59
8.3	COST ESTIMATE .....	59
8.4	MONITORING, AUDITING AND REPORTING REQUIREMENTS .....	59
9.	CONCLUSION .....	59

10.	SIGNATURE OF AUTHOR .....	59
11.	UNDERTAKING BY RIGHT HOLDER .....	60
12.	REFERENCES .....	61

## LIST OF FIGURES

Figure 1: Satellite view showing the location of the proposed mining area (yellow polygon) in relation to the surrounding landscape where the white polygon indicates the Blazecor mining permit area, the red polygon shows Portion 0 of De Klerks Kraal No 231, and the green polygon shows Portion 1 (Remaining Extent) of De Klerks Kraal No 231. (Image obtained from Google Earth).....	22
---	----

## LIST OF TABLES

Table 1: Summary of the relevant rehabilitation sections of the MPRDA, 2002 .....	14
Table 2: Requirements of Government Notice 527 .....	15
Table 3: NWA, 1998 applicable sections.....	16
Table 4: NEMA, 1998 applicable sections.....	17
Table 5: GPS coordinates of the proposed mining footprint.....	21
Table 6: Summary of the impact specific procedures .....	41
Table 7: Closure schedule .....	43
Table 8: Relinquishment criteria .....	46
Table 9: Monitoring, auditing and reporting requirements.....	48
Table 10: Reporting requirements .....	49
Table 11: Monitoring Programmes .....	54
Table 12: Rating of duration used in the assessment of potential latent risks .....	55
Table 13: Rating of extent / spatial scale used in the assessment of potential latent risks .....	55
Table 14: Example of calculating overall consequence in the assessment of potential latent risks .....	55
Table 15: Rating of frequency used in the assessment of potential latent risks .....	56
Table 16: Rating of probability used in the assessment of potential latent risks .....	56
Table 17: Example of calculating overall likelihood in the assessment of potential latent risks.....	57
Table 18: Determination of overall significance in the assessment of potential latent risks .....	57
Table 19: Description of environmental significance and related action required in the assessment of potential latent risks.....	58



## **1. INTRODUCTION**

Vengablox (Pty) Ltd applied for environmental authorisation to mine sand from 238.5426 ha (hereafter rounded off to 239 ha) that extends over Portion 0 and Portion 1 (Remaining Extent) of the farm De Klerks Kraal No 231 RD within the Lejweleputswa magisterial district of the Free State Province.

Greenmined Environmental (Pty) Ltd (“Greenmined”) is the consultants responsible for the mining right application, and considering this, an Annual- and Final Rehabilitation, Decommissioning and Mine Closure Plan (*in aliis verbis* Closure Plan) was accordingly drafted for the proposed sand mine. This report (the Closure Plan) stipulates the rehabilitation methods to be followed in the restoration of the earmarked mining footprint. 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, November 2017 (GN 1228, Financial Provision Regulations 2017).

### **1.1 BACKGROUND INFORMATION**

Portion 0 and 1 (Remaining Extent) of the farm De Klerks Kraal No 231 lays within the jurisdiction of the Matjhabeng Local Municipality, ±35 km north of Theunissen and ±25 km south of Welkom. Blazecor 226 CC holds a mining permit (MP) to mine sand from the banks of the Sand River over a portion of Portion 0 of the farm De Klerks Kraal No 231. Vengablox entered into an agreement with Blazecor to apply for the proposed mining right over the current mining permit area of Blazecor.

### **1.2 PROJECT PROPOSAL**

In light of the above, Vengablox applied for environmental authorisation and a mining right over ±239 ha of the above mentioned properties, where sand will be mined from the Sand River as well as adjacent to it.

Although the proposed project footprint extends over a large area, the Applicant proposes to divide the mining right footprint (hereinafter referred to as the “major area”) into smaller mining areas of  $\pm 2.5$  ha each (hereinafter referred to as the “minor areas”). It is proposed that no more than two (2) minor areas will be mined at any given time. In addition to the proposed 2.5 ha minor areas, the Applicant will have a designated processing- and stockpiling area (1.5 ha) where the mined material will be screened and washed prior to being stockpiled and transported to clients. In other words, the total footprint to be altered by mining activities at any given time calculates to  $\pm 6.5$  ha of the 239-ha mining right area. Once a 2.5 ha area is mined the area will be rehabilitated prior to the opening of a third minor area. Considering this, the current project proposal will entail the disturbance of  $\pm 2.7\%$  of the mining right area (major area) at any given time.

The proposed MP project will therefore entail the:

- ❖ Clearing of vegetation;
- ❖ Stripping and stockpiling of topsoil of the operational areas;
- ❖ Excavation and/or pumping of sand;
- ❖ Screening and washing of sand;
- ❖ Stockpiling of the sand until it is sold; and
- ❖ Replacing the topsoil and reinstatement of the mined block prior to moving to a new minor area.

In addition to the abovementioned mining of sand from the riparian area, the Applicant also proposes to mine sand from the riverbed. It is proposed that the sand will be pumped with an agitating sand pump from the riverbed into the adjacent sand pit (in the riparian area), where the water will either syphon through the floor of the pit or be pumped to the associated settling pond. Once in the sand pit, the sand will be mined as prescribed earlier. Only one sand pump will be used in the river at any given time, with a single access made to allow for the installation and operation of the pump.

The processing area will be established in the floodplain/riparian area outside the proposed 38 m buffer/no-go areas. The following site infrastructure will be established within the footprint of the processing area (1.5 ha):

- ❖ Ablution Facilities;
- ❖ Buildings for administration, storage, and workshop purposes;
- ❖ Diesel depot ( $< 23 \text{ m}^3$ );
- ❖ Generators;
- ❖ Internal roads;
- ❖ Parking area;

- ❖ Screening- and washing plant;
- ❖ Settling pond; and
- ❖ Wash bay.

### 1.3 OBJECTIVE OF THE CLOSURE PLAN

The purpose of the Closure Plan is to describe the rehabilitation processes that need to take place to ensure that 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 at minimum cost and 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

Vengablox (Pty) Ltd appointed Greenmined Environmental (Pty) Ltd to compile the Closure Plan of the mine. 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 seventeen years' experience in doing environmental impact assessments and compliance monitoring in South Africa (see CV and proof of experience attached as Appendix Q to the EIAR & EMPR).

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

*Tel No:* 021 851 2673

*Fax No:* 086 546 0579

*E-mail address:* christine.f@greenmined.co.za

Declaration of Independence:

I, Christine Fouche, in my capacity as environmental assessment practitioner declare that–

- ❖ I act as independent environmental assessment practitioner in this matter;
- ❖ I will perform the work relating to this document in an objective manner;
- ❖ I have expertise in conducting environmental compliance audits, and -applications, 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: 07 July 2022

### 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 1: Summary of the relevant rehabilitation sections of the MPRDA, 2002*

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Environmental Management	Section 37	<i>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.</i>
	Section 38	<i>Requires the applicant to manage all environmental impacts in accordance with his or her environmental management plan (EMP) or the approved EMPR.</i>
	Section 39	<i>Deals with the requirements of an EMP/EMPR, whichever is applicable.</i>
Financial Provision	Section 41	<i>Financial provision needs to be provided and annually assess the environmental liability.</i>
Closure Certificate	Section 43	<i>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.</i>
Removal of Infrastructure	Section 44	<i>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.</i>

#### 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 2: 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)	<i>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&amp;AP's) in line with Section 24(a) of the National Constitution.</i>
Mine Closure	Regulation 43	<i>A closure plan contemplated in Section 43(3)(d) of the Act, forms part of the EMPR or EMP and must include – a summary of the results of progressive rehabilitation undertaken.</i>
Part III of R 527 deals with environmental regulations for mineral development, petroleum exploration and production.	Regulation 56	<i>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.</i>

### **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 3: NWA, 1998 applicable sections*

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Prevention and remedying effects of pollution.	Section 19	<i>Any situation exists 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.</i>
Control of emergency incidents.	Section 20	<i>Incidences of pollution needs to be reported the Department and the relevant catchment agency</i>
General principles: Water uses	Section 21	<i>The MR Holder has a valid General Authorisation issued by DWS in 2017.</i>

### **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 4: NEMA, 1998 applicable sections

AREA OF CONCERN	SECTION	LEGAL REQUIREMENTS
Principles that may significantly affect the environment.	Section 28	<i>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 reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</i>
Control of emergency incidents.	Section 30	<i>Incidences of pollution needs to be reported the Department.</i>
Environmental Management Plan.	Section 34	<p><i>A draft EMP must include –</i></p> <p><i>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 –</i></p> <p><i>(iv) rehabilitation of the environment;</i></p> <p><i>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.</i></p>

### 3.4.1 Regulation 1228 of NEMA, 1998

NEMA, GNR 1228 GG 41236, known as the NEMA Financial Provision Regulations, 2015 (amended 2017), 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 19 September 2023.

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. 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 bringing 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

Recently 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.

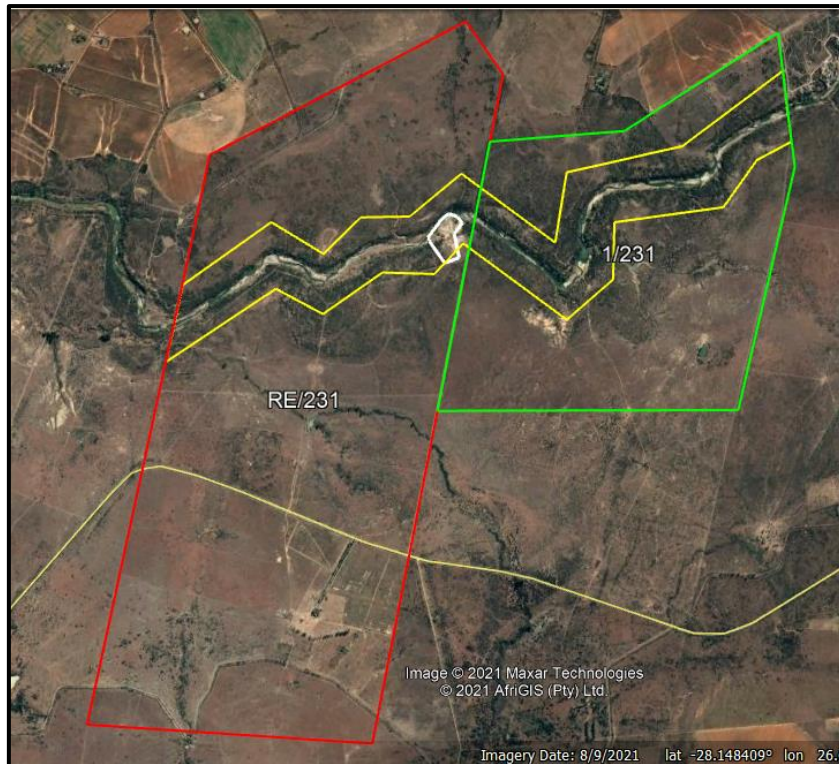
## 4. ENVIRONMENTAL AND PROJECT CONTEXT

### 4.1 PROJECT LOCATION

The mining right application was lodged over ±239 ha of Portion 0 and 1 (Remaining Extent) of the farm De Klerks Kraal No 231 in the Matjhabeng municipal area. The table below lists the GPS coordinates of the proposed mining footprint.

*Table 5: GPS coordinates of the proposed mining footprint.*

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	28°08'30.08"	26°39'05.39"	-28.141689°	26.651496°
B	28°08'15.33"	26°39'28.64"	-28.137591°	26.657956°
C	28°08'22.60"	26°39'42.58"	-28.139611°	26.661827°
D	28°08'14.18"	26°39'52.30"	-28.137272°	26.664529°
E	28°08'13.90"	26°40'05.35"	-28.137194°	26.668152°
F	28°08'03.78"	26°40'19.05"	-28.134384°	26.671957°
G	28°08'20.02"	26°40'43.87"	-28.138894°	26.678852°
H	28°08'03.36"	26°40'46.99"	-28.134266°	26.679719°
J	28°07'57.21"	26°41'17.71"	-28.132559°	26.688252°
K	28°07'39.27"	26°41'44.66"	-28.127575°	26.695738°
L	28°07'56.16"	26°41'46.76"	-28.132268°	26.696321°
M	28°08'00.53"	26°41'37.49"	-28.133481°	26.693746°
N	28°08'11.85"	26°41'28.46"	-28.136626°	26.691238°
P	28°08'15.33"	26°40'59.56"	-28.137592°	26.683212°
Q	28°08'28.76"	26°40'59.15"	-28.141321°	26.683096°
R	28°08'38.27"	26°40'46.86"	-28.143964°	26.679683°
S	28°08'20.29"	26°40'19.55"	-28.138970°	26.672098°
T	28°08'27.50"	26°40'11.92"	-28.140971°	26.669979°
U	28°08'27.19"	26°39'58.16"	-28.140887°	26.666156°
V	28°08'36.86"	26°39'42.70"	-28.143572°	26.661860°
W	28°08'30.96"	26°39'30.11"	-28.141932°	26.658365°
X	28°08'48.06"	26°39'01.46"	-28.146683°	26.650406°



*Figure 1: Satellite view showing the location of the proposed mining area (yellow polygon) in relation to the surrounding landscape where the white polygon indicates the Blazecor mining permit area, the red polygon shows Portion 0 of De Klerks Kraal No 231, and the green polygon shows Portion 1 (Remaining Extent) of De Klerks Kraal No 231. (Image obtained from Google Earth).*

## **4.2 PROPOSED MINING OPERATION**

### **4.2.1 Site Establishment Phase**

Site establishment entails the demarcation of the mining boundaries (of the first two minor areas) the buffer/no-go areas, and the processing area; clearance of vegetation from the floodplain (where necessary), and the stripping and stockpiling of topsoil to access the sand and establish the mining related infrastructure and stockpile area (floodplain).

#### **4.2.1.1 Demarcation of Mining Boundaries**

Pursuant to receipt of an Environmental Authorisation (EA) and Mining Right (MR), and prior to mining, the boundary of the mining footprint has to be demarcated. However, because of the size of the mining right footprint ( $\pm 239$  ha), the installation of beacons along the outer mining boundaries is deemed impractical. The Applicant therefore proposes to demarcate the boundaries of each operational minor area ( $\pm 2.5$  ha) as well as the processing area. Additional thereto, the 38 m buffer around the river channel, the wetland conditions (marginal- and lower zone), all lateral drainage lines and backwater wetlands will be demarcated and managed as no-go areas, with the exception of one entrance point into the river channel (at a time), where minimal access will be needed to allow for the placement and operation of the proposed sand pump as discussed in more detail below.

#### **4.2.1.2 Access Road**

The Applicant will use the existing gravel farm roads, that provide access to the farms (both north and south of the river) from tertiary roads (surfaced north of the river, and gravel south of the river) that ultimately connect with the R30 provincial road to the east, to access the mining areas and transport material from the mine. Haul roads will be extended into the mining area as mining progresses, the Applicant will strive to confine these roads to the existing internal farm roads. However, should haul roads be needed where no farm roads exist the footprint of the haul roads will be contained to the approved mining area, specifically to areas where mining still needs to be done. No haul roads will be allowed over rehabilitated areas and upon closure of the site all haul roads will be ripped and rehabilitated if no longer needed by the landowners. The building/upgrading of farm roads will not exceed the thresholds of the listed activities in terms of the NEMA EIA Regulations, 2014 (as amended).

#### **4.2.1.3 Vegetation Clearing**

The floodplain/riparian zone is dominated by a low shrub layer, scattered trees, and well-developed riparian thicket, with a poorly developed grass layer dominated by pioneer species, a few succulent species, as well as exotic weeds. In this circumstance, the removal of the vegetation layer will be necessary to access the resource and establish the mining infrastructure. The intention is to minimize the removal of vegetation to only the affected areas (immediately prior to mining), and to in the end restore the footprint (riparian/floodplain area) to land suitable for grazing upon closure of each minor area, and ultimately the lapse of the mining right.

As mentioned earlier, only one entrance point (at a time) will be allowed into the river channel to allow for the placement and operation of the proposed sand pump. The entrance point will be demarcated to prevent sprawling and will be reinstated immediately after the pump is moved to another location along the MR footprint. The entrance into the river channel will be carefully selected to minimise disturbance of the marginal zone and avoid steep banks of the river.

#### **4.2.1.4 Topsoil Stripping**

It is proposed that topsoil removal will be restricted to the exact footprint of each minor area to be mined during the operational phase of the activity. The topsoil will be stockpiled at a designated signposted area within the boundary of each minor area to be replaced during the rehabilitation of the area. It will be part of the obligations of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon (the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. The topsoil berm will measure a maximum of 2 m in height to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.



#### **4.2.1.5 Introduction of Mining Machinery and Site Equipment**

The processing area will be established in the floodplain/riparian area outside the proposed 38 m buffer/no-go areas. The following site infrastructure will be established within the footprint of the processing area (1.5 ha):

- ❖ Ablution Facilities;
- ❖ Buildings for administration, storage, and workshop purposes;
- ❖ Diesel depot (<23 m<sup>3</sup>);
- ❖ Generators;
- ❖ Internal roads;
- ❖ Parking area;
- ❖ Screening- and washing plant;
- ❖ Settling pond; and
- ❖ Wash bay.

No infrastructure other than a settling pond will be established in each minor area (2.5 ha). A sand pump will be placed inside the river channel that will be connected to the associated settling pond (in the minor area) via a pipeline. Apart from the sand pump and associated pipeline, no other infrastructure will be established inside the river channel, marginal- and/or lower zones, the lateral streams or backwater wetlands.

### **4.3 Operational Phase**

The Applicant proposes to mine sand from both the riverbed (Sand River), as well as the adjacent floodplain/riparian area within the approved mining footprint. Mining will be conducted during normal working hours (07:00 – 17:00) from Monday to Saturday. No mining or processing will take place on Sundays or after sunset.

#### **4.3.1 Sand Mining from the Riparian Area**

The mining method to be used will resemble small scale opencast mining, where the sand will be mined from the earmarked area ( $\pm 2.5$  ha/minor area) along benches. An excavator will load the sand onto trucks that will transport it to the screening- and washing plant, after which it will be stockpiled until sold and transported to clients. In addition, to the direct excavation of the sand by excavator, the Applicant may also implement the use of an agitating sand pump to mine the sand from the bottom of the sand pit. Water runoff from the washing plant and sand pit will be collected in settling ponds and reused at the plant and/or sand pump.

#### **4.3.2 Sand Mining from the Riverbed**

In addition to the abovementioned mining of sand from the riparian area, the Applicant also proposes to mine sand from the riverbed. It is proposed that the sand will be pumped with an agitating sand pump from the riverbed into the adjacent sand pit (in the riparian area), where the water will either syphon through the floor of the pit or be pumped to the associated settling pond. Once in the sand pit, the sand will be mined as prescribed earlier. As discussed earlier, only one sand pump will be used in the river at any given time, with a single access made to allow for the installation and operation of the pump.

### **4.4 TOPOGRAPHY**

The topography is closely associated with the Sand River and its functioning. The surrounding topography outside the application area is dominated by alluvial plains which also forms part of the historical floodplain of the river. These plains also have a gradual and gentle slope toward the river. Within this alluvial floodplain, being dominated by fine, silt sediments, several drainage lines and stream systems have become incised into the terrain and form prominent watercourses in the study area. The banks of the river consist of an elevated upper zone, dominated by riparian thicket with a gentle slope, which then transitions into the steep sloped lower zone (the banks of the river). The lower zone again levels off into the marginal zone along the main channel of the river. Altitude varies from 1 300 m to 1 275 m and should illustrate the gradual slope from the surrounding alluvial plain areas toward the river.

#### **4.5 AIR AND NOISE QUALITY**

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

#### **4.6 GEOLOGY**

The study area is underlain by Karoo Supergroup rocks. These sedimentary rocks form the base on which younger, superficial deposits of late Cenozoic age has been deposited. Dykes and sills of resistant Jurassic dolerites largely determine landscape topography as indicated by the distinctive koppies and flat-topped inselbergs in the region (Rossouw, 2017). The deposits of the Karoo Supergroup in the region are assigned to the Lower Beaufort Group rocks followed by the Adelaide Subgroup. The study area extends across a floodplain, underlain by well-developed overbank sediments.

Further to this, the study area is situated on geology associated with the Volksrust Formation. The Volksrust Formation of the Ecca Group in the vicinity of Theunissen is dominated by underlying mudrock. However, the site and surroundings are dominated by quite deep alluvial deposits consisting of fine sand and silt soils.

#### **4.7 HYDROLOGY, GEOHYDROLOGY AND GROUNDCOVER (INCLUDING WETLANDS)**

The study area is located at the Sand River that falls within quaternary catchment C42L, which forms part of the Middle Vaal Catchment (Sand/Vet sub water management area). The main channel, banks, and floodplain of the Sand River, which forms the main study area, is largely still intact and natural. The surface water runoff in the area is not significantly high. As a result, wetlands are uncommon in the area although several wetland areas are associated with the floodplain of the Sand River and the drainage lines and seasonal streams transecting the floodplain of the river.

In terms of the chemical water quality parameters the water within Sand River seem to fall within the excepted standards. High bacteriological values indicate that the water is not suitable for consumption but do not pose a significant risk for full contact recreation. High levels of turbidity during the current sampling may be a result of the recent flooding of the river. The Sand River has an Instream IHI of category C: Moderately Modified and Riparian IHI of category C: Moderately Modified. This is largely due to the change in flooding regime and disturbance/transformation of the habitat. The system should still be regarded as sensitive with a very high conservation value and mining should endeavour to keep impacts on it to a minimum.

The results of the WET-Health of the floodplain wetlands indicated an overall PES of Category B: Largely Natural, largely natural with few modifications. The EI&S of the floodplains associated with the Sand River has been rated as being Moderate: Floodplains that are ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. The riparian habitat associated with the river does not have a significant diversity of species. It is considered unlikely that the site will provide a significant feeding or migratory site for wetland species. The ecological integrity of the river is moderate as it has been affected by several upstream impacts.

The specialist determined that a buffer of 38 m from the edge of the floodplain wetland areas and the wetland conditions along the Sand River main channel and lateral stream systems must be maintained. The portions of the floodplain outside this 38-meter buffer are still regarded as having a moderate sensitivity but impacts here will be more easily manageable. As a result, mining operations, except for one sand pump and associated access, should aim to avoid all areas regarded as having a very high and high level of sensitivity, while focussing operations in areas with moderate sensitivity.

No rare or endangered species were encountered in the area. A few protected species had been observed in the surrounding areas and may also be likely to occur on the site. These include *Ammocharis coranica*, *Kniphofia ensifolia* and *Crinum bulbispermum*.

The Aquatic Assessment classified the riparian and instream habitats as being largely modified (D) for all the sites sampled. The macro-invertebrate integrity was calculated to be largely modified (D) for all sites. The ASPT scores indicated the family diversity mainly consisted of tolerant species resulting in all three sites to be classified as largely modified (D). The MIRAI score and EC of the current study showed that all sites were largely modified (D), compared to reference conditions. None of the macro-invertebrates sampled were sensitive. The PES for the sites sampled was largely modified (D). The aquatic habitats were impacted due to general catchment activities including upstream agricultural and anthropogenic activities and weirs that induced modifications to flow regime, in-stream channel, and water quality. The study area does not fall within a Freshwater Ecological Protected Area (FEPA).

#### **4.8 TERRESTRIAL FAUNA**

No resident faunal species of conservation concern were identified within the proposed mining area. The avifauna co-exist with the existing sand mine, as all bird species are all highly mobile and can readily move away from disturbance.

#### **4.9 CULTURAL AND HERITAGE ENVIRONMENT**

No sites of archaeological, cultural, or palaeontological importance were identified during the EIA. Site management will implement chance find protocol should any artefacts of archaeological- and/or palaeontological significance be discovered during the various phases of the mining activities.

#### **4.10 EXISTING INFRASTRUCTURE**

Apart from the mining infrastructure at the Blazecor mining area, no other infrastructure exists on the proposed mining footprint that could be affected by the proposed activity.

### **5. ANNUAL REHABILITATION PLAN**

Appendix 3 to the Financial Provision Regulations, 2015 states that the objectives of the annual rehabilitation plan are 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 OF 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 11<sup>th</sup> month of the operative period to ensure the timeous submission of the subsequent annual review.

## **5.2 MONITORING RESULTS**

### **5.2.1 Control of Invasive Alien Vegetation**

The right holder will continuously monitor the mining footprint for the invasion of alien vegetation in accordance with the Invader Plant Species Management Plan of the site (Appendix L of the EIAR & EMPR). This practice will continue through-out the site establishment-, operational-, and decommissioning phases of the project.

### **5.2.2 Noise Monitoring**

A qualified occupational hygienist will quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring will be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.

Silencers will be fitted to all project related vehicles, and vehicles will be in a road worthy condition as stipulated in terms of the National Road Traffic Act, 1996. The type, duration and timing of each blast will be planned with due cognizance of other land users and structures in the vicinity.

### **5.2.3 Dust Monitoring**

The above mentioned occupational hygienist will also report on the gravimetric dust levels of the site. Site management must ensure that the dust generating activities at the site comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). Dust levels will be controlled through the management processes stipulated in the EIAR & EMPR.

Monthly fallout dust monitoring will continue at the operational areas as currently implemented at the mining permit area.

### **5.2.4 Waste Monitoring**

Site management will be 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, will be contained in sealable refuse bins that will be placed at the office area until the waste is transported to a recognised general waste landfill site.

Hazardous waste (such as spills) will be cleaned up immediately (within two hours of the occurrence) and the contaminated soil will be contained in designated hazardous waste containers that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility.

### **5.2.5 Water Monitoring**

Water quality and -biomonitoring will be implemented for the duration of the project in accordance with the requirements of the Water Use Licence to be issued by the Department of Water and Sanitation.

## **5.3 SHORTCOMINGS IDENTIFIED**

This report is the first Annual Rehabilitation Plan in terms of the Financial Provision Regulations, 2015 that was compiled for the proposed mine. No shortcomings have therefore been identified.

#### **5.4 REHABILITATION ACTIVITIES FOR THE FORTHCOMING 12 MONTHS**

Not yet applicable as mining has not yet commenced. Upon approval of the mining right application and receipt of the EA, the right holder will annually report on the planned rehabilitation actions.

#### **5.5 REVIEW OF THE PREVIOUS YEAR'S REHABILITATION ACTIONS**

This report is the first Annual Rehabilitation Plan in terms of the Financial Provision Regulations, 2015 that was compiled for the proposed mine. In this circumstance no annual rehabilitation activities have been identified that can be reviewed.

#### **5.6 COSTING**

To be determined once the annual rehabilitation objectives were established.

### **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 (as described above);
- 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; 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 the proposed mine is to restore the natural vegetation (where possible) and return the area to agricultural use (grazing). In this context, the primary objectives for the closure of the mining operations are:

- ❖ Remove all infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources and Energy.
- ❖ 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 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/invaser plant species by intensive management of the mine site.

## **6.1 CLOSURE STRATEGY GUIDED BY THE ENVIRONMENTAL RISK ASSESSMENT**

The overall objective of the closure plan is to minimize adverse environmental impacts associated with the mining activity whilst maximising the future utilisation of the property. The idea therefore, is to leave the mined out areas in a condition that reduces all negative impacts associated with the activity. Significant aspects to be borne in mind in this regard is visibility of the mining scar, re-vegetation of the mining footprint, stability, and environmental risk in an old mine environment. The rehabilitated and immediate surroundings must also be free of weeds and alien vegetation.

The proposed mining and rehabilitation procedures was formulated to optimise the extraction of the raw material while creating a stable mining area that will not present an unreasonable safety risk once the mine is closed. Rehabilitation will include activities to be divided into medium- and long-term categories. In the medium term, rehabilitation will entail the continuous reinstatement of mined minor areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve the reinstatement of the processing area by removing the stockpiled material and site infrastructure/equipment and landscaping the disturbed footprints. The MR holder will further be responsible for the seeding of all rehabilitated areas.

The decommissioning activities will therefore consist of the following:

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

## **6.2 DESIGN PRINCIPLES**

The Applicant proposes the following for rehabilitation of the mined blocks:

- ❖ The mine plan will be such that topsoil is stockpiled for the minimum possible time through rehabilitating each mining block (minor area) as mining continues.
- ❖ After mining, any steep slopes at the edges of excavations will be reduced to a minimum and profiled to blend with the surrounding topography.
- ❖ The stockpiled topsoil will then be evenly spread over the disturbed mining area, so that there is a depth of 300 mm of sandy topsoil above the underlying layer. The depth will be monitored during spreading to ensure that coverage is adequate and even.
- ❖ The Applicant will strive to (when possible) spread topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, is minimized.
- ❖ A cover crop (indigenous vegetation) that ties in with the proposed land use will be planted immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop will be fertilised for optimum biomass production.
- ❖ The rehabilitated area as well as the land down slope of it will monthly be monitored for erosion, and appropriately stabilized if any erosion occurs.

- ❖ The Applicant will ensure monthly monitoring of weeds/invasiver plants that may germinated within the rehabilitated area. The invasive plant species management plan will continually be implemented on site.
- ❖ The 38 m buffer between the mining area and the river will be kept intact for the duration of the mining activities and the decommissioning phase.
- ❖ The sludge in the settling ponds will be removed (once dry) and used in the landscaping of the excavations. The area where the settling ponds were made will be reinstated and landscaped to match the rehabilitation of the surrounding landscape.

Final rehabilitation will entail the reinstatement of the final minor areas (as listed above), as well as the processing area. This will entail the removal of all manmade structures and mining related equipment no longer needed by the landowner, the dumping of coarse natural material used for the construction of ramps into the excavations, removal of all stockpiles, removal of the sand pump from the river, and the ripping and topsoiling of all compacted and disturbed areas.

### **6.3 POST-MINING LAND USE**

As mentioned earlier, the preferred post mining land use for the proposed mine is to restore the natural vegetation (where possible) and return the area to agricultural use (grazing).

### **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.

As mentioned earlier, rehabilitation of the mining area will largely fall within two categories namely, those that will occur within the medium term when an area is mined out, and those that will occur in the long term upon final closure of the site.

#### **6.4.1 Medium Term Rehabilitation**

In the medium term, progressive rehabilitation of mined areas will be done and will include the following closure objectives:

- ❖ Reduce any steep slopes at the edges of excavations to a minimum and profile it to blend with the surrounding topography;
- ❖ Replace the stockpiled topsoil evenly over the mined area to a depth of 300 mm;
- ❖ Maintain the stormwater measures proposed in the Stormwater Management Plan (SWMP) to prevent erosion of newly rehabilitated areas;

- ❖ Reinststate the settling pond/s;
- ❖ Seed the reinstated area with a seed mix of commercial- and native seeds including annuals and perennials to diversify rooting depths;
- ❖ Control invasive plant species for at least one growth season;
- ❖ Monitor the area for erosion until vegetation established.

#### **6.4.2 Long Term / Final Rehabilitation**

Upon closure of the mine, the Right Holder will commence with the reinstatement of the final minor area/s (as listed above) and the processing area. The right holder will also comply with the minimum closure objectives as prescribed by DMRE and detailed below:

##### **Rehabilitation of the excavated area:**

- ❖ The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material (if any) removed from the excavation must be dumped into the excavation.
- ❖ No waste may be deposited in the excavations.
- ❖ Once overburden and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
- ❖ The area must be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from closure of the site.
- ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

##### **Rehabilitation of processing area:**

- ❖ Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- ❖ Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.

- ❖ On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
  - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- ❖ Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.
- ❖ On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- ❖ The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the DMRE Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

**Final rehabilitation:**

- ❖ Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), maintenance, and clearing of invasive plant species.
- ❖ All equipment, plant, and other items used during the mining period must be removed from the site (section 44 of the MPRDA).
- ❖ Waste material of any description, including receptacles, scrap, rubble, and tyres, must be removed entirely from the mining area, and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

- ❖ The management of invasive plant species must be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) need to be eradicated from the site.
- ❖ Final rehabilitation must be completed within a period specified by the Regional Manager (DMRE).

#### **6.4.3 Revegetation of Rehabilitated Areas**

When an area was mined, progressive rehabilitation must occur wherein a stable vegetation cover is established with a grass layer. It is imperative that any mined areas are re-vegetated as soon as possible. The goal of re-vegetation is:

- ❖ Preventing erosion and avoiding further soil loss;
- ❖ Restoring the affected area to the best possible condition compared to the original state or equivalent benchmark/pristine areas;
- ❖ Reduce, or ideally prevent, surface runoff and the carrying away of topsoil so that the sedimentation into rivers and/or wetlands is reduced;
- ❖ Restore a best possible ecosystem functioning, via plant succession, so that the local biodiversity can return, preferably to conditions as close to the original state as possible.

A suitable layer of topsoil, of the same type and quality as that of an equivalent benchmark site to that of the mined area, should immediately be applied to an area after it has been fully mined, and before revegetation of that area commences. The recommended depth of soil is 300 mm. 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 Foxtain Buffalo Grass (*Cenchrus ciliaris*).

#### **6.4.4 Maintenance and Monitoring**

Rehabilitated areas need to be monitored and managed after the initial rehabilitation. The proposed mine's primary tool for maintenance of the rehabilitated area will be monitoring of the reinstated areas until the closure certificate is issued. The following aspects must closely and regularly be monitored:

- ❖ Topsoil Depth: it is crucial that a proper topsoil depth is maintained to 300 mm;
- ❖ Soil Erosion Status: any existing erosion must be controlled, and any new erosion that arises must be corrected immediately;
- ❖ Vegetation cover and Species Diversity: vegetation must regularly be assessed to determine whether target species have established and whether a sufficient vegetation cover has been obtained.

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.

#### **6.4.5 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.

#### **6.4.6 Impact Specific Procedures**

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



Table 6: Summary of the impact specific procedures

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
<b>SOCIO-ECONOMIC</b>		
<ul style="list-style-type: none"> <li>❖ The retrenchment process will be followed as per requirements of the applicable legal process; and</li> <li>❖ All existing social investments will be phased out over an agreed period with beneficiaries.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Progressive rehabilitation must be implemented as mining progress.</li> </ul>	<ul style="list-style-type: none"> <li>❖ The Social and Labour Plan (SLP) must be audited on an annual basis;</li> <li>❖ Any commitments made to I&amp;AP'S will be attended to the relevant I&amp;AP's satisfaction as agreed upon between the I&amp;AP'S and the mine.</li> </ul>
<b>TOPOGRAPHY AND EROSION CONTROL</b>		
<ul style="list-style-type: none"> <li>❖ The area will have contours constructed to prevent soil erosion.</li> </ul>	<ul style="list-style-type: none"> <li>❖ All slopes which may incur erosion will be profiled in such a way that a preferential down drain can be installed;</li> <li>❖ Erosion control measures such as contour banks and cut off berms must 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.</li> <li>❖ The specifications of the SWMP must be implemented on site.</li> </ul>	<ul style="list-style-type: none"> <li>❖ 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;</li> <li>❖ 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;</li> <li>❖ Any deficiencies will be corrected by placing material in these areas as per the closure plan;</li> <li>❖ Any compacted soils will be ripped or disked and re-vegetated with indigenous flora. Vegetation will then be monitored in these areas;</li> <li>❖ All recommendations made by the specialists will be implemented where deemed appropriate;</li> <li>❖ 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 consulted with regards to the use of certain chemicals</li> </ul>

CLOSURE MANAGEMENT OBJECTIVES	SPECIFIC PERFORMANCE CRITERIA	ACTION REQUIRED
<b>ECOLOGY</b>		
<ul style="list-style-type: none"> <li>❖ The rehabilitated area will be protected from surface disturbance to allow vegetation to establish and stabilise.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems;</li> <li>❖ The rehabilitated ecosystem will have equivalent functions and resilience as the target ecosystem;</li> <li>❖ Soil properties will be appropriate to support the target ecosystem;</li> <li>❖ The rehabilitated areas will provide appropriate habitat for fauna.</li> </ul>	<ul style="list-style-type: none"> <li>❖ 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;</li> <li>❖ 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.</li> </ul>
<b>LAND USE</b>		
<ul style="list-style-type: none"> <li>❖ To ensure that rehabilitation is done to such an extent that land use potential is regained for agricultural use and associated zoning.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Only after the levelled areas have been inspected and approved by the Mine Manager/Site Manager will topsoil be placed to a depth of 300 mm. The topsoil layer must be as even as possible, i.e. it must be smooth, and the depth must remain consistent throughout;</li> <li>❖ Once the topsoil has been replaced, vehicle movement must be restricted to prevent compaction of the topsoil;</li> <li>❖ 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;</li> <li>❖ Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible; and</li> <li>❖ Once the seed mixture has been sown, the land must be rolled to ensure consolidation around the seeds and effective moisture retention.</li> </ul>	<ul style="list-style-type: none"> <li>❖ N/A</li> </ul>

## 6.5 CLOSURE SCHEDULE

As explained earlier the Mining Right holder intends progressive rehabilitation of each mined area prior to mining the subsequent area, thereby minimizing the denuded areas because of the mining activity.

At this stage it is proposed that the final rehabilitation of the mining area will take approximately four months to complete. Rehabilitation will, however, not be considered complete until the first cover crop is well established and therefore the rehabilitation phase will extend over at least a six-month period.

Control of invasive plant species is an important aspect after topsoil replacement and seeding has been completed in an area. Site management will implement an invasive plant species management plan during the 12-month aftercare period to address germination of problem plants in the area. Final rehabilitation shall be completed within a 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 7: Closure schedule

CLOSURE SCHEDULE	
DECOMMISSIONING / CLOSURE ACTION	TIMEFRAME
<b>EXCAVATION (EACH MINED MINOR AREA – OPERATIONAL PHASE)</b>	
<ul style="list-style-type: none"> <li>❖ Create irregular benches along the mined faces;</li> <li>❖ Dump excess coarse material into the excavation;</li> <li>❖ Place topsoil over benches;</li> <li>❖ Dispose all waste off-site;</li> <li>❖ Reinstate the settling pond;</li> <li>❖ Seed reinstated area or arrange for planting of relevant cover crop;</li> <li>❖ Retain the stormwater control measures for as long as needed.</li> </ul>	<p>Once area is mined, and prior to the opening of a consecutive area. Seeding to be done at the end of the wet season.</p>

<b>CLOSURE SCHEDULE</b>	
<b>DECOMMISSIONING / CLOSURE ACTION</b>	<b>TIMEFRAME</b>
<b>PROCESSING AREA (DECOMMISSIONING PHASE)</b>	
<ul style="list-style-type: none"> <li>❖ Dump coarse natural material used for ramps into the excavations;</li> <li>❖ Remove all product stockpiles;</li> <li>❖ Remove all structures/equipment from the footprint;</li> <li>❖ Rip any compacted area;</li> <li>❖ Landscape and level the area to prevent any depressions and allow for agricultural activities;</li> <li>❖ Replace the stockpiled topsoil over the reinstated and landscaped area;</li> <li>❖ Seed reinstated area or arrange for planting of relevant cover crop;</li> <li>❖ Retain the stormwater control measures for as long as needed.</li> </ul>	Week 1 - 12
<b>FINAL EXCAVATION AREA (DECOMMISSIONING PHASE)</b>	
<ul style="list-style-type: none"> <li>❖ Create irregular benches along the mined faces;</li> <li>❖ Dump excess coarse material into the excavation;</li> <li>❖ Place topsoil over benches;</li> <li>❖ Dispose all waste off-site;</li> <li>❖ Reinstate the settling pond;</li> <li>❖ Seed reinstated area or arrange for planting of relevant cover crop;</li> <li>❖ Retain the stormwater control measures for as long as needed;</li> <li>❖ Remove the sand pump from the river and reinstate the access into the river.</li> </ul>	Week 13 - 16
<b>MAINTENANCE AND AFTER CARE</b>	
<ul style="list-style-type: none"> <li>❖ Erosion Monitoring</li> <li>❖ Weeds and Invader Plant Control</li> </ul>	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 Vengablox (Pty) Ltd. 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 right holder 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, 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 completed rehabilitation must be measured are:

1. that the topography has been sufficiently shaped without steep excavation edges;
2. that topsoil has been spread on the surface;

3. that there is a potential rooting depth of at least 300 mm, of non-compacted soil material, which is suitable for root growth, across the mining area;
4. 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;
5. 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 the mining area:

*Table 8: Relinquishment criteria*

<b>RELINQUISHMENT CRITERIA FOR CLOSURE ACTIVITIES</b>			
<b>CATEGORY</b>	<b>RELINQUISHMENT CRITERIA</b>	<b>INDICATORS</b>	<b>REPORTING REQUIREMENTS</b>
Removal of all equipment.	No visible man-made structures (no longer needed by the landowner) should remain.	Closeout 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 utilising the Department of Mineral Resources and Energy guideline document for calculating financial provision the proposed mine needs to provide a financial provision value of R 576 997.91 (calculated June 2022).

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 2022 EIAR & 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.**

Not applicable as no amendments were made to the Final Rehabilitation, Decommissioning and Mine Closure Plan.

### **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 and closure phase. 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. Monitoring, auditing, and reporting needs to be conducted until mine closure has been approved by the DMRE and the closing certificate obtained.

Table 9: Monitoring, auditing, and reporting requirements

<b>MONITORING, AUDITING AND REPORTING REQUIREMENTS</b>			
<b>AUDIT</b>	<b>RESPONSIBLE PERSON</b>	<b>FREQUENCY OF AUDIT</b>	<b>CLOSE OUT APPROACH</b>
<b>LEGISLATED AUDITING AND REPORTING</b>			
<b>Environmental Auditing</b>	<b><u>Internal Review</u></b>		
	Site manager to ensure compliance with Environmental Management Programme and Closure Plan.	Daily compliance monitoring.	Any non-conformance must immediately be addressed by site management and weekly reported on.
	<b><u>External Auditing</u></b>		
	External Environmental Consultant	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.
<b>Financial Provision Review</b>	Financial Provision Review	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 would increase the financial provision to meet the audited financial provision within 90 days from the date of the signature.
<b>MONITORING</b>			
<b>Dust Monitoring</b>	Dust Monitoring Specialist	Monthly Fallout Dust Monitoring	Site management has a maximum of two weeks to develop and implement a dust management plan should the dust levels increase, and such a plan is required by DMRE or the municipality.
<b>Noise Monitoring</b>	Noise Monitoring Specialist	Quarterly Noise Monitoring	Site management has a maximum of one week to designate additional noise zone where applicable. Hearing protection equipment must be always available to employees.
<b>Water Quality, and Biomonitoring</b>	Hydrologist	Bi-Annual Monitoring	Any non-conformance with the water quality guidelines has to be corrected in accordance with guidance from a hydrologist, or as directed by the DWS.



MONITORING, AUDITING AND REPORTING REQUIREMENTS			
AUDIT	RESPONSIBLE PERSON	FREQUENCY OF AUDIT	CLOSE OUT APPROACH
<b>Invader Plant Monitoring</b>	Site Management	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.

## 7.1 SCHEDULE FOR REPORTING REQUIREMENTS

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

Table 10: Reporting requirements

REPORTING REQUIREMENTS			
AUDIT	LEGISLATION	REPORTING REQUIREMENTS	UPDATE DISCLOSURE
<b>Environmental Auditing</b>	NEMA; EIA Regulations, 2014	Reporting on the environmental compliance of the mining area will be in accordance with Regulation 34 of the NEMA EIA Regulations, 2014. 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.
<b>Financial Provision Review</b>	NEMA Amendment Act, 2014 (Act No 25 of 2014)  Financial Provision Regulations, 2015	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.	The auditor will report on the adequacy of the financial provision and any adjustments that need to be made to the financial provision.
<b>Health and Safety Auditing</b>	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.

REPORTING REQUIREMENTS			
AUDIT	LEGISLATION	REPORTING REQUIREMENTS	UPDATE DISCLOSURE
<b>Water Quality, and Biomonitoring</b>	National Water Act, 1998 (Act No 36 of 1998)  Water Use Licence Conditions	Reporting on the water quality and biomonitoring health of the mining area will be in accordance with the National Water Act, 1998.	The hydrologist will conduct the monitoring in accordance with the conditions of the water use licence and DWS requirements.

## 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) quantify 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 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 each 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 to 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 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 affect 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 11: Monitoring Programmes

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 12: 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 13: 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 14: Example of calculating overall consequence in the assessment of potential latent risks*

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4

Consequence	Rating
<b>SUBTOTAL</b>	<b>10</b>
<b>TOTAL CONSEQUENCE:</b> (Subtotal divided by 3)	<b>3.3</b>

***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 15: 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 16: 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 17: Example of calculating overall likelihood in the assessment of potential latent risks

Consequence	Rating
Frequency	Example 4
Probability	Example 2
<b>SUBTOTAL</b>	<b>6</b>
<b>TOTAL LIKELIHOOD</b> (Subtotal divided by 2)	<b>3</b>

### 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.

Table 18: Determination of overall 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 19: Description of environmental significance and related action required in the assessment of potential latent risks

Significance	An insignificant risk (cc)	A 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 mine 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.

Vengablox (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 Fouche		08 June 2022

## 11. UNDERTAKING BY RIGHT HOLDER

I, ....., the undersigned and duly authorised thereto by ..... that Vengablox (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 ..... on this .....day of .....20.....

---

Name:

Designation:

## 12. REFERENCES

- ❖ Chamber of Mines of South Africa, 1981. Guidelines for the rehabilitation of land disturbed by surface product mining in South Africa, Johannesburg
- ❖ Department of Water Affairs and Forestry, 2003. Draft: A practical procedure for the identification and delineation of wetlands and riparian areas, Pretoria
- ❖ Department of Environmental Affairs and Tourism: Integrated Environmental Management Information Series: Impacts Significance
- ❖ Department of Water Affairs and Forestry (DWAF) (2007b) Best Practice Guideline A4: Pollution control dams. The Government Printer, Pretoria