Conceptual Rehabilitation and Closure Plan for Klipspruit Colliery' Proposed Nwabu Project - Pit BD and Pit H Underground Mining Expansion Project

Prepared for

Seriti Power (Pty) Ltd

Document Detail

Project Number:	SER04	**Authority Reference:**	MP 30/5/1/2/2/125MR
Report Title:	Conceptual Rehabilitation and Closure Plan for Klipspruit Colliery' Proposed Nwabu Project - Pit BD and Pit H Underground Mining Expansion Project		
Project Name:	Klipspruit Colliery's Proposed Nwabu Project - Pit BD and Pit H Underground Mining Expansion Project		
Client Name:	Seriti Power (Pty) Ltd		
EAP:	Niara Environmental Consultants (Pty) Ltd		

Document History

Revision	EAP/Author	Reviewed By	Date of Issue	Comments
0	Vumile Ribeiro	Ndumiso Dlamini	20 July 2024	

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Declaration of Independence

I Vumile Ribeiro, as duly authorised representative of Niara Environmental Consultants (Pty) Ltd., hereby confirm my independence and declare that I:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Signature of the EAP:	V. Ribeiro
Designation:	Environmental Consultant
Qualifications:	Post Graduate Degree (Hons): BSocSc Environmental Analysis and Management
Name of Company:	Niara Environmental Consultants (Pty) Ltd
Experience (Years):	Seventeen (17)
Date:	July 2024

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1 Introduction

Seriti Power (Pty) Ltd ("Seriti Power") is the holder of a Mining Right for coal in respect of its Klipspruit Colliery ("KPS") operation issued under the Department of Mineral Resources and Energy ("DMRE") (Ref No. MP 30/5/1/2/2/125 MR).

KPS consists of three mining areas under a single Mining Right. These areas are referred to as:

- KPS Main Pit which includes the Main Pit, Smaldeel and Bankfontein Pits;
- "KPSX" or Klipspruit Extension Weltevreden including Pit BD, Pit H, Pit G and Pit S; and
- "KPSS" or Klipspruit South which includes the KPSS East of the Thungela conveyor and the KPSS West of the Thungela conveyor.

KPS Main Pit holds an Environmental Management Programme Report ("EMPr"), converted in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) ("MPRDA") and approved on 14 September 2010 and the EMPr for KPSS and KPSX (Pit BD) which was approved on 17 August 2017. KPS was further awarded an Environmental Authorisation ("EA") for the Opencast ("OC") mining of Pit H in October 2022. In August 2023, an EA was granted for the OC mining of Pit G & S.

In October 2022, KPS was granted a Section 102 ("S102") amendment approval as contemplated under the MPRDA to convert the mining method for KPSX and KPSS from opencast ("OC") to underground ("UG") bord and pillar mining. A subsequent amendment application for the EA was submitted to the DMRE on the 18th August 2023 as provided for under Regulation 29 of the NEMA Environmental Impact Assessment ("EIA") Regulations ("GNR 326"), for the conversion of the mining method from OC to UG of the area within KPSX named Pit BD. The approval of this EA is still pending.

KPS intends to apply for a change in mining method to the remainder of the KPSX and KPSS reserves from OC to UG (including all future mining areas of KPSX that fall outside of the Pit BD and inclusive of Pit H). This project has been termed and will for the purposes of this application be referred to as, the "Nwabu Project".

KPS intends on applying for an EA and an Integrated Water Use License ("IWUL") for proposed change in mining method to KPSX and KPSS. The application process to be followed in terms of NEMA, for the additional activities proposed across KPSX and KPSS, is a Basic Assessment ("BA") process as contemplated under Chapter 4 of GNR 326. Seriti Power is also required to apply for a Water Use Licence for the proposed amendments, in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998).

1.1 Project Applicant

Table 1-1: Applicants Details

Name of Applicant:	Seriti Power (Pty) Ltd (previously known as South32 SA Coal Holdings (Pty) Ltd)
Registration No:	1963/000537/07
Responsible Person:	Moyahabo Jumbo Makgalefe

	Lead Health Safety & Environment
Physical Address:	Klipspruit Colliery: Portion 12, Farm Klipfontein 3Registration Division IS Ogies, 2230 South Africa
Postal Address:	15 Chaplin Corner Oxford and Chaplin Roads Illovo 2196
Telephone No:	013 689 4620
Email:	Moyahabo.Makgalefe@seritiza.com

1.2 Details of the EAP

Niara Environmental Consultants (Pty) Ltd (Niara) has been appointed as an Independent Environmental Assessment Practitioner (EAP) by Seriti Power to undertake the BA process in support of an EA application, and an Integrated Water Use Licence Application (IWULA). The details of the EAP are captured in Table 1-2 below.

Table 1-2: EAPs Details

Name of Practitioner:	Vumile Ribeiro
Registration No:	2019/1183
Responsible Person:	Niara Environmental Consultants (Pty) Ltd
Physical Address:	Office 1 Palm Place Office Park 22 Bram Fischer Drive, Linden, Johannesburg 2195
Postal Address:	28 Shamrock Street, Ferndale, Randburg, Johannesburg 2194
Telephone No:	+27 82 767 2786
Email:	vumile@niara.co.za

1.3 Project Locality

KPS and KPSS are located approximately 1 km west of the town of Ogies, with KPSX located 6 km north of the town of Ogies, in the eMalahleni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province. Refer to Figure 1-1 and Appendix B, Plan 1 for a regional setting.

Table 1-3 provides the location for which the proposed project will be undertaken. Plan 2a in Appendix B provides a local setting for the proposed infrastructure.

Table 1-3: Activity Location

Farm Name:	Hartebeestlaagte 325 JS, Weltevreden 324 JS, Tweefontein 328 JS, Wildebeesfontein 327 JS, Grootpan 7 IS, Oggiesfontein 4 IS, Prinshof 2 IS, Klipfontein 3 IS, Smaldeel 1 IS, Phola Plant 830 IS, Zwaaiwater 11 IS.
Magisterial District:	Nkangala District Municipality
Distance and Direction from Nearest Town:	Approximately 6km north of Ogies town.
21 Digit Surveyor General Code for each Farm Portion	Attached as Appendix B.

1.4 Locality Map

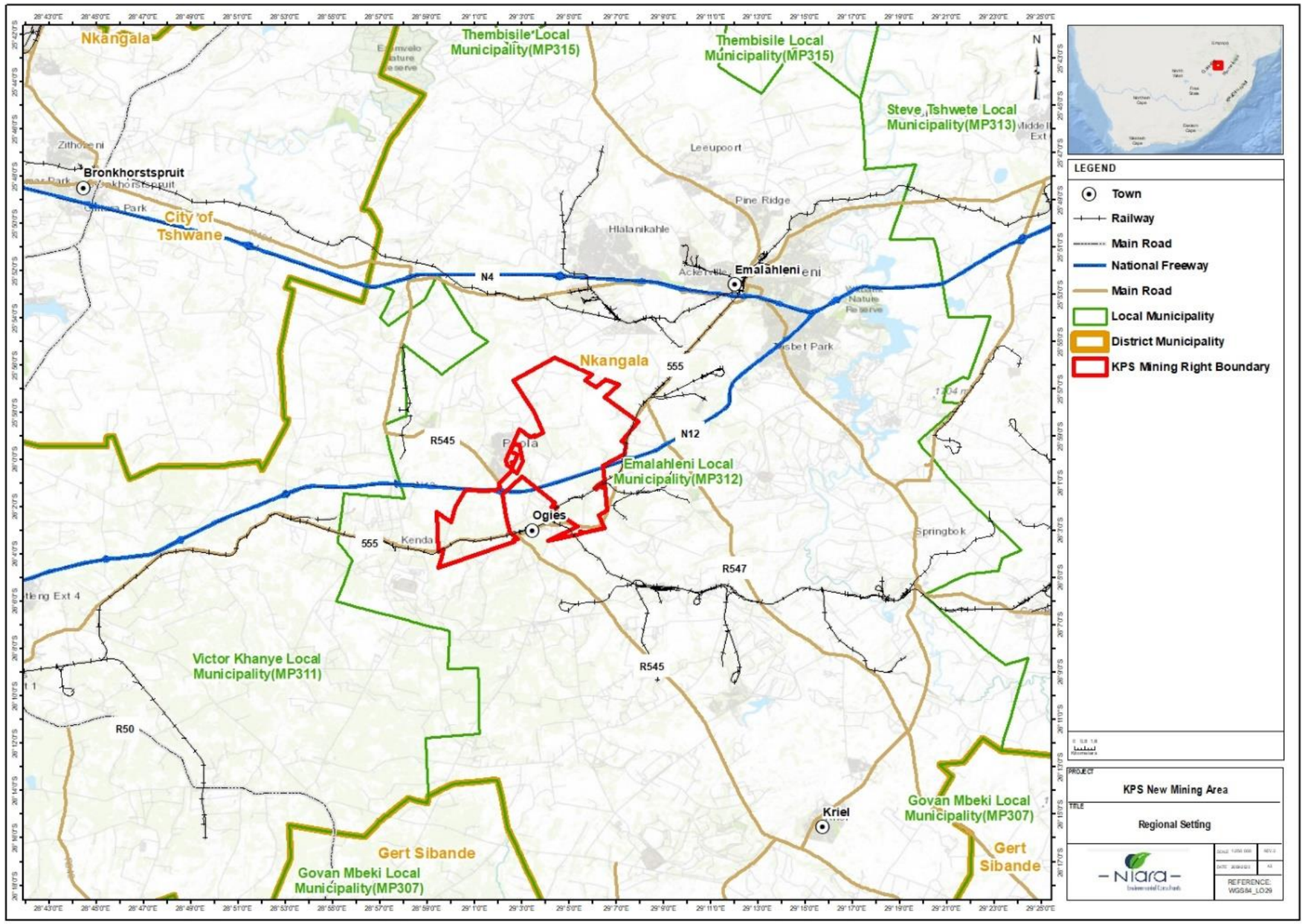

Figure 1-1: Locality Map

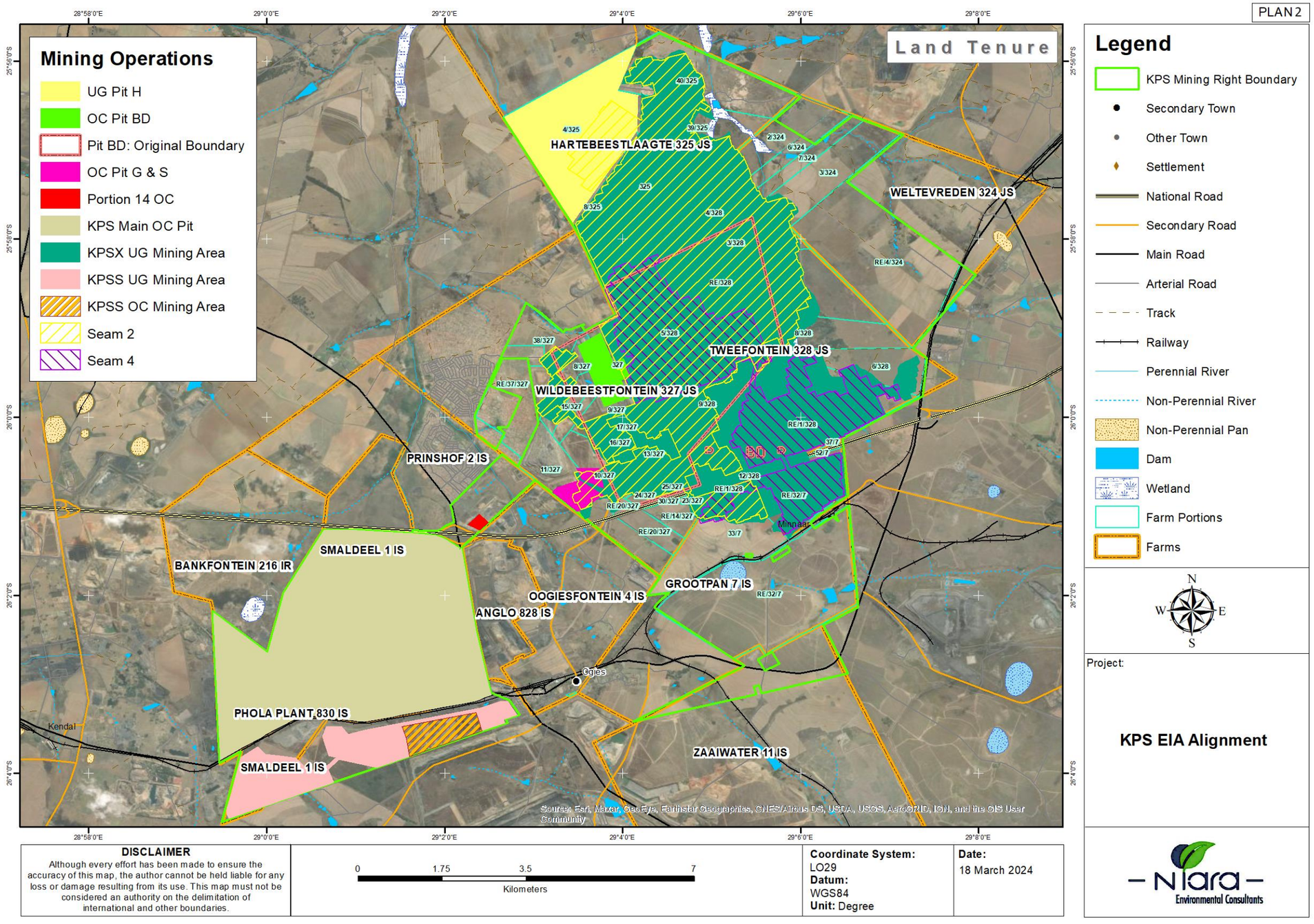

Figure 1-2: Affected farm portions over existing and proposed UG mining areas

1.5 Purpose of this Report

This report serves as the Rehabilitation and Closure Plan specifically developed for the Project and is one of several reports, undertaken for the Project. The Rehabilitation, Decommissioning, and Closure Plan (RCP) is a component of the closure planning suite of documents required in terms of the NEMA (Act No. 107 of 1998) (NEMA, 1998) and associated Financial Provisioning Regulations, 2015 (Government Notice Regulation (GN R) 1147 published in Government Gazette (GG) 39425) (GN R 1147, 2015)

The following suite of documents have been compiled for Project:

- Closure Plan aligned with the minimum requirements for a Final RCP (Appendix 4 of GN R 1147);
- Environmental Risk Assessment Report (ERR) in accordance with the minimum requirements for an ERR (Appendix 5 of GN R 1147); and
- Annual Rehabilitation Plan (ARP) adhering to the minimum requirements for an ARP defined in Appendix 3 of GN R 1147.

Apart from the requirements of the GN R 1147 regulations, mine closure planning is also required to be compliant with additional legislation, which is summarised below.

A high-level overview of the mine closure planning processes is presented in Figure 3. The approach followed in compiling this closure planning document is as follows:

- Undertake a kick-off meeting with the relevant site personnel to ensure scope alignment and to source updated site information;
- Undertake a desktop review of the site to confirm the site battery limits and inform identification of closure related risks and the development of the closure measures required for successful rehabilitation outcomes;
- Review the Environmental Risk Assessment (RA);
- Update the final Land Use Plan (LUP);
- Develop closure measures based on the mitigation measures identified in the RA;
- Compile closure costs for financial provisioning based on the closure measures developed;
- Develop site relinquishment criteria based on the envisioned final land use;
- Identify the residual/ latent risks presented that may manifest on-site and cost the mitigation measures required to manage these risks; and
- Develop the ARP for the operation as aligned with the operational rehabilitation plan and cost the rehabilitation budget required for the next 12 months.

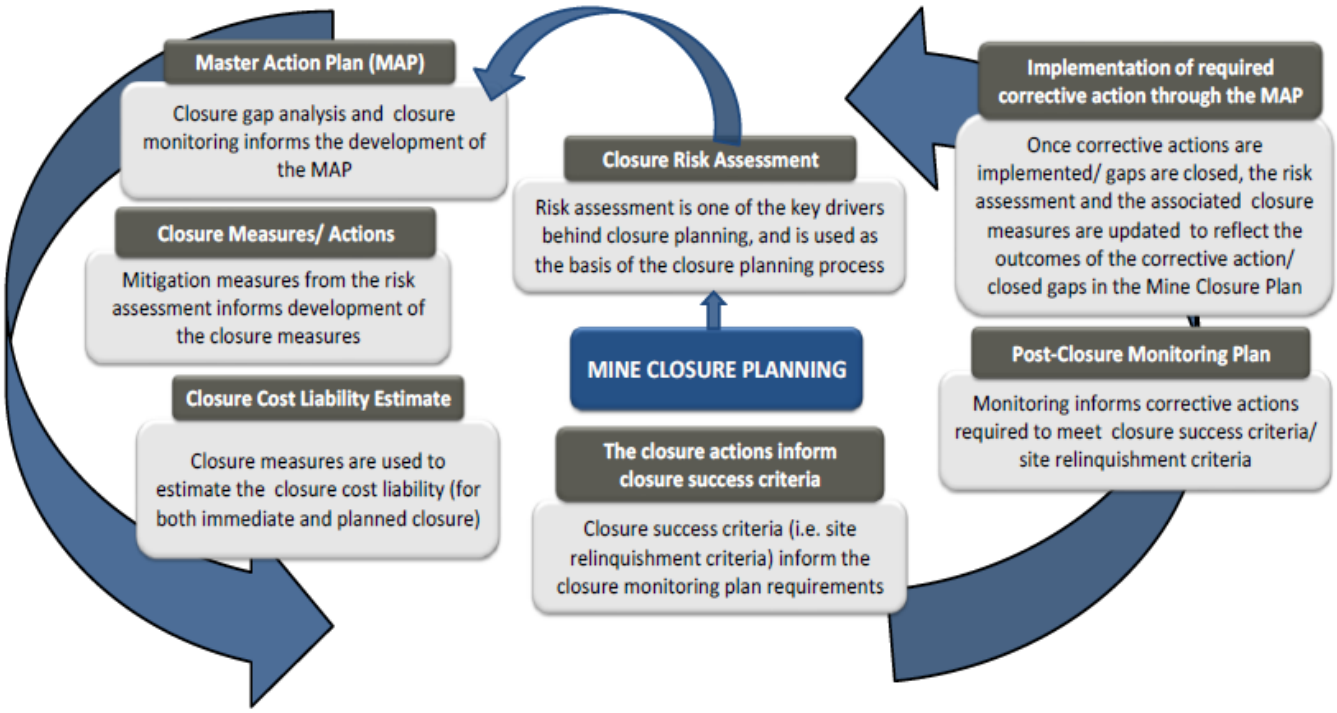

Figure 1-3: High-Level Closure Planning Process (Digby Wells, 2023)

1.6 Terms of Reference

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

a) Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;

b) Outlining the design principles for closure;

c) Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;

d) Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;

e) Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;

f) Identifying knowledge gaps and how these will be addressed and filled;

g) Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and

h) Outlining monitoring, auditing and reporting requirements.

GN R1147 provides detailed content requirements for operational rehabilitation and closure planning, and requires a mining right hold to compile three distinctive plans:

- Annual rehabilitation plan;
- Final rehabilitation, decommissioning and closure plan; and
- Environmental risk report.

1.6.1 Annual Rehabilitation Plan (ARP)

An ARP will need to be developed for the operation and should be linked to the action plan and schedule contained within the RDCP. This report needs to document the progress made regarding rehabilitation for the past 12 months and plan for rehabilitation for the next 12 months. The content of such a report is summarised below:

- Review of concurrent rehabilitation activities;
- Assessment and review of objectives set and outcomes for the next 12 months;
- Scheduling, planning, and budgeting for rehabilitation for the next 12 months, including areas to be rehabilitated, areas to be disturbed or planned to be disturbed, details of rehabilitation measures to be implemented and description of objectives and design criteria that have been adopted for the past 12 months;
- Assessment of rehabilitation from the past 12 months;
- Comparison of the next 12 months of rehabilitation compared to the past 12 months of rehabilitation;
- Evaluate and update the cost of rehabilitation for the 12 months and closure;
- Results of monitoring and risks identified; and
- Identification of shortcomings and how these will be addressed.

1.6.2 Rehabilitation, Decommissioning and Closure Plan (RDCP)

In general, the RDCP should contain information relating to the following:

- Providing vision, objectives, targets, and criteria for final rehabilitation;
- Legal and governance framework;

- Baseline environment, including social context, which will influence the closure objectives and post-mining land use;
- Assessment of post-closure options that are practical and within the socio-economic and environmental opportunities;
- The motivation for the preferred closure option;
- Proposed final land use and mapping;
- Ongoing research on closure and rehabilitation options;
- A detailed description of assumptions made;

- Stakeholder issues and comments;
- Outline of design principles for closure, including designs and drawings of how the mine will develop, including a schedule of actions for final rehabilitation, which is linked to the mine works program;
- Risk assessment approach and outcomes and linking this to closure activities;
- The detail on closure actions to mitigate/manage identified risks and describe the nature of residual risks that will need to be managed and monitored post-closure;
- Scheduling, budget, roles, and responsibilities to be assigned for final rehabilitation;
- Identification of knowledge gaps and how these will be addressed;
- Detail of full financial provision for the life of the project;
- Information on the organisational capacity to implement the rehabilitation plan;
- Auditable action plan for audits and update of the annual rehabilitation plan;
- Relinquishment criteria for infrastructure; and
- Outline of monitoring, auditing, and reporting requirements.

1.6.3 Environmental Risk Report (ERR)

The objective of the ERR is to determine the potential financial provision associated with the management of latent or residual environmental risks post closure. The ERR should address the following key aspects:

- A description of the risk including possible triggers and expected timeframes;
- An assessment of alternatives;
- Costing indicating the quantum of the liability; and

- Monitoring, auditing, and reporting requirements.

There is substantial duplication of information between the three reports in terms of content. Therefore, this report is a consolidation of the content requirements of all three reports due ensure consistency and remove redundant information

1.7 Details and Expertise of Specialist

Ndumiso Dlamini is an Associate Ecology Consultant for Niara Environmental Consultants. Ndumiso has 10 years of professional and international experience in Environmental Assessment Consulting and Management primarily within the minerals resources, infrastructure development and agriculture sectors.

Ndumiso Dlamini obtained his BSc Life and Environmental Sciences in 2010 and his BSc Hons degree in Botany in 2011, both at the University of Johannesburg and is a registered Pr. Sci. Nat with SACNASP in Botanical Science and Ecological Science. Having worked within environmental consultancies and undertaking various multidisciplinary biophysical projects, Ndumiso has a competent understanding of ecosystems and their importance. Ndumiso has been involved in numerous projects and has considerable experience across a range of developmental and environmental sciences; also, having worked in South Africa, Mozambique, Malawi and Zambia he is knowledgeable on the various ecological difference across Southern Africa.

Ndumiso is particularly interested and well versed in the assessment and management of wetlands, biodiversity, ecosystems and sustainable development. Having conducted countless wetland assessments, ecological and habitat rehabilitation, he has gained considerable experience in the value of wetlands and the services they provide. Ndumiso is currently a water resources specialist that specialises on wetland environments and the impacts to these ecosystems.

2 Design Principles

2.1 Statutory Requirements

NEMA is the primary South African legislation governing rehabilitation and closure reporting for a mine site. However, there are several Acts including the Mineral and Petroleum Resources Development Act of 2002 (which legislates mine closure certification) which needs to be considered in closure planning. This section provides an overview of the key relevant South African legislation which is illustrated in Table 2-1.

Table 2-1: South African legislative framework for rehabilitation and mine closure

Legislation	Description
Constitution of the Republic of South Africa, 1996	The Constitution guarantees everyone the right to an environment that is not harmful to their health or wellbeing and guarantees the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.

Legislation	Description
National Environmental Management Act (NEMA), No. 107 of 1998	In 2015, all environmental-related provisions of the MPRDA were repealed and provided for in the amendment to the NEMA, as promulgated on 08 December 2014. Mining operations include several activities which are in the Listing Notices 1-3 and should any of the listed activities be triggered an Environmental Authorisation (EA) would be required. Additionally, once a mine reaches the decommissioning phase, to obtain closure for the mining operations and its associated infrastructure, listed activity 22 of Listing Notice 1 will be triggered which requires an EA before the closure of the mine. A Basic Assessment Process must be followed, and Closure Report submitted to the competent authority for approval. Furthermore, Section 24(P) requires that the holder of a mining right must make financial provision for remediation of environmental damage and comply with General Notice Regulation (GNR) 1147 "Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations" was promulgated on 20 November 2015 (GNR1147).
Mineral and Petroleum Resources Development Act, 2002	Section 43(3) requires an application for a closure certificate to be made to the Regional Manager within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion and must be accompanied by the required information, programs, plans and reports prescribed in terms of this Act and the NEMA. Information required to accompany the closure certificate application is prescribed in Regulation 527 and includes a final performance assessment, a closure plan including closure objectives and Form P. The requirements of Regulation 527 must be read in conjunctions with the NEMA EIA and Financial Provision regulations which also prescribes the minimum content requirements for closure plans.
National Water Act (NWA), No. 36 of 1998	This Act specifies in Section 19 the 'Duty of Care' principle, noting that "*A duty is imposed on the owner of the land, a person in control of the 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*". In addition, the NWA's Regulation 704 on the "Use of Water for Mining and Related Activities aimed at the Protection of Water Resources" underpins the governance expectation on an operation to adequately manage clean and dirty water impacted by, and/or generated and emanating from, its site. Regulation 704 acknowledges the principle of co-operative governance and the respective roles for the DMR, the Department of Environmental Affairs (DEA), and the DWA in regulating pollution from mining activities.
Spatial Planning and Land Use Management Act, 2013	The Act requires that each Local Municipality must, after public consultation, prepare, adopt, and implement a land use scheme (LUS), (consistent with any existing Municipal Spatial Development Framework (SDF)) within five years of the Act being brought promulgated (end-2018). Importantly, SPLUMA determines that the land use-related decisions of the local authority cannot be overturned at a national level except in the case of agricultural land. This could have implications on an operation when applying for amendments to predefined post-mining land use/s and/or transfer of Title Deeds

2.2 Financial Provisioning Regulations

On 20th November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA. The regulations aim to regulate the determine and making of financial provision as contemplated in the NEMA 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. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, exploration, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
    - Annual rehabilitation – annual rehabilitation plan
    - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and
    - Remediation of latent and residual impacts – environmental risk assessment report.
- Regulation 10: An applicant must
    - Ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002; and
    - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, exploration, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations.

2.3 South African Good Practice Guidelines

The South African DMR published a Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision by a Mine (DMR, 2005) to direct and assist officials of the Department with the assessment of financial provisions made by mines. Over time, the DMR quantum was adopted by the industry as the standard for closure planning and costing for several years as it was the only guideline document available.

However, several South African best practice guidelines and tools are available most notably is the Best Practice Guidelines (BPG) published by the Ministry responsible for water to assist with aspects of DWAF's water management hierarchy. Included in this series of guidelines is BPG5: Water Management Aspects for Mine Closure. The principles in the BPG5 that are appropriate and that have been used to formulate the rehabilitation strategy are:

- Management measures at closure should primarily be passive 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 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 resource;
- Biodiversity plan will address issues that are interrelated with the mine water management plan, particularly about the environmental water balance and the effects that mining may have thereon.

3 Project Description

In terms of the National Environmental Management Act (Act 107 of 1998) ("NEMA"), as amended and the EIA Regulations of 2014, an application for Environmental Authorisation for certain listed activities must be submitted to the competent authority, the Department of Mineral Resources and Energy ("DMRE"), depending on the types of activities.

The current EIA regulations of 2014 ("GN R.326"), Listing Notice 1 of 2014 ("GN R.327"), Listing Notice 2 of 2014 ("GN R.325") and Listing Notice 3 of 2014 ("GN R.324") promulgated in terms of Sections 24(5), 24M and 44 of the NEMA, and subsequent amendments, commenced on 04 December 2014.

Listing Notice 1 ("GN R.327") and Listing Notice 3 ("GN R.324") lists those activities for which a Basic Assessment ("BA") process is required, while Listing Notice 2 ("GN R.325") lists the activities requiring a full Scoping and EIA process. The EIA Regulations of 2014 ("GN R.326") define the processes that must be undertaken to apply for the EA.

3.1 Description of the Activities to be Undertaken

3.1.1 Mining

KPSX was approved in 2011 with the mining of the full extent of Pit BD via the OC method. Pit H was further approved in 2023 for mining via OC method. When Seriti Power took over the operation of KPS in 2021 from South32 SA Coal Holdings, Seriti Power undertook an evaluation of all the assets obtained. The evaluation's focus was on the viability of the mine, including product market evaluations, operational optimisation and cost optimisation. This resulted in Seriti Power's change in mining strategy for the whole of KPS's remaining reserves from OC to UG. UG mining was the initial strategy for KPSS mining in 2006 but was later changed to OC in 2017 due to the economic value at the time.

3.1.1.1 KPSX Proposed Mining

The KPSX mining of Pit BD was amended from OC to UG in October 2022 through a S102 amendment process as contemplated under the MPRDA. The EA amendment is still outstanding. The S102 approved amendment covers the full extent of the unmined UG reserves within the KPSX (including Pit H) and KPSS mining areas as indicated in **Figure 1-2** above. The mineable coal seams within the KPSX area are the following and the focus of the UG mining will be on the main seams as illustrated in **Figure 3-1** and **Figure 3-2**:

- 5 seam ("S5")
- 4 upper A seam ("S4A")
- 4 upper seam ("S4U")
- 4 lower seam ("S4L")
- 2A seam ("S2A")
- 2 seam ("S2")
- 1 seam ("S1")

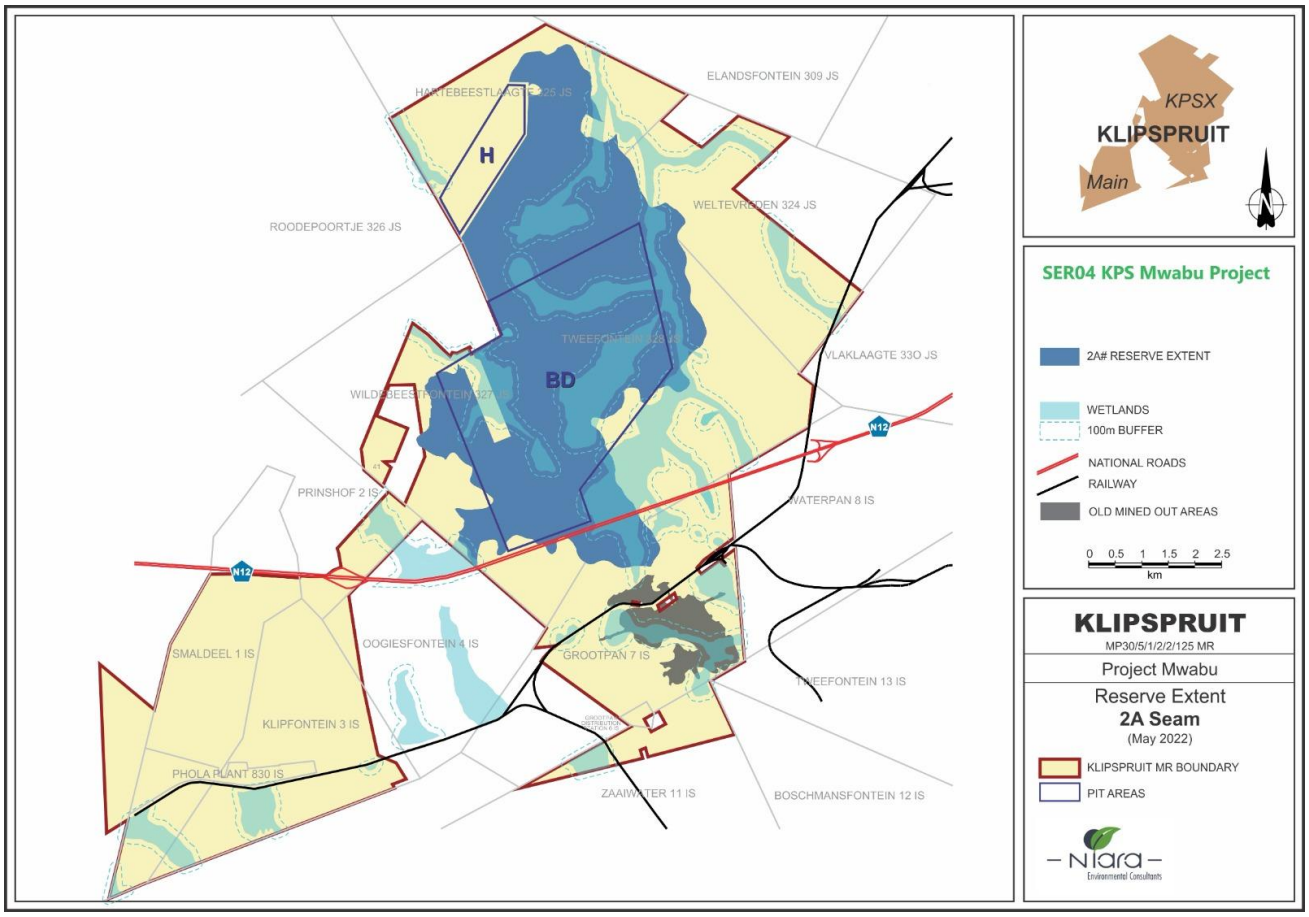

Figure 3-1: Proposed S2A mining

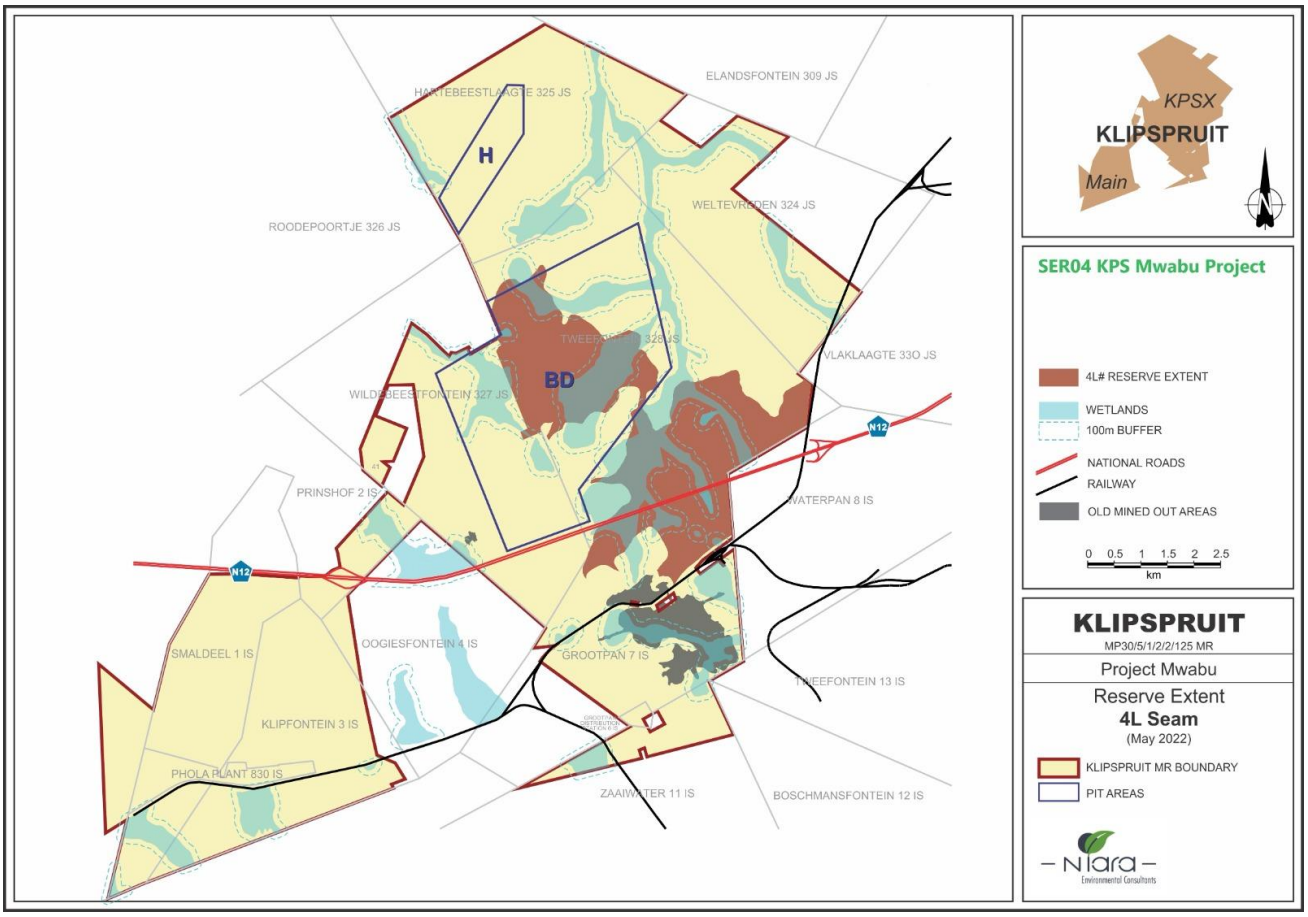

Figure 3-2: Proposed S4L Mining

The mineable coal seams at KPSS will include S5, S4U, S2 and S1.

UG mining has commenced within the Pit BD boundary and the mining method being utilised is bord and pillar mining. The inclusion of the bord and pillar mining method was to ensure optimal extraction of areas that are not profitable by OC method due to high strip ratio**Invalid source specified.**. An adit has been developed from the pit BD highwall which provides access to the UG workings. The mining will advance towards the North, East, West and Southern directions from the Pit BD boxcut area. The proposed UG mining for both KPSS and KPSX is depicted in Figure 3-3 below. The proposed UG mining will extend mining to 2042. The UG workings designs are based on the following principles for both KPSS and KPSX **Invalid source specified.**:

- UG workings are expected to be located approximately 25m below the ground surface with a mining height cut-off at 1.5m.
- A safety factor of not less than 1.3 will be applied on all workings with a pillar survival estimated at >99% for >500 years.
- No superimposition of the pillar between S4L and S2A and superimposition of the pillar between S2A and S1 as recommended by the geotechnical study.

UG mining using bord and pillar method will be conducted using a Continuous Miner ("CM") with parallel roadways in the direction of the advance. Perpendicular roads called splits will be developed at predetermined intervals to parallel roads. These road interlinks are the ones that create the pillars. The following activities form part of the board and pillar mining method **Invalid source specified.**:

- Coal cutting and loading: The CM uses the rotating drum to cutting head, equipped with cutting picks to cut the coal face. The loading mechanism collects the broken coal and delivers it onto the gathering arm, which loads the coal on the CM's chain conveyor. The CM's conveyor transports the broken coal from the front to the rear of the CM. The CM's chain conveyor's capability of horizontal and vertical movements allows for coal loading into the shuttle car.
- Coal hauling and tipping: The loaded shuttle car is used to haul the coal to the section feeder breaker that crushes the coal and feeds it into the conveyor belt system.
- Roof support: A roof bolt machine installs the roof bolts once the CM has finished the development face and roof support is installed on a systematic basis. Roof bolts enhance the stability of the overlying roof. The spacing between roof bolts and the length of the roof bolts is determined during geotechnical studies.
- Coal transportation: The coal is transported using a conveyor belt system from the mining sections to the coal stockpile, linked with the overland conveyor on surface via the UG adit.

The strategy for the mining of the KPSS UG reserve will follow the same methodology as the one depicted above for KPSX and the UG resource will be accessed by using an adit which will be developed on the KPSS OC highwall.

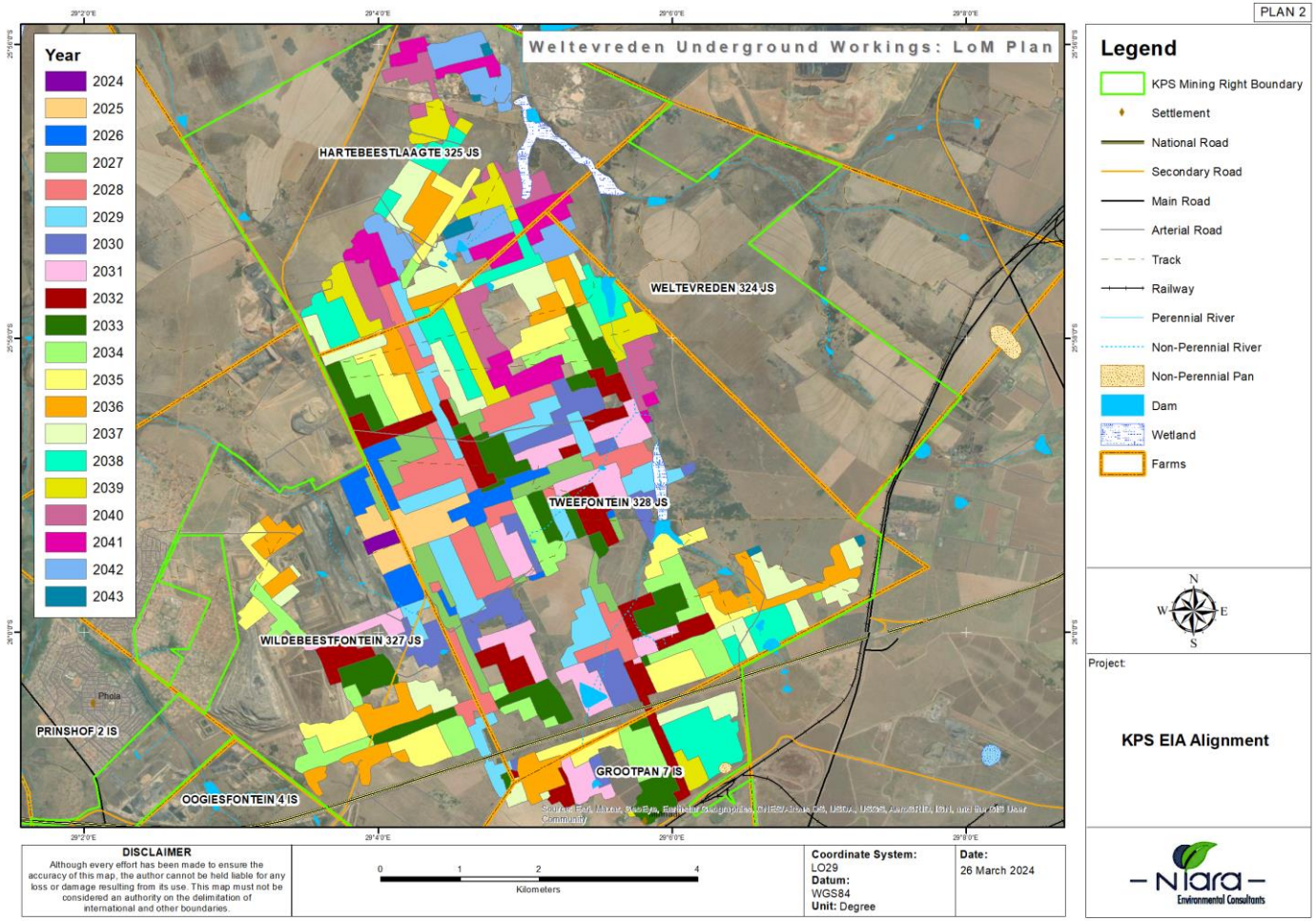

Figure 3-3: Life of Mine plan for the proposed KPSX UG mining

3.1.1.2 Processing

Once the coal is mined from the UG workings, it will be transported via a network of conveyors to the Phola Processing Plant ("PCPP") which is located adjacent to the KPS operation. The coal is beneficiated here resulting in various grades of quality produced. Following beneficiation at the PCPP, the coal will be transported via rail to the Richards Bay Coal Terminal for export, with a small component being retained for domestic use. Coal discard will be stored at the existing discard dump at the KPS and will be used as additional backfill material in the mining voids as part of the rehabilitation of the KPS.

3.1.1.3 Waste Management

All waste generated on site will be managed accordingly as per KPS' existing waste management procedures.

3.1.1.4 Summary of the Infrastructure Requirements

An adit has already been developed to support the UG mining at KPSX together with the supporting UG conveyors. An adit with the supporting UG conveyors will be constructed to support the UG mining at KPSS. This will be constructed on the existing KPSS OC highwall. Further, additional ventilation shafts and rescue boreholes will be constructed in strategic areas as the mining advances for both KPSX and KPSS. To manage additional dewatering activities from the UG workings, pipelines will be constructed which will link up with existing pipelines on surface and discharge in existing pollution control dams ("PCDs"). Should there be a need in future, a storage dam might also be constructed underground. Potable water supply to the UG workings will be delivered by pipelines which will link up with the existing potable water supply from the Emalahleni Water Treatment Plant. All other existing infrastructure will be utilised to support the proposed UG mining development including PCDs, power supply, haul roads, workshops, pipelines and water supply. The layout for the infrastructure at KPSX is depicted in **Figure 3-4**.

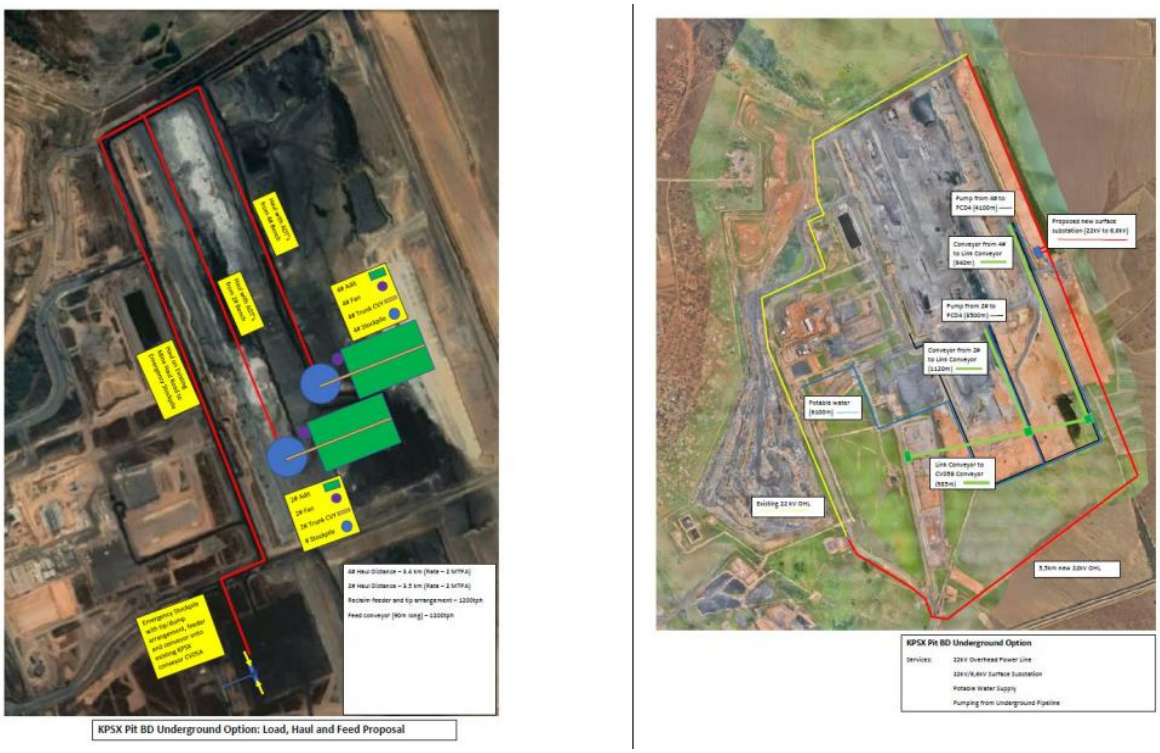

Figure 3-4: Layout for KPSX UG haul roads, pipelines, conveyor, load-haul and feed infrastructure

4 Approach and Methodology

The development of a conceptual rehabilitation plan is based on best practice knowledge and the receiving baseline environment. In the South African context, the broad rehabilitation objectives include three schools of thought, explained below:

- Restoration of previous land capability and land use;
- No net loss of biodiversity; and
- What the affected community wants, the affected community gets.

Rehabilitation objectives need to be tailored to the project at hand and be aligned with the Environmental Management Programme (EMPr) and Mine Closure Plan. And thus, the overall rehabilitation objectives for the Nwabu Project are as follows:

- Re-establishment of the pre-mining land capability to allow for a suitable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and water bodies within the area;
- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase)
- Prevent soil, surface water and groundwater contamination;

- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

5 Baseline Environment

5.1 Vegetation

5.1.1 Regional Vegetation

The regional vegetation occurring within the project area was the Eastern Highveld Grassland Vegetation unit (Figure 5-1). The vegetation unit is found throughout the Mpumalanga and Gauteng provinces. The landscape is dominated by moderately undulating plains at altitudes that range between 1520m – 1780m. The status of the vegetation, as at the time of publishing (2006), is summarised in Table 5-1 and the dominant plant species within the vegetation unit are shown in Table 5-2.

This vegetation type occurs on moderately undulating planes, including some low hills and pan depressions. The vegetation is a short dense grassland dominated by the usual Highveld grass composition (*Arsitida, Digitaria, Erafrostsis, Themeda, Tristachya* etc.) with small scattered rocky outcrops with, wiry sour grasses and some woody species. Some 44% transformed primarily by cultivation, plantations, mines, urbanisation and by the building of dams. No serious alien invasions are reported (Mucina & Rutherford, 2006).

Table 5-1: Vegetation Status

Vegetation Name	Ecological Status	Conservation Status	% of Project Area
Eastern Highveld Grassland	Largely Modified	Endangered	100%

Table 5-2: Dominant Plant Species

Vegetation Unit	Dominant Plant Species
Eastern Highveld Grassland	*Andropogon shirensis, Cynodon dactylon, Eragrostis curvula, Eragrostis plan, Harpachloa falx Aristida congesta Sporobulus africana, Panicu,a natalense, Themeda triandra*

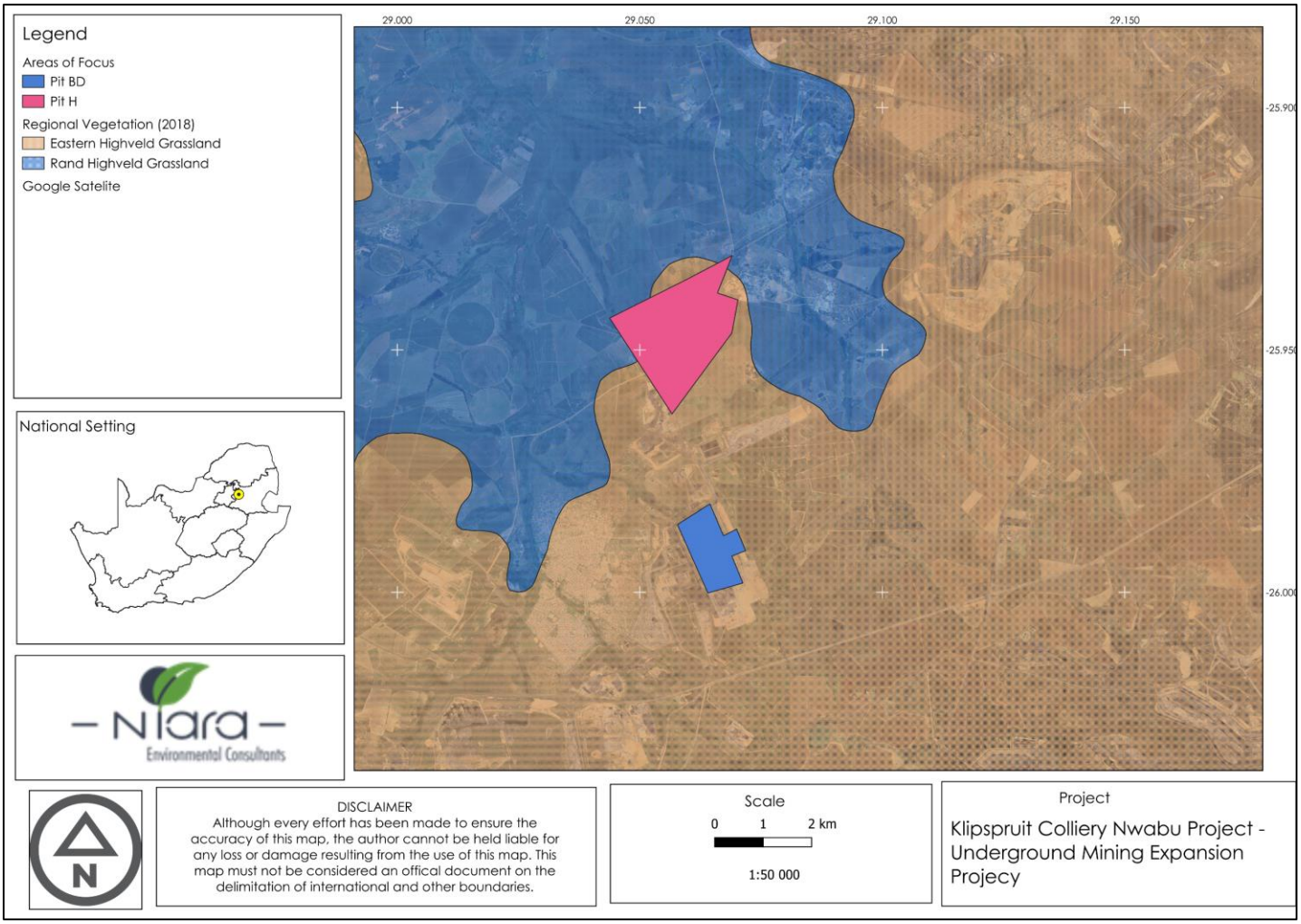

Figure 5-1: The regional vegetation associated with the proposed project

5.1.2 Site Vegetation

The vegetation within the proposed project area was determined to be mostly secondary grassland on areas that were previously classified as agricultural crop fields as presented in Figure 5-2. Parts of the vegetation were dominated by dense *Digitaria eriantha* grassland with good ground cover; however, very monospecific. Other parts were observed to be patchy grassland dominated by *Gomphocarpus physocarpus*. The grassland was largely unidentifiable as the grass species were in a poor condition as a result of seasonal changes and grazing (Figure 5-3). Furthermore, areas of bare soil were common throughout the area which indicates the degraded state of the vegetation.

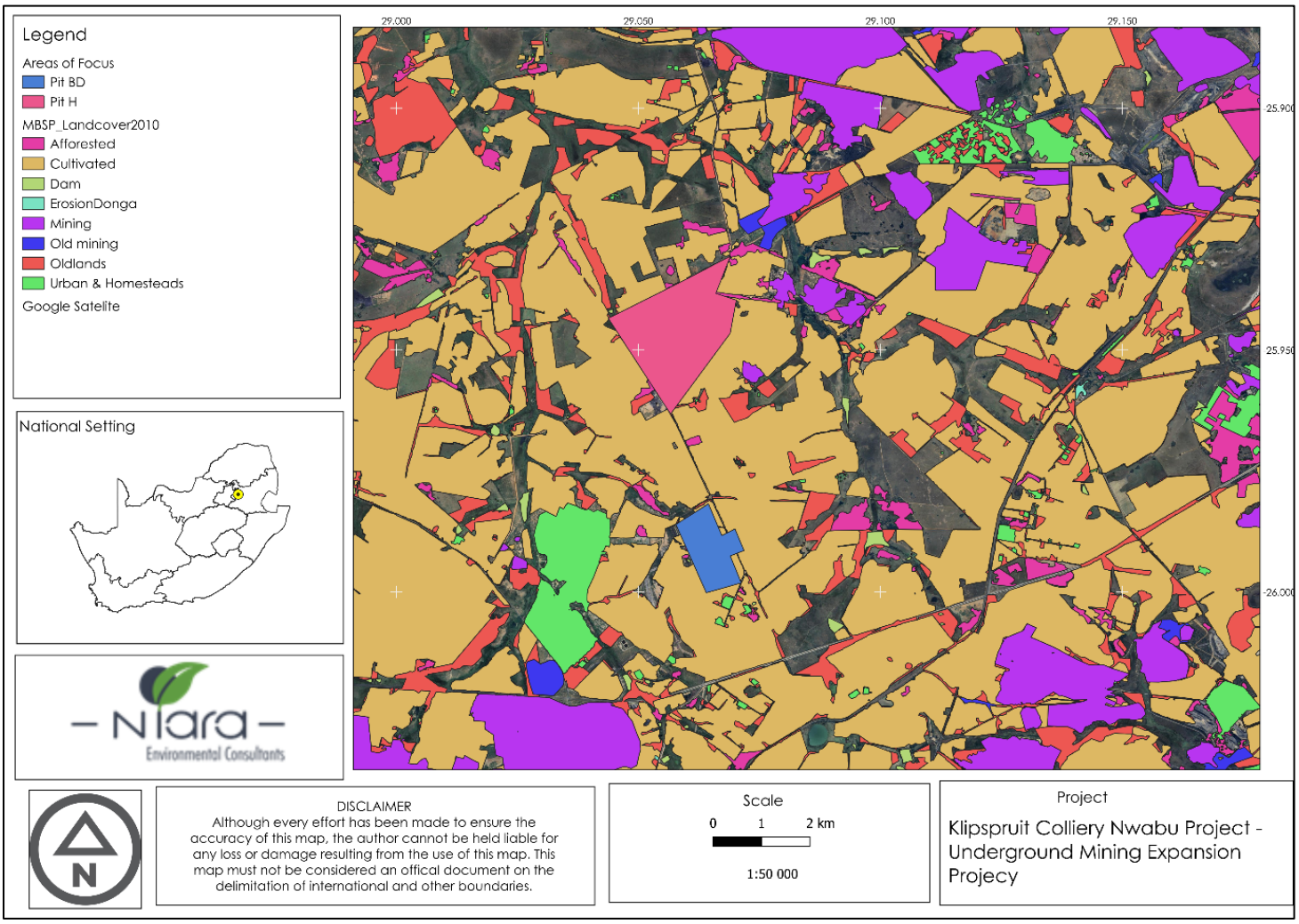

Figure 5-2: Land Cover over the proposed project area

Figure 5-3: Vegetation within the project area

The plant species observed within the project area are listed in Table 5-3. Some plant species were suspected based on the plant material available and the probability of occurrence. The dry season had commenced at the time of the assessment and the seasonal changes were evident with the loss of flowering parts on the majority of the floral species. No plant species of conservation concern were identified and the vegetation classified as secondary grassland (Figure 5-4).

Table 5-3: Plant species observed in the project area

Species Name	Common Name	Conservation Status
Acacia mearnsii	Black wattle	Category 1b invasive
Bidens pilosa	Black jack	

Species Name	Common Name	Conservation Status
Cynodon dactylon	Couch grass	
Digitaria eriantha	Rhodes grass	
Eragrostis curvula	Weeping love grass	
Gomphocarpus physocarpus	Balloon plant	
Seriphium plumosa	Bankrupt bush	
Solanum syssimbrifolium	Wild tomato	Category 1b invasive
Sporobolus africanus	Rat's tail grass	
Tagetes minuta	Khakibos	
Verbena bonariensis	Purple top	Categroy 1b invasive

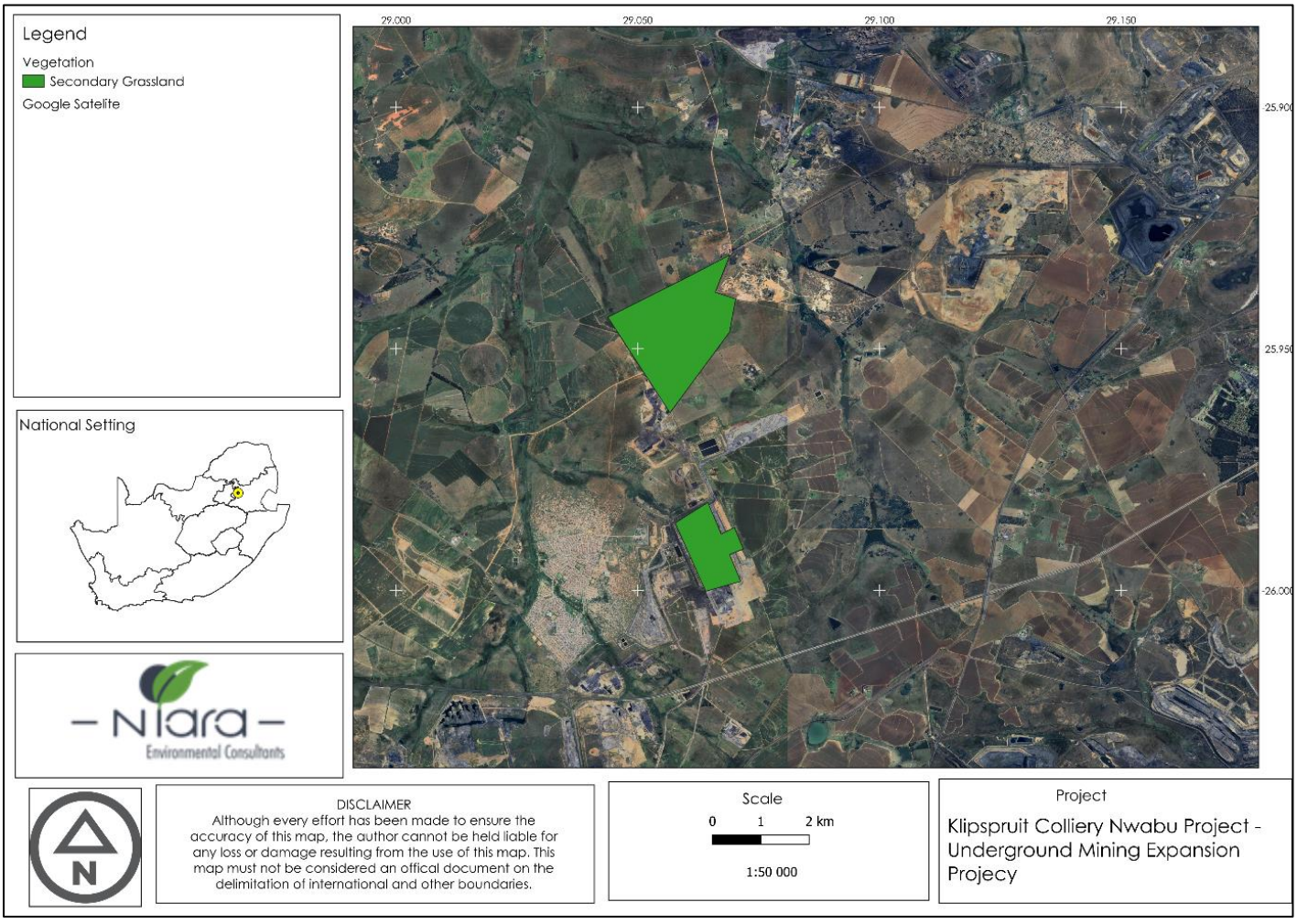

Figure 5-4: The classification of the vegetation within the project area

5.2 Fauna

5.2.1 Mammals

The assessment for mammal species was conducted at the desktop level and field investigation to determine the probability of occurrence of faunal species. The potential species that may occur within the project area are listed in Table 5-4. It must be noted that the possible species list is at the desktop level and may include species that were previously recorded in the area and maybe no longer occurring within the project area. It is likely that, as a result of the increased anthropogenic pressures, mining and modifications in the area, faunal species may have migrated away from the area.

Table 5-4: The possible mammal species occurring within the project area

Family	Scientific Name	Common Name	Conservation Status
Bathyergidae	*Cryptomys hottentotus*	Southern African Mole-rat	LC
Cercopithecidae	*Cercopithecus albogularis*	Samango Monkey	
Cercopithecidae	*Papio ursinus*	Chacma Baboon	LC
Elephantidae	*Loxodonta africana*	African Bush Elephant	LC
Gliridae	*Graphiurus (Graphiurus) murinus*	Forest African Dormouse	LC
Herpestidae	*Herpestes sanguineus*	Slender Mongoose	LC
Muridae	*Mastomys natalensis*	Natal Mastomys	LC
Muridae	*Otomys angoniensis*	Angoni Vlei Rat	LC
Muridae	***Otomys auratus***	**Southern African Vlei Rat**	**NT**
Muridae	*Rattus rattus*	Roof Rat	LC
Mustelidae	*Mellivora capensis*	Honey Badger	LC
Nycteridae	*Nycteris thebaica*	Egyptian Slit-faced Bat	LC
Rhinolophidae	*Rhinolophus clivosus*	Geoffroy's Horseshoe Bat	LC
Rhinolophidae	***Rhinolophus cohenae***	**Cohen's Horseshoe Bat**	**VU**
Rhinolophidae	*Rhinolophus simulator*	Bushveld Horseshoe Bat	LC
Rhinolophidae	***Rhinolophus swinnyi***	**Swinny's Horseshoe Bat**	**VU**
Soricidae	*Crocidura flavescens*	Greater Red Musk Shrew	LC
Soricidae	*Crocidura silacea*	Lesser Gray-brown Musk Shrew	LC
Soricidae	*Myosorex varius*	Forest Shrew	LC
Soricidae	*Suncus lixus*	Greater Dwarf Shrew	LC
Soricidae	*Suncus varilla*	Lesser Dwarf Shrew	LC

Family	Scientific Name	Common Name	Conservation Status
Vespertilionidae	*Miniopterus sp.*	Long-fingered Bats	
Vespertilionidae	*Miniopterus fraterculus*	Lesser Long-fingered Bat	LC
Vespertilionidae	*Miniopterus natalensis*	Natal Long-fingered Bat	LC
Vespertilionidae	*Myotis tricolor*	Temminck's Myotis	LC
Vespertilionidae	*Neoromicia capensis*	Cape Serotine	LC

5.2.2 Avifauna

A desktop avifaunal investigation was conducted to determine the bird species that may occur within the project area. The total number of bird species is expected to occur within the project area is presented in Appendix 2; however, a total of 8 were considered to be of conservation concern as listed in Table 5-5.

Table 5-5: Avifaunal species that may occur within the project area

Common Name	Species Name	Conservation Status
Swallow, Blue	*Hirundo atrocaerulea*	CR
Stork, Black	*Ciconia nigra*	NT
Secretarybird, Secretarybird	*Sagittarius serpentarius*	NT
Falcon, Lanner	*Falco biarmicus*	NT
Eagle, African Crowned	*Stephanoaetus coronatus*	NT
Kingfisher, Half-collared	*Alcedo semitorquata*	NT
Ground-thrush, Orange	*Zoothera gurneyi*	NT
Warbler, Broad-tailed	*Schoenicola brevirostris*	NT

5.2.3 Herpetofauna

The herpetofauna survey consisted of a desktop study and a field investigation. The desktop study determined that the species listed in Table 5-6. There was one herpetofauna of conservation concern expected for the project area, indicated in bold.

Table 5-6: The possible herpetofauna within the project area

Family	Scientific name	Common name	Conservation Status
Reptiles			
Agamidae	*Agama atra*	Southern Rock Agama	LC
Chamaeleonidae	*Bradypodion transvaalense*	Wolkberg Dwarf Chameleon	LC
Chamaeleonidae	*Chamaeleo dilepis*	Common Flap-neck Chameleon	LC
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake	LC
Colubridae	*Dasypeltis inornata*	Southern Brown Egg-eater	LC

Family	Scientific name	Common name	Conservation Status
Colubridae	*Philothamnus hoplogaster*	South Eastern Green Snake	LC
Colubridae	*Philothamnus natalensis occidentalis*	Western Natal Green Snake	LC
Cordylidae	*Chamaesaura anguina anguina*	Cape Grass Lizard	LC
Cordylidae	*Cordylus vittifer*	Common Girdled Lizard	LC
Cordylidae	*Platysaurus sp.*		LC
Cordylidae	*Platysaurus orientalis orientalis*	Sekhukhune Flat Lizard	LC
Cordylidae	*Pseudocordylus melanotus melanotus*	Common Crag Lizard	LC
Cordylidae	*Smaug vandami*	Van Dam's Girdled Lizard	LC
Elapidae	*Dendroaspis polylepis*	Black Mamba	LC
Elapidae	*Naja annulifera*	Snouted Cobra	LC
Gekkonidae	*Homopholis wahlbergii*	Wahlberg's Velvet Gecko	LC
Gekkonidae	*Lygodactylus capensis capensis*	Common Dwarf Gecko	LC
Gekkonidae	*Lygodactylus nigropunctatus*	Black-spotted Dwarf Gecko	LC
Gekkonidae	*Lygodactylus ocellatus*	Spotted Dwarf Gecko	LC
Gekkonidae	*Pachydactylus vansoni*	Van Son's Gecko	LC
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	LC
Gerrhosauridae	*Tetradactylus breyeri*	Breyer's Long-tailed Seps	LC
Lacertidae	*Nucras lalandii*	Delalande's Sandveld Lizard	LC
Lamprophiidae	*Amplorhinus multimaculatus*	Many-spotted Snake	LC
Lamprophiidae	*Aparallactus capensis*	Black-headed Centipede-eater	LC
Lamprophiidae	*Duberria lutrix lutrix*	South African Slug-eater	LC
Lamprophiidae	*Inyoka swazicus*	Swazi Rock Snake	LC
Lamprophiidae	*Lycodonomorphus inornatus*	Olive House Snake	LC
Lamprophiidae	*Lycodonomorphus laevissimus*	Dusky-bellied Water Snake	LC
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake	LC
Lamprophiidae	*Prosymna stuhlmannii*	East African Shovel-snout	LC
Lamprophiidae	*Psammophis brevirostris*	Short-snouted Grass Snake	LC
Lamprophiidae	*Psammophis crucifer*	Cross-marked Grass Snake	LC
Lamprophiidae	*Psammophylax rhombeatus rhombeatus*	Spotted Grass Snake	LC
Lamprophiidae	*Pseudaspis cana*	Mole Snake	LC
Leptotyphlopidae	*Leptotyphlops scutifrons conjunctus*	Eastern Thread Snake	LC
Scincidae	*Panaspis wahlbergi*	Wahlberg's Snake-eyed Skink	LC
Scincidae	*Scelotes mirus*	Montane Dwarf Burrowing Skink	LC
Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink	LC
Scincidae	*Trachylepis striata*	Striped Skink	LC
Scincidae	*Trachylepis varia sensu lato*	Common Variable Skink Complex	LC

Family	Scientific name	Common name	Conservation Status
Typhlopidae	*Afrotyphlops bibronii*	Bibron's Blind Snake	LC
Frogs			
Brevicepitidae	*Breviceps adspersus*	Bushveld Rain Frog	LC
Brevicepitidae	*Breviceps mossambicus*	Mozambique Rain Frog	LC
Brevicepitidae	*Breviceps verrucosus*	Plaintive Rain Frog	LC
Bufonidae	*Schismaderma carens*	Red Toad	LC
Bufonidae	*Sclerophrys gutturalis*	Guttural Toad	LC
Bufonidae	*Sclerophrys pusilla*	Flatbacked Toad	LC
Heleophrynidae	*Hadromophryne natalensis*	Natal Cascade Frog	LC
Hyperoliidae	*Hyperolius marmoratus*	Painted Reed Frog	LC
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	LC
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	LC
Pipidae	*Xenopus laevis*	Common Platanna	LC
Ptychadenidae	*Ptychadena porosissima*	Striped Grass Frog	LC
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	LC
Pyxicephalidae	*Cacosternum nanum*	Bronze Caco	LC
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog	LC
Pyxicephalidae	*Strongylopus grayii*	Clicking Stream Frog	LC
Pyxicephalidae	*Tomopterna natalensis*	Natal Sand Frog	LC

5.3 Wetlands

5.3.1 Wetland Delineation and Typing

The wetland delineation was conducted with the aid of aerial imagery as well as a site visit conducted in February 2024. Findings indicate that two wetland hydro-geomorphic (HGM) units were identified within the proposed project area. The identified wetland HGM unit is classified as a hillslope seepage wetland connected to a watercourse as well as a channelled valley bottom wetland as indicated in Figure 5-5 below. The identified wetland types are described below.

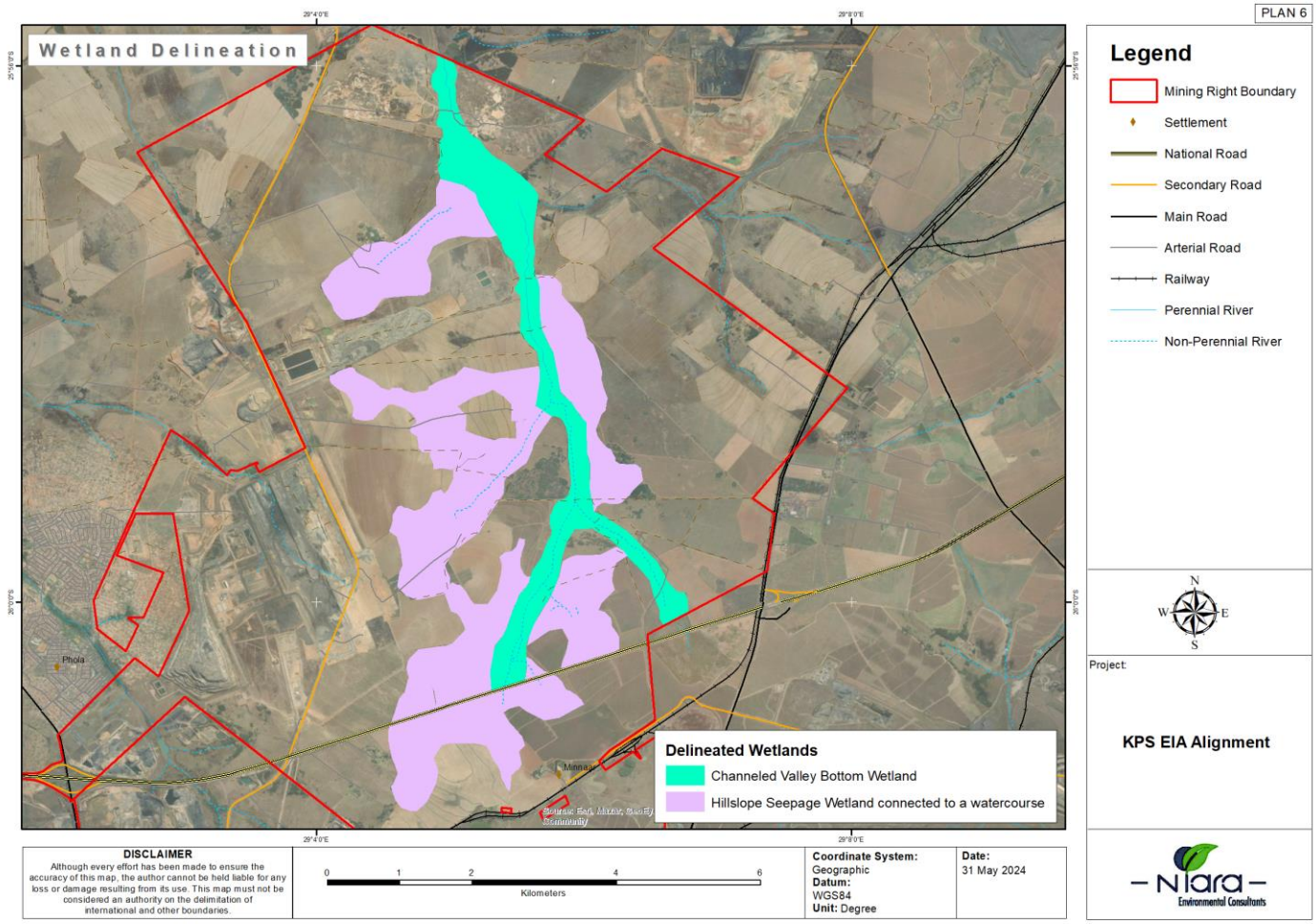

Figure 5-5: Map of the delineated wetland areas within the underground mining area

5.3.1 Hillslope Seepage Wetlands

Hillslope seepage wetlands are usually associated with a perched groundwater table, where precipitation that occurs within the greater catchment is temporarily stored within the soil profile as a result of impervious strata. The impervious strata within the soil profile is normally made up of an un weathered parent material or swelling clays typically associated with granites, sandstones or shales. Hillslope seepage wetlands are expressed where the soil profile is shallow enough such that impervious layer and the water stored within the soil profile are expressed on the surface. The soils in the area must be waterlogged long enough for oxygen to be depleted through a chemical process of reduction which results in the presence of radoximorphic features in the soil. Hillslope seepage wetlands are created and maintained by infiltration processes that occur in the surrounding non-wetland areas within the catchment. Hillslope seepage wetlands connected to watercourses are wetland systems which are directly linked on the surface to watercourses. This type of system typically contributes to flow in the watercourses, even if this contribution is only on a seasonal basis. Some of the indicators used to classify the identified HGM unit are indicated in below in Figure 5-6 below.

Figure 5-6: Typical hillslope seepage wetland features

5.3.2 Channelled Valley Bottom Wetland

The valley bottom wetlands are typically located at the lowest position in a landscape where the water drained from the local slopes accumulate. Water expressed in the hillslope seepage wetlands may also drain towards the valley bottom wetlands. These wetland systems play important functions such as sediment trapping, flood attenuation and nutrient-cycling. The valley bottom wetland on site receives extensive amounts of sediment and flow from the surrounding cultivated slopes as well as from the mining infrastructure (overburden stock piles etc). This allows an opportunity for contact between solute-laiden water and the wetland vegetation, thus providing an opportunity for flood and contaminant (nutrients, pesticides, herbicides) attenuation. Extensive areas of these wetlands remain saturated as stream channel input is spread diffusely across the valley bottom, even at low flows (Kotze et al., 2007). These wetlands also tend to have a high organic content. Facultative wetland indicator plant species, comprising a mixture of grasses and sedges are evident as longitudinal bands within a relatively narrow zone along the valley bottoms. Facultative wetland plant species usually grow in wetlands (67-99% of occurrences) but occasionally are found in non-wetland areas. The valley bottom wetland within the project are has become channelled due to construction of dams, construction of canals to facilitate drainage and excessive erosion. Figure 5-7 below indicates a distinct channel that drains the wetland and the associated soil type.

Figure 5-7: A distinct channel that is typical Channelled Valley Bottom Wetland system

5.3.3 Present Ecological Status

The identified wetlands within the project area is located within an active mining area that has been exposed to coal mining, human settlements and agricultural land use for many years. Some of the anthropogenic impacts identified on the wetlands include:

- Active mining activities in the direct catchment of the wetland area, as well as immediately adjacent to the wetland;
- Mining activities encroaching into the edges of the wetland areas;

- Crop farming encroaching into the edges of the wetland areas
- Overburden and coal stock piling in close proximity to the wetland, potentially adding to the deteriorating water quality;
- Impoundment of flow due to a dam;
- A number of formal and informal road crossings leading to flow impoundment;
- Illegal dumping that impacts the water quality;
- Abandoned mine shaft;
- Active erosion (head cuts);

Based on the findings of the current assessment study, the present ecological state of the wetlands on site can be described as follows. Due to deviation from the reference condition, the hillslope seepage wetland connected to a watercourse located within the project area have been classified as follows:

- **PES-C: Moderately Modified where a moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact and**
- **PES-D): Largely Modified where a large change in ecosystem processes and loss of natural habitat and biota has occurred.**

The Channelled Valley Bottom Wetland located within the project area has deviated significantly from the reference condition such that it has been classified as Seriously Modified (PES: E) where the change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable.

5.4 Land Types and Soil Forms

A land type survey on a scale of 1:250 000 was conducted in the early 1970s to compile inventories of the natural resources of South Africa in terms of soil, terrain, and climate. The land type indicates the dominant soil forms and their occurrence in terms of percentages. The study area comprises of land types of Ba4, Ba5 and Bb13, as illustrated in Figure 5-8 and Figure 5-9. Land type Ba and Bb indicates land in which red and/or yellow-brown apedal soils are dystrophic and/or mesotrophic, dominate over red and/or yellow-brown eutrophic soils. Soils observed during the survey include Witbank, Hutton, Clovelly, Fernwood, and Longlands, as illustrated in Figure 5-10.

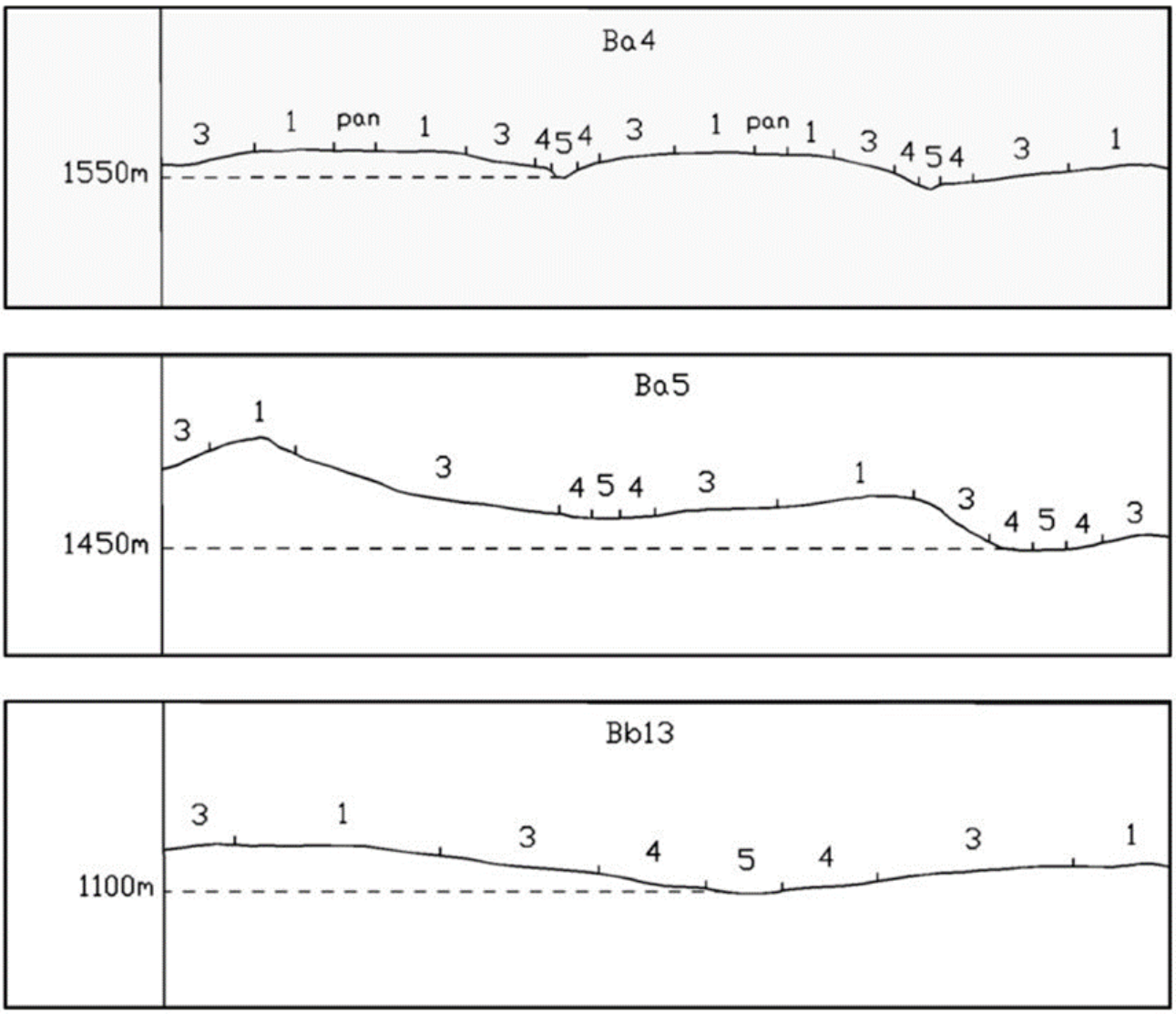

Figure 5-8: Representative Terrain Form Sketch of Land Types

The **Ba4** Land Type is dominated by 45% crest and 40% mid-slope terrain unit positions in the landscape. Other positions in the landscape are foot-slope and valley bottom positions occupying 10% and 5% of the landscape positions respectively see the representative terrain sketch. The **Ba5** Land Type is dominated by 20% crest and 60% mid-slope terrain unit positions in the landscape. Other positions in the landscape are foot-slope and valley bottom positions occupying 15% and 5% of the landscape positions respectively see the representative terrain. The **Bb13** land type is, is dominated by 40 % crest and 45 % midslope positions, the remainder (15 %) is occupied by valley bottom landscape positions see the representative terrain form sketch. The **Hutton** soil form consists of an orthic A and red apedal B over unspecified material. These soils are well-drained, usually slightly acidic, and have a low cation exchange capacity (CEC) due mainly to clay mineral composition (kaolinite, iron oxides) and sometimes low clay content. The **Clovelly** soil form consists of an orthic A and yellow-brown apedal B over unspecified material. Like those of the **Hutton**

form, these soils are well-drained, slightly acidic and have low CEC. The **Longlands** soil form consists of orthic topsoil on an E horizon, over soft plinthic B subsoil. The E horizon is distinguishable by criteria, namely:

- Grey, pale yellow or white matrix colours.
- Being intermittently saturated with water.
- The depletion of iron oxides, clay, and organic matter.
- Being loose when wet and hardens and becomes brittle when dry.

In the study area, the mottling found in the **Longlands** soil form is formed because of the gentle, concave slopes of the study site which intermittently receive Fe-rich water through seepage from surrounding areas. From a land use point of view, the **Longlands** soil form has a low to moderate agricultural potential. The waterlogged, anaerobic conditions can present problems with rooting depth. The Witbank soil form (Transported Technosols), which are materials intentionally transported by human intervention and already been impacted by mining activities (open cast areas and stockpiles). The properties of these soil forms are affected strongly by the nature of the material or the human activity that placed it and they are more likely to be contaminated than soils from other groups. The **Fernwood** soil form consists of orthic A on an E horizon. This sequence of horizons indicates a waterlogged soil indicating a potential lateral water movement in the soil profile on the low water permeability of the sandstone layer underlying the soil observed in low lying areas (seepage zones). Soils with an E horizon as representing 'Permanent or Seasonal Wetness'

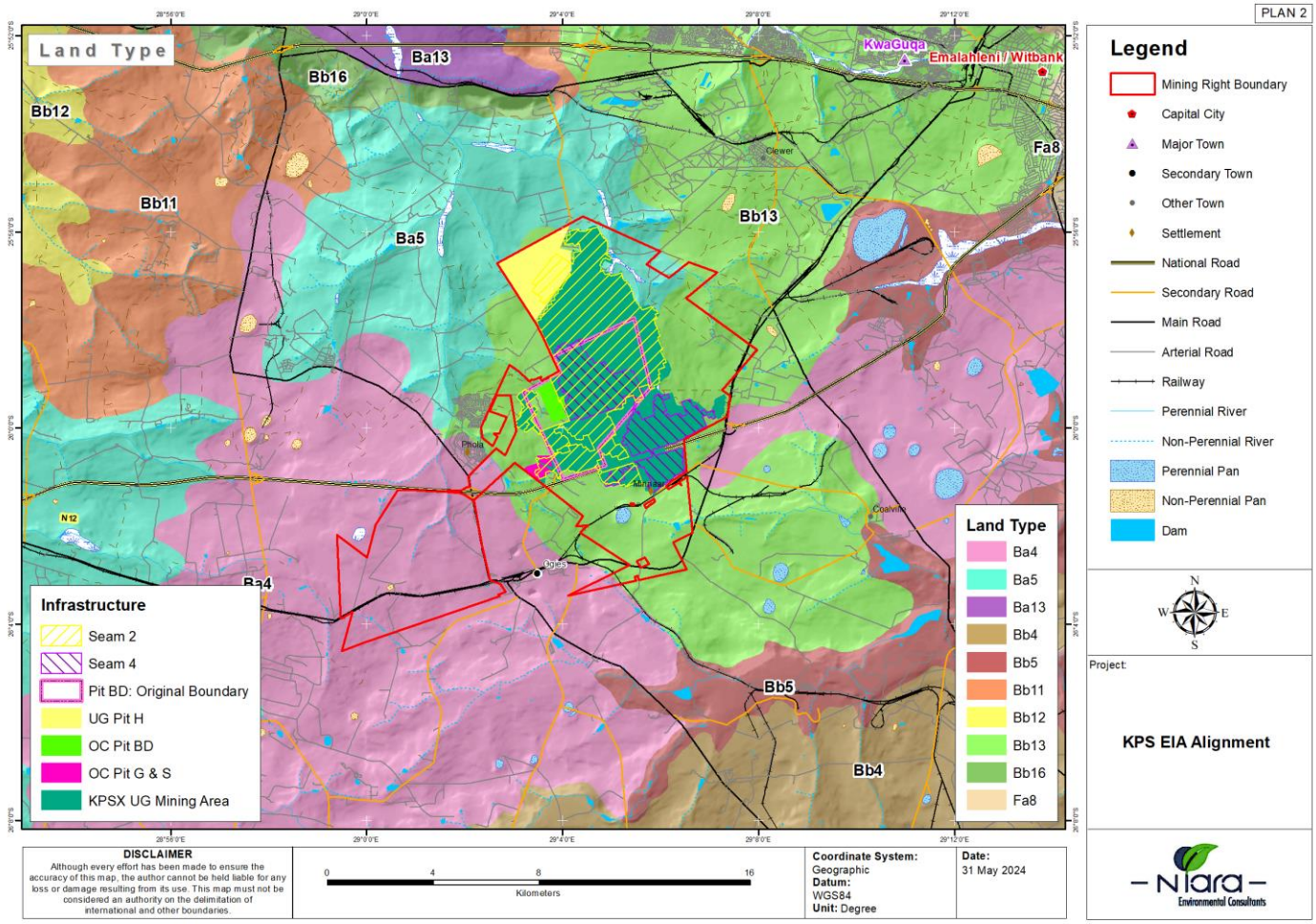

Figure 5-9: Land Types in the Vicinity of the Project Area

Figure 5-10: Examples of the identified soil forms: A – C) Hutton (Red apedal), D) Clovelly, E) Longlands, F) Albic & G – H) Witbank (Transported Technosols)

6 Conceptual Rehabilitation Plan

The conceptual rehabilitation plan is designed for the proposed underground mining expansion and therefore will consider surface infrastructure that will be developed in support of the proposed expansion areas. An adit with the supporting UG conveyors will be constructed to support the UG mining at KPSS. This will be constructed on the existing KPSS OC highwall. Further, additional ventilation shafts and rescue boreholes will be constructed in strategic areas as the mining advances for both KPSX and KPSS. To manage additional dewatering activities from the UG workings, pipelines will be constructed which will link up with existing pipelines on surface and discharge in existing pollution control dams ("PCDs"). Should there be a need in future, a storage dam might also be constructed underground. Potable water supply to the UG workings will be delivered by pipelines which will link up with the existing potable water supply from the Emalahleni Water Treatment Plant. All other existing infrastructure will be utilised to support the proposed UG mining development including PCDs, power supply, haul roads, workshops, pipelines and water supply.

6.1 Pre-Mining

It is important to prepare the land area before mining takes place to ensure that planned activities are conducted efficiently and limit the damage to the receiving environment. Furthermore, the preparation during the pre-mining stage aids in the mine being able to achieve maximise utilisation and recovery of soils, vegetation and other ecologically important aspects of the project area. Some of the points that should be considered during the construction phase of the project are as follows:

- Mine planning should minimise the area to be occupied by mine infrastructure. The affected area should be kept as mijimal as practically possible and should be clearly defined and demarcated;
- Care should be taken around sensitive landscapes e.g. wetlands to ensure that impacts to them are none to minimal and that the buffer zones around these sensitive landscapes are taken into account;
- Construction crews should restrict their activities to planned areas and training on good practices must be conducted to ensure compliance to the instructions and statutory requirements;
- Infrastructure should be designed with closure in mind. Infrastructure should either have a clearly defined dual purpose or should be easy to demolish. This aspect of rehabilitation should be considered if changes in the mine design are made;
- Soil stripping is a very important process which determines rehabilitation effectiveness. It should be done in strict compliance with the soil stripping guidelines, which should define the soil horizons to be removed; and
- If rock quarries or borrow pits are required include them into the environmental plans, however it is suggested that other material could be utilised to avoid further impacts to soils.

6.2 Post-Mining Land Use

Land capability determination is to grade the potential of the land in terms of its best and worst uses in an arable situation. The land is classified according to its limitations, either on a permanent or temporary basis. The system is biased towards soil conservation and is based on the negative features of the land. The classification system is categorised on a scale of I to VIII so yield potential matrices can be easily formulated. Land Capability Class (LCC) I soils to LCC III soils are suitable for arable crops. LCC IV soils can sometimes be cultivated for annual crops, but under carefully controlled conditions. LCC V soils are usually wetlands while LCC VII and VIII soils are suited to domestic livestock and wild game only. The Land Capability Classes and descriptions are presented in Table 6-1. The final post-mining use has been identified as Class VI (grazing), although the land could be classified as Class III or Class IV (arable), it is most practical to utilize the land for grazing.

Table 6-1: The Land Capability Classes (Camp et all., 1998)

Land Capability Class	Description	Land Capability Group
Class I	Little to no limitations, high potential for intensive arable use	Arable
Class II	Land subject to certain limitations or hazards. It is suitable for cropping with adequate protection measures, which may sometimes include special management practices and regular rotations	
Class III	Land subject to moderate limitations or risk of damage, which is suitable for cropping only with intensive protection measures and special practices, which may include long ley rotations with short cropping periods	
Class IV	Land subject to severe permanent limitations or hazards. Suitable for occasional row cropping in long ley rotations, or for use under perennial vegetation. Limitations may include: steep slopes, shallow soils, soils of very low water-retaining capacity, high erodibility, unfavourable characteristics in the surface soil, and severe, but correctable, wetness	
Class V	Watercourses and land subject to wetness limitations. These limitations include temporary, periodic and semi-permanent wetness. Cultivation is only permitted with very special practices and measures. Vleis and watercourses subject to severe wetness are best left under permanent vegetation	Grazing

Land Capability Class	Description	Land Capability Group
Class VI	Land which has such severe soil and/or slope limitations that cropping must be excluded but which is productive under perennial vegetation, but is susceptible to moderate erosion	
Class VII	Not suited for cultivation, severe limitations for grazing or farming	Wilderness
Class VIII	Extremely rough, suited only for wildlife or recreation	

6.3 Soil Management

Soils can be considered the most vital ecological component, particularly for effective rehabilitation. It is important that soils are handled with care and treated with the final result (post-mining capability) in mind. The proposed mining method will be underground mining; however, there will be development of necessary surface infrastructure which will require that soils be handled in the correct manner.

6.3.1 Soil Stripping Method

Correct stripping of soils will firstly ensure that enough soils are available for rehabilitation and secondly, that the soils are of adequate quality to support vegetation growth and thus ensure successful rehabilitation. The following requirements should be considered wherever possible:

- Over areas of deep excavation strip all usable soil as defined (700 mm). Stockpile alluvial/colluvial (transported wet based) soils separately from the in-situ materials, which in turn should be stored separately from the underlying overburden. Store the soils in berms or stockpile dumps of no more than 1.5m high if space allows;
- At rehabilitation replace soil to appropriate soil depths in the correct order, and cover areas to achieve an appropriate topographic aspect and attitude so as to achieve a free draining landscape that is as close as possible the pre-mining land capability rating;
- Over area of conveyor servitudes strip the top 150 mm of usable soil over all affected areas and stockpile in longitudinal stockpile within the mining lease area;
- The lower portions of the subsoil's (>500 mm) and the soft overburden material (where removed) can be stored as separate stockpiles close to the areas where they will be required for backfilling and final rehabilitation;
- It is proposed that prior to soil stripping, an appropriate fertilizer should be added to the sandy loams and silty clay loams at a rate of about 200 kg/ha if they have not previously been fertilized. This will help to enhance the seed pool and encourage growth within the stored materials;

- Soils should be stripped and replaced using the truck and shovel method as far as possible. This method will limit the compaction of soils and soils must be stripped when dry to minimise compaction;
- Close supervision will ensure that soils are being stripped from the correct area and to the correct depths, and placed on the correct stockpiles to minimise compaction; and
- The handling of the stripped topsoil must be minimized.

6.3.2 Stockpiling of Soils

Stockpiling should be minimised as far as possible since it increases compaction and decreases the viability of the seed bank.

The steps that should be taken during soil stockpiling are as follows:

- Mark stockpile locations accurately on a plan to ensure that re-handling is minimised (i.e. soils will not have to be moved a second or third time);
- Ensure that the location is free draining to minimise erosion loss and waterlogging;
- Minimise compaction during stockpile formation. The soils should be kept loose by, preferably, tipping at the edge of the stockpile not driving over the stockpile (avoid end-tipping as this causes compaction).
- The positions of the soil stockpiles should be indicated on a map and the soil stockpiles should be protected using a fence because soil loss due to unauthorised use can and will occur.
- Restrictive stockpile heights are usually recommended because soil quality is affected negatively by anaerobic conditions occurring in large stockpiles. The stockpile height in the case of the Platreef Project can be adjusted according to the space needed because the soil will be stored for a long time before used for rehabilitation purposes. Limit the stockpile height so as to prevent internal compaction (soil stockpiles should be <2 m in height);
- Re-vegetate with a seed mixture similar to the final rehabilitation seed mixture; and
- Ensure that the stockpiled soil is only used for the intended purposes.

6.4 Removal of Infrastructure

The final land use of the post-mining landscape is expected to be grazing and therefore the removal of surface infrastructure such as conveyer belts must take place. In some instances, surface infrastructure that can be utilized for other purposes can be left as is; however, this must be well documented and accounted for.

There are steps to consider during the removal of infrastructure with the main aspects being safety of contractors and consideration of the final landscape. These are a few factors (Tanner *et. al.*) to consider when designating and removing surface infrastructure:

- Identify infrastructure items that may be of use to the future land users;

- In association with those users and the authorities, define what could be left, how it would be used and how sustainable that use would be;
- The remaining infrastructure should be assessed for its suitability for re-use/recycling;
- The re-usable items should be removed from the site;
- Hazardous material locations and deposits require specialised assessment and analysis to determine how these materials should be decontaminated and to ensure that all residual hazardous materials are deposited in officially-sanctioned hazardous waste deposit sites;
- Mining infrastructure that will be left on site must be rendered safe;
- Remaining structures should be demolished and the demolition rubble removed;
- The final landform agreed for the infrastructure areas should be created; and
- Soil should be replaced on the disturbed area and revegetated.

6.4.1 Ventilation Shafts

Ventilation shafts are part of the safety features that are necessary for underground mining to take place safely and in accordance with safety standards. These have surface infrastructure (Figure 6-1) as well as tunnels that are established in the underground mine, the key consideration is the sealing and making safe of these ventilation shafts and any other routes to the underground workings. In all cases, all the access routes must be sealed.

It is recommended that for the closure and rehabilitation of the ventilation shaft, the procedure involves the removal of surface infrastructure, filling of the shaft, as far as practically possible with inert rouble from demolition, or waste materials. The shaft must be sealed with concrete seals, designed by a professional engineer and approved by the DMR and should be positioned in unweathered rock to ensure that they are permanent.

In addition it will be a requirement to install “breather” pipes for gas release, or for water release systems where the ultimate re-establishment of the water table will result in water decant from the shaft position. Finally, the seals should be covered with inert material and topsoil and then re-vegetated.

Figure 6-1: A typical ventilation shaft surface infrastructure (Greene Group Consulting Engineers (Pty) Ltd, 2024)

The following actions will be required in the removal of the ventilation shafts:

- Remove all vent shaft related infrastructure;
- Cap shaft with engineering requirement seal (6.1 m diameter)
- Appropriate topsoil should be replaced to a minimum of 300 mm thick in all rehabilitated areas. This must be included in the monitoring programme;
- Topsoil should be fertilised and ripped to 200 mm to reduce compaction. The fertiliser requirements can only be determined once a fertility assessment is carried out at the proposed project area;
- Reseed with grasses and replant species that were relocated due to mining construction;
- Remove alien invasive plants;
- Prevent access of people/machinery/vehicles/grazing animals on newly rehabilitated land to allow regeneration of vegetation and reduce erosion; and

- Ensure that robust care and maintenance plans are in place.

6.4.2 Conveyor Belt

The conveyer belt will be used to transport mined resources to the processing plant and as presented in Figure 6-2, the conveyor belt is linear infrastructure that may cover a long distance, depending on the requirements. Although it is linear the conveyor belt will alter a long surface area and during the removal of the infrastructure, it must be ensured that these areas are rehabilitated which includes the removal of all infrastructure, removal of fixtures and any concrete foundations, the ripping and preparation of the soil and revegetation of the area.

Figure 6-2: A typical conveyor bel carrying mined resources

The removal of the conveyor belt and its associated infrastructure will require the following actions:

- Infrastructure, including foundations, belts, etc. should be removed:
    - The re-usable items should be removed from the site;
    - Remaining structures should be demolished to 1 m below surface and the demolition rubble removed;
    - Soil should be tested for contamination. If contamination is discovered, this soil should be removed and disposed of at the appropriate waste disposal facility.

- Once the site has been cleared of all infrastructure and rubble and no contamination is present, the exposed underlying materials should be reshaped to create a gently sloping, free-draining topography. Natural drainage lines should be reinstated to limit erosion and sediment build up within local river courses;
- Appropriate topsoil should be replaced (all usable topsoil stripped from these areas should be placed back in these areas) in all rehabilitated areas. This must be included in the monitoring programme;
- Topsoil should be fertilised and ripped to 200 mm to reduce compaction. The fertiliser requirements can only be determined once a fertility assessment is carried out at the proposed project site;
- Reseed with grasses and replant species that were relocated due to mining construction;
- Remove alien invasive plants;
- Prevent access of people/machinery/vehicles/grazing animals on newly rehabilitated land to allow regeneration of vegetation and reduce erosion; and
- Ensure that robust care and maintenance plans are in place.

6.4.3 Rescue Boreholes

Rescue boreholes are a part of an underground operation's safety and rescue plan and are drilled strategically as the underground mining progresses. These boreholes are large diameter boreholes () and will have surface infrastructure to facilitate access and rescue operations, as well as subsurface tunnels and casings along with whatever is deemed necessary, including refuge bays. During the closure and rehabilitation phase, the operation, on expert advise, decommission all these boreholes or maintain others as release boreholes after closure. Those that will be decommissioned will be required to remove all surface infrastructure, remove casings and any other infrastructure associated and then backfill these boreholes as far as practically possible with inert rouble from demolition, or waste materials. The shaft must be sealed with concrete seals, designed by a professional engineer and approved by the DMR and should be positioned in unweathered rock to ensure that they are permanent.

Figure 6-3: Large diameter drilling for rescue boreholes (Georoc, 2024)

The removal of the conveyor belt and its associated infrastructure will require the following actions:

- Infrastructure, including foundations, belts, etc. should be removed:
- Seal all underground access with a concrete plug on accordance with engineering requirements;
- Once the site has been cleared of all infrastructure and rubble and no contamination is present, the exposed underlying materials should be reshaped to create a gently sloping, free-draining topography. Natural drainage lines should be reinstated to limit erosion and sediment build up within local river courses;
- Appropriate topsoil should be replaced (all usable topsoil stripped from these areas should be placed back in these areas) in all rehabilitated areas. This must be included in the monitoring programme;
- Topsoil should be fertilised and ripped to 200 mm to reduce compaction. The fertiliser requirements can only be determined once a fertility assessment is carried out at the proposed project site;

- Reseed with grasses and replant species that were relocated due to mining construction;
- Remove alien invasive plants;
- Prevent access of people/machinery/vehicles/grazing animals on newly rehabilitated land to allow regeneration of vegetation and reduce erosion; and
- Ensure that robust care and maintenance plans are in place.

6.5 Subsidence

It is proposed that waste rock material will be utilised to fill the bords and that the pillars will be removed. This is being undertaken to allow for complete extraction of the mineral from the underground workings. It is important to note that when pillar extraction "robbing" is undertaken that there is a potential risk for subsidence to occur. This is as a result of the back areas being left unsupported and are allowed to collapse. This collapse will continue until the resistance to compaction of the collapsed material equals the weight of the overlying material. The rate of collapse can be slow and it is anticipated that the rate of collapse will take several weeks for 90% of the total subsidence to occur, the remainder subsidence will occur over several years.

To mitigate against the potential of subsidence occurring at KPSS and KPSX will use a paste material to fill the bords left and then remove the pillars. This is being done to avoid the risk of subsidence occurring as the roof of the underground workings will be supported by the constructed pillars from waste material. In order to mitigate against the possibility of subsidence occurring a Rock Mechanic should be consulted during the process to ensure the correct safety factors are put into place

6.6 Final Landform and Shaping

Once the mine site has been cleared of all infrastructure and rubble the exposed underlying materials should be reshaped to create a gently sloping, free-draining topography. The topsoil that was removed during the construction phase should be replaced, fertilised and ripped.

In cases where the foundations of the structures are impractical to remove, the foundations should be covered with a combination of soft overburden or B horizon material topped with a layer of topsoil. This layer should be at least 1 m thick.

After these tasks have been completed the infrastructure sites can be included in the rehabilitation process for the rest of the mining area for re-vegetation, monitoring and maintenance.

The question is raised time and time again, can impacted mine land be rehabilitated back to the pre-mining land use and will there be a reduction in the land capability post mining (impacts to crop yields pre and post mining). The answer to this question is dependent on several factors, such as the capability of the mine to undertake rehabilitation successfully, soil stripping and stockpiling during mining, placement of soil during rehabilitation, progressive monitoring of both topsoil stockpiles and rehabilitated areas and nutrients available in the soil post rehabilitation.

6.7 Vegetation

The objectives for the re-vegetation of reshaped and top-soiled land are to:

- Prevent erosion;
- Re-establish eco-system processes to ensure that a sustainable land use can be established without requiring fertilizer additions; and
- Restore the biodiversity of the area as far as possible

To ensure successful vegetation, the following steps are to be treated as a best-practice guide:

1. Ensure that the soils have been replaced correctly according to the soil replacement guideline;
2. All soils are to be ripped to full potential rooting depth to correct compaction induced by the soil replacement activity;
3. Analyse the topsoil to determine the lime and fertilizers requirements;
4. Prepare the soil by adding lime and fertilizer and ploughing the area, followed by tillage to prepare the seed bed;
5. Plant a grass seed mixture consisting of a range of indigenous or non-invasive naturalised species. For wetland areas, Imperata cylindrica (Cotton Wool Grass) can be hand planted and hydrophilic species can be worked into the seed mix. Recommendations regarding the seed mixtures for both grassland areas and wetland areas is provided further on in the report (Where good quality grazing land or wilderness land soil is replaced by direct transfer – this will be avoid the need to plant grass mixtures. The majority of plant species present in the un-mined areas will re-establish naturally, provided the soils are replaced correctly and the tillage is done correctly;
6. Inspect the area after a good rainfall event;
7. Control and remove weeds where necessary;
8. Repeat the procedure for the next growing season;
9. Application of fertilisers is crop and site specific, analysis of the soils and stockpiles should be undertaken to determine the appropriate fertilisers to be used, if required;
10. Define and establish the long-term land management system (grass needs regular defoliation if it is to be sustainable);
11. Leave pasture to allow natural grasses to become re-established;
12. Conduct annual monitoring (repeatable demarcated transect surveys); and
13. Steps 9 to12 will apply for areas that were previously under crops, or where significant infestations of alien species were present. Initial establishment of improved pastures will result in a more ecologically satisfactory end product.

6.7.1 Secondary Grassland

There will be areas of the surface that will not be impacted by surface infrastructure; however, are considered poor secondary grassland. These areas must be continually rehabilitated and monitored to ensure that species diversity is introduced. Furthermore, these areas will serve as template for final closure phase and as a seed bank at the final stage. It is therefore recommended that a species plan and fertilization strategy be developed and/or implemented for these areas that will remain unaffected by infrastructure footprint.

6.7.2 Infrastructure Areas

The areas that will need to be backfilled, cleared and re-soiled must be revegetated to protect the soil and promote diversity throughout the project area in the post-mining landscape. It is imperative that revegetation of these areas considers preservation of soil and establishment of vegetation above diversity in the initial closure period.

6.7.3 Methods of Vegetation

The common methods used to establish vegetation include seeding and hydroseeding. Flat areas should be seeded using tractor implements and slopes too steep for tractors should be hydroseeded.

In the event where soils are stripped and returned directly (i.e. no stockpiling) and the areas stripped have good vegetation cover with suitable species present, natural re-colonisation may occur and there will be no need for re-seeding. In this case, it may be best to simply replace the stripped soils, lightly level and rip thoroughly, and leave for one growing season to assess the extent and suitability of the natural re-vegetation, however, this method is not suitable for any areas previously infested with alien invader species such as wattle.

Mulching with locally cut grass will also enhance the seed bank and ecological succession.

6.7.4 Alien Invasive Plants (AIP) and Weed Management

Alien invasive species are known to proliferate in areas that have been disturbed and will outcompete the indigenous flora leading to large infestations. It is important that an AIP Management Plan be developed and updated accordingly for the duration of he mining and the post-mining phase.

6.7.4.1 Control Measures

Alien species control programmes are long-term management projects and should consist of a clearing plan which includes follow up actions for rehabilitation of the cleared area. The lighter infested areas should be cleared first to prevent the build-up of seed banks. Pre-existing dense mature stands ideally should be left for last, as they probably won't increase in density or pose a greater threat than they are currently. Collective management and planning with neighbours may be required in the case of large woody invaders as seeds of alien species are easily dispersed across boundaries by wind or watercourses. All clearing actions should be monitored and documented to keep records of which areas are due for follow-up clearing.

6.7.4.1.1 Mechanical Control

This entails damaging or removing the plant by physical action. Different techniques could be used, e.g. uprooting, felling, slashing, mowing, ringbarking or bark stripping. This control option is only really feasible in sparse infestations or on a small scale, and for controlling species that do not coppice after cutting. Species that tend to coppice, need to have the cut stumps or coppice growth treated with herbicides following the mechanical treatment. Mechanical control is labour intensive and therefore expensive and could cause severe soil disturbance and erosion.

Different species require different clearing methods such as manual, chemical or biological methods or a combination of both. Care should however be taken that the clearing methods used do not encourage further invasion and that they are appropriate to the specific species of concern. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum. Fire should not be used for alien species control or vegetation management at the site. The best-practice clearing method for each species identified should be used.

Table 6-2: Advantages and Disadvantages of Mechanical removal

Advantage	Disadvantage
Effective method in areas with low infestations	Not an effective method for dense infestations, as the cost of clearing is extremely high, with little or no impact
High job creation and associated poverty alleviation potential	Time consuming – may be slower to complete than other forms of control
No contamination of water with herbicides as these are applied directly to the tree	If no herbicides are used, then the manual control techniques must be very well executed to ensure success

6.7.4.1.2 Chemical Control

Although it is usually preferable to use manual clearing methods where possible, such methods may create additional disturbance which stimulates alien plant invasion and may also be ineffective for many woody species which re-sprout. Where herbicides are to be used, the impact of the operation on the natural environment should be minimised by observing the following:

- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control.
- All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures.
- Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of at a suitable site.
- To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.
- Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation.
- The appropriate health and safety procedures should also be followed regarding the storage, handling and disposal of herbicides.

- The use of chemicals is not recommended for wetland areas.

For all herbicide applications, the following Regulations and guidelines should be followed:

- Working for Water: Policy on the Use of Herbicides for the Control of Alien Vegetation.
- Pesticide Management Policy for South Africa published in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) – GNR 1120 of 2010.
- South African Bureau of Standards, Standard SANS 10206 (2010)

According to Government Notice No. 13424 dated 26 July 1992, it is an offence to "*acquire, dispose, sell or use an agricultural or stock remedy for a purpose or in a manner other than that specified on the label on a container thereof or on such a container*".

Contractors using herbicides need to have a valid Pest Control Operators License (limited weeds controller) according to the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947). This is regulated by the Department of Agriculture, Forestry and Fisheries.

Table 6-3: Advantages and Disadvantages of Chemical removal

Advantage	Disadvantage
Achieve results over a short period (within 6 weeks of application).	Herbicides are expensive.
Large areas can be treated quickly.	The use of herbicides may contaminate sites used for drinking water, for washing and for fishing, and can therefore threaten human and animal health
Complements mechanical control methods, increasing the effectiveness of IAP control activities.	May kill non-target plants or species.
	Specialised training and certification is required for use of herbicides

6.8 Monitoring Plan

The requirement to monitor and audit should be carried through all phases of the proposed exploration activities (i.e. planning and operational phases). Please refer to the EMPr for the details regarding the monitoring of compliance and the specific monitoring tools and outcomes specified.

The plan will provide details as to the frequency of the monitoring efforts to ensure the maintenance of the system is conducted. The primary focus for the plan is to evaluate the success of the rehabilitation efforts. Numerous monitoring frequencies have been proposed for this aspect of the project, the details of which are presented in Table 6-4. Further descriptions (clarity) of the referred to frequencies is discussed below.

Rehabilitation: Monitoring will be required for the wetlands during the rehabilitation period to determine if the measures are being applied correctly, and if any unforeseen issues need to be addressed. This monitoring can be undertaken by the Environmental Control Officer (ECO) appointed to oversee compliance for the project.

Post-rehabilitation: After completion of the rehabilitation phase, wetland areas should be monitored to evaluate the success of the rehabilitation efforts. In the unlikely event of potential "risks" to the systems being identified, this inspection may allow for corrective

measures to be applied. This monitoring can be undertaken by the Environmental Control Officer (ECO) appointed to oversee compliance for the project.

Seasonal monitoring: The applicant must appoint an independent contractor to conduct seasonal (wet season) monitoring for a period of two years after the completion of the rehabilitation measures. The monitoring should be conducted during October or shortly after the first summer rains, and also after any intensive rainfall events. A further monitoring surface should be conducted towards the end of the wet season (March). The monitoring should inspect the following:

- Evidence of any erosion gullies or scouring of the area;
- Recovery of the vegetation layer;
- Extent of alien vegetation establishment;
- Effect of storm water management, and structural integrity and efficiency;
- The stability of the embankments and gabion structures; and
- The ecological integrity and functioning of the wetland system

Table 6-4: The proposed monitoring plan for the project

Variables	Methods	Monitoring Frequency	Indicator	Corrective Action
Wetland status and functioning	• Standard wetland methods to determine wetland PES, EIS and ecological services •	• Bi-annually for the first two years post-closure •	• Maintain (at least) the REC for the wetland system	• Regular inspections and monitoring of the wetlands. • Review and amended rehabilitation measures to be implemented for corrective action
Vegetation cover	• Monitor species and cover abundance • Monitor indigenous vs alien plant encroachment • Photography record •	• After rehabilitation • Seasonal for the first two years	• Establishment of primarily indigenous plants • Ground cover abundance must be increasing	• Replanting of indigenous plants should be done at sites of concern
Erosion	• On-site inspection • Photography record • Compare to adjacent areas •	• After rehabilitation • Seasonal for the first two years post-closure and soon after heavy rainfall events	• Areas with no cover • Erosion gullies and flow paths • Storm water discharge area	• Short term: Rocks / boulders, and on-site debris • Medium term: Replanting of indigenous vegetation • Long term: Rehab methods that may include gabion

Variables	Methods	Monitoring Frequency	Indicator	Corrective Action
				baskets, mattresses and should be discussed with specialists
Sedimentation	• On-site inspection • Photography record	• During & after rehabilitation • Seasonal for the first two years post-closure and soon after heavy rainfall events	• Scouring and erosion of the area • Excess sediment in wetlands	• Sources of sedimentation should be noted and addressed • If possible, excess sediment can be removed manually.
Exotic Invasive Plant Species	• Monitor exotic invasive plant encroachment • On-site inspection • Photography record •	• After rehabilitation and follow- up clearing • Seasonal for the first two years post-closure	• Establishment of exotic invasive plant species	• Removal of exotic plants. • Do not use chemicals for the removal process

7 Knowledge Gaps

The following knowledge gaps have been identified, concerning threats, opportunities and uncertainties to the compilation of this plan:

- Complete a numerical or analytical groundwater model for the project site for a closure scenario;
- Ongoing surface water and groundwater quality monitoring during the operational LoM to determine trends over time and to monitor changes in water quality over time to determine if the mine is impacting water quality and/or quantity within the vicinity of the mine;
- Updated approved rehabilitation designs for all areas;
- Rehabilitation audits confirming the standard and sustainability of the rehabilitation undertaken; and
- Ongoing engagement with communities and stakeholders surrounding the area to develop a social closure plan.

Additional work will be required to improve the understanding of the abovementioned gaps and reduce the level of uncertainty. It is recommended that these knowledge gaps be addressed as soon as possible once the mine has been commissioned.

8 Financial Provision Determination

8.1 Cost Determination

Regulations 53 and 54 of the MPRDA require that the holder of a mining right must make full financial provision for rehabilitation of negative environmental impacts.

The methodology is guided by the Department of Mineral Resources (DMR) "Guideline Document for the Evaluation of the Quantum of Closure- related Financial Provision Provided by a Mine" (DME, 2005), as per the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

- The financial provision must guarantee the availability of sufficient funds to undertake the following:
- Rehabilitation of the surface area;
- The prevention and management of pollution of the atmosphere;
- The prevention and management of pollution of water and the soil;
- The prevention of leakage of water and minerals between subsurface formations and the surface; of the adverse environmental impacts of the listed or specified activities;
- Decommissioning and final closure of the operations;
- Post closure management of residual and latent environmental impacts.

As part of the transitional period, the Department of Mineral Resources (DMR) still accepts the DMR quantum methodology[1] as part of the transitional period of GN R1147 (Government Gazette 42464, 2019).

8.2 Describe The Closure Objectives and The Extent to Which They Have Been Aligned to The Environmental Authorisation Described Under the Regulation.

The existing rehabilitation and closure objectives for KPS include the following:

- Identify post-closure uses of land occupied by mine infrastructure in consultation with the surrounding landowners. Should a suitable use for any mine infrastructure not be found, it will be demolished and removed;
- Rehabilitate all disturbed land to a condition that is suitable for its post-closure uses;

[1] DMR (2005): Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision by a Mine

- Rehabilitate all disturbed land to a condition that facilitates compliance with applicable environmental quality objectives, such as air and water quality objectives as an example;
- Reduce the visual impact of the mine components through rehabilitation of all disturbed land and residue deposits;
- Rehabilitate all disturbed land and residue deposits to a condition where post-closure management is minimised; Develop a retrenchment programme promptly;
- Keep authorities informed of the progress of the activities during the Decommissioning Phase;
- Submit monitoring results to the relevant authorities; and
- Maintain the required pollution control facilities and the condition of the rehabilitated land following closure.

8.3 Financial Provision Estimate

Based on the above approach and assumptions, the immediate final rehabilitation and closure costs, as of April 2024, for this project based at KPS is **R 1 248 705 331.75** (including VAT). Refer to Table 8-1 for a summary of the financial provision estimate.

Table 8-1: Summary of the Financial Provision Estimate

2024 Financial Provision update - Klipspruit Colliery							
Based on DMRE guideline for the evaluation of the quantum (2005)							
Immediate (unscheduled closure)							
Mine:	Klipspruit Colliery		**Location:**				Mpumalanga province
Mine right ref. no.		MP 30/5/1/2/2/125 MR				**Date:**	Feb-24
No.	**Description**	**Unit**	**Quantity**	**Master Rate**	**Multiplication factor**	**Weighing factor 1**	**Amount (Rand)**
1	Dismantling of processing plant	m³	21217.57	R 19.64	1.00	1.00	R 416 727.16
2(A)	Demolition of steel buildings & structures	m²	42653.83	R 269.45	1.00	1.00	R 11 493 177.42
2(B)	Demolition of reinforced concrete structures	m²	226988.29	R 397.09	1.00	1.00	R 90 134 271.32
3	Rehabilitation of access roads	m²	2014714.65	R 48.22	1.00	1.00	R 97 145 106.62
4(A)	Demolition and rehabilitation of electrified railway lines	m	38393.81	R 468.00	1.00	1.00	R 17 968 160.02
4(B)	Demolition and rehabilitation of non-electrified railway lines	m	0.00	R 255.27	1.00	1.00	R -
5	Demolition of housing and facilities	m²	24071.40	R 538.90	1.00	1.00	R 12 972 194.46
6	Opencast rehabilitation including final voids and ramps	ha	439.23	R 274 274.19	1.00	1.00	R 120 469 451.48

7	Sealing of shafts, adits and inclines	m³	0.00	R	144.65	1.00	1.00	R	-
8(A)	Rehabilitation of overburden and spoils	ha	259.95	R	188 333.05	1.00	1.00	R	48 957 383.86
8(B)	Processing waste deposits and evaporation ponds (salt)	ha	0.00	R	234 565.41	1.00	1.00	R	-
8(C)	Processing waste deposits and evaporation ponds (acid, metal)	ha	442.90	R	681 289.14	1.00	1.00	R	301 744 508.25
9	Rehabilitation of subsided areas	sum	67.00	R	157 700.57	1.00	1.00	R	10 565 938.00
10	General surface rehab and grassing	ha	939.27	R	149 191.54	1.00	1.00	R	140 131 767.85
11	River diversions	ha	0.00	R	149 191.54	1.00	1.00	R	-
12	Fencing	m	44623.29	R	170.18	1.00	1.00	R	7 594 013.06
13	Water management	ha	420.53	R	56 726.82	1.00	1.00	R	23 855 557.66
14	2 to 3 years of maintenance and aftercare	ha	2528.31	R	19 854.39	1.00	1.00	R	50 198 108.49
15	Specialist studies	ha	0.00	R	-	1.00	1.00	R	-
			Sub-Total 1				***Sum of items (1 - 15)***	**R**	**933 646 365.66**
			Preliminary and general costs				*Add 6% of sub-total 1 if sub-total 1 > 100 000 000*	R	56 018 781.94
			Weighing factor 2				*Multiply P&G cost by Weighing factor 2 (1.05)*	R	58 819 721.04
			Contingency				*10% of sub-total 1*	R	93 364 636.57
			Sub-total 2				***Sum of weighing factor 2 & contingency***	***R***	***152 184 357.60***
			Sub-total 3				***Sum of sub-totals 1 & 2***	***R***	***1 085 830 723.26***
			Vat				15% of sub-total 3	R	162 874 608.49
							GRAND TOTAL	**R**	**1 248 705 331.75**

9 Motivation for Amendments

This rehabilitation and closure plan has been aligned with the proposed mining method and associated infrastructure changes for KPS and no further amendments are required.

10 Concluding Remarks

Mine rehabilitation must be considered as an on-going process aimed at restoring the physical, chemical and biological quality or potential of air, land and water regimes disturbed by mining to a state acceptable to the regulators and to post mining land users (Whitehorse Mining Initiative, 1994).

The overall objective of the rehabilitation plan is to ensure activities associated with the Nabu Project and associated infrastructure will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem. With respect to what has been recommended in the rehabilitation plan, there is a possibility that there may be long term post closure liabilities that need to me mitigated. Rehabilitation can and should reduce the significance of these liabilities, however liabilities such as groundwater impacts and the potential for AMD formation need to be considered and the appropriate tools adopted in the attempt to reduce the severity of this impact in the long term.

This Plan was compiled in alignment with the requirements of NEMA GNR 1147 and based on information available at the time. Specifically, it provides the closure vision, objectives, actions, relinquishment criteria and monitoring requirements against which to assess the successful rehabilitation of Klipspruit Colliery. This Plan should be reviewed and amended as the mine develops and additional information or data is received.

It is understood that the landscape can never be returned to its pre-mining condition; however, closure and rehabilitation is 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, that seek to return the post-mining landscape to best possible ecologically sound state. These rehabilitation and closure activities will aid to achieve a more satisfactory environmental conclusion and reduce the financial burden of closure and rehabilitation. Rehabilitation and closure objectives have been tailored to the project at hand with the objective of assisting Seriti in carrying out successful rehabilitation and ensuring the best possible ecological condition of the site once mining is completed.

It is recommended that the following actions be taken prior to the update of the Rehabilitation, Decommissioning and Mine Closure Plan:

- Care must be taken when stripping and stockpiling soil due to the sensitive nature of the soils on site;
- Soil stockpile locations need to be determined and sited away from sensitive landscapes, such as pans/wetlands;
- Implement the measures as outlined in the specialist studies to minimise the risk to surface/groundwater contamination from the operations during rehabilitation and closure;

- Further trials should be conducted during the operational phase to determine other rehabilitation options that could be considered for the closure and rehabilitation of the disturbed site;
- There should be a constant interaction and communication with local stakeholders, so that their requirements can be taken into consideration in the rehabilitation process;
- Regular audits should be undertaken by a soil scientist during the soil stripping process. This will guarantee that soils are stripped and stockpiled correctly;
- Regular monitoring of the groundwater should take place in order to determine if there is a potential for mine affected water to occur;
- Regular update of the ERA as more information becomes available;
- Invasive alien plants should be removed on an ongoing basis; and
- Monitoring and maintenance of the rehabilitated areas should take place on an annual basis for at least three years after closure

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Seriti Power (Pty) Ltd: Klipspruit Colliery

Closure Liability Report FY24 in line with MPRDA regulations

Report date:	4/17/2024
DMRE Reference:	MP 30/5/1/2/2/125 MR
Report Reference:	SER-GRO-22-07-06

SHANGONI
Management Services (Pty) Ltd

Stewards | Problem Solvers | Team Players

Influencing decisions since 2000 through identification, quantification and mitigation of environmental, safety, health and compliance risks

CLOSURE LIABILITY UPDATE REPORT FY24 (MPRDA)

COMPILED IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT NO 28 OF 2002) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) REGULATIONS PERTAINING TO THE FINANCIAL PROVISION FOR PROSPECTING, EXPLORATION, MINING OR PRODUCTION OPERATIONS (GN. NO. R. 1147, 20 NOVEMBER 2015)

Mine Name	Seriti Power (Pty) Ltd: Klipspruit Colliery
Location	Ogies, Mpumalanga Province
Project	Annual closure liability review and update
Document	Closure Liability Update Report FY24 (in line with MPRDA)
Project Number	SER-GRO-22-07-06
Seriti Reference	RFP/HO/1861/AK/ IFRS and NEMA accounting provisions - YEAR 2 (2024) - SER-GRO-22-07-07
DMRE Reference No	MP 30/5/1/2/2/125 MR
Compiled by	Anika van Vuuren
Technical reviewer	Jan Nel
Date	April 2024

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SHANGONI
Management Services (Pty) Ltd

Executive summary

Project context:

Shangoni Management Services (Pty) Ltd ("Shangoni") was appointed by Seriti Power (Pty) Ltd ("Seriti Power"). to review and update the closure liability for Klipspruit Colliery located near Ogies, Mpumalanga Province. The purpose of this document is to provide the closure liability calculation for the operation as required by the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA") and the Mineral and Petroleum Resources Development Act, (Act 28 of 2002) ("MPRDA").

Summarised updated liability:

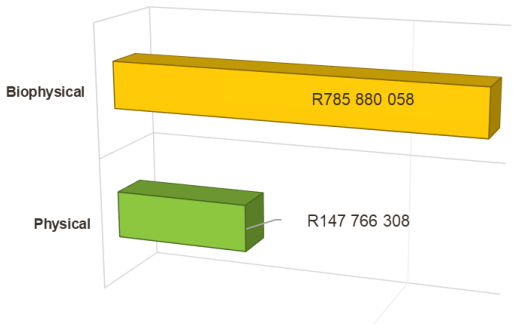
Item	Total
Physical	R147 766 308
Biophysical	R785 880 058
Sub-Total 1 (Sum of items 1 - 15)	***R933 646 366***
Preliminary and general costs (P&Gs) (6%)	R56 018 782
P&Gs and Weighing factor 2 (5%)	R58 819 721
Contingency (10%)	R93 364 637
Sub-total 2 (P&Gs and contingencies)	***R152 184 358***
Sub-total 3 (Excluding VAT)	**R1 085 830 723**
VAT (15%)	R162 874 608
Grand Total	**R1 248 705 332**

Summary:

The closure liability for Klipspruit Colliery is R1 085 830 723 (Excl. VAT).

The liability is made up of two main components namely physical (demolition/removal of infrastructure) and biophysical (rehabilitation of disturbed areas).

The largest portion of the liability lies with the biophysical cost components including the rehabilitation of the opencast pit, overburden dump and spoils and general surface rehabilitation.



FY23 Liability:
R1 031 450 485 (Excl. VAT)

FY24 Liability:
R1 085 830 723 (Excl. VAT)

5.3% / R54 380 238 increase

Reason for change:

- Rates used in FY23 were updated with CPI (December 2023) of 5.1%.
- Updated mining and general disturbed footprints
- Newly constructed infrastructure included (Fraser plant, Blue Mining additional infrastructure, Transfer tanks at KPSX).

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Definitions

Term	Explanation
Concurrent rehabilitation	Rehabilitation that occurs during the process of mining as the ore body is mined out in parts of a mine.
Environment	The surroundings (biophysical, social and economic) within which humans exist and that are made up of: (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Impacts	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
Financial Provision	The insurance, bank guarantee, trust fund or cash that applicants for an environmental authorisation must provide in terms of this Act guaranteeing the availability of sufficient funds to undertake the- (a) rehabilitation of the adverse environmental impacts of the listed or specified activities; (b) rehabilitation of the impacts of the prospecting, exploration, mining or production activities, including the pumping and treatment of polluted or extraneous water; (c) decommissioning and closure of the operations;

Term	Explanation
	(d) remediation of latent or residual environmental impacts which become known in the future; (e) removal of building structures and other objects; or (f) remediation of any other negative environmental impacts.
Land use	The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.
Rehabilitation	The process of reshaping and re-vegetating land to restore it to a stable condition with a land-use that is appropriate for the particular location and is not associated with any pollution issues such as water pollution.
Topography	Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.
Vegetation	All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.
Waste	As per the definition of the National Environmental Management: Waste Amendment Act, 2014 – means (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the Act; or (b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste: (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered; (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered; (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

Abbreviations

BoQ	Bill of Quantities
CPI	Consumer Price Index
DMRE	Department of Mineral Resources and Energy
EIA/EMPr	Environmental Impact Assessment and Environmental Management Programme report
FRDMCP	Final Rehabilitation Decommissioning and Mine Closure Plan
JV	Joint Venture
LOM	Life of Mine
MPRDA	Mineral and Petroleum Resources Development Act
MRA	Mining right area
NEMA	National Environmental Management Act
P&Gs	Preliminary and General costs
PCD	Pollution Control Dam

1. Introduction

1.1. Appointed reviewer

Table 1: Appointed reviewer & experience

Name of firm	Shangoni Management Services
Postal address	P.O. Box 74726 Lynnwood Ridge 0040
Telephone No.	(012) 807 7036
Fax	(012) 807 1014
E-mail	anika@shangoni.co.za

Team of Environmental Assessment Practitioners on project

Name	Qualification	Responsibility
Jan Nel	M.Sc. Environmental Management (UFS)	Technical and quality assurance
Anika van Vuuren	B.Sc. (Hons) Environmental Management (NWU)	Liability review and update

Relevant experience of the project team is provided in Appendix C.

1.2. Mine details

Table 2: Mine / Client details

Aspect	Description
Company name	Seriti Power (Pty) Ltd (“Seriti Power”)
Name of Mine	Klipspruit Colliery
DMRE Ref. No.	MP 30/5/1/2/2/125 MR
Responsible Person	Nicola Torley
Physical address	15 Chaplin Road Cnr. Oxford and Chaplin Roads Illovo Sandton 2196
E-mail	nicola.torley@seritiza.com

1.3. Project background

Seriti is a broad based, 91% black owned and controlled South African mining company co-owned by four anchor shareholders namely the Masimong Group, Thebe Investments, Zungu Investments (Zico) and Community Investment Holdings (CIH).

Shangoni Management Services (Pty) Ltd ("Shangoni") was appointed by Seriti Power to review and update the closure liability cost for the Seriti Klipspruit Colliery. The operation is situated in the Mpumalanga Province, 6km north of the town of Ogies.

The purpose of this document is to supply the Department of Mineral Resources and Energy ("DMRE") with the closure liability estimate for the activities associated with the operation at Klipspruit Colliery as required by the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA") and the Mineral and Petroleum Resources Development Act, (Act 28 of 20025) ("MPRDA").

2. Legislation and guidelines applicable

2.1. The MPRDA (2002) (Act 28 of 2002) and regulations

The Mineral and Petroleum Resources Development Regulations as published in GN R527 in GG 26275 of 23 April 2004, as amended (MPRDR) are still in force and applicable to mine closure. The following principles in regulation 56 of the MPRDR govern mine closure:

"*In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that -*

a) the closure of a prospecting or mining operation incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation;
b) risks pertaining to environmental impacts must be quantified and managed pro-actively, which includes the gathering of relevant information throughout the life of a prospecting or mining operation; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014.
c) the safety and health requirements in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) are complied with;
d) residual and possible latent environmental impacts are identified and quantified; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014.
e) the land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development; in accordance with the provisions of the National Environmental Management Act, 1998, the Financial Provision Regulations, 2015 and the Environmental Impact Assessment Regulations, 2014; and
f) prospecting or mining operations are closed efficiently and cost effectively."

Regulation 54 of the MPRDR states that:

(1) The quantum of the financial provision as determined in a guideline document published by the Department from time to time, include a detailed itemization of all actual costs required for-

(a) premature closure regarding-

(i) the rehabilitation of the surface of the area;

(ii) the prevention and management of pollution of the atmosphere;

(iii) the prevention and management of pollution of water and the soil; and

(iv) the prevention of leakage of water and minerals between subsurface formations and the surface.

(b) decommissioning and final closure of the operation; and

(c) post closure management of residual and latent environmental impacts.

(2) The holder of a prospecting right, mining right or mining permit must annually update and review the quantum of the financial provision -

(a) in consultation with a competent person;

(b) as required in terms of the approved environmental management programme or environmental management plan; or

(c) as requested by the Minister."

3. Mine description and closure objectives

3.1. Mine description

Klipspruit Colliery, including Klipspruit Extension-South and Klipspruit Extension-Weltevreden, is an operational open pit and underground coal mining operation located in Mpumalanga, South Africa. The mine is owned and operated by Seriti Power. The mine is bordered on the north by the N12 and to the south by the R555 Road. The majority of KPSX-Weltevreden is north of the N12, with a smaller section of the Mining right area ("MRA") to the south of the N12 and west of the R555. KPSX-South, which is approximately 557 ha in size, is located west of the town of Ogies and separated from it by the R545 regional road.

The Klipspruit MRA is situated on farms Klipfontein 3 IS, Smaldeel 1 IS, Oogiesfontein 4 IS, Bankfontein 216 IR, Grootpan 7 IS, Hartebeeslaagte 325 JS, Prinshof 2 IS, Tweefontein 328 JS, Vlaglaagte 330 IS, Weltevreden 324 JS, Wildebeesfontein 327 IS and Zaaiwater 11 IS

Coal extraction operations started in October 2003. The converted mining right for Klipspruit Colliery incorporates the following pits:

- Klipspruit Colliery Main Pit, including Smaldeel mini-pit, R545 pit and Bankfontein pit;
- Klipspruit Extension-South;
- Klipspruit Extension-Weltevreden (Pit BD).

The mine provides coal to Eskom's Kendal Power Station and international coal markets, through opencast and underground mining methods. The Phola Coal Processing Plant, that processes Zibulo Colliery and Klipspruit Colliery's coal, is a joint venture between Seriti Power and Thungela Coal and is managed and operates independently from the Colliery. Certain facilities are shared between Phola Coal Processing Plant

and Klipspruit Colliery, including Balancing Dam, the discard dump, ROM and product stockpile areas. Although Phola Coal Processing Plant is a separate business entity, the plant forms part of Seriti Power's environmental liability in terms of the approved environmental management programme (EMPr) and closure financial provisioning and is therefore included in this report. The current Life of Mine ("LOM") is 2041(17 years).

Rehabilitation is currently underway at the R545 area, with topsoil placed in August 2023 and a targeted 130 ha to be seeded by FY25.

A discard dump has been established on previously mined out areas over the Main Pit area. This discard facility will remain active to support Phola, South pit, Pit BD and New Largo Pit F until end of LOM, when it will be capped and rehabilitated.

Seriti Power extended its life of Mine by implementing the Klipspruit Extension (KPSX) which included mining resources at Klipspruit South and incorporating three neighbouring prospecting right areas, collectively known as Weltevreden. The total Klipspruit Mining Right Area (MRA) is 11,110 ha, with a combined surface disturbance expected to extend over an area of 3,212 ha at decommissioning. Mining at KPSX: Weltevreden commenced in early 2021 with underground mining commencing in October 2023 via an underground portal.

The liability contained in this report also covers the Rietspruit Non-JV portion of Seriti's liability, Portion 14 and Minnaar (from Seriti Closed operations). Future planned mining activities are planned for KPSX Pit H, as well as Pits S and G.

3.2. Closure objectives / commitments

The EIA/EMPr compiled in 2009 (SRK Consulting) listed the following closure objectives:

- Identify post-closure uses of land occupied by mine infrastructure in consultation with the surrounding landowners. Should a suitable use for any mine infrastructure not be found, it will be removed.
- Rehabilitate all disturbed land to a condition that is suitable for its post-closure uses.
- Rehabilitate all disturbed land to a condition that facilitates compliance with applicable environmental quality objectives (e.g., air and water quality objectives).
- Reduce the visual impact of the mine components through rehabilitation of all disturbed land and residue deposits.
- Rehabilitate all disturbed land and residue deposits to a condition where post-closure management is minimised.
- Develop a retrenchment programme in a timely manner.
- Keep authorities informed of the progress of the decommissioning phase activities.
- Submit monitoring results to the relevant authorities.
- Maintain the required pollution control facilities and the condition of the rehabilitated land after closure.

3.3. End-land use

The end land use of grazing was concluded in the *Klipspruit Colliery Revised and Amended EIA and EMPr* (SRK Consulting, 2009). The arable land capability of the strip-mining area will be converted to grazing land during mining and rehabilitation.

The section below, discussing land use in more detail was listed in the *Closure Planning Reports for Klipspruit Colliery, as Aligned to the GN R. 1147 Financial Provisioning Regulations* (Golder Associates, 2021).

To re-instate suitable land capabilities across the rehabilitated portions of the mine site the following will be ensured:

- Where possible, land capability will be reinstated matching that of the surrounding undisturbed areas. If not, effort will be put into achieving the next best land capability. Land capability could be compromised on limited areas over the greater rehabilitated mine site, by meeting the requirements for a healthy, safe and stable post mining landscape.
- A functional post-mining landscape is achieved that enables self-sustaining agricultural practices where possible.
- Invasive vegetation species will be combated to assist towards the desired land capability and functioning of riparian zones.
- Sustain an agreed, predetermined best attainable state for the ecological functionality of the Wilge River and Saalklapspruit wetland areas delineated in the Wetland Mitigation Strategy.
- Maintain a productive vegetation cover that supports a regional pasture-related carrying capacity of 1.7 ha/LSU and/or 5t/ha of hay, at a vegetal cover of > 75%.
- Achieve the creation of habitats or local fauna expected to occur within the rehabilitated areas on which grazing is taking place.
- Maintain a visual landform as aligned to the approved surface rehabilitation landform design of the rehabilitated landscape, that blends into the surrounding areas.

4. Liability parameters and limitations

As part of the closure liability calculation, certain parameters have been identified to clarify or indicate any assumptions, decisions, uncertainties, limitations or constraints applicable to the liability calculation, including:

- No allowances have been made for money received from mine infrastructure assets salvage values, i.e., the sale of equipment, recyclable materials, structures, vehicles or the hiring-out of infrastructure.
- Seriti's internal infrastructure verification process outputs (Seriti Power (Pty) Ltd, 2024a) based on information supplied by the operation was used to inform changes to the infrastructure (demolition or new construction) from April 2023 to March 2024.
- The cost associated with the rehabilitation of infrastructural areas, mining areas (Such as opencast pits, access roads, overburden and spoils' footprints) and the rehabilitation of general disturbed areas were costed based on quantities obtained from the "Seriti Internal rehab and water template/model" (Seriti Power (Pty) Ltd, 2024).

- The Seriti Internal rehab and water template/model has been signed off by the operation.
- Prior to determining which buildings should be demolished, the requirements of section 44 of the Mineral and Petroleum Resources Development Act should be considered.
- As a worst-case scenario, it is assumed that all structures that are not required to support the final land use will be demolished post closure. This has been taken into account in the closure liability calculations.
- The care and maintenance rate was applied as a once-off rate for a three-year period.
- Items costed using component 5 (Demolition of housing and/or administration facilities) already includes floor slabs – therefore concrete was not costed additionally under component 2(B) (Demolition of reinforced concrete buildings and structures).
- Containers/mobile homes were costed under component 2(A) (Demolition of steel buildings and structures) with an assumed footprint of 3 x 6 m (18 m²) per container, with park homes and mobile homes also costed under 2(A) – with assumed footprints of 3 x 12 m (36 m²).
- The Phola flotation plant (50/50 joint venture between Seriti Power and Thungela Coal) was not included in this liability, only the section of Phola previously included (as allocated to Seriti Power's mining right).
- A number of dams, amounting to a total area of 33.6 ha, was not costed for rehabilitation as per guidance from Seriti. It has been noted that these dams will be used during post-closure water management. These dams are Klipspruit South PCD dam, PCD 1, PCD 2, PCD 3 and PCD 4.

5. Closure liability calculation

5.1. Process followed (methodology)

The following steps were taken to compile the environmental closure liability cost:

- A site visit was conducted on the 27th of September 2023.
- The baseline infrastructure list was based on the final Haaks BOQ (July 2023). In January 2024, Seriti conducted an internal infrastructure verification process to incorporate any changes (new construction or demolition) between April 2023 and March 2024 (Seriti Power (Pty) Ltd, 2024a).
- Mining aspect and general surface rehabilitation components' earthmoving volumes and footprints requiring rehabilitation were supplied by Seriti, as sourced from the "*Seriti Internal rehab and water template/model*" (Seriti Power (Pty) Ltd, 2024). This data along with other documents necessary to update the closure liability was reviewed and information was incorporated in the calculation spreadsheet.
- The DMRE master rates were updated with CPI of 5.1% (as of December 2023) to calculate the FY24 liability.
- The relevance of the assumptions was reviewed and adjusted where necessary.

The closure liability calculation consists of the following main categories:

- Physical - Demolition of infrastructure where infrastructure does not form part of end-land use.
- Biophysical - Actions to safeguard (making safe and stable) and re-establish the biophysical components to ensure a sustainable landform and mitigate identified risks. This includes ripping disturbed areas and seeding some of the ripped areas (where vegetation could not establish naturally).

The following information (Table 3) serves as input into explaining the process followed to calculate the closure liability required.

Table 3: Calculation input based on the DMRE quantum guideline

Aspects	DMRE Guideline Ref.	Input
Minerals mined / processed	Table B12	Coal
Primary risk class	-	A (High)
Environmental sensitivity	Table B4	High
Specialist studies required	Table B9	Water pollution potential studies Overall quantified risk assessment
Preliminary and General	N/A	Subtotal 1 > 100 000 000 = 6%
Contingency	N/A	10%
Weighing factor 1 – Nature of terrain	Table B7	1 Flat
Weighing factor 2 – Proximity to urban area	Table B8	1.05 (5%) Peri-urban (less than 150 km from a developed urban area)

5.2. Demolition and rehabilitation rates

The DMRE Regional Office's personnel are required to review and approve the quantum, that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review as being sufficient to cover the environmental liability at that time and at closure of the mine.

A guideline document titled *Guideline document for the evaluation of financial provision made by the mining industry* has been developed to address this need and is for use by the DMRE personnel in the Regional Offices. The guideline for the calculation of closure cost issued by DMRE in 2005 was used to support the calculation of the closure cost quanta.

The tariffs used in the liability calculation were obtained from the DMRE on the 10th of May 2021. These rates were updated with CPI of 7.4% (as of November 2022) to calculate the FY23 liability. With the FY24 update, the FY23 rates were updated with a CPI of 5.1% (as of December 2023) as per Statistics South Africa (2023). The FY24 master rates are included in Appendix B of this document.

5.3. Closure liability update 2024

Table 4: Closure liability comparison - 2023 vs 2024

No.	Description	Unit	Quantity - 2023	Quantity - 2024	Variance %	Master Rate - 2023	Master Rate - 2024	Variance %	Amount (Rand) - 2023	Amount (Rand) - 2024	Increase / decrease	Variance %	Reason for change
1	Dismantling of processing plant	m³	21 108	21 218	0.5%	R18.69	R19.64	5.1%	R394 450	R416 727	R22 277	5.6%	Updated as per infrastructure verification process, inclusion of Fraser plant additional infrastructure. Excludes Phola Flotation plant.
2(A)	Demolition of steel buildings & structures	m²	42 012	42 654	1.5%	R256.38	R269.45	5.1%	R10 770 874	R11 493 177	R722 303	6.7%	Updated as per infrastructure verification process, inclusion of Blue Mining additional infrastructure, Transfer tanks at KPSX and bypass stockpile container. Excludes Phola Flotation plant.
2(B)	Demolition of reinforced concrete structures	m²	226 908	226 988	0.0%	R377.82	R397.09	5.1%	R85 730 261	R90 134 271	R4 404 010	5.1%	Updated as per infrastructure verification process, inclusion of Fraser plant additional infrastructure. Excludes Phola Flotation plant.
3	Rehabilitation of access roads	m²	2 051 880	2 014 715	-1.8%	R45.88	R48.22	5.1%	R94 136 176	R97 145 107	R3 008 930	3.2%	No change to physical road footprints. Excludes Phola Flotation plant but includes Phola roads.
4(A)	Demolition and rehabilitation of electrified railway lines	m	38 394	38 394	0.0%	R445.29	R468.00	5.1%	R17 096 251	R17 968 160	R871 909	5.1%	No change to railway lines. Excludes Phola Flotation plant Rietspruit Non-JV costed under component 10.
5	Demolition of housing and facilities	m²	24 071	24 071	0.0%	R512.75	R538.90	5.1%	R12 342 716	R12 972 194	R629 479	5.1%	No change to Facilities. Excludes Phola Flotation plant but includes Phola structures.
6	Opencast rehabilitation including final voids and ramps	ha	485	439	-9.4%	R260 964.97	R274 274.19	5.1%	R126 523 648	R120 469 451	R-6 054 197	-4.8%	Footprint decrease for the rehabilitation of the ramps and voids.
8(A)	Rehabilitation of overburden and spoils	ha	281	260	-7.5%	R179 194.15	R188 333.05	5.1%	R50 335 637	R48 957 384	R-1 378 253	-2.7%	Footprint decrease for the rehabilitation of the dumps and spoils.
8(C)	Processing waste deposits and evaporation ponds (acid, metal)	ha	450	443	-1.7%	R648 229.44	R681 289.14	5.1%	R291 955 857	R301 744 508	R9 788 651	3.4%	Footprint decrease for the rehabilitation of the coal stockpiles, dumps waste, dumps discards and dams. Disturbed Land not to be rehabilitated (33.57 ha). These areas consists of dams that will be used post closure for water treatment. Therefore, no liability is calculated for the removal and rehabilitation of these dams.
9	Rehabilitation of subsided areas	sum	64	67	4.7%	R150 048.11	R157 700.57	5.1%	R10 103 079	R10 565 938	R462 859	4.6%	Aligned quantity with what is used in NEMA model.
10	General surface rehab and grassing	ha	823	939	14.2%	R141 951.99	R149 191.54	5.1%	R116 795 615	R140 131 768	R23 336 153	20.0%	Footprint increase for the rehabilitation of the infrastructure land area, topsoil stripped footprint , re-disturbed area, topsoil dumps, areas to be topsoiled and areas to be seeded. Excludes Phola flotation plant footprint.
12	Fencing	m	44 623	44 623	0.0%	R161.92	R170.18	5.1%	R7 225 512	R7 594 013	R368 501	5.1%	No change to fences quantities. Excludes Phola Flotation plant but includes Phola fences
13	Water management	ha	360	421	17.0%	R53 974.14	R56 726.82	5.1%	R19 406 942	R23 855 558	R4 448 615	22.9%	Updated as per footprint data provided for the rehabilitation of the voids
14	2 to 3 years of maintenance and aftercare	ha	2 333	2 528	8.4%	R18 890.95	R19 854.39	5.1%	R44 070 758	R50 198 108	R6 127 350	13.9%	Updated as per above footprint changes, including updated footprints for Rietspruit Non-JV. Excludes Phola flotation plant footprint.
									Sub-total 1: Sum of items (1 - 15)	***R886 887 778***	***R933 646 366***	***R46 758 588***	***5.3%***	
									Preliminary and general costs: Add 6% of sub-total 1 if sub-total 1 > 100 000 000	R53 213 267	R56 018 782			
									Weighing factor 2: Multiply P&G cost by Weighing factor 2 (1.05)	R55 873 930	R58 819 721			
									Contingency: 10% of sub-total 1	R88 688 778	R93 364 637			
									Sub-total 2: Sum of weighing factor 2 & contingency	***R144 562 708***	***R152 184 358***			
									Sub-total 3: Sum of sub-totals 1 & 2	***R1 031 450 485***	***R1 085 830 723***	***R54 380 238***	***5.3%***	
									VAT: 15% of sub-total 3	R154 717 573	R162 874 608			
									GRAND TOTAL	**R1 186 168 058**	**R1 248 705 332**			

The closure liability for Klipspruit for FY24 is **R1 085 830 723** (including P&Gs and Contingencies and excluding VAT). The FY23 closure liability was R1 031 450 485 (including P&Gs and contingencies and excluding VAT). The liability increased by 5.3% for the 2024 update. Table 4 provides the 2024 liability calculation with a comparison to the 2023 liability. It is evident that the changes made to the general surface rehabilitation component contributes the most towards the liability increase.

The detailed reason behind specific changes to the liability have been noted in the table above. As evident in Figure 1 below, the biophysical components (Components 6, 8A, 8C, 9, 10, 11, 13, 14 and part of 3) contributes 60% to the closure liability. Only 11% of the liability cost can be allocated to the Physical components (Components 1,2A, 2B, 4A, 5, 12 and part of 3).

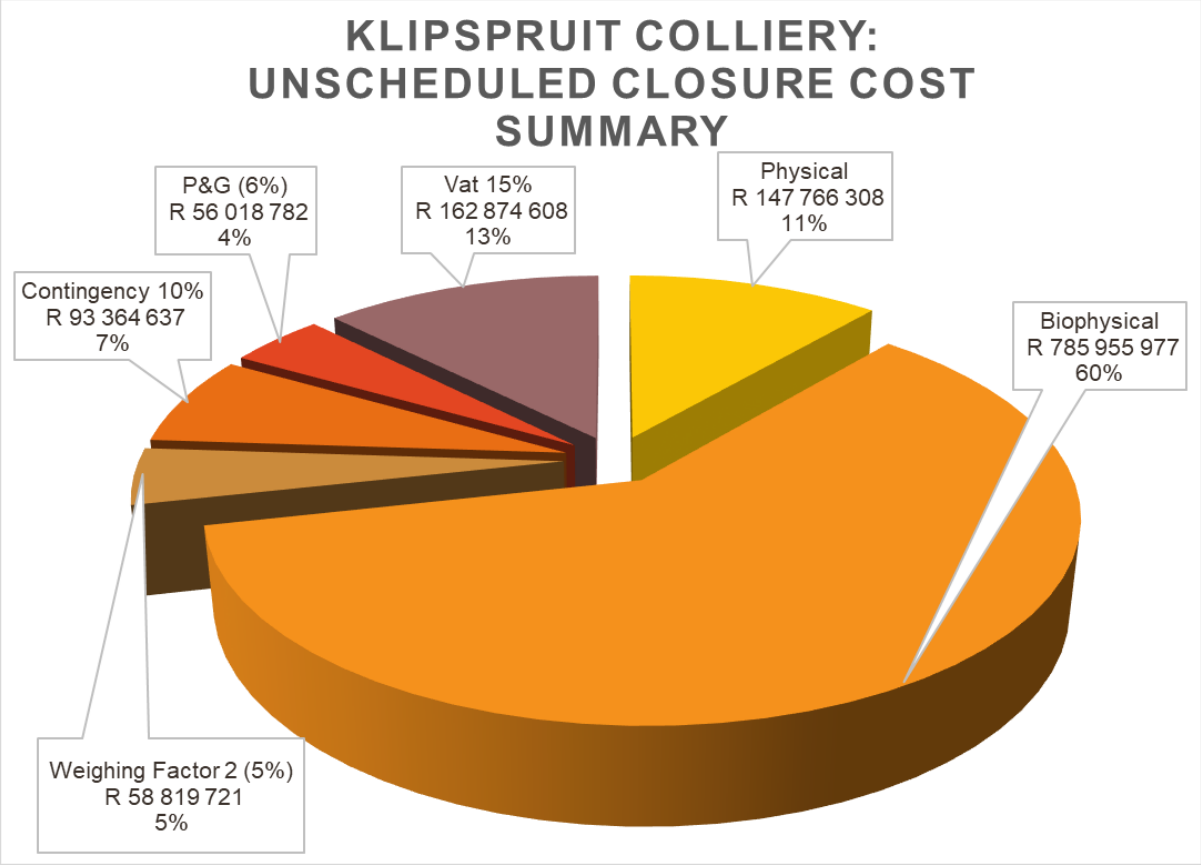


Figure 1: Klipspruit Colliery FY24 liability summary

6. Knowledge gaps and opportunities

The following knowledge gaps are identified that could have an effect on the closure liability:

- It is important to note that the DMRE opencast rehabilitation closure Component 6 (including final voids and ramps) does not cost for backfilling of the void, but only makes provision for the sloping of the pit walls to 1V:3H i.e. making the voids safe for humans and domestic animals.

7. Disclaimer

This report has been produced by Shangoni Management Services (Pty) Ltd., ("Shangoni") with the skill and care ordinarily exercised by a reasonable Environmental Consultant at the time the services were performed. Further, and in particular, the Services were performed by Shangoni taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources. None of the work performed during this project shall constitute or be represented as a legal opinion of any kind or nature but shall be a representation of the findings.

No warranties or guarantees, expressed or implied, are included in or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by professional consultants or firms that perform the same or similar services. Any reference to legislation in this report should not be perceived as a substitute for the provisions of such legislation. In the event of any inconsistency between this document and such legislation, the latter would prevail.

Whilst every endeavour has been made by the Shangoni to ensure that information provided is correct and relevant, this report is, of necessity, based on information that could reasonably have been sourced within the time period allocated to the assessment, and is, furthermore, of necessity, dependent on information provided by management and/or its representatives. It should, accordingly, not be assumed that all possible and applicable findings, observations and/or measures are included in this report as this report represents a sample of assessable parameters. As a subsequent event, should additional information become available, Shangoni reserves the right to amend its findings, observations, measures and executive summary.

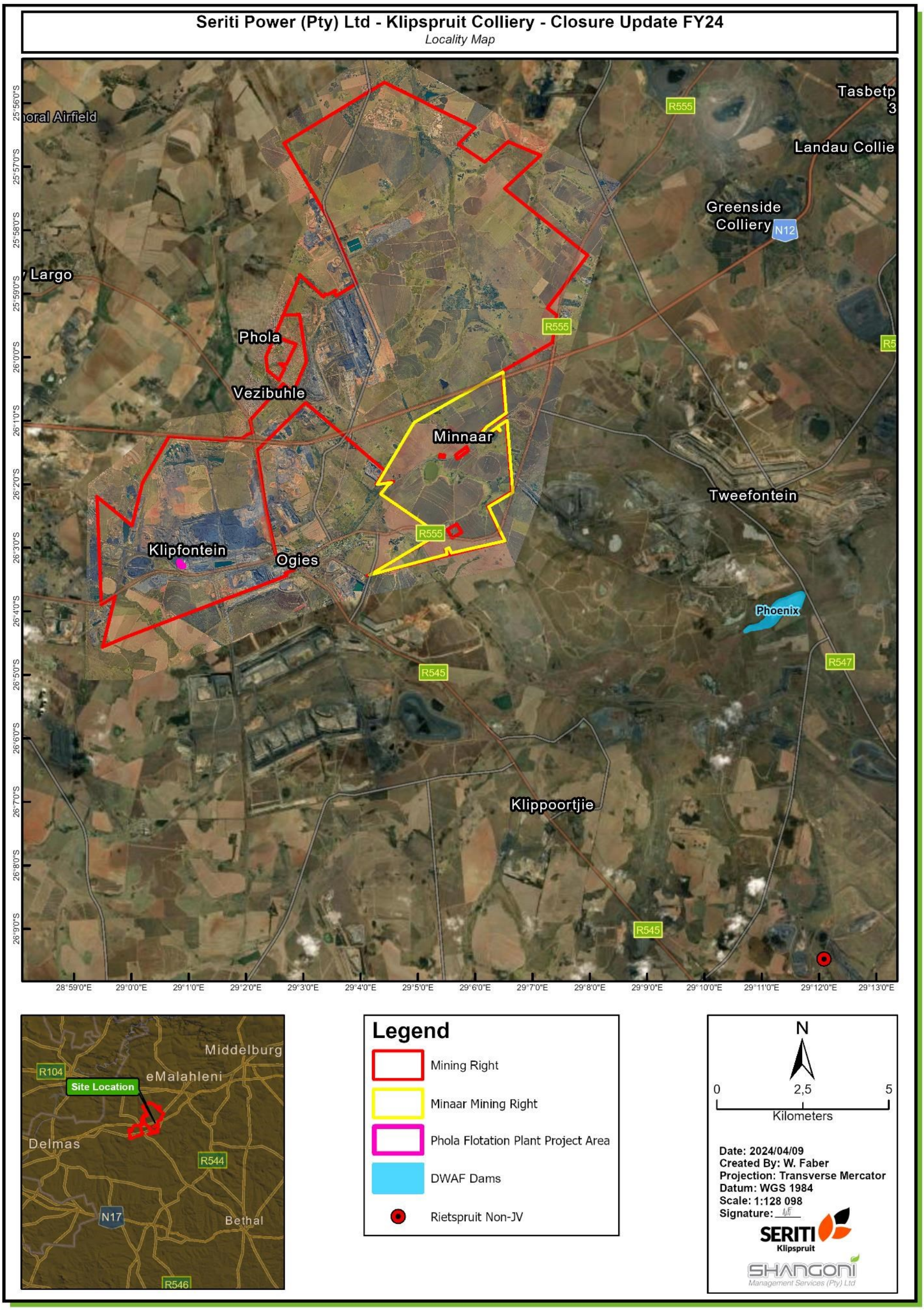
8. Declaration of independence

Shangoni hereby declares that it is an environmental consultant in that it has no business, financial, personal or other interest in this project in respect of which Shangoni is appointed. Furthermore, no circumstances exist that may compromise the objectivity of Shangoni, excluding fair remuneration for work performed in connection with this report.

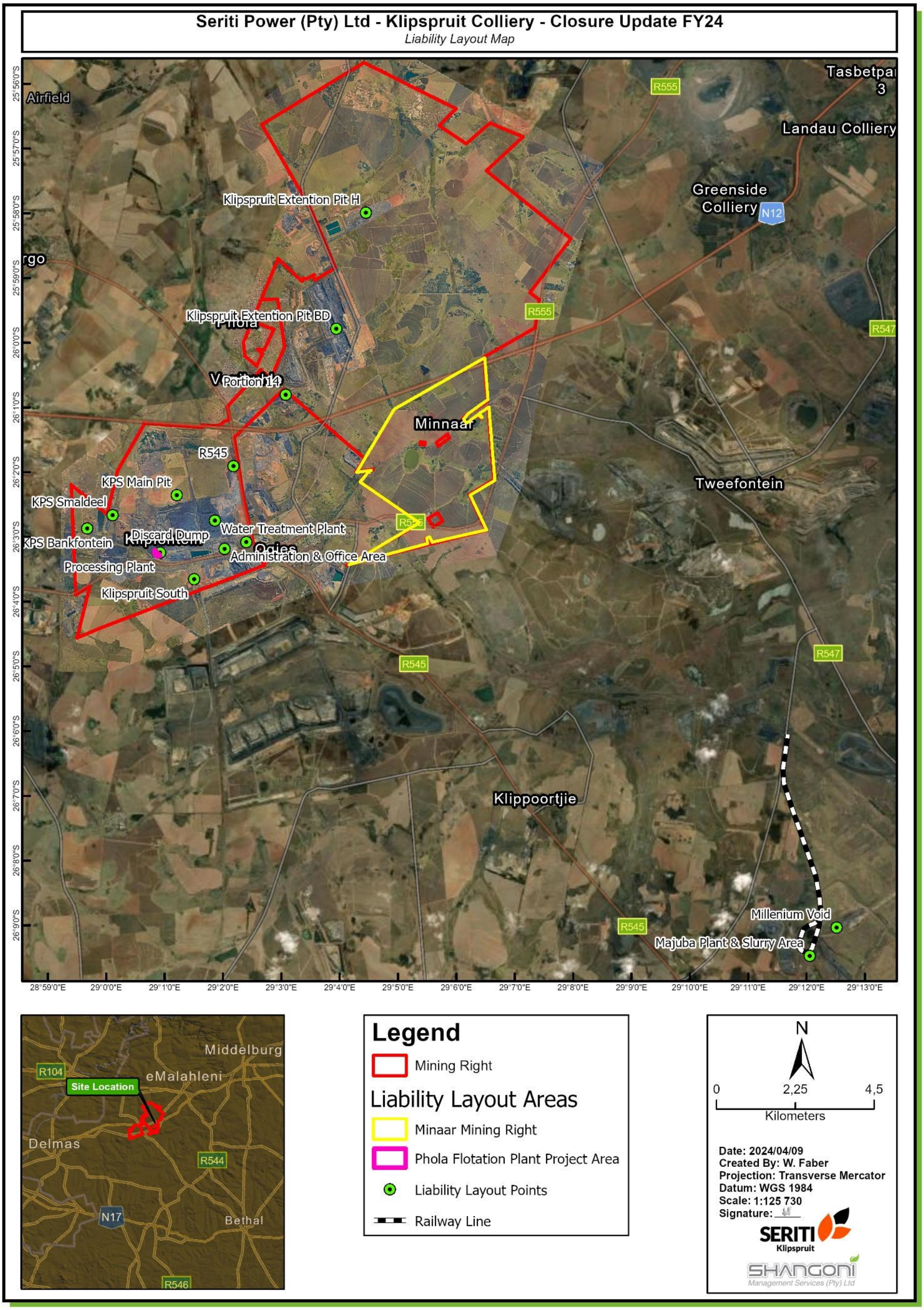
Report compiled by:	Name: Anika van Vuuren Date: 2024/04/17 Project Code SER-GRO-22-07-06	
Report reviewed by:	Name: Jan Nel Date: 2024/04/17 Project Code SER-GRO-22-07-06	

Appendix A: Maps

Appendix A1: Locality map



Appendix A2: Layout map



Appendix B: Master Rates

Rate #	Description	Unit	FY23	FY24
S1.2	**Annual adjustment for published CPI figures**		**DMRE rates received in 2022 update with CPI of 7.4%**	**Update with CPI as at December 2023 (5.1%)**
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m^3	R18.69	R19.64
2A	Demolition of steel buildings and structures	m^2	R256.38	R269.45
2B	Demolition of reinforced concrete buildings and structures	m^2	R377.82	R397.09
3	Rehabilitation of access roads	m^2	R45.88	R48.22
4A	Demolition and rehabilitation of electrified railway lines	m	R445.29	R468.00
4B	Demolition and rehabilitation of non-electrified railway lines	m	R242.88	R255.27
5	Demolition of housing and/or administration facilities	m^2	R512.75	R538.90
6	Opencast rehabilitation including final voids and ramps	ha	R260 964.97	R274 274.19
7	Sealing of shafts, adits and inclines	m^3	R137.63	R144.65
8A	Rehabilitation of overburden and spoils	ha	R179 194.15	R188 333.05
8B	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	R223 183.08	R234 565.41
8C	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	R648 229.44	R681 289.14
9	Rehabilitation of subsided areas	ha	R150 048.11	R157 700.57
10	General surface rehabilitation	ha	R141 951.99	R149 191.54
11	River diversions	ha	R141 951.99	R149 191.54
12	Fencing	m	R161.92	R170.18
13	Water management	ha	R53 974.14	R56 726.82
14	2 to 3 years of maintenance and aftercare	ha	R18 890.95	R19 854.39

Appendix C: Project team experience

Name	Project Related Experience	Registration
Jan Nel	Master's Degree in Environmental Management. 28 years' experience in environmental management. 26 years' experience in mine rehabilitation and closure. Strategic environmental advisor for amongst other ArcelorMittal Thabazimbi Iron ore mine, Exol oil, Imerys, Glencore Coal SA. More than 10,000 audit hours including EMPr/ Regulation 34, WUL/ GN 704, SEMP, and ISO 14001 audits. Completed 1 EHS legal services (register, opinion, liability training) project. Managed more than 50 ISO 14001 system implementation projects. Provides training for the university of Potchefstroom on ISO 14001 implementation, awareness and auditing. Provides training on mine closure and rehabilitation for the University of Pretoria (enterprises department).	ISO TC 207 (Environmental Management) RSA Chair
Jan is the Operations Director at Shangoni and holds a Master's Degree in Environmental Management. He has been actively involved in environmental management for the past 28 years focussing on the mining industry in providing assistance with EMP Compliance, Environmental Impact Assessments (EIA), Financial Provision Calculations, Closure Plans, Rehabilitation Plans, Environmental Management Programme Reports (EMP) and EMP compliance Assessments. He is furthermore experienced in environmental management through third party certification audits as well as Environmental Management System (EMS) implementation and has more than 9000 audit hours. Jan is also involved in TC 207 local in South Africa and the International ISO TC207 committee as well as the Strategic leadership Group of ISO TC207 focussing on international trends in environmental management. Jan represents Shangoni on the board of Shangoni Laboratory services.		
Anika van Vuuren	B.Sc.Hons. Geography and Environmental Management. 9 years' experience in mine rehabilitation and closure. Completed 21 full closure planning projects in line with NEMA Financial provision regulations (GN.R. 1147) (Financial provision update, Closure Plan, Risk Assessment report and annual rehabilitation plan). Completed 32 closure liability update projects in line with NEMA Financial provision regulations. Completed 31 closure liability update projects in line with MPRDA. Completed 4 Emergency rehabilitation plan. 11 completed RSIP projects.	Member of the Land Rehabilitation Society of South Africa
Anika studied at the University of North West where she graduated Cum Laude with a B.Sc degree in Environmental and Biological Sciences, with majors in Geography and Botany. In 2013 she obtained her B.Sc. Honours degree Cum Laude in Environmental Sciences from the North-West University (Potchefstroom) specialising in Environmental Management. Anika is part of the Closure and Rehabilitation department and is involved in the completion of Financial Provision calculations and reports (in accordance with NEMA and MPRDA), the revision of client's financial provision, the compilation of Final Rehabilitation, Decommissioning and Closure Plans, Annual Rehabilitation Plans, Environmental Risk Assessment Reports, Emergency Rehabilitation Plans and Rehabilitation Strategies and Implementation Programmes (RSIP's). She also has experience in implementing and managing Environmental Management Systems (ISO 14001).		

Name	Project Related Experience	Registration
Willie Faber	B.Sc. Hons Environmental and Biological Sciences in Ecological Interactions and Ecosystem Resilience. 2 years' experience in GIS mapping. Conducting GIS maps on all Shangoni's projects. More than 70 completed GIS work on projects. Conducted and assisted in 2 Land Capability projects. Conducted 1 WULA project.	SACNASP
Willie obtained a B.Sc. Hons in Environmental and Biological Sciences in Ecological Interactions and Ecosystem Resilience and a B.Sc. degree in Geology & Botany from the North-West University. He is an Environmental Consultant GIS Specialist responsible for co-compiling environmental reports such as WUL audits and Land Capability Reports and the GIS Component at Shangoni with over 2 years' experience. He is registered at the following professional bodies: Geological Society of South Africa, South African Association of Botanists, Soil Science Society of South Africa, Society of South African Geographers, Grassland Society of Southern Africa, Water Institute of Southern Africa, Southern African Association of Geomorphologist and Land Rehabilitation Society of Southern Africa.		