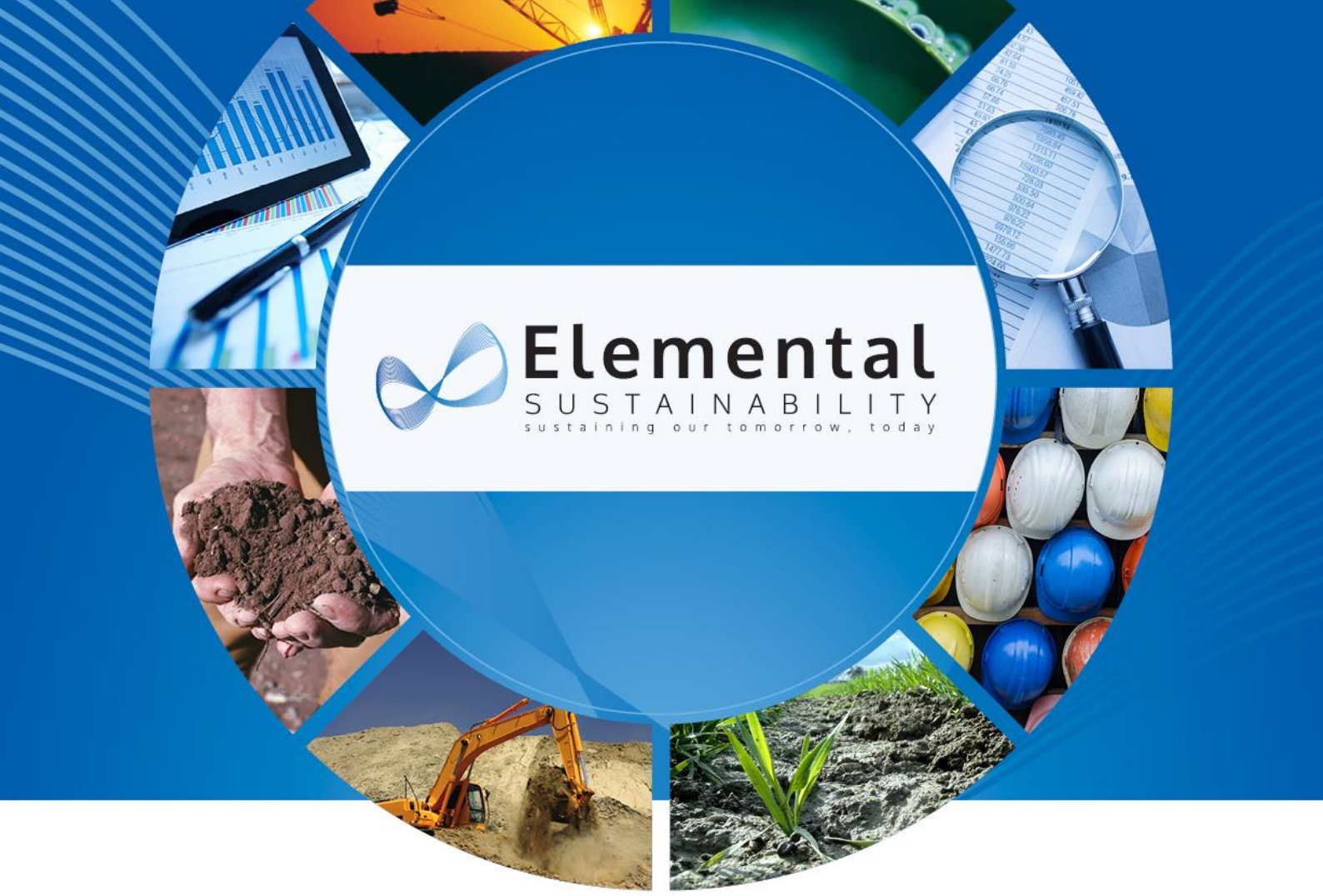

PRELIMINARY CLOSURE AND FINANCIAL PROVISION ASSESSMENT FOR 2 SEAM COLLIERY

2 SEAM (PTY) LTD

Mining Right: MP 30/5/1/2/3/2/1 (405) MR

REPORT DETAILS

Report Title	Preliminary Closure and Financial Provision Assessment for 2 SEAM
Report Number	CCA_2SEAM_041
DMR Nr	MP 30/5/1/2/3/2/1 (405) MR
Client	2 Seam (Pty) Ltd Paul Erskine Chief Operating Officer
Author	Elemental Sustainability (Pty) Ltd DuToit Wilken dutoit@elemental-s.co.za
Client Reviewed	2 Seam (Pty) Ltd Paul Erskine
Report Revision	Final 0.0
Date of Report	10 November 2022

EXECUTIVE SUMMARY

Elemental Sustainability (Pty) Ltd (Elemental-S) was appointed by 2 SEAM (Pty) Ltd to undertake an assessment of the Quantum for Closure-Related Financial Provision for the 2 Seam Mine.

This report is presented within the extended transitional period as presented in Government Notice No. R. 495 of 11 June 2021: "*unless regulation 17A, a holder of a right or permit, who applied for such right or permit prior to 20 November 2015, regardless when the right or permit was obtained –*

(a) must by no later than 19 June 2022 comply with these Regulations; and

(b) shall, until 19 June 2022, be regarded as having complied with the provisions of these Regulations, if such holder has complied with the provisions and arrangements regarding financial provisioning, approved as part of the right or permit issued in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)."

This assessment of the quantum for closure-related financial provision for 2 Seam (Pty) Ltd was undertaken by Elemental Sustainability (Pty) Ltd and completed in the extended transitional period as presented the Amendment to Financial Provision Regulations, 2015 (as amended). During the transitional arrangements a holder must review the financial provision in terms of the requirements as set out in Regulations 17(1) and (3).

No additional contribution is currently required towards the Rehabilitation Trust as sufficient provision is currently in place for the Un-scheduled Closure Cost. The following contributions will be required for the Scheduled Closure Cost.

- OC04A - **R 5 984 490,25**
- OC6 - **R 13 935 022,88**

The contribution to the Rehabilitation Trust for each of the mining areas must be made before mining commences at the mining area. It is estimated that mining will commence at OC04A in 2023 and in 2025 at OC6.

		Un-Scheduled	Scheduled
UN-SCHEDULE – TOTAL LIABILITY		**R 38 594 603.41**	
OC4A – SCHEDULE COST			**R 5 984 490,25**
OC6 – SCHEDULE COST			**R 13 935 022,88**
Bank Guarantee_ Lombard Nr. M-72910	Annexure A1	R 21 035 466.00	
Bank Guarantee_ Lombard Nr. M-63597	Annexure A2	R 5 099 603.95	
Bank Guarantee_ Lombard Nr. M-64630	Annexure A3	R 12 758 350.41	
Un-schedule Closure Cost		**R 38 594 603.41**	
TOTAL PROVISION		R 38 893 420.40	
Over provision		**R 298 817.00**	

CONFIDENTIALITY

The contents of this report are of a confidential nature, intended for 2 SEAM (PTY) LTD and permitting authorities as required by law. Any unauthorised use, alteration or dissemination of the contents of this report is strictly prohibited.

DISCLAIMER

- This assessment is based on the independent update and review of the quantum for closure-related financial provision, as per the requirements of *the Mineral and Petroleum Resources Development Act 28 of 2002* (MPRDA) Regulations, *National Environmental Management Act* (NEMA), *GNR 1147* and the *Amendment to Financial Provision Regulations (as amended).*
- This report is independent and free of any external prejudice or influence. The contents of this updated Closure Cost Assessment – Liability Report is based solely on observations made during the physical inspection on site, interviews with 2 SEAM personnel and review of documents, as presented by 2 SEAM, and as related to legal and other requirements.

The specialist further declares that, as a representative of Elemental Sustainability:

- All work undertaken in relation to the assessment was conducted in an objective, independent and uninfluenced manner
- There is no compromise on the objectivity exercised in undertaking the assessment.
- The relevant knowledge, expertise and experience required to undertake this assessment is held by the specialist, including, but not limited to, the MPRDA, NEMA and relevant regulations, guidelines relevant to the activity, as well as the skills required by the assessor
- All information furnished in this report is true and correct as at the time of the finalised report

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LIST OF ABBREVIATIONS

ACRONYM	DESCRIPTION
CPI	Consumer Price Index
DMRE	Department of Mineral Resources and Energy
DHSWS	Department of Housing Services, Water and Sanitation
ECO	Environmental Control Officer
ELEMENTAL	Elemental Sustainability (Pty) Ltd
EMP	Environmental Management Plan
GNR	Government Notice Regulations
Ha	Hectares
LOM	Life of Mine
MPRDA	Mineral Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Area
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
P&G's	Preliminary and General
ROM	Run of Mine

LIST OF GLOSSARY

ACRONYM	DESCRIPTION
Closure	The act of sealing a redundant mine opening which is acceptable for final mine closure.
Environmental management programme:	A programme contemplated in section 39 of the Minerals Act, submitted to and approved by the Director: Mineral Development, and detailing the plan to be adopted and implemented by a mine for managing the environmental effects of the operations of the mine.
Scheduled closure:	Planned closure of the mine.
Mine openings	Man-made mining excavation exiting on surface or near surface which results in surface instability
Redundant:	Permanently 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).
Unscheduled closure:	The closure cost associated with immediate closure and provision.

1. INTRODUCTION

2 Seam (Pty) Ltd (2 Seam) is in possession of the mining right ((MP) 30/5/1/2/3/2/1 (405) EM) over portions 6, 29, 31, and 50 of the Farm Vlaklaagte 45 IS and portion RE of the Farm Lourens 472 IS within the eMalahleni local municipality in the Mpumalanga Province. 2 Seam is proposing to establish a coal wash plant and a tailings facility on site, to divert the Olifants River, to add two Pollution Control Dams (PCD) and a contractor's yard and to include an additional opencast mining area within the approved mining right boundary. Figure 1 indicates the locality of the 2 Seam Mine.

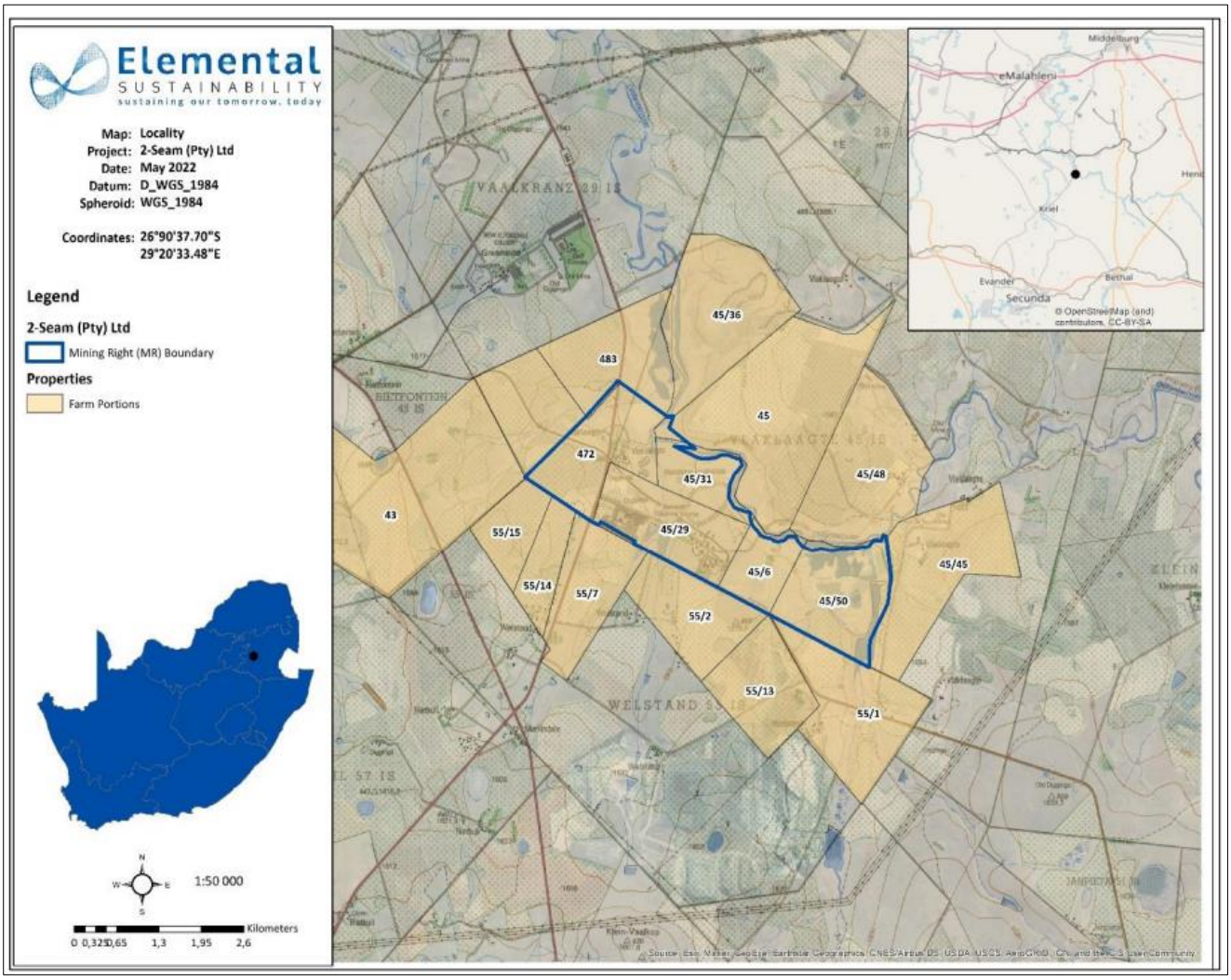


Figure 1: The regional locality of the proposed project

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) prescribes that Mines must comply with the prescribed financial provision for the rehabilitation, closure and on-going post-decommissioning management of negative environmental impacts arising from the mining operation. This Report aims to meet the NEMA requirements and has been prepared in terms of the NEMA Financial Provisioning Regulations, 2015 (as amended).

The report is presented within the extended transitional period as presented in Government Notice No. R. 46378 of 19 May 2022.

" Unless regulation 17A, a holder of a right or permit, who applied for such right or permit prior to 20 November 2015, regardless when the right or permit was obtained –

(a) must by no later than 19 September 2023 comply with these Regulations; and

(b) shall, until 18 September 2023, be regarded as having complied with the provisions of these Regulations, if such holder has complied with the provisions and arrangements regarding financial provisioning, approved as part of the right or permit issued in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)."

According to the regulations, financial provision must be made for annual rehabilitation, final rehabilitation, decommissioning, and closure activities at the end of prospecting, exploration, mining, or production operations; and remediation and management of latent or residual environmental impacts which may become known in the future. In order to address these requirements this document includes an annual rehabilitation plan, a final rehabilitation, decommissioning and closure plan, and an environmental risk assessment report.

1.1. MINE CONTACT DETAILS

Table 1: Mine contact details

Name of Company	2 SEAM (Pty) Ltd
Name of Project	Preliminary: Closure and Financial Provision Assessment – 2 Seam
Contact Person	Paul Erskine paul@2seamcoal.com

1.2. CLOSURE ASSESSMENT PRATITIONER

This closure plan was compiled by Elemental Sustainability, under the technical lead of DuToit Wilken. Contact details are provided below.

Table 2: Contact details for Closure Assessment Practitioner

Name of Company	Elemental Sustainability (Pty) Ltd
Address	323 Brooks Street, Menlo Park, Pretoria, 0081
E-mail	dutoit@elemental-s.co.za
Cellular nr	084 588 2322

The specialist who contributed to the closure planning process, and the relevant professional registrations and experience, are listed in Table 3.

Table 3: Details of specialist

Specialist	Task	Professional Registrations/Experience
DuToit Wilken	Closure Plan Compilation	BSc MSc – (Geography – Mine Closure) *Pr.Sci.Nat* - 12 years' experience

2. GUIDING PRINCIPLES

The following broadly accepted principles have been adopted to guide the preliminary closure planning for 2 SEAM:

- Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning, and closure of the project.
- Outlining the design principles for closure.
- Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation.
- 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.
- Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure.
- Identifying knowledge gaps and how these will be addressed and filled.
- Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- Outlining monitoring, auditing, and reporting requirements.

According to the NEMA GNR 1147 the objective of the final rehabilitation, decommissioning, and closure plan, is to identify a post-mining land use that is feasible.

- Rehabilitation and Closure Planning must comply with relevant legislation, as well as with generally accepted good practices.
- Closure objectives must be realistic and achievable.
- Closure related rehabilitation of land disturbed by mining must be conducted to allow for pre-determined post-mining land uses, as agreed with stakeholders. In this regard, the rehabilitated areas must be safe, stable, and non-polluting for integration into the existing land uses.
- Closure actions / measures conceptualised and implemented must limit the potential adverse effects of the closed mine site on the receiving environment, and thereby ensure that the quality of life of the surrounding / resident communities is not compromised after closure by possible threats to the health and safety of people and their animals.
- Closure measures must be sustainable under foreseeable natural events.

- Priority must be given to the use of locally available natural materials and / or vegetation as opposed to imported / synthetic material and / or exotic vegetation. The measures provided must be appropriate for the site-specific conditions.
- Manage activities within the study area in order to maintain and/ or improve ecological integrity of the study area.
- Maximise the service provision and ecological function of the watercourse
- The success, performance and sustainability of the closure measures must be demonstrated and confirmed by suitable monitoring and measurement for an adequate period post closure.
- A site with limited residual care-and-maintenance requirements must be sought. In this regard, proven sustainable passive measures must be favoured over measures that require ongoing maintenance and / or active care post-closure.
- Involvement of stakeholders must be undertaken in a meaningful manner to inform Closure planning by reflecting local requirements, priorities, and preferences, as well as the requirements as stipulated in local and provincial planning as well as the municipal Integrated Development Plans / frameworks; and
- Closure should be achieved as efficiently and cost effectively as possible.

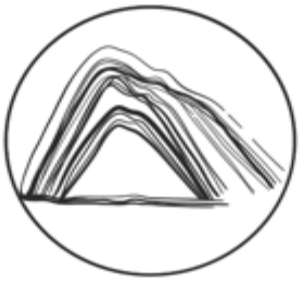
3. APPROACH

The approach adopted in undertaking closure planning for 2 Seam as further refinement to the guiding principles documented above, is based on the following key planning foci:

3.1. Application of an iterative closure planning/ design process

This iterative process underpins the principle that planning for closure should occur throughout the life of the mine, with solutions continually being evaluated through the process cycle.

3.2. Key Closure Objectives

 physical stability	To create a physically stable, safe, rehabilitated landscape that limits long term environmental degradation, erosion, and failure / collapse of unavoidably remnant mining residue which are present on the mine site post closure, thus enabling the successful establishment of the planned post-mining land use.
 environmental quality	To ensure that local environmental quality is not adversely affected by possible physical effects and chemical contamination arising from the mine site or individual facilities, as well as to sustain catchment yield as far as possible after closure
 healthy and safety	To limit the possible health and safety threats to humans and animals using the rehabilitated mine site as it becomes available
 land capability land use	To re-instate a suitable land capability over the mine site to facilitate the progressive implementation of the planned post-mining land use

 landscape viability	To create a landscape that is self-sustaining and over time will converge to the desired ecosystem structure, function, and composition
 biodiversity	To encourage, where appropriate and as aligned to the planned post-mining land use, the re-establishment of native vegetation on the rehabilitated mine site such that the terrestrial biodiversity is largely re-instated over time
 socio-economic resilience	To ensure that there is constructive engagement and alignment with local communities and regulatory authorities regarding the proposed end land use

3.3. Tiered Risk-based Process

The application of a tiered risk-based process to allow for an understanding of the challenges and opportunities that need to be addressed and refining, abstracting, and prioritising essential issues. The structure of this report is presented below in Figure 3.

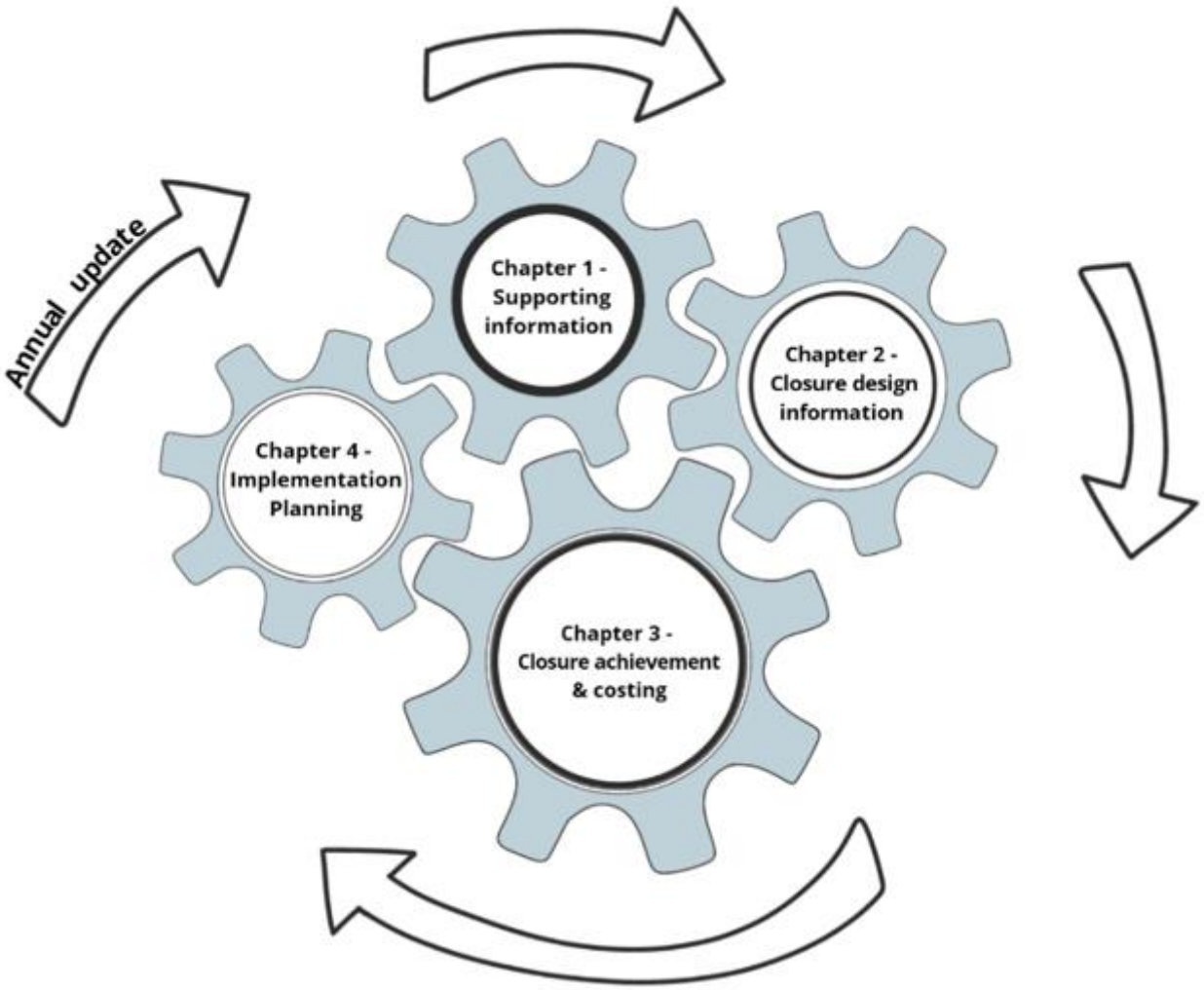
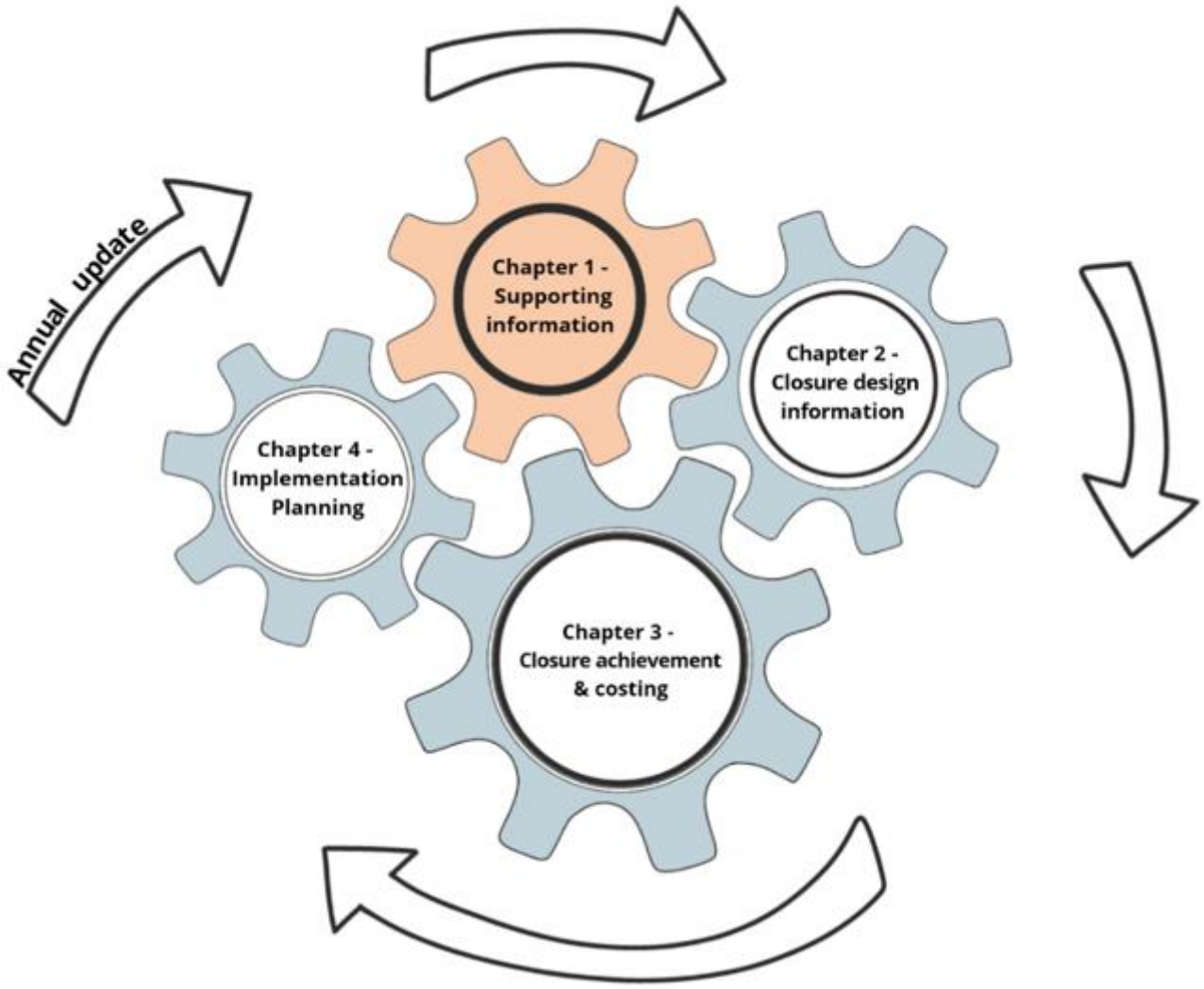


Figure 2: Approach to closure plan compilation

CHAPTER 1: SUPPORTING INFORMATION



Chapter 1: Review and documentation of relevant project information:

- A description of the mine – material information and issues that have guided the development of the plan.
- A summary of the legal and governance framework and interpretation of these requirements for the closure design principles.
- Environmental and Social Context.

4. MINE DESCRIPTION

4.1. BACKGROUND

2 Seam (Pty) Ltd (2 Seam) is in possession of the mining rights ((MP) 30/5/1/2/3/2/1 (405) EM) over portions 6, 29, 31, and 50 of the Farm Vlaklaagte 45 IS and portion RE of the Farm Lourens 472 IS within the Emalahleni local municipality in the Mpumalanga Province (Figure 3 and Table 4).

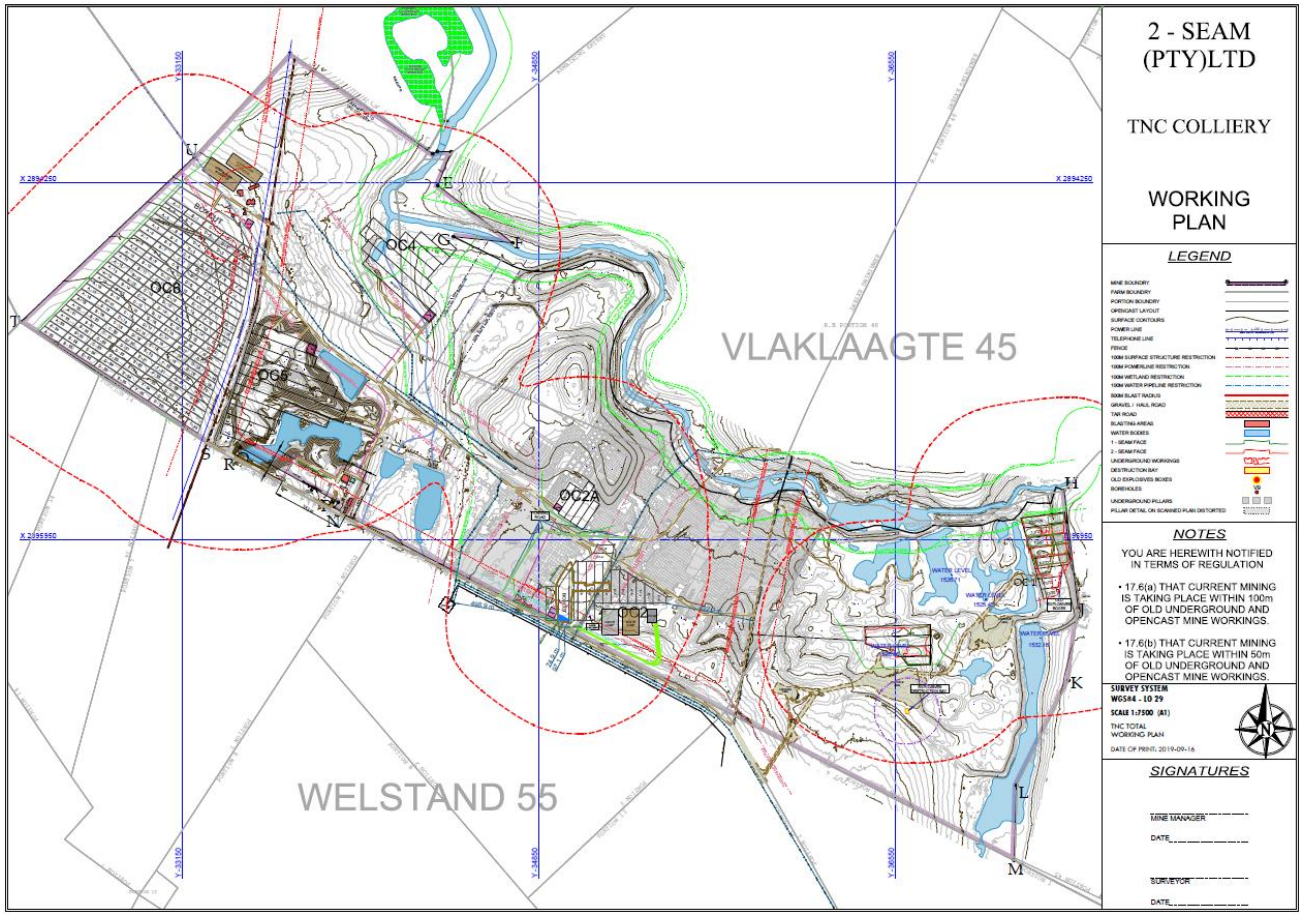


Figure 3: 2 SEAM Mining Right Area

Table 4: Property description and surveyor codes

Farm Name	Land Owner	21 Digit SG Code	Titel Deed Nr
Lourens 472 IS	Exxaro Coal Central Dorstfontein West Regional	T0IS00000000047200000	T3712/2010
Portion 31 of the Farm Vlaklaagte 45 IS	SOUHT 32 SA COAL HOLDINGS PTY LTD	T0IS00000000004500031	T65609/1991

Portion 29 of the Farm Vlaklaagte 45 IS	SOUHT 32 SA COAL HOLDINGS PTY LTD	T0IS00000000004500029	T65609/1991

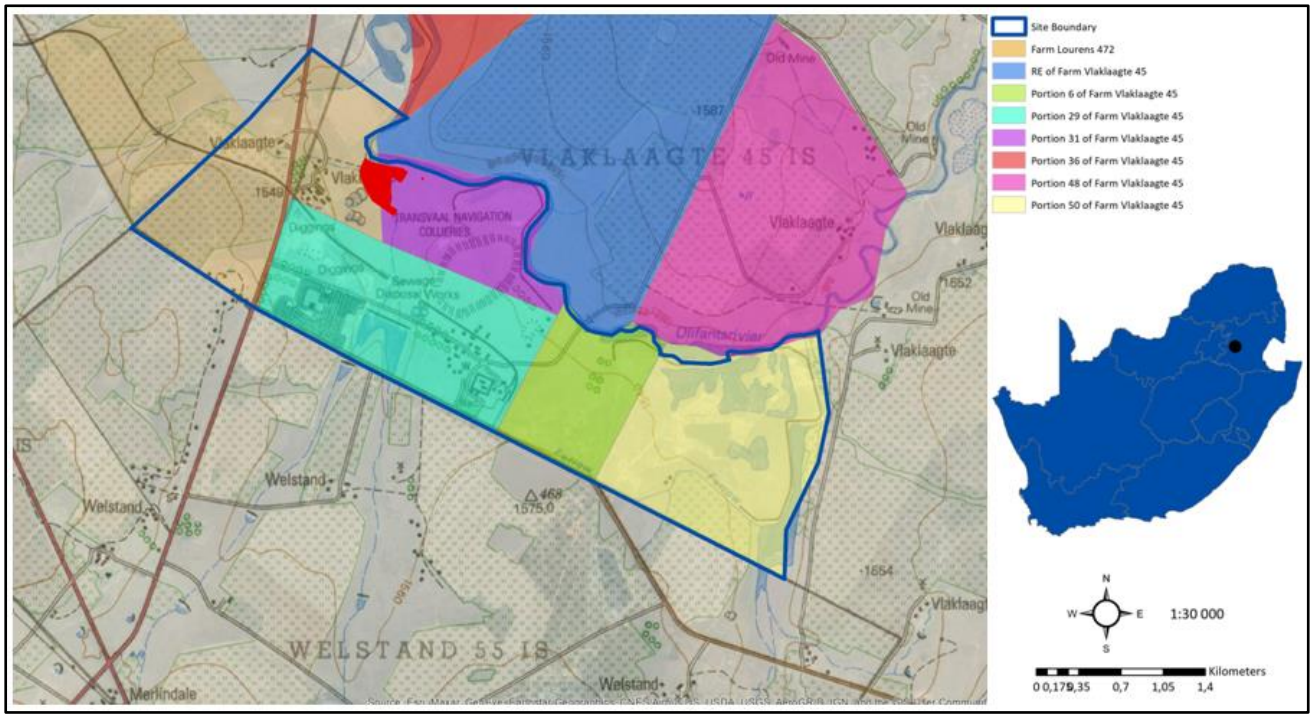


Figure 4: 2 SEAM Mining Right Area – Portions

The historical land use of the site and the surrounding areas are predominately agriculture (mainly grazing) and coal mining. The current (and more recent past) land use on the site is mainly coal mining. A limited amount of mine infrastructure is currently on site, which include the mobile screen plant, mobile offices and pollution control dam.

The site details, license holder and property description are presented in Table 5 below.

Table 5: License Holder Description

Mine Name	2 SEAM (Pty) Ltd
Portions	Portions 6, 29, 31, and 50 of the Farm Vlaklaagte 45 IS and portion RE of the Farm Lourens 472 IS
Cell phone Number	083 659 3996
Mine CEO	Paul Erskine Chief Operating Officer
Mine manager	Tim Erskine
Regional Setting	Emalahleni Local Municipality and regionally by the Nkangala District Municipality
Mineral Deposit	Coal
Mine Product	Coal

Mining Method	Opencast Mining
LOM	30 years

4.2. MINERAL RESOURCES

2 Seam Mine has mined four opencast pits (i.e., OC1, OC02, OC02A and OC3) in recent years and is currently mining the fifth opencast pit (OC4), using conventional opencast strip-mining techniques (i.e., drilling, blasting, loading and hauling). Mining of an additional four opencast pits (OC4A, OC4B, OC5 and OC6) is proposed. Based on background information provided by the client, the proposed mining and infrastructure are summarized below:

- The remaining opencast pits to be mined, in sequence, are OC4A, OC4B, OC5 and OC6.
- Mining will be conducted in a phased approach, i.e., mining will start and cease in each opencast prior to the commencement of mining in the next opencast.
- ROM and clean coal will be stockpiled in approved demarcated areas before being transported off-site.
- Stripped topsoil and subsoil will be stockpiled in demarcated areas.
- Haul roads will be constructed and used during the operational phase of the mining for transporting coal materials to a processing facility. In addition, internal service roads will be constructed on an as needs basis.

Mining of OC4 will target the No. 2 seam and based on the mine plan for OC4, mining will be conducted over twelve (12) months and will commence after mining at OC2A is completed (estimated around November 2022). For the proposed opencast and mine expansion to take place (referred to as OC4A – extension to OC4 and OC4 Box cut – orange polygon), there will need to be a stream diversion of a portion of the Olifants River, flowing in the mining right area. The following is proposed:

- Initially, a 40 to 50 m buffer zone will be maintained between OC4 and the Olifants River, and then the expansion of OC4A into the river with a river diversion is proposed;
- A 50m buffer will then be maintained between the opencast and the diverted section of the Olifants River;
- Diversion of the tributary of the Olifants River that flows across the OC4A area, to a position approximately 450 m east of its current position within the central section of the OC4A layout;
- The construction of a berm between OC4A and the Olifants River corresponds to the 1:100-year flood line for the diverted Olifants River section;
- A clean water berm is situated west and south of OC4A, to prevent overland flow into the opencast area; and
- A barrier pillar of 30 m will be maintained between the historical underground workings and OC4 & OC4A.

4.3. SCHEDULE ACTIVITIES

4.3.1. OPENCAST OC4A AND STREAM DIVERSION

Mining of OC4 will target the No. 2 seam and based on the mine plan for OC4, mining will be conducted over twelve (12) months and will commence after mining at OC2A is completed. For the proposed opencast and mine expansion to take

place (referred to as OC4A – extension to OC4 and OC4 Box cut), there will need to be a stream diversion of a portion of the Olifants River, flowing in the mining right area. The following is proposed:

- Initially, a 40 to 50 m buffer zone will be maintained between OC4 and the Olifants River, and then the expansion of OC4A into the river with a river diversion is proposed;
- A 50m buffer will then be maintained between the opencast and the diverted section of the Olifants River;
- Diversion of the tributary of the Olifants River that flows across the OC4A area, to a position approximately 450 m east of its current position within the central section of the OC4A layout;
- The construction of a berm between OC4A and the Olifants River corresponds to the 1:100-year flood line for the diverted Olifants River section;
- A clean water berm is situated west and south of OC4A, to prevent overland flow into the opencast area; and
- A barrier pillar of 30 m will be maintained between the historical underground workings and OC4 & OC4A.

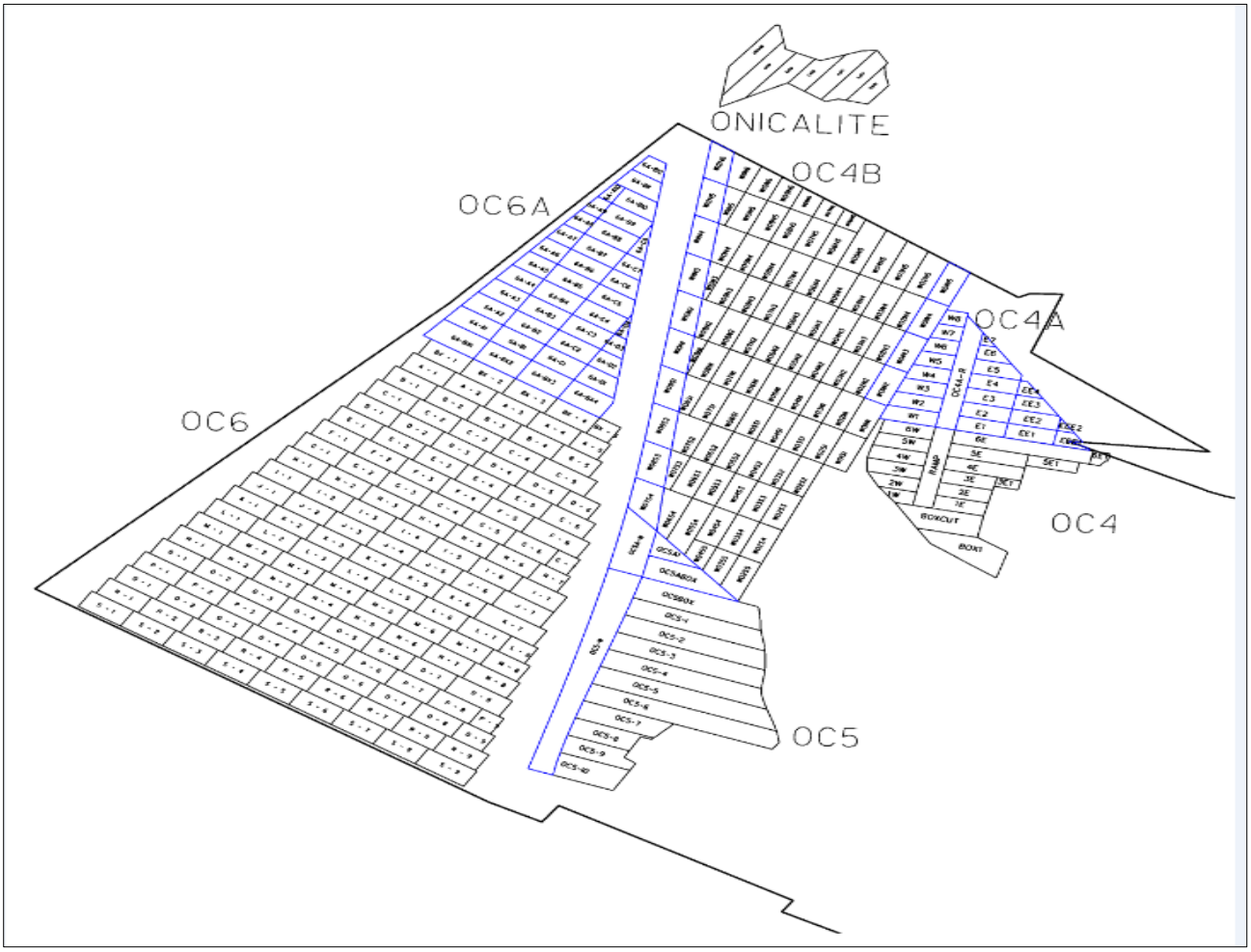


Figure 5: Sequencing of the proposed opencast mining

A diversion of the Olifants River is proposed in order to access additional coal resource. An original river diversion was proposed in 1986 to the DWS and it is understood that the DWS approved the diversion. The river diversion was dug in 1987, but never utilised and can be seen on the photograph below (Figure 6).

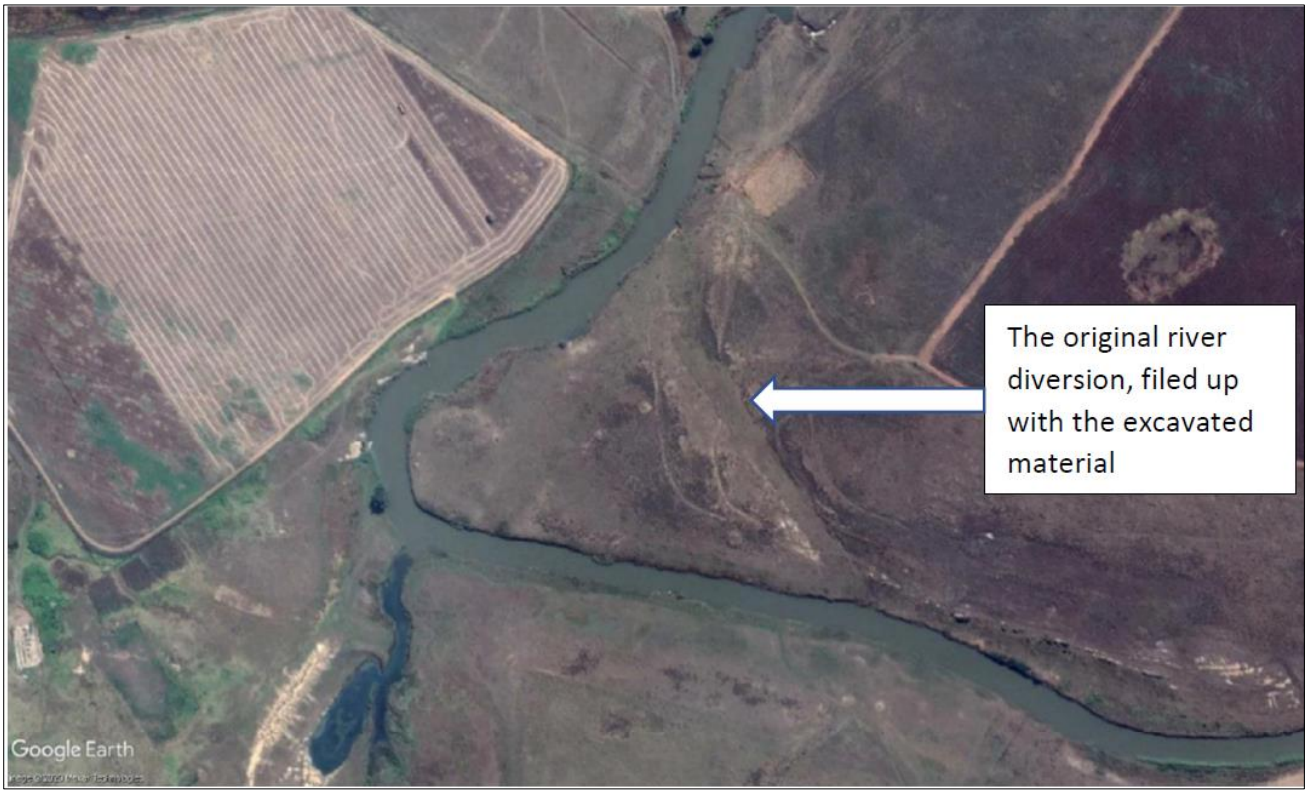


Figure 6: Original dug river diversion site

This diversion can easily be dug open again and the original plan put into use with the clean sandstone material being utilised to form the flood barriers that will prevent the Olifants River from topping the berm Gabion baskets will be used to prevent the river from eroding the berm and a backup weir will be installed to control the upriver flow rate.

The preliminary design of the flood protection and diversion berm/channel for the Olifants River for the proposed extension of existing opencast pit OC4 is based on the 1:100-year floodline as calculated to include the effect of the berm and channel, with a 1m freeboard.

The berm will have to have a clay core in areas where the river water will permanently pond against the proposed berm (such as at the existing river sections). In the same areas grouting of the embankment(berm) foundation may be required to minimise seepage into the pit.

The river side zone of the berm has to be rockfilledor will have to have adequate rip-rap protection (with a natural appearance). The pit side zone of the embankment has to be from material with a fairly high angle of repose in order to

have a slope as steep as possible in order to not encroach on the proposed pit edge. The mine's Rock Engineer will have to confirm the safe pit edge distance from the berm.

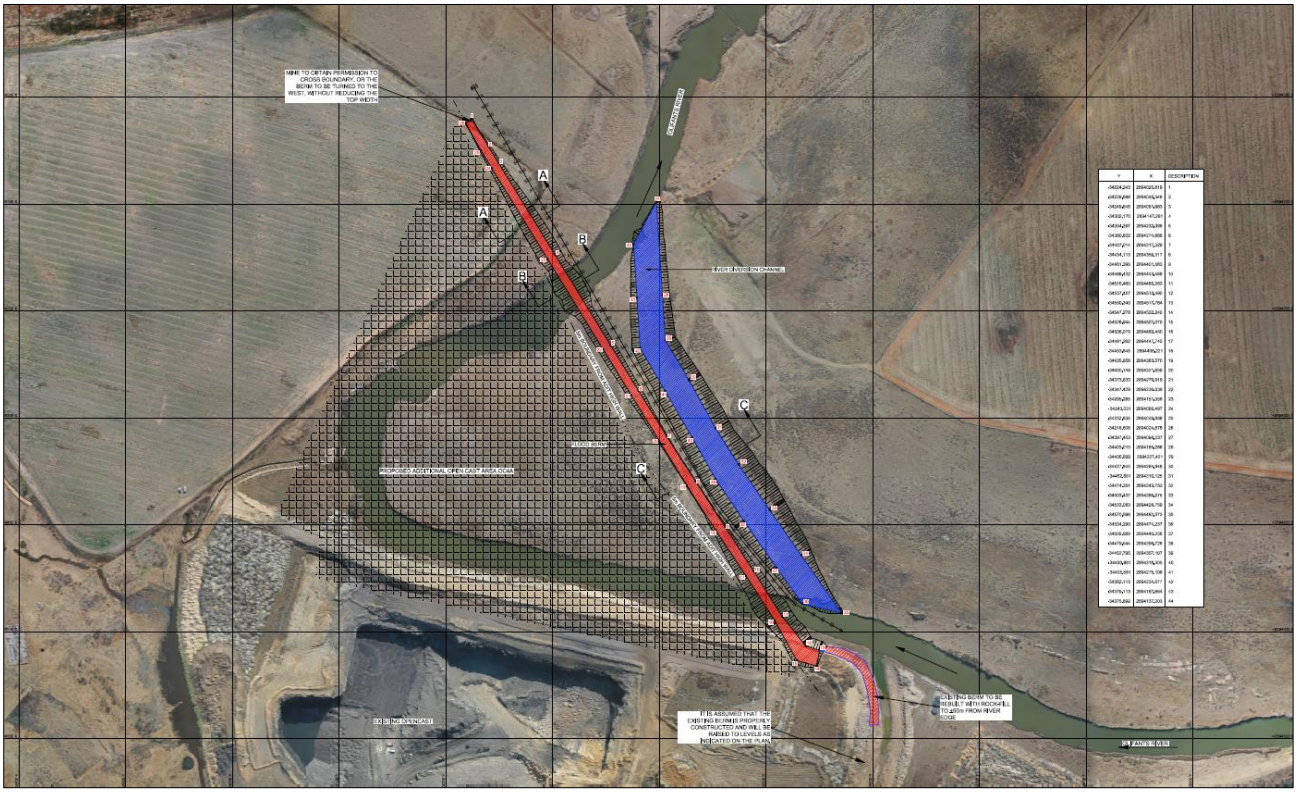


Figure 7: Proposed layout of Olifants River Diversion

4.3.2. PROCESSING PLANT

The proposed processing plant is a heavy media cyclone plant, the ROM coal is brought to the primary section and fed through a primary crusher; a recirculating load secondary crusher reduces the coal to -50.0mm. The coal is then fed via conveyors into a mixing tank where magnetite and water are mixed with the coal and are fed into the cyclone that spins out the rock and the clean coal. The clean coal goes to screens to create different products and the rock goes to discard for rewash or stacking.

Fine coal is screened out to go to the filter press or to the spiral section. The < 3.0mm coal is fed into a spiral circuit with water where the effect of centrifugal forces and gravity separate the coal from rock. Refer to Figure 8 for the proposed layout of the coal wash plant. A series of water only Jig plants may be used instead of the DMS type plant. A double stage wash can be used if extra jigs are put in series. The discard from the water jigs is placed in the pit below the shale horizon.

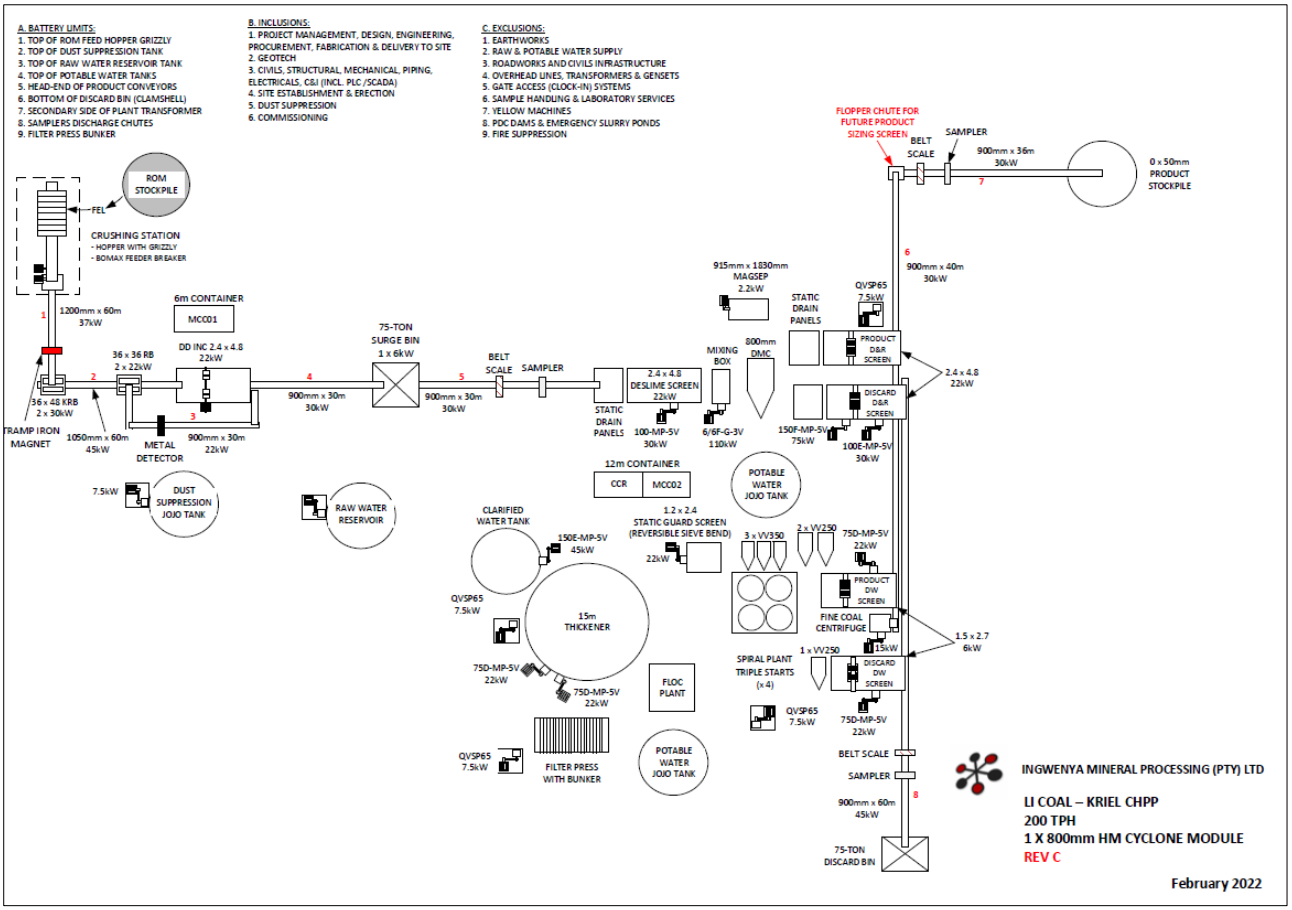


Figure 8: Proposed Coal Wash Plant Layout

5. LEGAL AND GOVERNANCE FRAMEWORK

NEMA Regulations GNR 1147

This closure plan will be progressively updated to comply with Appendix 4 of the NEMA Regulations (GNR. 1147), 20 November 2015. This report is aligned to the requirements pertaining to the content of the closure plan as required by Appendix 4 of GNR. 1147, with references to the sections where the given requirement is addressed in the report as presented in Table 1 of the regulations.

The purpose of these Regulations is to regulate the determination and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. The Regulations also include detailed descriptions of the wording required in the documentation to support the provisioning for liability using Bank Guarantees and Trust Funds. Finally, the legislation also provides detail on the information to be contained in the following plans: Annual rehabilitation plan, Final rehabilitation, decommissioning and mine closure plan as well as the Environmental risk assessment report

Other National Regulations

Mineral and Petroleum Resources Development Act No. 28 2002 (MPRDA), Section 43:

A holder of a prospecting right, mining right, retention permit or mining permit remains responsible for any environmental liability, pollution or ecological degradation and the management thereof, until the Minister has issued a closure certificate to the holder concerned.

National Environmental Management Act, No. 107 of 1998 (NEMA):

If it is determined that a mine, regard to its known ore reserves and mining activities, is likely to cease mining operations within a period of five years, the owner of that mine must promptly notify the Minister in writing -

- of the likely cessation of those mining operations; and
- of any plans that are in place or in contemplation for-
    - the rehabilitation of the area where the mining operations were conducted after mining operations have stopped; and
    - The prevention of pollution of the atmosphere by dust after those operations have stopped.

Duty of care (Section 28 of NEMA) to take reasonable measures to prevent significant pollution or degradation of the environment from occurring, continuing or re-occurring or where such pollution or degradation cannot be reasonably stopped or avoided, such person must take reasonable measures to minimize and rectify such pollution or degradation.

Section 28. (1) 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, 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.

In terms of section 28, the mine is required to obtain authorisation by Law and to provide proof that the degradation can be rehabilitated and or remediated after mining. In terms of the Financial Provision Regulations (GNR 1147), the cost associated with environmental damages should be provided for in some form of a financial guarantee.

Environmental Impact Assessment Regulations, 2014 (as amended):

Regulation 19 (6): *"A closure plan must contain the information set out in Appendix 5 to these Regulations, and, where the application for an environmental authorisation is for prospecting, exploration, or extraction of a mineral or petroleum resource, including primary processing, or activities directly related thereto, the closure plan must address the requirements as set in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations, made in terms of the Act."*

Regulation 19(7A): *"The content of a closure plan may be combined with the relevant plan contemplated in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations, made in terms of the Act, on condition that the requirements of both those Regulations and Appendix 5, respectively, are met."*

An application for an environmental authorisation (Basic Assessment) must be submitted for the decommissioning of any activity requiring -

- A closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or
- A prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

NEMA Principles

In terms of section 38 of the MPRDA, holders of reconnaissance permissions, prospecting rights, mining rights, mining permits or retention permits must promote compliance with the principles set out in section 2 of the NEMA, which provide that -

- the disturbance of ecosystems and loss of biological diversity is avoided, or, wherever it cannot altogether be avoided, is minimised and remedied;
- pollution and degradation of the environment is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- the disturbance of landscapes and sites that constitute a nations cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and
- Negative impacts on the environment and on people's environmental rights be anticipated and prevented, and when they cannot be altogether prevented, are minimised and remedied.

The National Water Act (NWA), Act No. 36 of 1998:

A duty is imposed on the owner of land, a person in control of land or a person who occupies or uses the land to take all reasonable measures to prevent the pollution of a water resource from occurring, continuing or recurring;

It provides regulations on the use of water for mining and related activities aimed at the protection of water resources within GNR R704;

Any person in control of an existing mine must notify the Department of Water and Sanitation (DWS) 14 days before the temporary or permanent cessation of the operation of the mine;

Any person in control of a mine must at temporary or permanent cessation of mining operations, ensure that -

- Any person in control of a mine or activity must at temporary or permanent cessation of operations ensure that all pollution control measures have been designed, modified, constructed and maintained in accordance with GNR 704; and
- Any person in control of a mine or activity must ensure that the in-stream and riparian habitat of any water resource, which may be affected or altered by the mine or activity, is remedied so as to comply with GNR 704.

Provision is made for, *inter alia* -

- Regulation 4: Restrictions on locality regarding infrastructure;
- Regulation 5: Restrictions on use of material;
- Regulation 6: Capacity requirements of clean and dirty water systems; and
- Regulation 7: Protection of water resources.

Regulation 7 of GNR 704:

Every person in control of a mine or activity must take reasonable measures to -

- Prevent water containing waste or any substance which causes or is likely to cause pollution of a water resource from entering any water resource and must retain or collect such substance or water for use, re-use, evaporation or for purification and disposal in terms of the Act;
- Cause effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings; and
- Prevent the erosion or leaching of materials from any residue deposit or stockpile from any area and contain such material or substances so eroded and leached in such area by providing effective suitable barrier dams, evaporative dams or any other effective measures to prevent this material or substance from entering and polluting any water resources.

Conservation of Agricultural Resources Act No. 43 of 1983:

Regulation 15 of the Conservation of Agricultural Resources (CARA), Act No. 43 of 1983 provides a list of Category 1 plants (Weeds) and Category 2 and Category 3 plants (invaders) that must be controlled. Category 1, 2 and 3 plants may not occur on any land or inland water surface other than in biological control reserves and must be controlled by means of the methods prescribed in the regulations (unless exemption granted).

Constitution of the Republic of South Africa, Act No. 108 of 1996, Section 33:

- Everyone has the right to administrative action that is lawful, reasonable and procedurally fair;
- Everyone whose rights have been adversely affected by administrative action has the right to be given written reasons;
- Any application for, for example, a closure certificate or an application for transfer of liabilities and responsibilities in terms of the MPRDA must be considered by the relevant authority according to the criteria contained in Section 33 of the Constitution;
- Where the relevant authority has been given a discretion that discretion must be exercised in a reasonable manner and without bias, prejudice or any personal agenda; and
- Failing which, the decision may be set aside by way of an application to court or any internal procedures prescribed by the empowering legislation.

South African good practice

The Department Water and Sanitation (DWS), – commissioned a series of Best Practice Guidelines (BPG), in partnership with industry, to assist with aspects of DWAF's water management hierarchy. BPG5: Water Management Aspects for Mine Closure, includes the following principles:

- Management measures at closure should primarily be of a passive nature with minimal long-term maintenance and operating costs;
- The final landform must be sustainable, must be free-draining, must minimise erosion and avoid ponding;
- Concurrent rehabilitation must be undertaken in a manner that supports the final closure landform to ensure/avoid that rehabilitation does not need to be redone at a later stage;
- Land use plan which is directly interlinked with water management issues insofar as water is required to support the intended land use and the land use itself may have an impact on the water; and
- Biodiversity plan will address issues that are interrelated with the mine water management plan, particularly regarding the environmental water balance and the effects that mining may have thereon.

The Guidelines for the rehabilitation of mined land developed by the Chamber of Mines (updated 2007) was developed by key industry role players with focus on aspects of opencast mine rehabilitation. Pertinent aspects include:

- Stripping topsoil per a dedicated stripping plan and utilizing the correct equipment to minimise compaction, over stripping and mixing of horizons;
- Implementing concurrent rehabilitation, constructing a post mining landform free of ponding and prioritizing the live stripping and placement of topsoil where possible;
- Limiting topsoil management activities to dry seasons as increased moisture content can also increase the potential for compaction;

- Implementing effective strategies for topsoil stripping, placement and stockpiling to limit compaction; and
- Implementing a soil amelioration and revegetation strategy based on dedicated soil sampling and analysis.

Draft National Mine Closure Strategy 2021 (GN 446, 21 May 2021)

The aim of the strategy is to prevent or minimize adverse long term environmental and social-economic impacts, and to create a self-sustaining natural ecosystem or alternate land use. The Regional closure strategy will therefor set specific standards for all mines and promote the alignment of individual mine closure plans and regional mine closure plans, including the requirements for application for closure, requirements for Environmental Management Programmes/Plans and Financial Provision. A Regional Mine Closure Strategy (RMCS) is different to a Mine Closure Plan. The regional mine closure strategy considers the various issues that are relevant to mine closure on a broader integrated level and develops a strategic framework within which individual mine-closure plans will fit. RMCS therefore do not replace a mine closure plan.

<u>The objectives of National Mine Closure Strategy are:</u>

- To manage the closure of mine in a demarcated area in an integrated and sustainable manner, hence ensuring that these mines work together to achieved self-sustaining ecosystem after closure.
- To ensure that mines do not impact negatively on the livelihood of adjacent/interconnected mines in a demarcate area.
- To promote a strategic approach to managing water at mining and minerals processing sites so that water is more efficiently managed and value and to develop a post closer mine water strategy for an area.
- To make provision for post-closure stewardship and socio-economic sustainability, to continue monitoring the implementation of individual and regional mine closure plans.
- Integrated environmental management and related closure activities with socio-economic interventions and aligning these with development of a post-closure economy, by rationalising current wasteful spending on Environmental Management Programme (EMPr), Social and Labour Plan (SLP) and Corporate Social Investment (CSI) by reducing duplication of efforts and spending and aggregating available funding for coordinated regional projects.

<u>The identification of Mine Closure Regions</u>

The identification of closure regions is a multi-contextual process and requires consideration of social, environmental and economic impact geared towards sustainable post closure support for dependent communities. The initiative requires the identification of closure regions suitable for integrated development strategies. The identification of these closure regions should be made within the existing provisions of the MPRDA. The selection of logical mine closure regions will enable the aggregation of development and rehabilitation funds unto common regional economic development programmes underpinned by substantial financial capacity. This, in turn, provides the basis for collaborative regional development between mining companies, local government and other sectors. Examples of these regions are shown in the figure below.

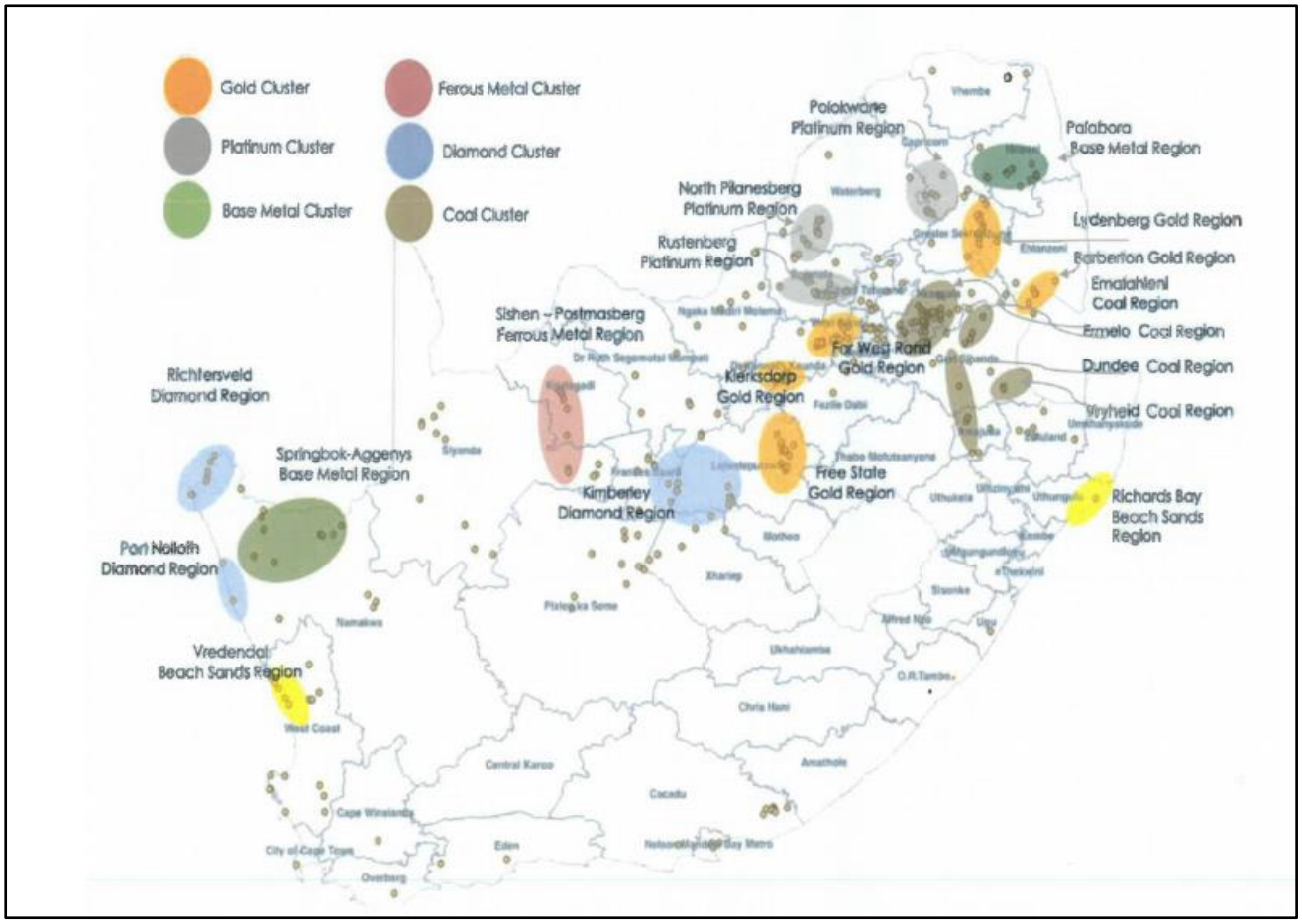


Figure 9: Regional Mine Cluster

6. ENVIRONMENTAL AND SOCIAL CONTEXT

An overview of the biophysical and socio-economic context within which closure will be implemented, is included. The summary is based on a review of the information made available for this closure plan. Several implications related to the information collected are provided, along with linkages with the seven key closure objectives.

6.1. Summary of the Environmental and Social Context of the Project

The pertinent environmental and social conditions at 2 SEAM is summarised in Table 6.

Table 6: Environmental and Social Context

Aspect	Description
Climate	The project area is situated in the summer rainfall region of southern Africa. The climate is temperate with hot summers and dry cold winters. Summer precipitation occurs in the form of mist, drizzle, hail and thunderstorms.

	At Bethal, the mean daily maximum exceeds 24°C between November and March, the hottest months. Average daily maximum temperatures in the winter months (May-August) range from 16.5°C to 19.9°C. The mean minimum summer temperatures range from 11.8°C (November and March) to 13.8°C (January) with winter mean minima ranging from 0.8°C to 4.4°C. The WR2012 historical records indicate a long-term average rainfall rate of approximately 688 mm per annum (see Figure 8). The month with the highest average values is that of January (117mm), with the lowest month being July (7mm). Evaporation data used for this site is based on the 1 541 mm per annum S-Pan evaporation and Evaporation Zone 4A (WRC, 2015)
Topography	The topography across the project site is slightly undulating with the general gradient forming (3° to 10°) towards the north-northeast where the Olifants River borders the site. Surface elevation ranges between ~1,530 m above Mean Sea Level (mamsl) and ~1,560 mamsl with some old, flooded, opencast mine workings and rehabilitated waste rock dumps superimposed on the relief. Wetlands have formed in some of the flooded opencasts and vary from small scale vegetated depressions to large deeply etched features.
Surface Water	The mine is located in Quaternary Catchment B11B, upper Olifants River Catchment within the Olifants Water Management Area. The tributary to the Olifants River flows on the northwestern boundary of the proposed opencast operations at Lourens 472 IS. The confluence of the tributary and the Olifants River is on RE of the farm Clydesdale 483 IS northeast of the mining area. The effective catchment in terms of surface runoff is approximately 490 km^2.
Groundwater	The weathered/fractured aquifer that underlies the site may be classified as a minor aquifer (Parsons, 1995) due to the general yields of less than 2.0 l/s. The Minor Aquifer System is defined as “fractured or potentially fractured rocks which do not have high primary permeability or other formations of variable permeability. Aquifer extent may be limited and water quality variable. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and in supplying base flow to rivers.”
Geology and Soils	The 2 Seam Mine falls within the Springs-Witbank Coalfield, comprising sediments of the Dwyka Group and the central lithostratigraphic coal-bearing unit of the Ecca Group, namely the Vryheid Formation. Together they represent part of the Karoo Supergroup, which were deposited on an undulating pre-Karoo floor comprising primarily felsites of the Bushveld Complex and other ancient strata such as the Waterberg Group and Transvaal Supergroup sedimentary rocks. These strata had a significant influence on the nature, distribution and thickness of many of the Karoo Supergroup sedimentary formations, including the coal seams.

Waste Classification and ABA	Mineralogy (XRD & XRF): • The hanging-and-footwall carbonaceous clastic rocks comprised mostly of kaolinite with lesser amounts of coal compared to the coal samples. The sandstone is comprised predominantly of kaolinite with lesser quartz. • Carbonaceous mudstone - sample comprises mainly kaolinite and coal as dominant and major minerals with lesser muscovite and quartz. • Carbonaceous shale with subordinate coal - sample comprises mainly kaolinite and coal as dominant and major minerals with lesser muscovite and siderite. • Coal with subordinate carbonaceous mudstone - samples comprise mainly coal and kaolinite as dominant and major minerals with lesser muscovite and quartz. • Fine sandstone with subordinate mudstone - sample comprises mainly kaolinite as the dominant mineral with lesser coal, microcline, muscovite, and quartz. • Coal with subordinate fine sandstone): The sample comprises mainly coal and kaolinite as dominant and major minerals with lesser quartz. ABA & NAG: • 33.3% (2 out of 6 samples) of the carbonaceous mudstone/shale samples collected have a high potential to generate acidic drainage (and will generate a high salt load), and 17% (1 out of 6) have a low potential to generate acidic drainage (and will generate a low to medium salt load), 17% (1 out of 6) has a very low potential to generate acidic drainage (and will generate a very low to medium salt load), 33.3% (2 out of 6 samples) of the carbonaceous mudstone/shale samples collected has no potential to generate acidic drainage (and will generate no salt load); • 100% (4 out of 4 samples) of the coal samples collected have a high potential to generate acidic drainage (and will generate a high salt load); • 50% (2 out of 4) of the shale samples collected have a very high potential to generate acidic drainage (and will generate a very high salt load), and 50% (2 out of 4) have a very low potential to generate acidic drainage (and will generate a very low salt load) • 25% (2 out of 8) of the sandstone/mudstone samples collected have a high potential to generate acidic drainage (and will generate a high salt load), and 38% (3 out of 8) have a low to medium potential to generate acidic drainage (and will generate a medium to high salt load), 17% (1 out of 8) has a low potential to generate acidic drainage (and will generate a low to medium salt load), 17% (1 out of 8) has a very low potential to generate acidic drainage (and will generate a very low to medium salt load) 13, 13% (13 out of 8 samples) of the sandstone/ mudstone samples collected has no potential to generate acidic drainage (and will generate no salt load); and • 100% (1 out of 1) of the soil and clay samples collected have low potential to generate acidic drainage (and will generate a low to medium salt load);

	• The carbonaceous mudstone samples generally have a variable %S content at an average of 0.274%. There is, however, an average neutralisation potential of 30.3 kg/t CaCO3, thus the initial leachate from these rocks will not be acidic as confirmed by the NAG testing but it is suspected that 66% of the samples have sufficient sulphide content and will acidify over the long-term because of the high sulphide content; • The coal samples all have a high %S content and a lower neutralisation content thus if subjected to oxidisation then leached acidic drainage will occur as confirmed by NAG testing; • The sandstone and mudstone samples have variable %S content with a relatively high neutralisation potential, but about 38-76% of the samples have the potential to generate acidic drainage if oxidised and subsequently leached as confirmed by NAG testing; • The weathered sandstone and clay sample have a relatively low %S content with a low neutralisation potential thus there is a low potential to generate acidic drainage. • Overall, it could be concluded that about 50% of the hanging wall/waste rock material (sandstone, mudstones, shales) has the potential to generate acidic drainage if the material is oxidised and leaching occurs subsequently. The coal samples have a high potential to generate acidic drainage if subjected to oxidisation. Usually, the coal is mined before significant oxidation occurs and only coal remaining in the mine will potentially be of concern over the long term. Reagent water leach: The static leach test performed at a 1:20 ratio is a relatively diluted extraction and did not leach the chemicals at significant concentrations. It is expected that metals like Fe, Mn, Co, Ni and Pb will only be significantly present in acidic leachate if the rocks are subjected to atmospheric conditions (oxidation).
Biodiversity	According to the National Vegetation Map (SANBI 2006 – 2018) the project area is in the Grassland biome, which is the second largest biome in South Africa, covering 28.4% of the country. Grasslands are dominated by a single layer of grasses. The state of the vegetation of the proposed project area varies from being moderately impacted to completely transformed. The following broad classification of Vegetation Units (VU) were found to occur on the proposed project footprint and 100 m extended project area: • Impacted grassland (VU1); • Transformed land (VU2); and • Riparian and wetland (VU3). Large sections of the area proposed is currently subjected to agricultural practices. The site proposed for OC6, OC6A and OC4B are all currently transformed habitat utilised as agricultural lands. Scattered wetlands have been noted. Natural habitat has been severely impacted within this footprint; however, a pristine natural area is found adjacent, across the fence. OC5 and OC4 footprints showed some mining

	disturbances which will be extended to include these proposed footprints completely and the river diversion will be implemented to continue mining across the banks of the Olifants River. Thirty-seven (37) species were sighted and one (1) national SCC species confirmed within the footprints. Mammals protected or regulated under MNCA have been found to occur as well, and these species should not be interfered with, nor relocated. Generally, the area was found to be visibly impacted, with predominant mining and agricultural activities prevalent in the surrounding area. Remaining natural footprint areas were mostly still fenced off from the current mining activities and once the project implementation begins, it could impact on sensitive habitat such as the various wetlands found to scattered over the landscape. The Mpumalanga Conservation Plan provides classification of the Terrestrial Biodiversity into various classification categories: • Protected areas - already protected and managed for conservation; • Irreplaceable areas - no other options available to meet targets—protection crucial; • Highly Significant areas - protection needed, very limited choice for meeting targets; • Important and Necessary areas - protection needed, greater choice in meeting targets; • Ecological Corridors – mixed natural and transformed areas, identified for long term connectivity and biological movement; • Areas of Least Concern – natural areas with most choices, including for development; and • Areas with No Natural Habitat Remaining – transformed areas that make no contribution to meeting targets. A small portion of the 2 Seam Mine is classified as CBA optimal and other natural areas occur within the mining right boundary. However, large sections within the project boundary have been heavily or moderately modified.
Land Use	Predominantly mining and some grazing and agricultural fields are present.
Socio-Economic	The Nkangala District Municipality is a Category C municipality in the Mpumalanga Province. It is the smallest district of the three in the province, making up 22% of its geographical area. It is comprised of six local municipalities: Victor Khanye, Emalahleni, Steve Tshwete, Emakhazeni, Thembisile Hani, and Dr JS Moroka.
Heritage and Archaeology	No sites of archaeological or cultural interest that will be impacted by the operations were identified within the project area, although there are graves on surrounding farms.

6.2. WATER MANAGEMENT AND DECANT

Table 7: Potential decant locations and probability

Block	OC1	OC2	OC2A	OC3	OC4A -1	OC4A -2	OC5	OC6
X	37148.823	35444.883	35081.537	36377.502	34235.2	34458.6	33899.743	33529.017
Y	-2895873.6	-2896215.9	-2895713	-2896357.6	-2894151	-2894151	-2895234.8	-2894458
Lowest Topography or Decant Elevation (mamsl)	1534	1549	1549	1534	1532.804	1532.059	1547	1551
Average WL Depth (mbgl)	5	16	14	12.5	5	5	13	9
Duration of Mining (months)	9	10	6	6	12	12	16	24
Approximate Average Depth Below Decant Point (m3/day)	27	24	38	15	31	31	22	29
Pit Surface Area (m2)	75300	42100	17300	61700	175859	175859	222500	697100
Minimum Time to Decant (years) (15% void ratio, 20% recharge)	7	18	16	14	18	18	17	18

Maximum Time to Decant (years) (25% void ratio, 8% recharge)	26	75	66	59	47	47	65	58
Minimum Decant Volume (m3/day)	11	6	3	9	26	26	33	102
Maximum Decant Volume (m3/day)	28	15	6	23	66.5	66.5	81	255
Comment	Likely to decant. Need to verify historical inflows.	Unlikely to decant.	Unlikely to decant.	Uncertainty regarding decant potential. Need to verify historical inflows.	Likely to decant.	Likely to decant.	Unlikely to decant.	Unlikely to decant.

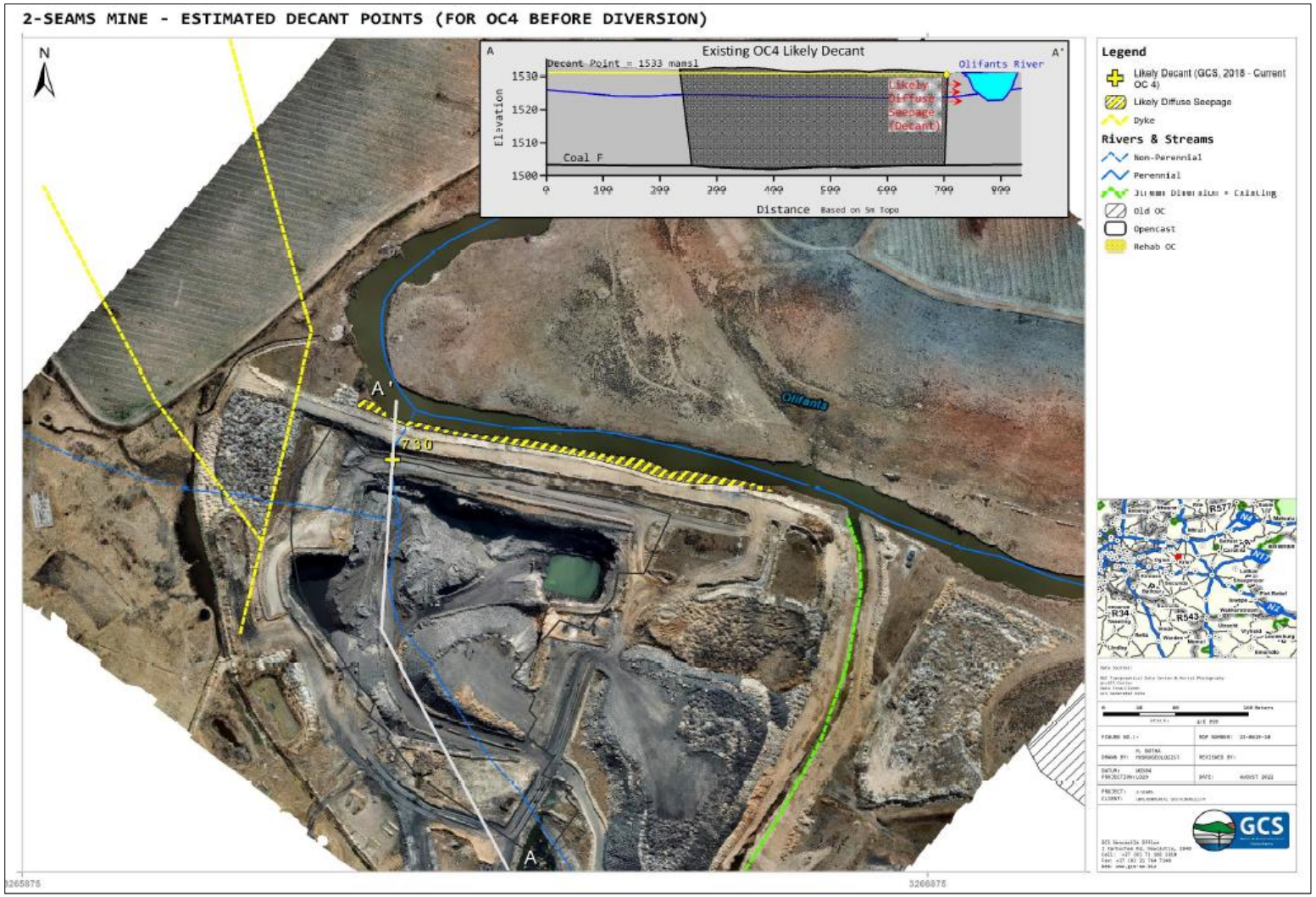


Figure 10: Estimated diffuse decant area

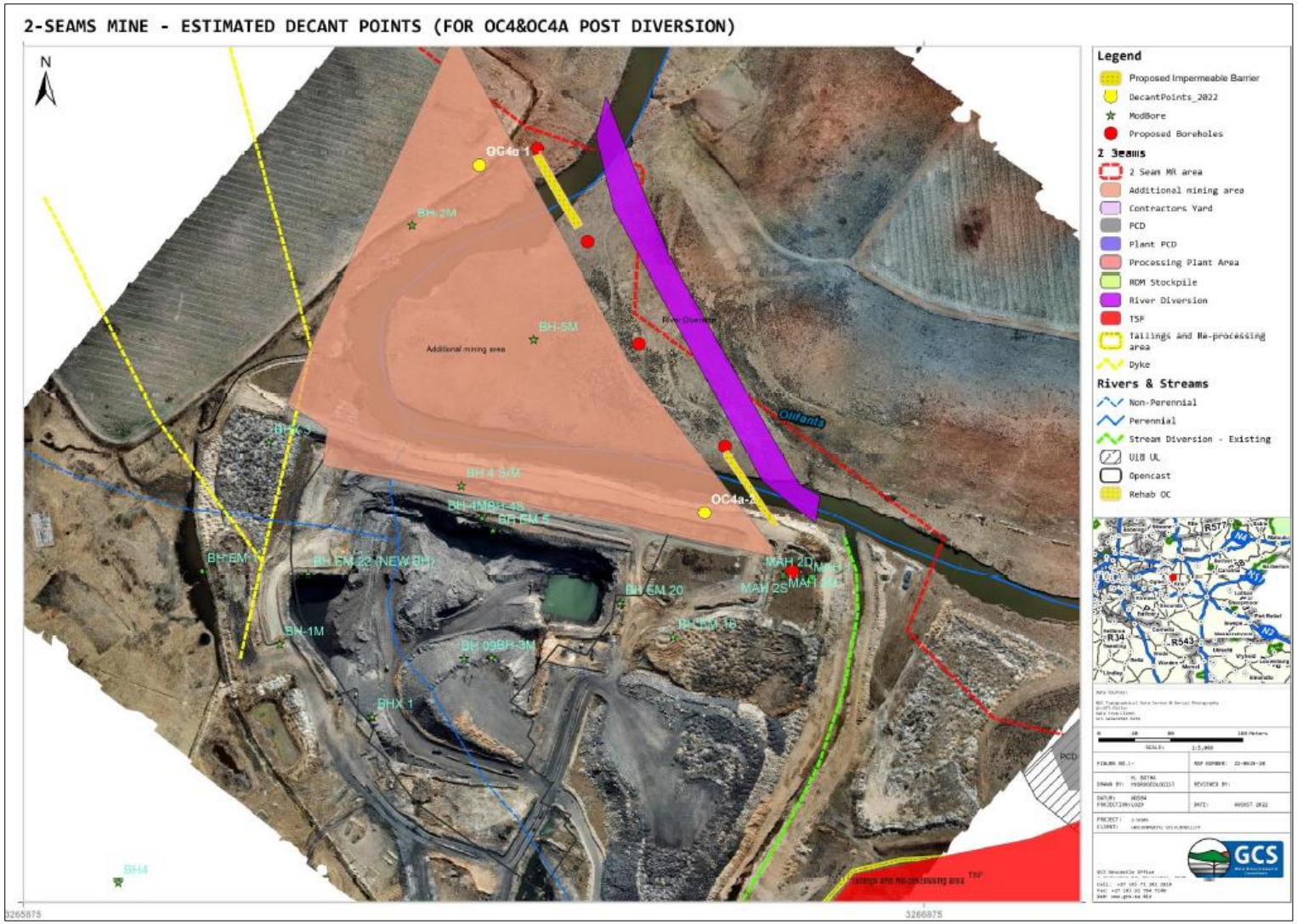


Figure 11: Identified decant points

7. KNOWLEDGE GAPS

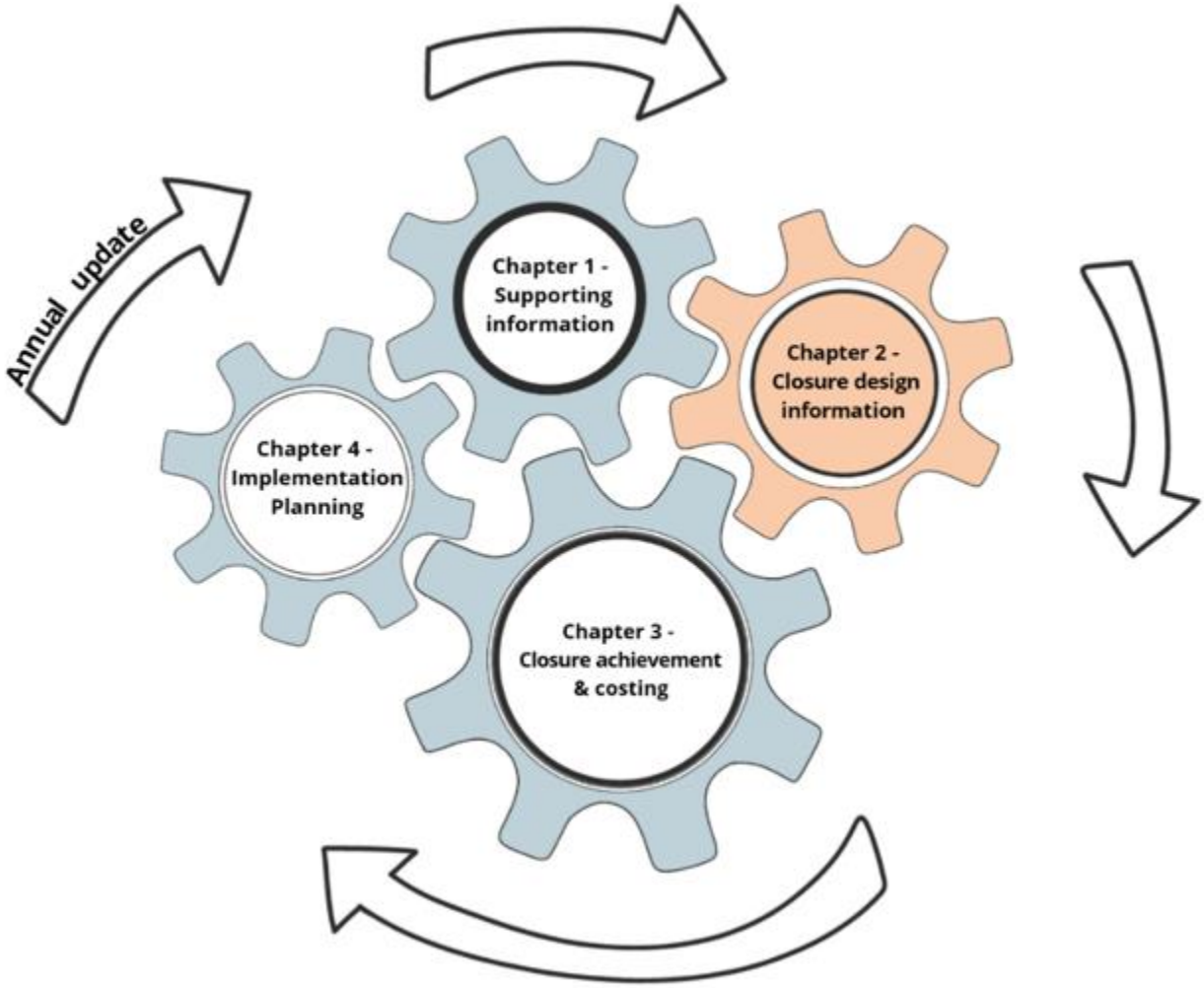
The following specialist studies and investigations are proposed to address the knowledge gaps relating to 2 SEAM:

- Decant volume and quality and when possible, decant will take place.
- Treatment system required for the treatment of possible decant.
- Groundwater management of historical underground area.

8. CONCERNS RAISED BY IA&PS

Please see the section in the Environmental Impact Assessment report for a full summary of the concerns raised.

CHAPTER 2: CLOSURE DESIGN INFORMANTS



Chapter 2 addresses the key closure design informants and develops the preceding survey data via analysis and synthesis. This part includes:

- The current post-mining end land use plan.
- The findings of, and commentary on, operational rehabilitation to date, as well as planned rehabilitation.

- Outcomes of closure-related stakeholder engagement, where applicable.
- An initial assessment of closure options / alternatives, along with a motivation for the preferred option and the formulation of the anticipated closure scenario and vision; and
- A summary of the environmental risk assessment undertaken in accordance with the requirements of GN. R. 1147, with a key focus on the formulation of mitigation measures which are further refined in the core section of this planning process.

9. NEXT LAND USE

9.1. Land Use Objective

The land use objective must be realistic, achievable and must be established through consultation with the landowners and I&AP's. The final land use is essential the end land use to which 2 SEAM would like to return the land affected by mining activities.

In support of achieving this post closure vision there are certain key rehabilitation, decommissioning, and closure objectives. 'Well-conceptualised rehabilitation objectives will allow assessment of the risks associated with achieving these objectives and guide the setting of suitable rehabilitation actions to be taken to mitigate these risks at every stage of the mine's life.

Rehabilitation objectives describe 'what' needs to be achieved to reach the mine's rehabilitation goal. These objectives should be aligned to site-specific characteristics that are within the mine's control. Rehabilitation objectives should be as specific, measurable, achievable, and realistic as possible. They should also define a time period against which they can be measured. Driven by the closure vision and with due consideration of the project context, the closure objectives are presented below.

To progressively reinstate a post mining landscape that:

- Is physically and chemically stable and supports the pre-mining land capability of grazing.
- Slopes are stable and non-erosive.
- Focus on establishing a functional post-mining landscape.
- Utilise closure strategies that promote a self-sustaining condition with little or no need for ongoing care and maintenance; and
- Comply with local, district and national regulatory requirements.

10. CLOSURE OPTIONS

The project, from a closure perspective, is complex even though the risks and impacts associated with the project are well understood. A preliminary best fit post closure land use option has been proposed within the context described. The rehabilitation measures proposed for this project are consistent with legislation and what is considered industry good practice in restoring the desired post mining land use. The following alternatives were considered:

10.1. PRE-MINING NATURAL GROUND LEVEL WITH FINAL VOID

Utilise the available overburden to backfill to natural ground level. The post mining landform would be consistent with the surrounding topography. The backfill material will not be sufficient to backfill all areas to natural ground level and a final void will remain after closure. This alternative was not considered for implementation due to the following:

- The expected bulking factor (25-35%) from the blasted overburden will not result in sufficient material for backfill to natural ground level of all the areas.
- Settlement factor is unknow (estimated at 10-20%) and will results in inconsistence settlement, leading to significant after care and maintenance.
- A final void will remain and will result in long term water management
- The result would be a reduced post mining land use across the mining area.
- Discard from the plant will remain in surface and will results in long term water management.
- Installation of active and passive treatment system to treat possible AMD.

10.2. PREFERRED CLOSURE OPTION

Based on the type of mining (opencast mining) and the associated risk that could occur post closure, the following recommendations have been made as a result of the outcomes of the Environmental Risk Assessment (ERA) conducted:

The preferred option for current closure planning is:

- Backfill the voids with available material and discard from the plant. All areas will be backfilled, and no final void will remain.
- Carboniferous material will be placed in the Carboniferous zone and compacted.
- Concurrent rehabilitation of the opencast area, through roll over mining.
- Replace all topsoil stripped ahead of mining.
- Backfill the open pit with all the available overburden to create a free-draining post mining landform.
- Plant naturally occurring grasses to prevent erosion, to provide a limited grazing potential.
- Monitoring of groundwater water levels and mine inflow rates.
- Installation of active and passive treatment system to treat possible AMD.

The preferred closure option will result in a stable slope with minimal erosion over a long period.

10.3. CLOSURE ASSUMPTIONS

Information currently available may need to be supplemented during the opencast mining phase and closure phase of the project. As additional information will be collected during operations and these assumptions will need to be reviewed and revised.

The assumptions used to prepare this report are the following:

- It is assumed that the mining area will be returned to the grazing land. No value of the farmland is included in the closure cost.
- The closure period will commence once the last planned coal has been extracted from the pits area, concurrent rehabilitation forms part of the operational phase.
- All opencast areas will be rehabilitated before the closure phase.
- The mine plan, design and layout have been adhered to.
- Vegetation establishment will be in line with a project specific Biodiversity Management Plan that the project is expected to develop to manage its impacts on biodiversity.
- Closure water quality compliance criteria will be governed by the Water Use Licence and input from the Department in the closure application.
- Passive and active treatment system will be installed during closure.
- There are limited opportunities for post closure infrastructure for community uses. All information associated with the farming operations will remain after mining and will not be removed.
- All non-permit structures (containers and plant) will be removed during rehabilitation. The plant is not included in the rehabilitation provision as the plant will be moved to another mining area during rehabilitation. The removal of the plant will be included as operational cost of the other mine.
- The SLP will be updated to include the structures that can be hand-over to the community during closure.
- Water management infrastructure (PCD, channels, berms) developed for the operational phase will be retained for closure at the end of the life of the project.
- The flood protection berms will not be removed after closure.
- All demolition rubble is considered General Waste as per the definition of Demolition waste in Category B of Schedule 3 of the National Environmental Management Waste Amendment Act (NEMWAA) and based on the classification as General can therefore be incorporated into the backfill.
- A post closure land capability of grazing and wilderness will be established which implies that growth medium of a minimum of 250 mm on average, being placed as the last layer of earthworks in any rehabilitation activity. Topsoil mainly consists out of Kalahari Sand.
- The bulking factor of between 25-25% and settlement of 10-20% is utilised for the final landform design. The bulking and settlement factor of the high potential swelling clays are unknow and will only be established during closure.
- Drainage lines will be constructed with energy dissipaters and a rock mattress
- All hazardous and domestic waste will be transported offsite for disposal in licenced landfills.
- Roads will be remain where applicable.
- The mine will be aligning the closure plan with the regional closure strategy when the strategy for the area has been developed.

10.4. CLOSURE SCENARIO

Leading on from the closure option analysis and the motivation of the preferred option, the closure scenario is formulated to provide the context within which decommissioning, and closure activities will occur, i.e., a "snapshot" view of the last day of operations, taking account of operational mine and rehabilitation planning.

Table 8: Closure Scenario

Aspect	Description
Mining and Mine Dumps	• Concurrent rehabilitation will be performed as mining progress. • The final void will be backfilled with the overburden stockpile material to design elevations. • Topsoil will be replaced from the topsoil berm onto the backfilled opencast. • The top-soiled areas will be cross ripped, to alleviate compaction, scarified and revegetated. • Contaminated soils will have been identified and addressed as they arise during operations, leaving only limited potentially contaminated soils / areas requiring clean-up at cessation of operations; and • All roads will remain after closure. • Overburden will be utilised to backfill opencast voids; the remaining overburden will be shaped to form part of the extended slope, whale back.
Water management	• Operational storm water measures will be filled in, shaped as required and the footprint scarified and re-vegetated. • The PCD will remain until the plant and all residue material has been removed. • Decant of AMD is likely to take place. Passive and Active treatment systems will be installed for the treatment of water.
Plant Area	• The sacrificial layer located under the plant will be excavated and will be processed by the plant to remove ore. • All infrastructure from the plant area will be removed. • Cement structures will be broken up and placed within the final voids.
Workshops & Infrastructure	• All formal structures will be removed. All non-permit structures (containers and plant) will be removed during rehabilitation.
Offices	• Offices will be removed as all offices consist out of movable containers

10.5. CLOSURE VISION

Closure and rehabilitation are a continuous series of activities that begin with planning prior to the project's design and construction, and end with achievement of long-term site stability and the establishment of a self-sustaining ecosystem. Not

only will the implementation of this concept result in a more satisfactory environmental conclusion, but it will also reduce the financial burden of closure and rehabilitation.

The preliminary closure vision is proposed for the opencast pit, is as follows:

- To create non-contaminating, secure and physically stable landforms and rehabilitated areas that contribute to the selected land use, biodiversity of the area and which are aesthetically acceptable.

11. OPERATIONAL REHABILITATION

A key mine closure principle is concurrent (progressive) rehabilitation. This includes the development and implementation of rehabilitation plans aligned with mining programmes. The specific aim is to minimise closure costs and liabilities and reduce environmental risks during operation and at closure of the mine through to post mining.

2 SEAM as an operational mine has commenced with concurrent rehabilitation, the mine has reached steady state mining. Roll over mining is taking place, where overburden removed from the new cuts are placed back into the already mined out areas. Each layer of overburden) will be placed back in the correct order.

Any waste material produced by the plant will be placed back in the carboniferous layer. The carboniferous layer will be sealed off with a number of overburden layers and compacting the layer to present water ingress. The final landform will be implemented on the rehabilitated sections as part of the operational phase. Despite of the expected bulking factor (25-35%) and settlement of between 10-20%, no overburden stockpile will remain on surface and the final free draining landform will be created.

11.1. VISION FOR THE OPERATIONAL PERIOD

The operational period will include rehabilitation activities that have a direct impact on the quality of rehabilitation attained at closure, particularly the management of soils. A proposed vision for the development and operation of the opencast pits are:

- To limit the development footprint as far as possible.
- Implement stormwater measures according to GNR 704.
- Strip and store soils prior to any development.
- Implement concurrent rehabilitation as soon as possible.
- Place discard back into the ore layer and seal the layer off.
- Compact rehabilitation to present water ingress and AMD formation.
- Prevent mixing of soil profiles.
- Re-vegetate topsoil stockpiles and berm to maintain soil fertility; and
- Prevent contamination of topsoil.

12. PLANNED REHABILITATION

12.1. FINAL LANDFORM DESIGN

In order to achieve the final landform design, the closure objectives and relinquishing criteria must be met. This will require that; slopes and surfaces will be stabilised to prevent subsequent rehabilitation and revegetation from being less effective and maintenance being prolonged.

Final landform design will take the following factors into consideration:

- Erosion potential of material on site.
- Recognition of pre-mining surface and groundwater flow.
- Alignment with existing topographical features.
- Slope angles and length to be visually compatible with the surrounding area and stable under local rainfall patterns and erosion processes.
- Recognition that unconsolidated material from disturbed areas will require greater protective measures to minimise erosion.
- Drainage pattern for the overall site should be planned as part of the overall landscaping, with drainage patterns and densities monitored during the operation phase on, and near site providing a guide to site requirements.

A backfill volume calculation and final landform design was undertake based on current landform. The annual rehabilitation requirements have been established from these plans.

12.1.1. Steps for the next year (2022-2023)

The current surface layout of the mine is presented in below. The footprint of the overburden stockpile will be reduced over time as the material will be utilised to backfill the opencast area. During the first phase of the mining, opencast mining will be undertaken. Roll over mining method is implemented during this phase and overburden have been stored for final rehabilitation on the overburden stockpile. Topsoil stripped from the mining area has stored on the topsoil stockpile. It is estimated that the mining phase will be undertaken for a period of 15-20 year if no extension of the resources is obtained.

During the second phase, final rehabilitation will be undertaken. After the removal of all the coal the final rehabilitation will be undertaken. All concrete structure will be broken down and placed into the final void. The waste of the plant area and material utilised to construct the plant platform will be placed back into the void. The overburden remaining on the overburden dump will be placed back into the void. The final material will be dozed into the slope and stormwater measures will be implemented.

Each of the closure units are discussed below. The preliminary implementation plan (annual plan) is presented in the Tables below. The plan will be audited and updated on an annual basis as required. The actional rehabilitation will be measured against the planned/scheduled rehabilitation and percentage completed as schedule will for part of the annual plan.

12.2. INFRASTRUCTURE AND REHABILITATION

12.2.1. STEEL STRUCTURES, CARPORT AND WORKSHOP

During final rehabilitation and decommissioning phase, the plant will be decommissioned, the steel infrastructure will be dismantled and moved to another mining area. It is anticipated that the plant will be relocated to new operations or sold off, the cost associated with the removal of the plant will form part of the operational cost of the other mine.

The quantity of item provided for is presented in Table 9, all infrastructure and concrete structures are included. No infrastructure from the land is included. The plant area is included as general surface rehabilitation. Once mining operations have ceased, decommissioning will commence and will involve the removal of buildings, infrastructure, equipment, and services, unless it has been agreed with stakeholders that any of these remain. Reusable or recyclable items will be removed and sold as scrap for recycling, or alternatively provided to community groups and businesses if this agrees with company policies. Community groups will be provided the opportunity to undertake some salvage activities in line with acceptable health, safety, and environmental practices. No salvage value for any of the steel structures, scrap steel and equipment that can be re-used or sold are permitted.

Items that cannot be salvaged will be disposed of offsite in accordance with the Integrated Water and Waste Management Plan for the project and best practice. The areas will be graded, ripped, and seeded. Mobile offices or containers used will be removed by the contractor.

All concrete footings, slabs and hardstand areas will be demolished and removed to at least 0.5 m below ground. Once the infrastructure has been removed from the area, the site will be ripped, re-profiled with a grader and seeded. The concrete will be placed in the final void and sealed off.

Table 9: Structures

Building, structures, and platforms	Un-schedule	Schedule
	Area (m^2)	Area (m^2)
Demolition of steel buildings and structures – OC6		270.00
Demolition of reinforced concrete buildings and structures – OC6		780.00
Demolition of reinforced concrete buildings and structures – Plant		1000.00

12.2.2. OPEN PIT

As the opencast mining progresses, the voids created are backfilled with overburden from the progressive opencast mining, and then overlain by the various soil horizons and rehabilitated. There will be no void at the end of life of mine. The topography of the backfilled void and in the area adjacent to the void will be shaped to ensure that a free draining topography result. Once the void has been backfilled, topsoil or soft overburden will be spread on rehabilitated areas. Once placed, the "growth medium" should then be fertilised, ripped and re-vegetated.

The total void area for the un-schedule opencast areas is presented below in Table 10. The scheduled activities are presented as well. The backfill of the voids will consist out of the following:

- Overburden, Waste rock and Topsoil located in surface dumps.
- Waste from the plant.

Table 10: Opencast Mining

Opencast Rehabilitation	Un-schedule	Schedule
	Area (ha)	Area (ha)
OC01	3,87	
OC2	0,00	
OC2A	1,19	
OC3	5,59	
OC4	2,52	
M - Pit	7,72	
OC4A		4,5
OC6		6,31

12.2.3. ACCESS ROADS

Access and haul roads were constructed from existing mining and farm roads. None of the roads constructed have been surfaced with tar or any form of hydrocarbons. The total roads are presented in Table 11.

Table 11: Roads

Opencast Rehabilitation	Un-schedule	Schedule
	Area (m2)	Area (m2)
Existing Roads	16 500.00	
OC4A		0.00
OC6		17 100.00

12.2.4. STORMWATER INFRASTRUCTURE

Stormwater measures on the mining area consist out of following:

- Pollution Control Dam
- Stormwater berms and cut of trenches (clean and dirty water separation).
- Flood protection berms

Flood protection berms have not been constructed and additional berms will be constructed as part of the OC4A extension. It is anticipated that the protection berms will not be removed during rehabilitation and will remain in place after closure. The PCD liner will be removed, and the area will be rehabilitated as part of general rehabilitation

Table 12: Stormwater Structures

Stormwater Structures	Un-schedule	Schedule
	Area (ha)	Area (ha)
Pollution Control Dam	1,84	
Tailings Area 1	2,90	
Tailings Area 2	0,32	
Pollution Control Dam 2		0,50

12.2.5. GENERAL SURFACE REHABILITATION

General surface rehabilitation will consist out of the cross ripping of all areas, placement of topsoil ripping of any compacted topsoil and seeding of topsoil. All areas impacted during mining, apart from the areas/ infrastructure that will remain after closure requires general rehabilitation. The total area disturbed as presented in Table 13. All the disturbed areas will be levelled, top soiled and ripped, will be prepared for planting.

The recommended approach, for which this costing has been derived, is as follows:

- Soil ameliorants are incorporated by deep ripping, which penetrated 100 mm through the soil into the underlying overburden material.
- Compound (NPK + Zn) fertilizer is applied and disced in as part of seedbed preparation.
- A grass seed mix is then planted, usually with first rains, or after rains have commenced; and
- The site is then mulched using locally obtained grass; this is to stimulate the long-term establishment of indigenous vegetation and to reduce erosion during early plant growth.
- No cost is allocated for any shortfall in topsoil. A topsoil balance to be established and any shortfall shall be costed for, and provision made before final closure.

Table 13: Rehabilitation of disturbed areas

General Surface Rehabilitation	Un-schedule	Schedule
	Area (m2)	Area (m2)
General surface rehabilitation (topsoil & seeding)	43.77	
General surface rehabilitation - OC4A (topsoil & seeding)		4.5
General surface rehabilitation - OC6		18,42
General surface rehabilitation - OC6 (seeding)		19,47

12.2.6. MAINTENANCE AND AFTERCARE

Maintenance and aftercare must be planned for a period of 5 years after the land preparation and replanting of vegetation has been completed. Maintenance will specifically focus on fertilizing the rehabilitated area annually, control of alien plants and general maintenance, including rehabilitation of subsidence and erosion gullies. Continuous erosion monitoring of rehabilitated areas and slopes should be undertaken and zones with excessive erosion should be identified. The cause of the erosion should be identified, and rectified. Zones with erosion will need to be repaired with topsoil.

12.2.7. LONG TERM WATER ISSUES

In terms of geohydrological assessment, it is anticipated ADM formation will take place over time and decant is likely to take place. The table below presents the expected volume of decant and when the decant will form. Provision is made for water management and the treatment of decant. The design and development of the treatment system will only be undertaken after closure as the volume of decant and the quality of the water is required before any system can be developed.

Table 14: Potential decant locations and probability

Block	OC1	OC2	OC2A	OC3	OC4	OC4A	OC5	OC6
Minimum Time to Decant (years) (15% void ratio, 20% recharge)	7	18	16	14	18	18	17	18
Maximum Time to Decant (years) (25% void ratio, 8% recharge)	26	75	66	59	47	47	65	58
Minimum Decant Volume (m3/day)	11	6	3	9	26	26	33	102
Maximum Decant Volume (m3/day)	28	15	6	23	66.5	66.5	81	255
Comment	Likely to decant. Need to verify historical inflows.	Unlikely to decant.	Unlikely to decant.	Uncertainty regarding decant potential. Need to verify historical inflows.	Likely to decant.	Likely to decant.	Unlikely to decant.	Unlikely to decant.

Table 15: Preliminary implementation plan

Year	Aspect/ Closure Activity	Size catered for in terms of quantum(s)	Actual implementation date	Percentage completed – to be updated annually	Work to be re-scheduled – to be updated annually
Phase 1: Opencast Mining Activities/Actions					
Concurrent Rehabilitation	Roll over mining	Based on area mined			
End of life of mine	Opencast rehabilitation – final voids and ramps	To be established			
Final Rehabilitation, closure, and aftercare					
End of life of mine	General surface rehabilitation and re-vegetation	To be established			
End of life of mine	Establishing of final landform	To be established			
End of life of mine	Implement erosion control	To be established			
End of life of mine	Removal of surface structures and plant	To be established			
End of life of mine	Implement Closure monitoring plan on area	To be established			
End of life of mine	Implement Active and Passive treatment	To be established			

13. OPERATIONAL MONITORING PLAN

An operational monitoring plan should be developed for the opencast pit. The proposed parameters to be monitored, frequency of monitoring and period of monitoring are indicated in Table 17 below.

Table 16: Proposed operational monitoring plan

Proposed operational monitoring plan			
Aspect	Parameters	Frequency	Responsibility
Material Balance – Topsoil	Soil stripping depth, soil stockpiling, soil placement depth and maintaining the life of mine topsoil balance. Verifying the actual overburden bulking factor	Active daily management of operations; and A monthly survey consolidation	Site environmental manager and the surveyor
Topsoil and subsoil quality	Soil physical and chemical properties, accurate implementation of soil management practices to reduce mixing and compaction	As topsoil stripping and placement occurs; and active daily management of stripping, stockpiling, and placement activities	Site environmental officer and soil scientist
Dust	Source and receptor monitoring	Monthly	Environmental Control Officer
Surface and groundwater quality	Upstream and downstream of mining area. In accordance with Water Use License requirements	Quarterly	Environmental Control Officer
Post mining landform	Non-erosion slopes, correct slope to be establish	Active daily management of operations	Site environmental manager and the surveyor

14. ENVIRONMENTAL RISK ASSESSMENT

The key to closure planning is not deferring the rehabilitation / closure costs but eliminating future closure activities through integrated closure and LOM planning. This includes a process of closure-focused risk assessment, strategic planning, and development of robust and applicable closure criteria to meet the closure vision. The objective of the risk assessment is outlined in the Financial Provisioning Regulations, 2015. The objective is to:

- Ensure timeous risk reduction through appropriate interventions.
- Identify and quantify the potential latent environmental risks related to post closure.
- Detail the approach to managing the risks.
- Quantify the potential liabilities associated with the management of the risks; and

- Outline monitoring, auditing, and reporting requirements.

14.1. RISK SCREENING METHODOLOGY

The approach to identifying potential risks is summarised as follows:

- High level discussions were held with regarding the opencast operation and the prevailing conditions at the proposed site.
- A preliminary site visit was conducted to become familiarized with the site location, soil conditions, topography, vegetation, and surface water bodies.
- A document review was done of available background information to inform the screening level risk assessment.
- The key potential risks were identified for relevant closure-related aspects. The focus is placed on the risk (change) and not the activity causing the risk; and
- The risks were arranged within a matrix format.

14.2. RISK RATING METHODOLOGY

The Environmental Impact Assessment (EIA) 2014 Regulations [as amended] promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the project be assessed in terms of their overall potential significance on the natural, social, and economic environments. The criteria identified in the EIA Regulations (2014) include the following:

- Nature of the impact.
- Extent of the impact.
- Duration of the impact
- Probability of the impact occurring.
- Degree to which impact can be reversed.
- Degree to which impact may cause irreplaceable loss of resources.
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented Appendix A.

14.3. COMPARATIVE RISK ASSESSMENT

The following steps were taken to compile a comparative risk assessment, between the pre-and post-mitigation scenarios:

- Devise measures, based on accepted industry best practice and experience, to mitigate consequences and impacts. The measures should be implemented concurrently during the LoM or at closure.

- Re-calculate the post-mitigation (residual risk), thus assuming reasonable effectiveness of the recommended measures.
- Highlight the risks that scored as highly negative or moderately negative in the pre-mitigation assessment, arrange in a table and indicate the proposed mitigation measures. This action highlights the priority measures associated with pre-emptively mitigating the risks.
- Discuss the potential post closure residual and latent risks based on the outcomes of specific specialist studies.
- Include and further develop the risks assessment findings in the Closure plan to ensure that:
    - The closure objectives have clearly defined actions to address the identified risks.
    - Feasible post-mining land uses are proposed, thus taking account of the identified risks.
    - Design principles for closure are adjusted to include uncertainties and to adequately scope potential further work to reduce the level of uncertainty; and
    - All potential risks are pro-actively managed / controlled.

Table 17: Risk Assessment

Potential Impact	Extent		Duration		Intensity		Reversibility		Irreplaceability (Extent + Duration + Intensity + Reversibility)	Probability		Significance without mitigation		Mitigation Efficiently		Significance with mitigation		Mitigation measures
Loss of topsoil through erosion at stockpiles, pit edges and rehabilitated areas	Footprint	1	Long term	4	Medium	3	Partly reversible	3	11	Highly likely	4	Medium	44	Medium	0,6	Low	26,4	Disturbed areas must be re-vegetated as soon as possible to reduce the risk of erosion; Ensure that all stockpiles have a storm water diversion berm for protection against erosion; Vegetate long-term soil stockpiles. Topsoil must be stripped and placed on the correct stockpiles. Topsoil must not be contaminated by other stockpiles.
Insufficient topsoil to cover all disturbed	Footprint	1	Long term	4	High	4	Nearly irreversible	4	13	Highly likely	4	Medium	52	Low	0,8	Medium	41,6	Optimise the limited topsoil resources available on site; Utilise the stored topsoil for the sole purpose of

areas during rehabilitation																	rehabilitation, no topsoil should be used for landscaping or construction purposes such as roads or embankments.
Ineffective soil amelioration resulting in poor vegetation establishment	Footprint	1	Long term	4	High	4	Partly reversible	3	12	Likely	3	Low	36	Medium	0,6	Low	21,6	Investigate soil quality through representative sampling and specialist analysis of laboratory results; Define remediation measures and correct soil fertility prior to establishing vegetation on rehabilitated soil; Conduct follow up soil sampling and analysis to inform further remediation should it be required; Conduct regular visual inspections and preventative care and maintenance.
The deterioration of groundwater quality down gradient of the mining operations due	Local	3	Permanent	5	Medium	3	Irreversible	5	16	Definite	5	High	80	Medium	0,6	Medium	48	Develop and maintain a surface and groundwater monitoring program in line with the WUL requirements; Drilling of monitoring boreholes into

to plume movement																	rehabilitated area after rehabilitation to monitor groundwater quality; Implement passive treatment system for the treatment of surface decant Rehabilitation of area to be in line with requirement to present ingress and oxidation.
Contamination of ground and surface water with SO4	Local	3	Permanent	5	Medium	3	Irreversible	5	16	Definite	5	High	80	Medium	0,6	Medium	48	Sulphate pollution will take place as a result of oxidation of sulphate material. Drilling of monitoring boreholes into rehabilitated area after rehabilitation to monitor groundwater quality; Implement passive treatment system for the treatment of surface decant. Rehabilitation of area to be in line with requirement to present ingress and oxidation.

Lack of rehabilitation-related post closure monitoring to support site relinquishment	Site	2	Medium term	3	Medium	3	Nearly completely reversible	2	10	Possible	2	Very low	20	Very high	0,2	Very low	4	Financial Provision to include funds for 10 years post-decommissioning monitoring; Annual audit of EMP, Rehabilitation & Closure Plan and monitoring network.
Insufficient profiling of the topography of the mining area during rehabilitation may lead to erosion	Site	2	Medium term	3	Medium	3	Nearly irreversible	4	12	Likely	3	Low	36	Low	0,8	Low	28,8	Profiling of topography should be deigned to reduce erosion; Erosion control measures to be implemented concurrent with rehabilitation. Visual monitoring of erosion to be undertaken throughout decommissioning phase until Closure Certificate is gained; Any erosion detected must be remediated and erosion control measures to be implemented where necessary.

Excessive dust/erosion from unvegetated areas	Local	3	Short term	1	Medium	3	Nearly completely reversible	2	9	Likely	3	Low	27	Medium to high	0,4	Very low	10,8	Develop and maintain dust suppression practices during the rehabilitation phase; Revegetate rehabilitated areas as soon as possible; Ensure sufficient financial provision for monitoring, care, and maintenance of rehabilitated areas.
Insufficient control of alien invasive species on rehabilitated land	Local	3	Medium term	3	Low	2	Nearly completely reversible	2	10	Highly likely	4	Medium	40	High	0,2	Very low	8	Compile AIP management plan to be implemented throughout LoM and decommissioning phase; Monitoring of AIP to be undertaken annually.
Lack of stakeholder buy-in on rehabilitated landscapes	Region	4	Long term	4	Medium	3	Nearly completely reversible	2	13	Possible	2	Low	26	Low to medium	0,8	Low	20,8	Update, audit and submit the closure plan and associated closure documentation to the regulators as prescribed by legislation; Undertake regular engagement to present the planning process and ensure alignment; Develop a post mining

																	land use plan considering the local spatial development framework (SDF) and Integrated Development Plan.
Deterioration of surface water quality due to runoff from and decant	Local	3	Permanent	5	Medium	3	Irreversible	5	16	Definite	5	High	80	Medium	0,6	Medium	48	Develop and maintain a surface and groundwater monitoring program in line with the WUL requirements; Contain any runoff on the rehabilitated area to prevent siltation and contamination of surface water; and Pollution control dams should be maintained to intercept polluted seepage water. Establish a passive treatment system of the treatment of decant from the rehabilitation area.
Changes in surface hydrology as a	Local	3	Medium term	3	Low	2	Nearly completely reversible	2	10	Highly likely	4	Medium	40	Medium	0,6	Low	24	Implement final landform design; Limit steep slopes; Establish free draining

result of rehabilitation																	landscape; Re-instate drainage lines and low laying areas.
Reduction in land capability after rehabilitation.	Footprint	1	Long term	4	High	4	Nearly irreversible	4	13	Highly likely	4	Medium	52	Medium to low	0,8	Medium	41.6	Optimise the limited topsoil resources available on site; Utilize the stored topsoil for the sole purpose of rehabilitation, no topsoil should be used for landscaping or construction purposes such as roads or embankments; Analysis of topsoil for fatality and apply require amelioration where required; Apply agricultural lime and fertiliser to soil profile
Uncertainty regarding the latent and residual risks due to site specific knowledge gaps	Local	3	Permanent	5	Medium	3	Irreversible	5	16	Definite	5	High	80	Medium	0,6	Medium	48	Geochemical site-specific data to be determined and the model updated. Utilised site-specific monitoring data to recalibrate the geochemical model; Determine the risk of latent and residual

																	impacts. If required, devise mitigation measures and implement controls, adjust the closure liability calculation to reflect any changes; Implement the mitigation measures (passive treatment) to limit the pollution plume
Subsidence of backfilled opencast pit	Footprint	1	Long term	4	Medium	3	Nearly completely reversible	2	10	Highly likely	4	Medium	40	Medium to high	0,4	Very low	16	Regular visual monitoring of rehabilitated areas; Any observed subsidence to be remediated. Backfill to be compacted during backfill to prevent cavities.

15. PROPOSED MITIGATION MEASURES

The risks with pre-mitigation significance ratings of Medium or High are indicated in Table 18 below. The risk classification provides an insight into the key aspects requiring management and intervention during the operations and into closure.

Table 18: Proposed mitigation applied in the risk assessment

Risk	Proposed Mitigations
Insufficient topsoil quality and quantity	• Optimise the limited topsoil resources available on site. • Strip all available soils within the pit boundary, pit fringe (5m buffer), road footprints prior to mining and store in the berm and stockpile; and • Utilize the stored topsoil for the sole purpose of rehabilitation, no topsoil should be used for landscaping or construction purposes such as roads or embankments. • Subsoil must be tested and ameliorated, to be used as topsoil.
Ineffective soil amelioration resulting in poor vegetation establishment	• Investigate soil quality through representative sampling and specialist analysis of laboratory results. • Define remediation measures and correct soil fertility prior to establishing vegetation on rehabilitated soil. • Conduct follow up soil sampling and analysis to inform further remediation should it be required; and • Conduct regular visual inspections and preventative care and maintenance. • Subsoil must be tested and ameliorated, to be used as topsoil.
Loss of topsoil through erosion at stockpiles, pit edges and rehabilitated areas	• Strip all available soils off the pit fringe; and • Disturbed areas must be re-vegetated as soon as possible to reduce the risk of erosion. • Ensure that all stockpiles have a storm water diversion berm for protection against erosion and contamination by dirty water. • Vegetate long-term soil stockpiles.
Compaction and sterilization of undisturbed topsoil underneath the topsoil berm	• Limit the height of the topsoil berm to below 3.0 meters. • Limit the heavy vehicle traffic over the topsoil berm. • Upon berm removal, cross rip the footprint with an agricultural ripper and scarify to alleviate compaction; and • Revegetate the footprint.
Compaction and decline in topsoil structure during, stripping, stockpiling,	• Limit the traffic over in situ or stockpiled soils as far as possible. • Develop a soil stripping and placement traffic management plan to ensure that no heavy wheel-based vehicles traverse over in situ or replaced topsoil.

and topsoil re-placement	• Care should be taken to tip enough soil per square unit to reinstate the total required post mining soil depth at once. • Spreading of soil over far distances and repeated traversing of heavy mechanical equipment should be avoided to prevent compaction.
Excessive dust/erosion from un-vegetated areas	• Develop and maintain dust suppression practices during the rehabilitation phase. • Revegetate rehabilitated areas as soon as possible; and • Ensure sufficient financial provision for monitoring, care, and maintenance of rehabilitated areas
Reduction in land capability after rehabilitation.	• Optimise the limited topsoil resources available on site. • Strip all available soils within the pit boundary, pit fringe (5m buffer), road footprints prior to mining and store in the berm and stockpile; and • Utilize the stored topsoil for the sole purpose of rehabilitation, no topsoil should be used for landscaping or construction purposes such as roads or embankments. • Analysis of topsoil for fatality and apply require amelioration where required. • Apply agricultural lime and fertiliser to soil profile
Changes in surface hydrology as a result of rehabilitation	• Implement final landform design. • Limit steep slopes. • Establish free draining landscape. • Re-instate drainage lines and low laying areas.
Lack of stakeholder buy-in on rehabilitated landscapes	• Update, audit and submit the closure plan and associated closure documentation to the regulators as prescribed by legislation. • Undertake regular engagement to present the planning process and ensure alignment. • Develop a post mining land use plan considering the local spatial development framework (SDF) and Integrated Development Plan.
Deterioration of surface and ground water quality	• Develop and maintain a surface and groundwater monitoring program in line with the WUL requirements and specialist studies. • Drilling of monitoring boreholes into rehabilitated area after rehabilitation as determined by WUL and Specialist. • Maintain stormwater measures during operational phase. • Contain any runoff on the rehabilitated area to prevent siltation and contamination of surface water; and • Update existing predictive tools to verify long-term impacts on groundwater. • Determine decant points, volume, and quality. Establish mitigation and management measures as determined by specialist

	• Establish passive and active treatment system for the treatment of AMD water. • Implement wetland offset and monitor the goals to ensure ecological classes are maintained.

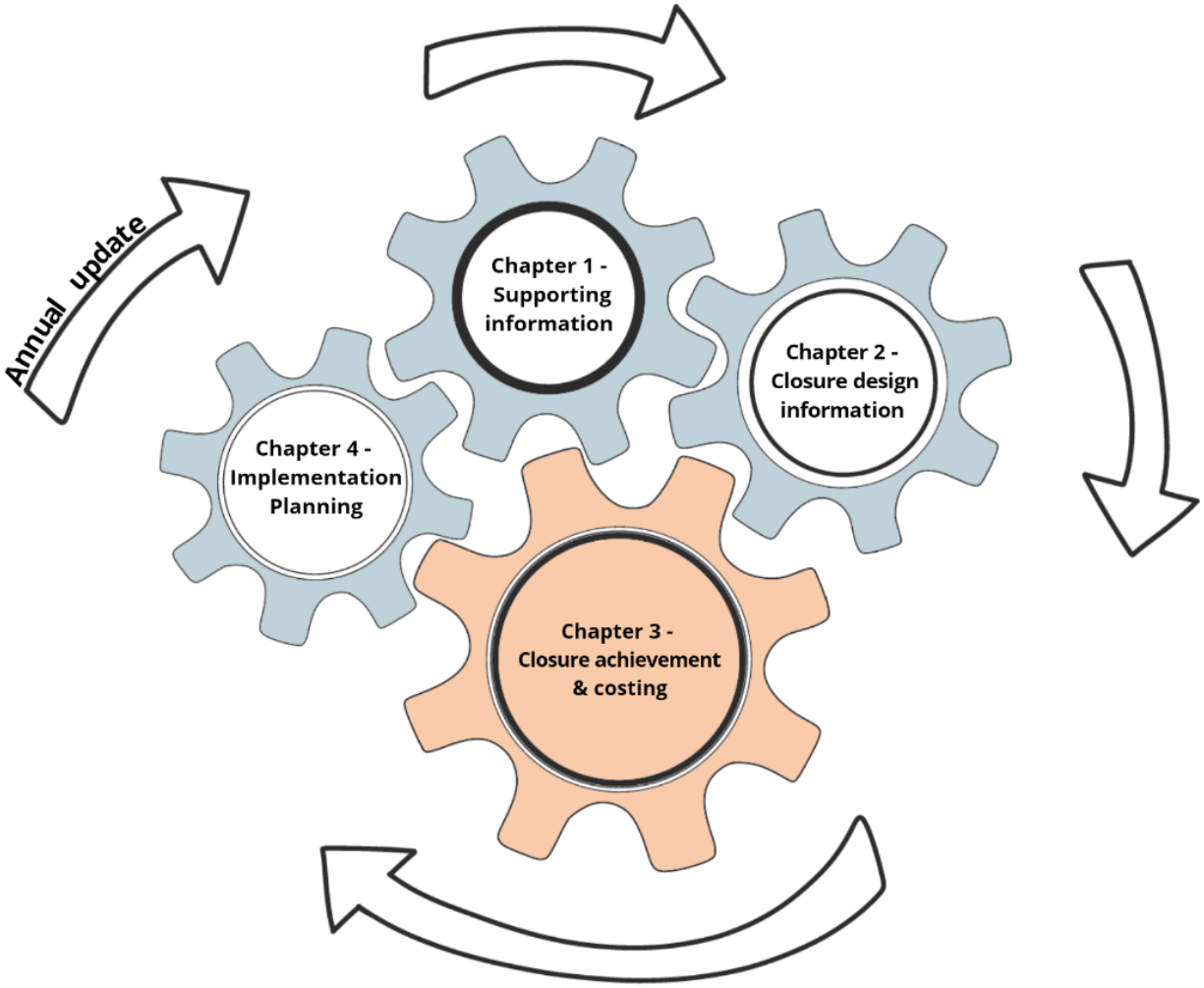
15.1. THREAT OPPORTUNITIES AND UNCERTAINTIES

The specialist studies for this site and the knowledge gaps that exist should be taking into consideration. It is envisaged that through the operational phase of this project many further specialist studies may be required, update of studies and improvements in technology will take place and as such, it is recommended this plan be revisited and updated with these findings as an annual requirement of GNR 1147. As presented in the risk assessment, the uncertainty, indicated as having a low significance, associated with the latent and residual risks after mitigation measures have been implemented. The following have been identified, with respect to threats, opportunities, and uncertainties with respect to the compilation of this plan to define any additional work that is needed in order to reduce the level of uncertainty.

- Ongoing surface water and groundwater quality monitoring during the operational LoM in order to determine trends overtime and to monitor changes in water quality overtime to determine if the mine is impacting on water quality resources.
- The sampling results should be utilised to update the Numerical Model and Geochemical Model, in order to refine the model and more accurately predict post closure impacts based on actual data obtained during the operational phase.
- Backfill material (i.e., Soft and hard Overburden) to be re-analysis to confirm the Acid formation potential and the Neutralisation potential. The placement of lime into the lowers point in the rehabilitated area to investigates as part of the Numerical Model and Geochemical Model update.
- Ongoing engagement with communities surrounding the area, with respect to the closure vision of the mine and tacking these issues into account when closure is being considered.
- Development and implement a wetland offset and active treatment system. Monitoring to be implemented to establish the ecological classes and measures require to maintain the class.
- Adopting closure recommendations as identified in the respective specialist reports, with particular emphasis on social, water and biodiversity related aspects; and
- A topsoil balance is required to establish the shortfall of topsoil and the risk of not placing topsoil on rehabilitated areas.

Further update and review of the rehabilitation, decommissioning and closure plan based on new information may highlight further gaps in the plan, however, this plan includes information available at present.

CHAPTER 3: CLOSURE ACTIONS AND COSTING



Chapter 3 is the combination of the findings of Chapter 1 and 2 and forms the core of the plan:

- The general closure actions (measures) aimed at achieving the seven key objectives.
- Refined into the specific closure actions for infrastructure, mining areas, general surface rehabilitation and post-closure aftercare and monitoring; and
- The closure cost determination based on the specific closure actions.

16. CLOSURE ENVIRONMENTAL MANAGEMENT PLAN

The main aim in developing the Final Rehabilitation, Decommissioning and Mine Closure Plan is to minimise and mitigate the impacts caused by mining and industrial activities and to restore land back to a satisfactory standard. It is best practice to develop the Plan as early as possible so as to ensure the optimal management of rehabilitation and closure issues that may arise. It is critical that a mine's Final Rehabilitation, Decommissioning and Mine Closure Plan is defined and understood

from before mining progresses and is complimentary to the objectives and goals set. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the Environmental Management Plan (EMP).

The Final Rehabilitation, Decommissioning and Mine Closure Plan aims to inform on the actions required to rehabilitate the project to ensure that the area is socially and environmentally safely and sustainably closed. Importantly, the Rehabilitation Plan consists of direct activities associated with rehabilitation of various infrastructure components. This EMP should inform how the mine infrastructure is either handed over legally or removed from site. During the operational phase it is recommended that an assessment be undertaken of the infrastructure to determine if some of the infrastructure can be utilised post closure.

The rehabilitation and closure actions for the particular infrastructure are detailed below and separated into phases. Although concurrent rehabilitation occurs during the operational phase, it has been included in this section as it directly impacts on final rehabilitation and closure.

16.1. CLOSURE ACTIONS

The conceptual mitigations proposed in the initial risk assessment is refined into a specific rehabilitation approach and sequence of actions. Table 19 provide the General Closure Actions for the mine.

Table 19: General Closure Actions

Aspect	Closure Action
Physical Stability	• Manage available soil carefully during the life of mine to limit the damage to an already scarce and denuded resource. • Design construct a post mining landform to specified elevations, ensuring a free draining topography. • Steep gradients must be protected from erosion. • Replace topsoil to specified depths on prepared areas and rip with an agricultural ripper to alleviate compaction and revegetate; and • Ensure that all rehabilitated areas on the mine site are free draining.
Environmental Quality	• Clean up sources of possible surface water contamination still present on the mine site to protect the downstream receiving environment. • Ensure that the rehabilitated project site is free draining. • Demonstrate by means of suitable sampling and analysis that the rehabilitated area is not causing contamination. • Monitor surface and groundwater against water quality limit and baseline to determine if any pollution plume is developing or surface decant is taking place.

	• Install passive treatment system to ameliorate water decanting from the rehabilitated area. • Monitor wetland offset area to ensure ecological class is maintained.
Health and Safety	• Limit dust generation on the rehabilitated mine site that could cause nuisance and / or health effects to surround communities. • Revegetate all bare areas as soon as possible; and • Demonstrate by means of suitable sampling and analysis that the threshold levels of wind-borne dust and associated contaminants are acceptable.
Land Capability Land Use	• Ensure that the rehabilitated portions of the project sites are safe and physically and chemically stable in the long-term. • Limit the loss of topsoil by stripping all areas to be disturbed and the pit fringes. • Replace soils to specified depths. • Define physical and chemical amelioration based on soil fertility analysis and interpretation by a suitable qualified professional. • The area will be restored to grazing. • Conduct rehabilitation monitoring of soils and vegetation for three years; and • Conduct a post closure land use and capability assessment after year 3 to demonstrate the achieved end land use.
Landscape viability	• Establish stormwater berms on post mining landform to preserve vital resources such as growth medium and nutrients, as far as possible, and stabilising disturbed areas to prevent erosion in the short- to medium-term until a suitable vegetation cover has established. • Replace soils to specified depths; and • Establish vegetation based on dedicated fertility sampling, analysis, and specifications.
Biodiversity	• Monitor, control, eradicate and manage declared Category 1, 2 and 3 invader plant species. • Establish a biodiversity management plan for rehabilitation. • Establish wetland offset; and • Establish viable self-sustaining vegetation communities that will encourage the reintroduction of local natural fauna as far as possible.
Socio-economic	• Mange the implementation and the expectations of various stakeholders throughout the process. • Update SLP to include structure that can be handed over to the community during final closure.

16.2. SPECIFIC CLOSURE ACTIONS

Specific rehabilitation and closure actions forming the basis of the rehabilitation and closure operations. The actions are aligned with the mitigations defined in the comparative risk assessment. These actions are planned to comply with the requirements of the vision and objectives. The closure actions form the basis for the closure liability assessment. The actions are indicated according to the following categories:

- Mining area – Open pit.
- Topsoil Berm.
- Overburden Stockpiles, Haul Road.
- Office Complex (Security, offices, PCD, Plant); and
- General surface rehabilitation and water management.

Mining Area - Open pit & Final void

The concurrent rehabilitation during the operations, will limit the mass earthworks during final rehabilitation. Final rehabilitation and closure measures, once mining has ceased, include the following:

The overburden will initially be hauled to an above-ground overburden dump, the overburden material will be utilised to be backfilled into the final void. The concurrent backfilling during the operations, will limit the mass earthworks to backfill the final void. The backfilled box cuts, and voids shall follow the natural surrounding topographical features and ensure minimised slopes to maximise potential land capability and reduce erosion risks as far as possible. None of the areas must be overfilled as this may result in a shortfall of material required to require the final landform. Stormwater berms should be installed on slopes. This will be to limit the length of a single slope and to create areas where vegetation can be established.

Rehabilitation should follow the following requirements:

- Each horizon (i.e., Horizon A – Topsoil, Horizon B – subsoil and Hard overburden Rock) should be backfilled following the sequence it was removed.
- Shape and contour slopes to be free draining and non-erosive.
- Rocks or clay to be utilised to protect steep sections of the slope.
- Load, haul topsoil or shovel from the topsoil berm, tip at the correct spacing and level to the specified depths (assumed 300mm).
- Conduct fertility sampling, have the soils analysed at an accredited laboratory and define amelioration measures based on the results.
- Cross rip replaced soils with an agricultural ripper to alleviate compaction and scarify the area; and
- Establish vegetation (includes specified amelioration and seed mix application).

Topsoil berm

- Load, haul topsoil or shovel topsoil berm onto slopes and backfilled areas.
- Ensure that the footprint is cleared of any fugitive material that could damage agricultural equipment.
- Cross rip in-situ soils with an agricultural ripper to alleviate compaction and scarify the area.
- Conduct fertility sampling, have the soils analysed at an accredited laboratory and define amelioration measures based on the results; and
- Establish vegetation (includes specified amelioration and seed mix application).

Haul roads

Haul roads will remain intact and be utilised during the final void backfilling operation. Sections of the road will remain for monitoring op the area and as farm roads. Rehabilitation will commence after topsoil has been replaced on the opencast post mining landform. The following actions will be implemented.

- Remove all signage.
- Re-establish natural drainage.
- Rip haul roads with construction equipment to a depth of at least 0.5 m, and over-rip with agricultural equipment to create suitable conditions for vegetation establishment.
- Profile to be free draining and emulate the natural surface topography.
- Conduct fertility sampling, have the soils analysed at an accredited laboratory and define amelioration measures based on the results; and
- Establish vegetation (includes land preparation, specified amelioration and seed mix application).

Infrastructure

All infrastructures will be removed from the mining area. Container, mobile office will be removed, and the footprint rehabilitated and re-vegetated. Contractors will be responsible for the removal of any infrastructure establish by the contractor.

Closure actions as detailed in the “Guidelines for the Rehabilitation of Mined Land” include:

- All power and water services to be disconnected and certified as safe prior to commencement of any demolition works.
- Salvageable equipment will be removed and transported offsite prior to the commencement of demolition.
- All fittings, fixtures and equipment within buildings will be dismantled and removed to designated temporary disposal yards.
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/ chemical residue remains.

- All above ground electrical, water and other service infrastructure and equipment to be removed and placed in designated temporary salvage yards, to be sold as scrap.
- Electrical, water and other services that are more than one metre below ground surface will remain.
- All pipes and structures deeper than one metre need to be sealed to prevent possible ingress and ponding of water.
- Non-hazardous concrete slabs and footings will be broken. This concrete (and metal) will be broken up and disposed of in the base of the pits.
- Soils beneath the plant, storage tanks and chemical storage areas will be sampled. Any contaminated soils found will be removed for disposal.
- Sacrificial layer underplant will be removed and coal will be removed, discard will be placed back into the final void.
- Plant and equipment will be removed from site and concert will be removed and used as backfill (be placed more than 1m under surface level); and
- All excavations resulting from demolition of plant, buildings, roads, etc. and earth structures will be left in a safe manner.

Pollution Control Dam

Pollution control dam will be retained during the majority of the closure period to provide water for closure activities as well as to capture any flows of contaminated water which may be generated on the site. The expectation is that as rehabilitation continues the contaminated water catchment area will reduce until there is no further need for containment. During this period the contained contaminated water will be evaporated or used for dust suppression. The dam will be dozed flat, and the area shaped to form a stable landform congruent with the surrounding landscape during final closure.

- Demolish all concrete structures.
- Remove any silt that accumulated in the dam, sample the silt according to Hazardous waste classification and dispose of accordingly.
- Remove liners and dispose of; accordingly, and
- Profile footprint to be free draining with no low points to accumulated water.

General Surface Rehabilitation

The general surface rehabilitation measures for the proposed opencast pit are limited to the following:

- Seeding of areas with natural grasses.
- Development of free draining profile as per landform design.
- Maintaining of area to prevent erosion.
- Soils, which should have been stripped according to form, should be replaced according to a pre-existing plan.
- A soil reserve should be retained to repair localised surface subsidence areas.

- Compaction should be minimised by use of appropriate equipment and replacing soils to the greatest possible thickness in single lifts.
- Soils should be moved when dry to minimise compaction. If they have to be moved when wet, shovel and truck should be used as bowl scrapers create massive compaction when moving wet soils.
- Where multi-layer soil profiles are re-created, running over the lower layers with heavy equipment should be minimised.
- Minimise compaction during smoothing of replaced soils by using dozers rather than graders.
- Following placement, all soils should be ripped to full rooting depth; and
- Where natural revegetation is not possible, the soils should be tilled to produce a seed-bed suitable for the plant species selected for seeding.
- Lime and superphosphate are applied to the surface.
- These ameliorants are then incorporated by deep ripping, which penetrated 100 mm through the soil into the underlying overburden material.
- Compound (NPK + Zn) fertilizer is applied and disced in as part of seedbed preparation.
- A grass seed mix is then planted, usually with first rains, or after rains have commenced; and
- The site is then mulched using locally obtained grass; this is to stimulate the long-term establishment of indigenous vegetation and to reduce erosion during early plant growth.
- No cost is allocated for any shortfall in topsoil. A topsoil balance to be established and any shortfall shall be costed for, and provision made before final closure.

Operational storm water measures

The measures are assumed to be limited to shallow trenching and berm construction. All berms, trenches and paddocks will be flattened by backfilling the excavations or dozing the structures to a functioning topography, except where they have been positioned prevent additional water flowing onto rehabilitated pit areas. The following will be undertaken:

- Shape the area and slopes to be free draining
- Cross rip in-situ soils with an agricultural ripper to alleviate compaction.
- Conduct fertility sampling have the soils analysed at an accredited laboratory and define amelioration measures based on the results; and
- Establish vegetation (includes land preparation, specified amelioration and seed mix application).

Long term water issues

Provision has been made for a passive water treatment system. Monitoring of groundwater and surface water resources will take place during the closure and aftercare phases of the project. As passive treatment system will be design and implemented when decant is detected.

During the closure phase the following will be undertaken:

- Installation of monitoring boreholes in the rehabilitated opencast area.

The groundwater monitoring point located within the rehabilitated are will be utilised to track the pollution plume and the possible formation of ADM. These mitigation and management measures will be investigated in future updates and the associated cost, management measures will be included.

Aftercare and Maintenance

During after care and maintenance a number of actions, monitoring and audits will be required to establish if the Relinquishment Criteria for each of the aspect have been reached. The Proposed Relinquishment criteria is presented in Table 20 with the monitoring requirements.

Any corrective measures required as a result of the monitoring or audits must be implemented during this period. It is anticipated that a stable final landform will be created within a period of 5 years. The annual audit will be utilised to established if the relinquishment criteria have been reached or if additional measures are required.

17. PERFORMANCE MONITORING

The following preliminary measures are proposed and are to be further refined with future updates of the closure plan. It is envisaged that a three-year demonstration period will be required for surface water to confirm success of closure. A period of three years is proposed for the demonstration of successful rehabilitation. Following the completion of earthworks and vegetation establishment a visual inspection will be undertaken to inform corrective action required, if needed. Thereafter ongoing monitoring and corrective action. The period can be extended if required if the final landform and relinquishing criteria has not been achieved.

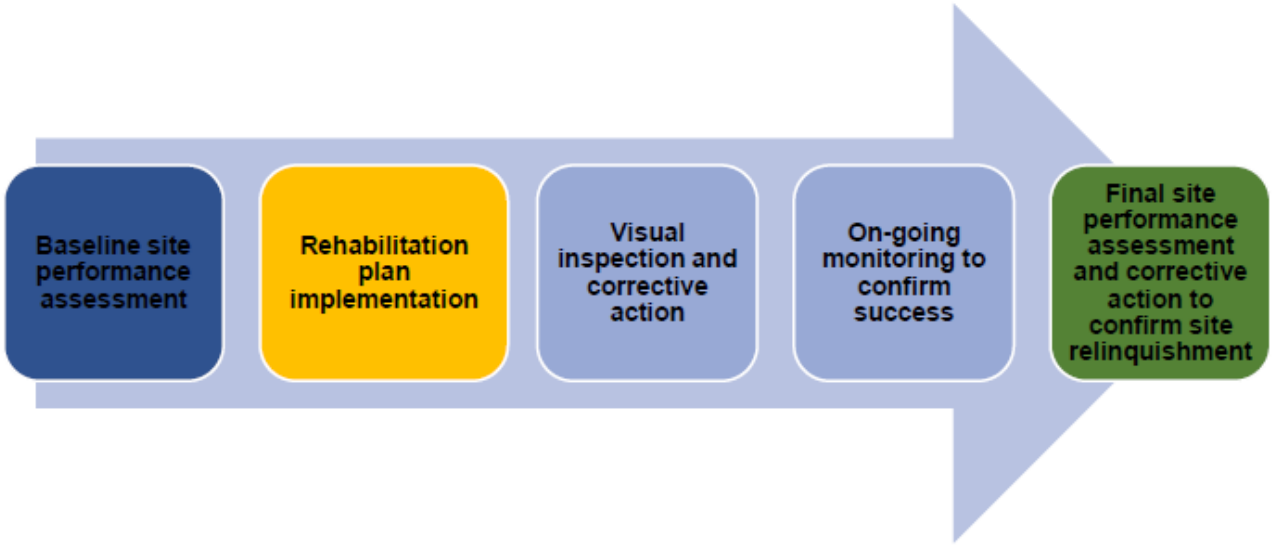


Figure 12: Final Rehabilitation plan roll out and performance monitoring

17.1. Monitoring and Closure Targets - Relinquishment Criteria

The measurable criteria indicated in Table 25 should be used to assess the effectiveness of the specific closure actions implemented during rehabilitation. They will also assist in determining when the standard of closure achieved is sufficient to relinquish responsibility for a specific area. The site-specific aspect, monitoring requirement, indicators and closure targets are included in the table.

The relinquishment criteria indicated in Table 25 is proposed for the mining area and is applicable to the rehabilitated areas. The criteria, indicators and reporting requirements are listed against the environmental aspect.

Table 20: Proposed Relinquishment criteria

Environmental Aspect	Closure Criteria – Relinquishment Criteria	Monitoring Requirements	Reporting Requirements
Biodiversity	Establishment of vegetation that has a basal cover of 15% and that is self-sustaining and can be measured over a 5-year period, indicating that natural succession has occurred. Establishment of grazing areas where possible and wilderness areas on the remained of the areas. Implement wetland offset – maintain required ecological class.	Vegetation monitoring and rehabilitation monitoring. Wetland and Biomonitoring to determine ecological class.	Monitoring Reports – Bi-annually Vegetation audits – Annually Wetland and Biomonitoring – Bi-Annually
Groundwater	Groundwater qualities need to comply with the qualities as stipulated in the Water Use Licence Application (WULA) and the appropriate Department of Water Affairs and Sanitation (DWS) and South African National Standards (SANS).	WUL requirements GNR 704 requirements. Geohydrological Assessment	Monitoring – Quarterly Reporting – Annually
Surface Water and Biomonitoring	Surface water quality and Biomonitoring need to comply with the qualities as stipulated in the WULA and the appropriate DWS and SANS Standards. Wetland offset	WUL requirements GNR 704 requirements. Offset requirements	Monitoring – Quarterly Reporting – Annually Wetland and Biomonitoring – Bi-Annually
Treatment System	Decant Treatment to be undertaken in line with the requirements as set out in the Water Use License.	WUL requirements GNR 704 requirements.	Monitoring – Quarterly Reporting – Annually
Air Quality	Dust and PM10 must comply with the minimum standards and limits as set by the NEM:AQA and applicable regulations and guidelines.	GNR 827 – National Control Regulations, SANS Standards. Monthly monitoring.	Monitoring Reports – Quarterly

		Compliance with the National Environmental Management Act: Air Quality (Act 39 of 2004).	
Soil, Land Capability and Land Use	Post land use mining assessment to determine status of rehabilitated areas with respect to soil quality and those rehabilitated areas have been rehabilitated to an agreed upon land use. In addition to the above, inspections should be undertaken to identify areas of erosion and that erosion measures have been constructed. Top soiling' depth must match that of the pre-disturbance condition, as determined by the pre-mining land capability; whereby pre-disturbance capability classes must ideally in the post-disturbance/mining condition be 'top soiled' with the following depths of suitable soil material: Arable (>= 0.6m), Grazing (>= 0.3m), and Non-Grazing ('Wilderness') and Wetland (>= 0.15m). In areas where the implementation of the Grazing depth standard is not possible, then these areas must be rehabilitated as per the Wilderness depth standard (>=0.3cm).	Regular post-closure monitoring using Standard measures of vegetative cover or Landscape Function Analysis; and visual observations. Photographic record. Post-rehabilitation slope analysis mapping must be conducted immediately after re-grading (re-sloping) [before 'top soiling'] utilising an aerial photograph and generated contours. Over steep slopes must be corrected before 'top soiling'. Photographic record. Closure and intermittent post-closure Agricultural soil fertility data (laboratory analysis) by independent consultants.	Results of soil quality report and erosion monitoring report – Annual report photographic evidence and mapping included in annual report
Social - Stakeholder Engagement	Grievance mechanism to be established. The SLP should be updated, and the structures should be handed over to the community. The handover should be sustainable, and skills transfer should have taken place.	Report (and investigate) any grievance or complaints received. SLP reporting.	Annual report

18. ORGANISATION CAPACITY

The organisational capacity of the project is detailed in the table below. As detailed, there is adequate capacity to perform the rehabilitation function during the operational phase. During final rehabilitation and closure phase of the mine, suitably skilled technical persons would need to be employed to ensure that rehabilitation works are completed correctly and successfully. These positions would include an Environmental Manager, a Rehabilitation Officer, and a Rehabilitation Superintendent, who will ensure that all work involving spoils replacement, topographical reshaping, top soiling, revegetation is done according to specification.

Table 21: Organisational Structure

CATEGORY	POSITION	REGULATION
Senior Management	Mine manager	3.1 (a)
Professionally qualified and experienced specialists and mid-management	General Manager	4.1
	Pit Superintendent	2.14.1
	Engineering Manager	2.13.1
	Open pit Engineer	2.13.3.1
	SHE Manager	2.17.4
	Occupational Hygienist	12(1)
	Chief Safety Officer	2.17.4
	Occupational Medical Practitioner	13.3(a)i
	Senior Surveyor	17.2 (a)
Skilled technical and academically qualified workers, junior management, supervisors, foreman and superintendents	Medical Nurse	13.3(a)ii
	Pit Shift Overseer	2.15.1
	Safety Officer	2.17.1
	Mine surveyor	2.12.7

19. CLOSURE COST

This section provides details on the closure cost. The outlined assumptions and limitations also underpin the basis of this closure cost determination. It is important to note that the estimation is based on existing information. The closure cost calculation has been performed in accordance with NEMA GNR 1147 financial provision, in the transitional period.

Due to the current uncertainty surrounding the change in the financial provision regulations, this report has utilised the current existing regulations but has only calculated the final rehabilitation cost and no concurrent rehabilitation cost is included based on the mine schedule.

Concurrent annual environmental costs will be included into the operating budget of the mine. The closure costs of the aspects linked with the project have been determined using current contractor cost.

This Closure Cost Assessment was compiled in order to comply with the requirements of Regulation 54(2) of the MPRDA. This financial provision is submitted in terms of regulation 53 and 54 of the MPRDA, within the extended transitional period as presented in Government Notice No. R. 495 of 11 June 2021: "*unless regulation 17A, a holder of a right or permit, who applied for such right or permit prior to 20 November 2015, regardless when the right or permit was obtained –*

(a) must by no later than 19 June 2022 comply with these Regulations; and

(b) shall, until 19 June 2022, be regarded as having complied with the provisions of these Regulations, if such holder has complied with the provisions and arrangements regarding financial provisioning, approved as part of the right or permit issued in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)."

19.1. METHODOLOGY

The costing methodology applied is summarized as follows:

- Developed an itemised plan indicating an inventory of closure aspects based on the proposed mine schedule and discussions with mine personnel.
- Defined specific rehabilitation actions for each through reviewing specialist studies, impact assessment outcomes, industry guidelines, conceptual modelling, and rehabilitation experience.
- Calculated monitoring and maintenance costs.
- Compiled a dedicated closure spreadsheet to determine the closure costs of the quantified actions through applicable rates. All quantities have been provided by the mine.
- Determine and update applicable unit rates by applying a Consumer Price Index (CPI) linked increase
- Determine Contingencies; Preliminary and General (P&G)
- DMR Guideline Process Approach

The methodology described below details how the final closure liability was estimated for the 2 SEAM.

19.2. ASSUMPTION AND QUALIFICATIONS

The following qualifications and assumption were made for the assessment:

- Input in this report is based on information obtained from the mine, reference documents, site visits and interviews.
- It is assumed that all the size and quantities provided by the mine is correct and complete and that all the required items are included in the data provided.

- This report is based on prescribed legal methodologies and applications, the report contains interpretations and assumptions documented and contextualized to the best ability of the writer. Particularly, with relation to futuristic and predictive matters associated with scheduled closure.
- Notice is taken of changing circumstances and associated report qualifications, which at the time of the report might be different to the time of the assessment. This report therefore represents a snapshot view of the operation at the time and date of the assessment.
- No warranty is included with this report, either express or implied, that the actual described conditions will conform exactly to the assessment and results contained in this report.
- No scheduled cost is included in the quantum calculations for financial provision.
- This report addresses rehabilitation costs required at closure and the post closure monitoring and maintenance in terms of the Legislative requirements.
- This closure plan and liability assessment do include a long-term decant from workings and its treatment costs.
- Calculations for infrastructure such as plant infrastructure, concreted areas and steel structures were based on estimates from survey information provided.
- The cost of the plant removal is not included in the cost, the plant will be removed by another mine as part of the operational cost of the mine.
- Only general surface rehabilitation provision is made for the plant area.
- A contingency of 10% has been included to allow for unforeseen costs associated with contractors or rate increases.
- Preliminary and general for unforeseen costs associated with the project is calculated at 12%.
- It was assumed that 5 years is adequate for the monitoring and maintaining of vegetation after rehabilitation. After the 5-year period the need for additional morning and maintenance will be established.
- For post-closure monitoring, costs of groundwater and surface water has been assumed to take place for a period of 5 years with sampling taking place on a biannual basis.
- A closure application and estimated specialist cost is included in the costing
- In this assessment the current aspects and activities will be considered to determine the environmental liability, excluding planned aspects for the next financial year which were not considered.
- Cost estimates will have an accuracy of ± 70 per cent for operations, or components of operations, 10 or more – GNR 1147.

In terms of the closure items the following assumptions have been made.

- Rehabilitation of roads in the plant and workshop area will be rehabilitated as general surface rehabilitation.
- A number of buildings will remain after closure. These buildings formed part of the farm before mining and will be utilised after mining by the farmer.

- It is assumed that mining has reach a steady state and that the overburden stockpile will remain stagnant in size. Roll over mining will take place form here onwards.
- Input in this report is based on information obtained from the mine, reference documents, site visits and interviews.
- No scheduled cost is included in the quantum calculations for financial provision.
- Site establishment costs, where applicable as per DMRE guideline, are included in the standard P&G's calculation.
- The unit rate update is based on an average CPI over the 2022 period and was calculated at 6.15%.
- Specialist studies, professional fees and project management has not been included in the closure cost as these will form part of the operational cost for closure.
- The mine will adhere to the requirements of Regulation 17B of GNR 24 and will submit the required document within the extended transitional period.
- None of the historical underground working have been taken into consideration. No cost provision has been made for the historical underground rehabilitation, water management or decant.
- The closure cost for the rehabilitation, maintenance & aftercare associated with the historical tailing storage facility is not included in this closure report.
- A geohydrological assessment is included in the closure cost. All other studies will be undertaken during the operational phase.

Based on the Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DMR, 2005), the following qualifications and assumption were made for the assessment:

a. PROCESSING PLANT AND STRUCTURES

- All infrastructure and concrete buildings will be broken down to natural ground level and buried into the plant site
- Foundations, structures and conveyors will be broken down to natural ground level
- The areas are to be covered with 1,0m subsoil, 300mm of topsoil and vegetation must be established, or as noted in the relevant EMP
- The mining infrastructure has no salvage value; no credit was allocated for scrap steel and equipment that can be re-used or sold
- The process of removal and disposal is included in the applied unit rate

b. TOPSOIL AND VEGETATION COVER

- No cost is allocated for any shortfall in topsoil. A topsoil balance will need to be established and any shortfall shall be costed for, and provision made
- Top soiling and vegetation for the areas are included under general surface rehabilitation
- All open areas where no vegetative cover is present will require general surface rehabilitation, and the unit rate applied accordingly

- Soil compaction on surface areas requiring general surface rehabilitation is uniform across all mining areas, and
- Overburden and spoils normally have a low pollution potential and hence only need to be shaped to create a stable landform. The Master Rate thus includes shaping and grassing/vegetation of the overburden and spoils.

c. ENGINEERING DESIGN

- Concrete thickness for all structures is on average 0.5m
- A typical berm size of 2m height, 1.5m top width and 1:1.5 side slopes will be used on areas where final voids are subjected to limited earthworks as closure objectives, and
- The final design of water trenches and cut off drains will be confirmed during closure.

d. FENCING

- Fencing and gates shall be used only where periodic inspection and maintenance is ensured through a maintenance agreement with a responsible government entity, landowner or organisation
- Fences or gates shall be constructed to keep unauthorised persons out and shall be located where subsidence or caving will not break their integrity
- Fences and or gates will remain after closure to prevent unauthorised access, and
- Fence line breakdown cost is the same per running meter and do not differ between fence specifications. Fence line support poles for diamond mesh, electrified, and palisade fences are equal distances apart and have equal amount of concrete for subsurface support at supporting poles.

e. WATER MANAGEMENT

- All stormwater management diversion measures, as prescribed under the GN704 and regulated in accordance with the NWA (Act No. 36 of 1998), to remain in place during the decommissioning stage
- The surface and groundwater monitoring programme, as required under the NWA and described within the WUL, to remain in place for the time specified in the License, and
- Water management and aftercare will largely (ultimately) be that of passive treatment i.e., containment and evaporation.

f. MAINTENANCE AND AFTERCARE

- Annual fertilising of rehabilitated areas
- Monitoring of surface and subsurface water quality as required by the WUL and EMPr
- Alien vegetation management shall take place in accordance with legal requirements and management plan
- General surface maintenance to take place, and
- Maintenance and control of erosion on rehabilitated workings shall continue for a minimum period of 2-3 years following decommissioning.

g. GENERAL SURFACE REHABILITATION

- The unit cost for general rehabilitation allows for shaping and landscaping of disturbed areas. The Master Rate allows for the shaping of material to a depth/thickness of about 500 mm. An extra over-allowance in the unit cost of 50 percent has been made to cover the removal and/or destruction of surface infrastructure remnants and/or other undesirable objects such as trees, foundations, concrete slabs, etc.
- Any structures, undesirable objects such as trees, foundations and concrete slabs not included under component 1, 2A and 2B will be removed and rehabilitated under component 10, as provision is made for this in the master rate.

19.3. ACCURACY LEVEL

Notwithstanding the above, the reflected costs provide a good indication of the costs for the current operation. Providing a sound basis for making the financial provision for the planned LoM, to an accuracy level of 70%.

19.4. ESCALATION APPLIED

The DME 2005-unit rates have been updated annually with the average Consumer Price Index (CPI). For the annual period from September 2022 to August 2022 the average CPI was calculated at 6.15 %. The headline year on year CPI rate is presented in the Table below.

Table 22: CPI headline year on year rate

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2020	4.5	4.6	4.1	3.0	2.1	2.2	3.2	3.1	3.0	3.3	3.2	3.1	3.3
2021	2.3	2.9	3.2	4.4	5.2	4.9	4.6	4.9	5.0	5.0	5.5	5.9	4.5
2022	5.7	5.7	5.9	5.9	6.5	7.4	7.8	7.6					

19.5. CONTINGENCY, PRELIMINARY AND GENERAL

An allocation of 12% was made for preliminary and general costs, and a 10% provision for contingencies. Both of these provisions were made in accordance with the DMRE guideline.

19.6. DMR GUIDELINE

The section below is an indication of the process followed in order to determine the quantum for financial provision for closure. The process followed is presented in Table 23 below. The weighting factors for Nature of Terrain is determined in Section 19.6.1 (Table 24), and the Proximity to Urban Area is determined in Section 19.6.2 (Table 25).

Table 23: Process followed to determine the Quantum for Financial Provision

Step No.	Description	2 SEAM Output or Section Reference
1	Determine mineral mined and saleable by-products	Type of Mineral by-product - **Coal** Primary Risk Class - **Class A**
2a	Determine primary risk class: ▪ Class A (High risk), ▪ Class B (Medium risk), or ▪ Class C (Low risk)	**Class A – High Risk**
2b	Revise primary risk class (if applicable) based on saleable by-products	**Class A – High Risk**
3	Determine environmental sensitivity of the mine • Low sensitivity • Medium sensitivity • High sensitivity	**High Sensitivity**
4	For Class A or B mining class operations	
4.1	Determine level of information available: • Extensive, or • Limited For extensive information, either • Option 1: Accept the quantum determined • Option 2: Commission an independent review by a competent person, or • Option 3: Follow a "rules based" approach and proceed to step No. 4.2 For limited information, follow a "rules-based" approach and proceed to step No. 4.2	**Extensive** - **Rules based**
4.2	Identify closure components	**Table 26 – Table 29**
4.3	Identify unit rates for closure components	**Table 29**
4.4	Identify and apply weighting factors	Nature of terrain - **Flat (1.00)** Proximity to Urban Area - **Urban (1.00)**
4.5	Identify areas of disturbance	**Table 26 – Table 29**
4.6	Identify closure costs from specialist studies	**Table 26 – Table 29**
4.7	Calculate closure costs	**Table 26 – Table 29**

19.6.1. WEIGHTING FACTORS – NATURAL OF TERRAIN

Table 24 below depicts the weighting factor applied, based on the nature of the terrain where the mine is located. The weighting factor is applied to each of the closure components as presented below.

Table 24: Weighting Factor 1 – Nature of terrain

Weighting Factor 1	Flat	Undulating	Rugged
Nature of the terrain/ accessibility	1.00	1.10	1.20

19.6.2. Weighting Factor – Proximity to urban area

Table 25 below depicts the weighting factor applied, based on the proximity of the mine to an urban centre. The weighting factor is applied to Preliminary and General Items as presented in below.

Table 25: Weighting Factor 2 – Proximity to urban area

Weighting Factor 1	Urban	Peri-urban	Remote
Proximity to urban area where goods and services are to be supplied	1.00	1.05	1.10

20. CLOSURE COST ASSESSMENT

The un-scheduled closure liability assessment is presented in Table 26. The scheduled cost for OC4A is presented in Table 27 and the scheduled cost for OC6 is presented in Table 28. An itemised breakdown is presented in Table 29.

Table 26: Un-schedule Closure Liability – 2 SEAM

CALCULATION OF THE QUANTUM							
Mine:	2 SEAM	**Location:**	MP				
Evaluators:	Elemental Sustainability	**Date:**	10-Nov-22				
			A	**B**	**C**	**D**	**E=A*B*C*D**
No.:	**Description:**	**Unit:**	**Quantity**	**Master rate**	**Multiplication**	**Weighting**	**Amount**
					Factor	**Factor 1**	**(Rands)**
3	Rehabilitation of access roads	m2	16500	R 42,10	1	1	R 694 720,41
6	Opencast rehabilitation including final voids & ramps	ha	20,89	R 265 044,10	1	1	R 5 536 771,21
8 (A)	Rehabilitation of overburden & spoils	ha	48,14	R 176 696,07	1	1	R 8 506 148,59
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	ha	5,06	R 639 192,70	1	1	R 3 234 315,06
10	General surface rehabilitation	ha	43,77	R 139 973,08	1	1	R 6 126 509,88
13	Water management	ha	43,77	R 53 221,71	1	1	R 2 329 471,60
14	2 to 3 years of maintenance & aftercare	ha	43,77	R 18 627,60	1	1	R 815 315,06
15 (A)	Specialist study	SUM	5%	R 265 375,00	1	1	R 265 375,00
			Subtotal 1 (Sum of 1-15 above)				
			Escalated Sum of 1-15 above				R 27 508 626,81
			Weighting factor 2			1.00	R 27 508 626,81
			Preliminary and General			12%	R 3 301 035,22
			Contingencies			10%	R 2 750 862,68
			(Subtotal 1 plus P&G and contingencies) Sub Total 2				**R 33 560 524,70**
			VAT (15%)				R 5 034 078,71
			GRAND TOTAL				**R 38 594 603,41**

Table 27: Closure Cost Assessment – Un-scheduled – OC04A

CALCULATION OF THE QUANTUM							
Mine:	2 SEAM - OC4A	**Location:**	MP				
Evaluators:	Elemental Sustainability	**Date:**	10-Nov-22				
			A	**B**	**C**	**D**	**E=A*B*C*D**
No.:	**Description:**	**Unit:**	**Quantity**	**Master rate**	**Multiplication**	**Weighting**	**Amount**
					Factor	**Factor 1**	**(Rands)**
2(B)	Processing Plant	m2	1000,00	R 372,54	1	1	R 372 544,04
3	Rehabilitation of access roads	m2	0	R 42,10	1	1	R 0,00
6	Opencast rehabilitation including final voids & ramps	ha	4,50	R 265 044,10	1	1	R 1 192 698,44
8 (A)	Rehabilitation of overburden & spoils	ha	0,00	R 176 696,07	1	1	R 0,00
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	ha	0,50	R 639 192,70	1	1	R 319 596,35
10	General surface rehabilitation	ha	4,50	R 139 973,08	1	1	R 629 878,87
13	Water management	ha	4,50	R 53 221,71	1	1	R 239 497,69
14	2 to 3 years of maintenance & aftercare	ha	4,50	R 18 627,60	1	1	R 83 824,19
15 (A)	Passive Treatment System	ha	2,50	R 720 000,00	1	1	R 1 800 000,00
			Subtotal 1 (Sum of 1-15 above)				
			Escalated Sum of 1-15 above				R 4 265 495,54
			Weighting factor 2			1.00	R 4 265 495,54
			Preliminary and General			12%	R 511 859,47
			Contingencies			10%	R 426 549,55
			(Subtotal 1 plus P&G and contingencies) Sub Total 2				**R 5 203 904,56**
			VAT (15%)				R 780 585,68
			GRAND TOTAL				**R 5 984 490,25**

Table 28: Closure Cost Assessment – Un-scheduled – OC06

CALCULATION OF THE QUANTUM							
Mine:	2 SEAM - OC6	**Location:**	MP				
Evaluators:	Elemental Sustainability	**Date:**	2022/11/10 (as assessed in OC6 application)				
			A	**B**	**C**	**D**	**E=A*B*C*D**
No.:	**Description:**	**Unit:**	**Quantity**	**Master rate**	**Multiplication**	**Weighting**	**Amount**
					Factor	**Factor 1**	**(Rands)**
2(A)	Demolition of steel buildings and structures	m2	270,00	R 212,69	1	1	R 57 426,30
2(B)	Demolition of reinforced concrete buildings and structures	m2	780,00	R 313,43	1	1	R 244 475,40
3	Rehabilitation of access roads	m2	17100,00	R 38,06	1	1	R 650 826,00
5	Demolition of housing and/or administration facilities	m	1580,00	R 425,38	1	1	R 672 100,40
6	Opencast rehabilitation including final voids & ramps	ha	6,31	R 222 986,17	1	1	R 1 407 042,73
8 (A)	Rehabilitation of overburden & spoils	ha	15,89	R 148 657,45	1	1	R 2 362 612,85
10a	General surface rehabilitation (topsoil)	ha	18,42	R 117 537,89	1	1	R 2 165 047,93
10b	General surface rehabilitation (seeding)	ha	19,47	R 15 885,88	1	1	R 309 298,08
12	Fencing	m	4210,00	R 134,33	1	1	R 565 529,30
13	Water management	ha	6,31	R 44 776,34	1	1	R 282 538,71
14	2 to 3 years of maintenance & aftercare	ha	19,47	R 15 671,72	1	1	R 305 128,39
15 (A)	Specialist study (Groundwater boreholes into mine area)	ha	1,00	R 319 785,00	1	1	R 319 785,00

	Subtotal 1 (Sum of 1-15 above)		
	Escalated Sum of 1-15 above		R 9 341 811,09
	Weighting factor 2	1.00	R 9 341 811,09
	Preliminary and General	12%	R 1 121 017,33
	Administration and supervision costs	6%	R 560 508,67
	Closure Plan		R 159 893,00
	Contingencies	10%	R 934 181,11

	(Subtotal 1 plus P&G and contingencies) Sub Total 2	**R 12 117 411,20**
	VAT (15%)	R 1 817 611,68
	GRAND TOTAL	**R 13 935 022,88**

Table 29: Closure Cost Assessment – Itemised Breakdown

No.:	Description:	Unit:	Quantity	Master rate	Multiplication	Weighting	Un-Scheduled	Scheduled
Demolition of steel buildings and structures								
2(A)	Structures at OC6	m2	270,00	R 212,69	1	1		R 57 426,30
Demolition of reinforced concrete buildings and structures								
2(B)	Structures at OC6	m2	780,00	R 313,43	1	1		R 244 475,40
2(B)	Processing Plant	m2	1000,00	R 372,54	1	1		R 372 544,04
Roads and Haul Roads								
3	Rehabilitation of access roads	m2	16500	R 42,10	1	1	R 694 720,41	
3	Rehabilitation of access roads - OC6	m2	17100	R 38,06	1	1		R 650 826,00
Demolition of housing and/or administration facilities								
5	Structures at OC6	m2	1580	R 425,38	1	1		R 672 100,40
Opencast Area								
6	OC01	ha	3,87	R 265 044,10	1	1	R 1 025 720,66	
6	OC2	ha	0,00	R 265 044,10	1	1	R 0,00	
6	OC2A	ha	1,19	R 265 044,10	1	1	R 315 402,48	
6	OC3	ha	5,59	R 265 044,10	1	1	R 1 481 596,51	
6	OC4	ha	2,52	R 265 044,10	1	1	R 667 911,13	
6	M - Pit	ha	7,72	R 265 044,10	1	1	R 2 046 140,44	
6	OC4A	ha	4,50	R 265 044,10	1	1		R 1 192 698,44
6	OC6	ha	6,31	R 222 986,17	1	1		R 1 407 042,73
Overburden								

8 (A)	OC01 - Overburden	ha	4,10	R 176 696,07	1	1	R 724 453,87	
8 (A)	OC2	ha	2,68	R 176 696,07	1	1	R 473 545,46	
8 (A)	OC2A	ha	2,77	R 176 696,07	1	1	R 489 448,10	
8 (A)	OC3	ha	6,19	R 176 696,07	1	1	R 1 093 748,65	
8 (A)	OC4	ha	3,59	R 176 696,07	1	1	R 634 338,87	
8 (A)	M - Pit	ha	28,81	R 176 696,07	1	1	R 5 090 613,65	
8 (A)	OC4A	ha		R 176 696,07	1	1		
8 (A)	OC6	ha	15,89	R 148 657,45	1	1		R 2 362 166,88
Pollution Control Facilities								
8 (C)	Pollution Control Dam	ha	1,84	R 639 192,70	1	1	R 1 176 114,57	
8 (C)	Tailings Area 1	ha	2,90	R 639 192,70	1	1	R 1 853 658,83	
8 (C)	Tailings Area 2	ha	0,32	R 639 192,70	1	1	R 204 541,66	
8 (C)	Pollution Control Dam 2	ha	0,50	R 639 192,70	1	1		R 319 596,35
Pollution Control Facilities								
10a	General surface rehabilitation (topsoil & seeding)	ha	43,77	R 139 973,08	1	1	R 6 126 509,88	
10a	General surface rehabilitation - OC4A (topsoil & seeding)	ha	4,50	R 139 973,08	1	1		R 629 878,87
10a	General surface rehabilitation - OC6	ha	18,42	R 117 537,89	1	1		R 2 165 047,93
10b	General surface rehabilitation - OC6 (seeding)	ha	19,47	R 15 885,88	1	1		R 309 298,08
Fencing								
12	Fencing - OC6	m2	4210,00	R 134,33	1	1		R 565 529,30
Water Management								
13	Water management	ha	43,77	R 53 221,71	1	1	R 2 329 471,60	
13	Water management - OC4A	ha	4,50	R 53 221,71	1	1		R 239 497,69
13	Water management - OC6	ha	6,31	R 44 776,34	1	1		R 282 538,71
Maintenance & aftercare								

14	2 to 3 years of maintenance & aftercare	ha	43,77	R 18 627,60	1	1	R 815 315,06	
15	2 to 3 years of maintenance & aftercare	ha	4,50	R 18 627,60	1	1		R 83 824,19
16	2 to 3 years of maintenance & aftercare	ha	19,47	R 15 671,72	1	1		R 305 128,39
Specialist Studies								
15(A)	Groundwater Assessment	SUM	Unit	R 265 375,00	1	1	R 265 375,00	
15(A)	Groundwater Assessment - OC6	SUM	Unit	R 319 785,00	1	1		R 319 785,00
15(A)	Passive Treatment System - OC4A	ha	2,50	R 720 000,00	1	1		R 1 800 000,00

21. DOCUMENT PROVISION – REHABILITATION PROVISION

The Guarantees are available and have been provided to the Department of Mineral Resources and Energy, as provided by 2 Seam to Elemental Sustainability, and is attached in Annexure A for confirmation. 2 SEAM is simultaneously with this Report, submitting to the DMRE Bank Guarantee - Lombard Nr. M-72910, . M-63597 and M-64630, in the total amount of R 38 893 420.40, in provision of its assessed rehabilitation exposure at its 2 Seam Mine. The sole object of these Bank Guarantees is to apply its assets for rehabilitation.

22. STATEMENT OF SHORTFALL/SURPLUS

The closure cost and provisions are presented in the table below.

- Bank Guarantee - Lombard Nr. M-72910 – R 21 035 466.00; (Annexure A1)
- Bank Guarantee - Lombard Nr. M-63597 – R 5 099 603.95; (Annexure A2)
- Bank Guarantee - Lombard Nr. M-64630 – R 12 758 350.41; (Annexure A3)

Table 30: Closure Provision Summary

Closure Provision for 2 SEAM Mine			
		Un-Scheduled	**Scheduled**
UN-SCHEDULE – TOTAL LIABILITY		**R 38 594 603.41**	
OC4A – SCHEDULE COST			**R 5 984 490,25**
OC6 – SCHEDULE COST			**R 13 935 022,88**
Bank Guarantee_ Lombard Nr. M-72910	Annexure A1	R 21 035 466.00	
Bank Guarantee_ Lombard Nr. M-63597	Annexure A2	R 5 099 603.95	
Bank Guarantee_ Lombard Nr. M-64630	Annexure A3	R 12 758 350.41	
Un-schedule Closure Cost		**R 38 594 603.41**	
TOTAL PROVISION		R 38 893 420.40	
Over provision		**R 298 817.00**	

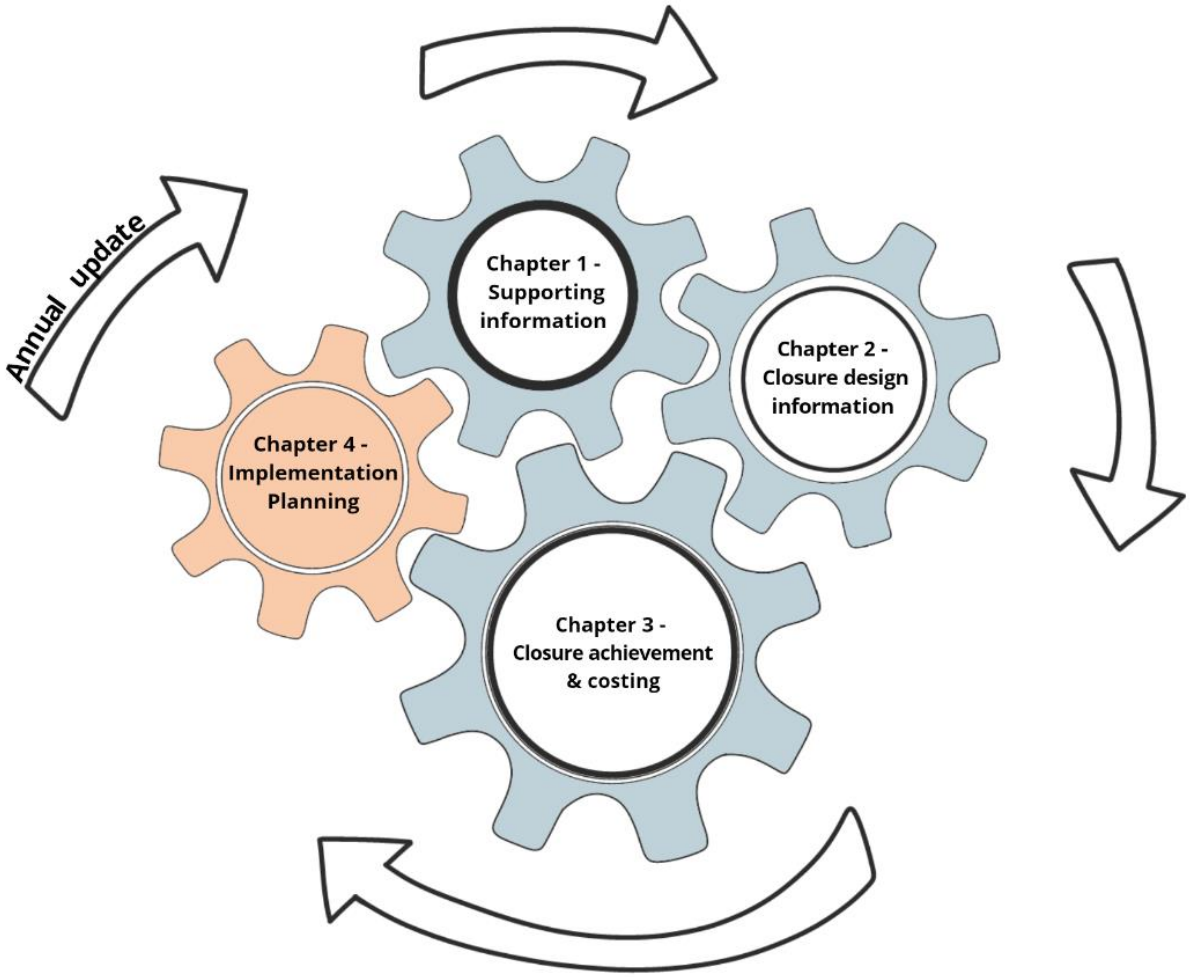
22.1. CONTRIBUTION SCHEDULE

No additional contribution is currently required towards the Rehabilitation Trust as sufficient provision is currently in place for the Un-scheduled Closure Cost. The following contributions will be required for the Scheduled Closure Cost.

- OC04A - **R 5 984 490,25**
- OC6 - **R 13 935 022,88**

The contribution to the Rehabilitation Trust for each of the mining areas must be made before mining commences at the mining area. It is estimated that mining will commence at OC04A in 2023 and in 2025 at OC6.

CHAPTER 4: IMPLEMENTATION PLANNING



Chapter 4, contains aspects related to implementation of the closure planning during the remaining operational period, at closure and post-closure, including:

- The organisational capacity required to champion closure planning for the MRA.
- Scheduling related to the various activities to occur during the remaining operational period in preparation for closure, at closure and post-closure; and
- The closure plan evaluation, which includes a gap analysis of the current information knowledge and the way forward for improved refinement.

23. SCHEDULE

A preliminary closure schedule is proposed in Table 31 below and includes the closure and post-closure timelines. As per the above documented approach, the closure plan is a live document that should be updated regularly throughout the LoM, as solutions are continually refined, and the knowledge base is developed.

Table 31: Closure Schedule

Facility life/ phase	Activity	Timeline	Frequency
Operational	Further refine / update the closure plan and closure action plan to incorporate detailed specialist assessment outcomes	2023/2046	As required
	Develop cash flows and related financial information for funding the implementation of the stipulated closure measures	2023/2046	As required
	Ongoing environmental monitoring to establish baseline conditions to benchmark the closure situation	Pre-mining and the LoM	Monthly
	Compile final closure plan	2046/2047	Once-off
Closure	Backfill final void, replace topsoil, prepare, and revegetate all affected areas; and General site rehabilitation	2046/2047	Once-off
	On-going communications with regulatory bodies and submission of required reporting and applications	To be determined	As required
Post-closure	Maintaining closure measures and conducting required inspection and monitoring to demonstrate achievement (success) of closure measures	Rehabilitation +- 5 years post-closure Surface water +- 10 years post-closure	Rehabilitation monitoring annually for 5 years; Surface water quarterly for 10 years
End state/land use	Implement agreed-upon end state/land use (requires a post mining land use and land capability assessment)	Approximately 5 years post-closure	Once-off
	Care and maintenance of rehabilitated areas	3 years post closure	Annually or as required

24. AUDITS

The closure plan must be updated during the operation's life to reflect known developments, new regulatory requirements, and any other material developments. A preliminary schedule of monitoring, auditing, and reporting requirements which relate to the risk assessment, legal requirements, effective implementation, and knowledge gaps is proposed as follows:

- Internal operational rehabilitation audits co-ordinated by the mine and including soils, groundwater, and closure specialists. The purpose is to review the closure plan and monitor the implementation of concurrent rehabilitation measures.
- External financial audits co-ordinated by the financial manager and the closure manager, by suitable qualified independent auditors; and
- Legal compliance audits co-ordinated by the Mine manager aligned with environmental authorisation requirements. Relevant aspects relating to closure, such as changes to the risk assessment, changes in closure options and changes in the closure provision will be reported.

25. CLOSURE PLAN REFINEMENT

25.1. Planned amendments and gaps

This preliminary closure plan, dated November 2022 is compiled in the overall approach and structure to align to Appendix 4 of GNR. 1147, namely minimum content of a final rehabilitation, decommissioning, and mine closure plan. This plan also reflects an integration and consolidation of closure-related studies and specialist work. The following should be implemented to further refine the closure planning for the mining area.

- Refine the conceptual post mining landform.
- Develop and include a detailed topsoil balance.
- Utilise the improved topsoil data to accurately plan the topsoil placement depths
- Develop a detailed monitoring plan.
- Develop detailed relinquishment criteria.
- Refine and developed a post closure water management plan.
- Refine the closure scheduling; and
- Include a revision of the closure costs to improve the accuracy running into the closure phase.

26. LIMITATIONS

This report is based on the following assumptions and limitations:

- Current information available to Elemental Sustainability was used in the development of this report.
- The information contained within this report is based on current layout plans available. If there is a significant change or addition of other infrastructure areas, this report will need to be updated to cater for this change.

- Mitigation measures and recommendations provided in this report is based on the specialist studies. All specialist studies have been completed prior to this report being completed; and
- This report must be considered as a living document and will be updated as additional information becomes available, and as monitoring and rehabilitation progresses. The report has to be updated as required by legal requirements.

26.1. Research and Development

During the opencast mining phase research can be completed on the following aspects:

- Wetland Passive treatment system
- Decant volume and the need for an active treatment system
- Effective erosion control measures.
- Water (surface and groundwater) post closure management plan.
- Vegetation re-establishment rates.

27. CONCLUSION

This preliminary closure plan was compiled in alignment to the NEMA GNR.1147 Regulations, the NEMA Appendix 5 (Closure Plan) and based on information provided by client, and specialist work. This report is completed in the extended transitional period as presented the Amendment to Financial Provision Regulations, 2015 (as amended). During the transitional arrangements a holder must review the financial provision in terms of the requirements as set out in Regulations 17(1) and (3). During the extended transitional period, the assessment was in accordance with the requirements as set out in Regulation 53 and 54 (MPRDA Regulations).

This Closure Cost Assessment was performed in accordance with the requirements as set out in Regulation 53 and 54. More specifically Regulation 54(2) (GNR 527, 23 April 2004, MPRDA) that required the holder mining right to annually update and review the quantum of the financial provision.

No additional contribution is currently required towards the Rehabilitation Trust as sufficient provision is currently in place for the Un-scheduled Closure Cost. The following contributions will be required for the Scheduled Closure Cost.

- OC04A - **R 5 984 490,25**
- OC6 - **R 13 935 022,88**

The contribution to the Rehabilitation Trust for each of the mining areas must be made before mining commences at the mining area. It is estimated that mining will commence at OC04A in 2023 and in 2025 at OC6.

28. REFERENCES

DMR. (2005). *Guideline document for the evaluation fo the quantum of closure-related financial provision provided a mine.* DMR.

SA, S. (2022), September 2022. *Stats SA*. Retrieved from Stats SA:

ANNEXURE A1: BANK GUARANTEE_LOMBARD – M-72910

LOMBARD
Guarantee

GUARANTEE NO. M- 72910

The Regional Manager

Department of Mineral Resources
314 Stateway Road
The Strip Building
Welkom
9459

Reference No: MP 30/5/1/2/3/2/1 (405) EM

Sir,

FINANCIAL GUARANTEE FOR THE REHABILITATION OF LAND DISTURBED BY MINING (EXECUTION OF ENVIRONMENTAL MANAGEMENT PLAN / PROGRAMME)

1. Concerning the responsibility in terms of the National Environmental Management Act, 1998(Act 107 of 1998), which is incumbent on

2 SEAM (PTY) LTD
(Reg. No. 2011/125334/07)
(hereinafter referred to as "the mine owner")

to execute the environmental management plan / programme approved in terms of the provisions of the said Act for the mine known as

OPENCAST AND UNDERGROUND COAL MINE ON PORTIONS 6,29,31,36 AND 50 OF THE FARM VLAKLAAGTE 45IS AND THE REMAINING EXTENT OF THE FARM LOURENS 472IS

situated in the Magisterial District of **KRIEL** Province **MPUMALANGA**, we the undersigned **PIETER JOHANNES VENTER** and **LOUIS FRANCOIS KNIPE** in our capacities as **MANAGER: MINING DIVISION** and **LEGAL MANAGER: GUARANTEE DIVISION** and as duly authorised representatives of

LOMBARD INSURANCE COMPANY LIMITED
(Reg. No. 1990/001253/06)
(hereinafter referred to as "the Guarantor")

confirm that the amount of **R 21 035 466.00 (Twenty-One Million, Thirty-Five Thousand, Four Hundred and Sixty-Six Rands Only)** is available to you for the purpose of executing the said environmental management plan / programme.

2. The Guarantor, who hereby waives the advantages of the exceptions, ***non numerate pecuniae, non causa debiti, excussionis et divisionis,*** the meaning and the consequences of which is known to the Guarantor, undertakes to pay to you the said sum of **R 21 035 466.00 (Twenty-One Million, Thirty-Five Thousand, Four Hundred and Sixty-Six Rands Only)** upon receipt of a written claim from you to do so and the claim may be submitted by you, if (in your opinion and discretion) the mine owner fails or remains in default to execute the said environmental management plan / programme, or if he ceases mining / prospecting operations, or if his estate is sequestrated, or if he should hand over his estate in terms of the Insolvency Acts which are applicable in the Republic of South Africa, or if the Guarantor gives written notice to you in terms of **Clause 5** of this agreement. The said claim may be instituted by you at any stage commencing from the date of signature of this guarantee.

2/ .....

LOMBARD

GUARANTEE NO. M- 72910

3. The said amount of R 21 035 466.00 (Twenty-One Million, Thirty-Five Thousand, Four Hundred and Sixty-Six Rands Only) may be held by you on the condition that you, after having complied with all the provisions of the said environmental management plan / programme, will give account to the Guarantor of how the amount was appropriated and repay any unappropriated amount to the Guarantor.

4. This undertaking is neither negotiable nor transferable and -

   a) must be returned to the Guarantor when giving account to the Guarantor in terms of Clause 3 above,

   b) shall lapse on the granting of a closure certificate in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and

   (c) shall not be construed as placing any other responsibility on the Guarantor other than the paying of the guaranteed amount.

5. The Guarantor reserves the right to withdraw from this guarantee after having given you at least three months written notice in advance of his intention to do so.

Yours faithfully,

SIGNED AT JOHANNESBURG ON THIS 12TH DAY OF MARCH 2020.

1. P. J. VENTER
MANAGER
MINING DIVISION

2. L. F. KNIPE
LEGAL MANAGER
GUARANTEE DIVISION

LOMBARD

AS WITNESSES:

1. V. CHETTY

2. T. TAU

ANNEXURE A2: BANK GUARANTEE_LOMBARD – M-63597

LOMBARD
Guarantee

GUARANTEE NO. M- 63597

The Regional Manager
Department of Mineral Resources
Saveways Crescent Centre
Mandela Drive
Witbank

Reference No. : MP 30/5/1/2/3/2/1 (405) EM

Sir,

FINANCIAL GUARANTEE FOR THE REHABILITATION OF LAND DISTURBED BY MINING (EXECUTION OF ENVIRONMENTAL MANAGEMENT PLAN / PROGRAMME)

1. Concerning the responsibility in terms of the National Environmental Management Act, 1998(Act 107 of 1998), which is incumbent on

2 SEAM (PTY) LTD
(Reg. No. 2011/125334/04)
(hereinafter referred to as "the mine owner")

to execute the environmental management plan / programme approved in terms of the provisions of the said Act for the mine known as

OPENCAST AND UNDERGROUND COAL MINE ON PORTIONS 6, 29, 31, 36 AND 50 OF FARM VLAKLAAGTE 45 IS AND THE FARM LOURENS 472 IS

situated in the Magisterial District of **KRIEL** Province **MPUMALANGA**, we the undersigned **CHRISTOPHER SCOTT BUCHAN** and **CHARLOTTE VAN ROOYEN** in our capacities as **MINAGER: MINING DIVISION** and **LEGAL MANAGER: GUARANTEE DIVISION** and as duly authorised representatives of

LOMBARD INSURANCE COMPANY LIMITED
(Reg. No. 1990/001253/06)
(hereinafter referred to as "the Guarantor")

confirm that the amount of **R5 099 603.95 (Five Million Ninety Nine Thousand Six Hundred and Three Rand and Ninety Five Cents)** is available to you for the purpose of executing the said environmental management plan / programme.

2. The Guarantor, who hereby waives the advantages of the exceptions, *non numerate pecunire, non causa debiti, excussionis et divisionis*, the meaning and the consequences of which is known to the Guarantor, undertakes to pay to you the said sum of **R5 099 603.95 (Five Million Ninety Nine Thousand Six Hundred and Three Rand and Ninety Five Cents)** upon receipt of a written claim from you to do so and the claim may be submitted by you, if (in your opinion and discretion) the mine owner fails or remains in default to execute the said environmental management plan / programme, or if he ceases mining / prospecting operations, or if his estate is sequestrated, or if he should hand over his estate in terms of the Insolvency Acts which are applicable in the Republic of South Africa, or if the Guarantor gives written notice to you in terms of **Clause 5** of this agreement. The said claim may be instituted by you at any stage commencing from the date of signature of this guarantee.

2/ .....

LOMBARD

GUARANTEE NO. M- 63597

3. The said amount of **R5 099 603.95 (Five Million Ninety Nine Thousand Six Hundred and Three Rand and Ninety Five Cents)** may be held by you on the condition that you, after having complied with all the provisions of the said environmental management plan / programme, will give account to the Guarantor of how the amount was appropriated and repay any unappropriated amount to the Guarantor.

4. This undertaking is neither negotiable nor transferable and -

   a) must be returned to the Guarantor when giving account to the Guarantor in terms of Clause 3 above,

   b) shall lapse on the granting of a closure certificate in terms of the Mineral and Petroleum Resources Development **Act, 2002 (Act 28 of 2002)** and

   (c) shall not be construed as placing any other responsibility on the Guarantor other than the paying of the guaranteed amount.

5. The Guarantor reserves the right to withdraw from this guarantee after having given you at least three months written notice in advance of his intention to do so.

Yours faithfully,

SIGNED AT JOHANNESBURG ON THIS 7th DAY OF AUGUST 2017.

1. **C. S. BUCHAN**
MANAGER
MINING DIVISION

2. **C. VAN ROOYEN**
LEGAL MANAGER
GUARANTEE DIVISION

AS WITNESSES:

1. **C. HEMRAJ**

2. **L. KNIPE**

ANNEXURE A3: BANK GUARANTEE_LOMBARD – M-64630

LOMBARD
Guarantee

GUARANTEE NO. M-64630

The Regional Manager

Reference No. : MP 30/5/1/1/2/10053PR

Department of Mineral Resources
Saveways Crescent Centre
Mandela Drive
Emalahleni
1035

Sir

FINANCIAL GUARANTEE FOR THE REHABILITATION OF LAND DISTURBED BY MINING (EXECUTION OF ENVIRONMENTAL MANAGEMENT PROGRAMME)

1. Concerning the responsibility in terms of the Mineral and Petroleum Resources Development Act 28, 2002, which is incumbent on

2 SEAM (PTY) LIMITED
(Reg. No. 2011/125334/07)
(hereinafter referred to as "the mine owner")

to execute the environmental management programme approved in terms of the provisions of the said Act for the mine known as

OPENCAST AND UNDERGROUND COAL MINE ON PORTIONS 6, 29, 31, 36 AND 50 OF THE FARM VLAKLAAGTE 45 IS AND THE FARM LOURENS 472 IS

situated in the Magisterial District of KRIEL Province MPUMALANGA, we the undersigned JAMES STANLEY BARROW and MARIA CHARLOTTE VAN ROOYEN in our capacities as UNDERWRITING MANAGER, GENERAL & COMMERCIAL GUARANTEES and LEGAL MANAGER, LOMBARD GUARANTEE and as duly authorised representatives of

LOMBARD INSURANCE COMPANY LIMITED
(Reg. No. 1990/001253/06)
(hereinafter referred to as "the Guarantor")

confirm that the amount of R 12 758 350.41 (Twelve Million, Seven Hundred and Fifty Eight Thousand, Three Hundred and Fifty Rand and Forty One Cents) is available to you for the purpose of executing the said environmental management programme.

2. The Guarantor, who hereby waives the advantages of the exceptions, *non numerate pecuniae, non causa debiti, excussionis et divisionis*, the meaning and the consequences of which is known to the Guarantor, undertakes to pay to you the said sum of R 12 758 350.41 (Twelve Million, Seven Hundred and Fifty Eight Thousand, Three Hundred and Fifty Rand and Forty One Cents upon receipt of a written claim from you to do so and the claim may be submitted by you, if (in your opinion and discretion) the mine owner fails or remains in default to execute the said environmental management programme, or if he ceases mining/prospecting operations, or if his estate is sequestrated, or if he should hand over his estate in terms of the Insolvency Acts which are applicable in the Republic of South Africa, or if the Guarantor gives written notice to you in terms of Clause 5 of this agreement. The said claim may be instituted by you at any stage commencing from the date of signature of this guarantee.

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LOMBARD
Guarantee

GUARANTEE NO. M-64630

3. The said amount of **R 12 758 350.41 (Twelve Million, Seven Hundrd and Fifty Eight Thousand, Three Hundred and Fifty Rand and Forty One Cents** may be held by you on the condition that you, after having complied with all the provisions of the said environmental management programme, will give account to the Guarantor of how the amount was appropriated and repay any unappropriabl amount to the Guarantor.

4. This undertaking is neither negotiable nor transferable and -

   a) must be returned to the Guarantor when giving account to the Guarantor in terms of Clause 3 above,

   b) shall lapse on the granting of a closure certificate in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and

   (c) shall not be construed as placing any other responsibility on the Guarantor other than the paying of the guaranteed amount.

5. The Guarantor reserves the right to withdraw from this guarantee after being given you at least three months written notice in advance of his intention to do so.

Yours faithfully,

SIGNED AT JOHANNESBURG ON THIS 9th DAY of NOVEMEBR 2017

1. J. S. BARROW
UNDERWRITING MANAGER
GENEREAL & COMMERCIAL
GUARANTEES

2. M. S. VAN ROOYEN
LEGAL MANAGER
GUARANTEE DIVISION

LOMBARD

AS WITNESSES:

1. P. J. DELPETHE

2. V. CHETTY

APPENDIX B: Environmental Risk Assessment (Methodology)

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

Extent of the impact

The EXTENT of an impact is the physical extent/area of impact or influence.

Score	Extent	Description
1	Footprint	The impacted area extends only as far as the actual footprint of the activity.
2	Site	The impact will affect the entire or substantial portion of the site/property.
3	Local	The impact could affect the area including neighbouring properties and transport routes.
4	Region	Impact could be widespread with regional implication.
5	National	Impact could have a widespread national level implication.

Duration of the impact

The DURATION of an impact is the expected period of time the impact will have an effect.

Score	Duration	Description
1	Short term	The impact is quickly reversible within a period of less than 2 years, or limited t the construction phase, or immediate upon the commencement of floods.
2	Short to medium term	The impact will have a short term lifespan (2–5 years).
3	Medium term	The impact will have a medium term lifespan (6 – 10 years)
4	Long term	The impact will have a medium term lifespan (10 – 25 years)
5	Permanent	The impact will be permanent beyond the lifespan of the development

Intensity of the impact

The INTENSITY of an impact is the expected amplitude of the impact.

Score	Intensity	Description

1	Minor	The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected.
2	Low	The activity will have a low impact on the affected environment.
3	Medium	The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way.
4	High	The activity will have a high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.
5	Very High	The activity will have a very high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.

Reversibility of the impact

The REVERSIBILITY of an impact is the severity of the impact on the ecosystem structure

Score	Reversibility	Description
1	Completely reversible	The impact is reversible without any mitigation measures and management measures
2	Nearly completely reversible	The impact is reversible without any significant mitigation and management measures. Some time and resources required.
3	Partly reversible	The impact is only reversible with the implantation of mitigation and managemer measures. Substantial time and resources required.
4	Nearly irreversible	The impact is can only marginally be reversed with the implantation of significan mitigation and management measures. Significant time and resources required t ensure impact is on a controllable level.
5	Irreversible	The impact is irreversible.

Probability of the impact

The PROBABILITY of an impact is the severity of the impact on the ecosystem structure

Score	Probability	Description
1	Improbable	The possibility of the impact occurring is highly improbable (less than 5% of impact occurring).

2	Low	The possibility of the impact occurring is very low, due either to the circumstances, design or experience (5% to 30% of impact occurring).
3	Medium	There is a possibility that the impact will occur to the extent that provision must be made therefore (30% to 60% of impact occurring).
4	High	There is a high possibility that the impact will occur to the extent that provision must be made therefore (60% to 90% of impact occurring).
5	Definite	The impact will definitely take place regardless of any prevention plans, and there can only be relied on migratory actions or contingency plans to contain the effect (90% to 100% of impact occurring).

Calculation of Impacts – Significance Rating of Impact

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the Irreplaceability (Magnitude, Extent, Duration, and Intensity) multiplied by the Probability of the impact. The significance of an impact is rated according the scores a presented below:

Equation 1:
Significance = Irreplaceability (Reversibility + Intensity + Duration + Extent) X Probability

Significance Rating

Score	Significance	Colour Code
1 to 20	Very low	
21 to 40	Low	
41 to 60	Medium	
61 to 80	High	
81 to 100	Very high	

Mitigation Efficiency

Degree to which the impact can be mitigated: The effect of mitigation measures on the impact and its degree of effectiveness:
Equation 2:
Significance Rating = Significance x Mitigation Efficiency

High	0,2

Medium to High	0,4
Medium	0,6
Low to Medium	0,8
Low	1,0

Confidence rating: Level of certainty of the impact occurring.

- Certain
- Sure
- Unsure

ANNEXURE C: DECLARATION OF INDEPENDENCE

Declaration of Independence

I, **DuToit Wilken**, in my capacity as a specialist consultant, hereby declare that I -

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member; and
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional judgement.

DuToit Wilken *(Pr.Sci.Nat)* Date: 10 November 2022

Senior Specialist - Auditor

SACNASP Reg. No. 118911

ANNEXURE D: CV

<table>
<tr><td>EDUCATION AND QUALIFICATIONS</td><td>Masters MSc. Environmental Science – 2015 - University of Pretoria.
- MSc Research Thesis: Value of classified class F fly ash as an ameliorant for degraded surface coal mine soils.
Honours BSc. Environmental Science – 2009 - University of Pretoria.
• Degree BSc. Environmental Science – 2008 - University of Pretoria;</td></tr>
<tr><td>CONTINUED PROFESSIONAL DEVELOPMENT</td><td>
<table>
<tr><th>COURSE</th><th>INSTITUTION</th><th>COMPLETED</th></tr>
<tr><td>Environmental Law Workshop</td><td>MacRobert</td><td>2017</td></tr>
<tr><td>Mine Closure and Rehabilitation</td><td>South Africa Asset Management Association</td><td>2017</td></tr>
<tr><td>Environmental Law Workshop</td><td>IMBEWU Sustainability Legal Specialists</td><td>2016</td></tr>
<tr><td>ISO 14001 Training SAATCA Registered</td><td>Centre for Environmental Management (CEM)</td><td>2014</td></tr>
<tr><td>Water Law in South Africa Workshop</td><td>IMBEWU Sustainability Legal Specialists</td><td>2013</td></tr>
<tr><td>Mining Law in South Africa Workshop</td><td>IMBEWU Sustainability Legal Specialists</td><td>2013</td></tr>
<tr><td>Post – Decision Environmental Monitoring and Enforcement</td><td>Centre for Environmental Management (CEM)</td><td>2012</td></tr>
<tr><td>Environmental Law for Environmental Managers</td><td>Centre for Environmental Management (CEM)</td><td>2011</td></tr>
<tr><td>Environmental Law (EMI)</td><td>University of Pretoria</td><td>2009</td></tr>
<tr><td>• Arc GIS 10</td><td>University of Pretoria</td><td>2009</td></tr>
</table>
</td></tr>
<tr><td>PROFESSIONAL STATUS</td><td>•
South African Council of Natural Scientific Professions - Registered Professional Scientist – <u>Environmental Science (118911)</u></td></tr>
<tr><td>WORK HISTORY
Employer
Period
Position
Responsibilities</td><td>• ELEMENTAL SUSTAINABILITY (Pty) LTD
• January 2018 – Current
• Senior Specialist and Director
• Senior Specialist and Director. Responsible for the management of all operations and projects. Senior specialist for Environmental authorisations projects (EIA, BAR, WULA, WML and AEL's), Mine Closure (Closure Cost and Rehabilitations plans), Audit (Environmental Authorisations), Compliance Monitoring and Specialist divisions (Bio monitoring, Wetlands and Biodiversity). Responsible for the development of Project plans and schedules, implementations of plans and budget planning. Risk identification and management of risk for each of the projects.</td></tr>
<tr><td>Employer
Period
Position
Responsibilities</td><td>• ENVIRONMENTAL ASSURANCE (PTY) LTD
• October 2010– January 2018
• SENIOR OPERATIONS MANAGER & MINE CLOSURE</td></tr>
</table>

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<tr><td></td><td colspan="3">

- Senior operations manager and mine closure specialist: Responsible for the management of all operations and projects. Senior project manager of the EIA, Mine Closure, Audit, Compliance Monitoring and Specialist divisions. Development of Project plans and schedules, budget planning and review of reports. Day to day tasks include, Compliance audits, reporting, Mine Closures, Closure Plans, Specialist work, tender documents and marketing, risk management, client interaction and development of new products.

</td></tr>
<tr><td>Employer
Period
Position
Responsibilities</td><td colspan="3">

- BOKAMOSO (PTY) LTD
- 2009 -2010
- ENVIRONMENTAL CONSULTANT
- Environmental Consultant responsible for the Environmental Authorisation Applications in terms of NEMA and SEMA's. Management of specialist and ensuring timely delivery of specialist reports.

</td></tr>
<tr><td>WORK EXPERIENCE AND SKILLS</td><td colspan="3">

- Development of Mine closure cost assessments in accordance with MPRDA regulations. Mine closure risk assessments, annual plans and final rehabilitation plans in terms of GNR 1147. Development of project plans, delivery schedules and budget planning. Project risk management. Development of audit protocol, conducting of audits. Environmental due diligences, WUL audits, EMPR PAR's and ROD audits. Specialist studies: Noise & Dust Baselines, EMP Performance Reviews, Air Emission Licenses (AEL), Visual Impact Assessment. Compilation of Scoping EIA, EIA, BAR and Environmental Management Plans for mines, industrial developments, and residential developments. Development of RSIP, IWWMP and Closure Plans. Application for Mining rights and prospecting rights. Development and implementation of various monitoring programs for water quality and air quality monitoring for mining and other industries. The use of fly ash for the rehabilitation of coal mine disturbed areas. Environmental legislation interpretation, recommendations, and implementation. Mentoring of Professional Natural Science in training towards professional registration.

</td></tr>
<tr><td rowspan="7">PROJECT EXPERIENCE</td><td>Client</td><td>Mining Area</td><td>Work Completed and Year</td></tr>
<tr><td>CiM International</td><td>Sand Mine</td><td>Closure Report in terms of GNR 1147 - 2018</td></tr>
<tr><td>Onicalite</td><td>Onicalite Colliery</td><td>Closure Report in terms of GNR 1147 - 2019</td></tr>
<tr><td>Vandaspark</td><td>Rondevly Colliery</td><td>Closure Report in terms of GNR 1147 - 2019</td></tr>
<tr><td>Tronox Mining</td><td>Eastern Mines</td><td>Closure Report in terms of GNR 1147 - 2017</td></tr>
<tr><td>MC Mining</td><td>Mooiplaats</td><td>Closure Cost Assessment – 2012 to 2016</td></tr>
<tr><td>Limpopo Coal</td><td>Vele Colliery</td><td>Closure Cost Assessment – 2015 to 2019</td></tr>
</table>

	Samancor WCM	Mooinooi, Elandsdrift, Buffelsfontein and Millsell Waterkloof	Closure Cost Assessment – 2012 to 2017
	SABRIX	Zandfontein and Boekenhoutkloof	Closure Cost Assessment – 2011 to 2017
	KILO SAND	Kilo Sand	Closure Cost Assessment – 2011 to 2019
	Eastplats	Kenndy's Vale, Spitzkop	Closure Cost Assessment – 2014 to 2017
	Barplats Limited	Zandfontein, Crocette and Maroelabult	Closure Cost Assessment – 2014 to 2017