DRAFT REPORT FOR CONSULTATION

Phure Resources (Pty) Ltd

Bankfontein Colliery C

DRAFT

Basic Assessment Report (BAR) and Environmental Management Programme (EMPr)

Compiled in terms of Appendix 1 and Appendix 4 of the amended Environmental Impact Assessment Regulations, 2014 (Government Notice 982) (EIA Regulations, 2014) and submitted as contemplated in Regulation 19 of Chapter 4 of the EIA Regulations, 2014

For
The application for an Environmental Authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Amended Environmental Impact Assessment Regulations 2014, Government Notice R983 of Listing Notice 1 2014

DMRE Reference No.: MP 30/5/1/1/3/13458 MP

April 2023

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Report Type: Draft BAR/EMPr

Project Title: Bankfontein Colliery C Mining Permit project.

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Version: Draft

Date: April 2023

Disclaimer:

The results and conclusions of this report are limited to the Scope of Work agreed between Geovicon Environmental (Pty) Limited and Phure Resources (Pty) Ltd for whom this report/ investigation has been conducted. All assumptions made and all information contained within this report and its attachments depend on the accessibility to and reliability of relevant information, including maps, previous reports and laboratory results, from the Client and Contractors. All work conducted by Geovicon Environmental (Pty) Limited is done in accordance with the Geovicon Standard Operating Procedures.

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Declaration:

I hereby declare:

1. I have no vested interest (present or prospective) in the project that is the subject of this report as well as its attachments. I have no personal interest with respect to the parties involved in this project.

2. I have no bias with regard to this project or towards the various stakeholders involved in this project.

3. I have not received, nor have I been offered, any significant form of inappropriate reward for compiling this report.

(Electronic signature)

C. Mogofe, BSc. Hons. (Geology) (Candidate Natural Scientist no: 127307)

This report was reviewed by:

(Electronic signature)

T. Shakwane, B.Sc. Hons. (Professional Natural Scientist no: 117080)

EXECUTIVE SUMMARY

Phure Resources (Pty) Ltd has lodged an application for a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2004 (Act 28 of 2004). Phure Resources (Pty) Ltd proposes to mine coal on a portion of portion 4 of the farm Bankfontein 215 IS, situated within Magisterial District of Breyten.

The proposed mining permit area falls within the Ermelo coalfield, where the seams are at a shallow depth, with the lowest seam seldom reaching 100 metres in the deepest lying parts of the field. The strata in which the coal seams occur consist predominantly of fine, medium and coarse-grained sandstone with subordinate mudstone, shale, siltstone and carbonaceous shale. Ideally there are seven coal seams with varying degrees of persistence. The opencast mining will be undertaken using the conventional truck and shovel mining technique with concurrent rehabilitation.

The life of this resource at the planned mining rate is 24 months, which includes a pre-production build up phase aimed mostly at establishing the box-cut and other related mining infrastructures. All R.O.M coal from the proposed mining permit area will be stockpiled on site. No coal processing (washing) will be undertaken; hence, no coal discards will be generated from the proposed mining permit area. However, crushing and screening will be conducted.

The mining related infrastructures such as the mobile offices, hard-park, storm-water management facility and stockpiling facilities will be placed at the mining permit area. Furthermore, an in-pit water storage and in-pit coal storage was decided upon. A surface pollution control dam and ROM will; however, be considered and constructed should the in-pit storage facilities not be sufficient during mining.

In view of the above, Phure Resources (Pty) Ltd has lodged a mining permit with the Department of Mineral Resources and Energy (Mpumalanga Regional Office) in accordance with the relevant guidelines and regulations under the Mineral and Petroleum Resources Development Act, 2002 as amended.

In addition to the above, the National Environmental Management Act, 1998 (Act 107 of 1998), (NEMA) requires that any person or entity that intends to undertake activities listed in the NEMA listing notice regulations (Government Notices No. 983, 984 and 985) as amended in 2017 before undertaking such activities. Activities that will require an environmental authorisation in terms of the above-mentioned acts were identified and are listed in a table contained in this report.

According to the NEMA EIA Regulations 2014, an application for an environmental authorisation for the above triggered listed activities, (environmental authorisation) must be submitted to a competent authority in line with the requirements of the above-mentioned regulations. The Department of Mineral Resources and Energy (eMalahleni Office) is the competent authority for the above-mentioned application.

Regulation 19 of the amended NEMA Regulations requires that if a BAR process must be applied to an application, the applicant must submit a basic assessment report and an EIR/EMPr to the competent authority which has been subjected to a public participation process and which reflects the incorporation of comments received, including any comments of the competent authority. In view of the above, a draft BAR and EMPr report which concerns assessment of environmental impacts and a programme for management of the impacts for the proposed activities at the Bankfontein Colliery C, was compiled and submitted in terms of the NEMA EIA Regulations, 2014 for review and commenting by the public including the competent authority. The environmental impact assessment, which results will thereof be

detailed in the final report, will be undertaken in compliance with the accepted plan of study described in the above-mentioned basic assessment report as well as studies requested by the interested and affected parties during the public and participation process.

PART A

BASIC ASSESSMENT REPORT

SECTION ONE

Introduction

1. INTRODUCTION

1.1 WHO IS DEVELOPING THE BAR AND EMPR?

1.1.1. Name and contact details of the Environmental Assessment Practitioner (EAP) who prepared the BAR and EMPR

EAP: Mr. Ornassis Tshepo Shakwane

Professional registration:

SACNASP: 117080

EAPASA: 2019/1763

IAIA Membership No.: 3847

Company: Geovicon Environmental (Pty) Limited

Postal Address:

P.O. Box 4050

MIDDELBURG, 1050

Tel: (013) 243 5842

Fax: (086) 632 4936

Cell No.: 082 498 1847

Email: tshepo@geovicon.com

1.1.2. Expertise of the EAP who prepared the BAR and EMPR

Geovicon Environmental (Pty) Limited is a geological and environmental consulting company. The company was formed during 1996, and currently has more than 20 years' experience in the geological and environmental consulting field. Geovicon Environmental (Pty) Limited has successfully completed consulting areas in the Mining sector (coal, gold, base metal and diamond), Quarrying sector (sand, aggregate and dimension stone), industrial sector and housing sector. Geovicon Environmental (Pty) Limited has undertaken contracts within all the provinces of South Africa, Swaziland, Botswana and Zambia. During 2001 Geovicon Environmental (Pty) Limited entered the field of mine environmental management and water monitoring.

Geovicon Environmental (Pty) Limited is a Black Economically Empowered Company with the BEE component owning 60% of the company. Geovicon Environmental (Pty) Limited has three directors i.e., O.T Shakwane, J.M. Bate and T.G Tefu.

Mr. O.T Shakwane obtained his BSc (Microbiology and Biochemistry) from the University of Durban Westville in 1994, and completed his honours degree in Microbiology in 1995. Mr O.T Shakwane has also completed short courses on environmental law and environmental impact assessment with the University of North West's Centre for Environmental Management. He has worked with the three state departments tasked with mining and environmental management i.e., Department of Water and Sanitation (Gauteng and Mpumalanga Region), Department of Mineral Resources (Mpumalanga Region) and Department of Agriculture, Conservation and Environment (Gauteng Region). Mr. Shakwane has been in the consulting field since 2004 and has completed various areas similar to the proposed Bankfontein Colliery C as an environmental assessment practitioner. Mr Shakwane is the

environmental assessment practitioner for the environmental impact assessment for the proposed Bankfontein Colliery C.

Over the past years Geovicon Environmental (Pty) Limited has formalised working relationships with companies that offer expertise in the following fields i.e., Geohydrology, Civil and Geotechnical Engineering, Geotechnical Consultancy, Survey and Mine Planning and Soil & Land Use Consultancy. Geovicon Environmental (Pty) Limited is an independent consulting company, which has no interest in the outcome of the decision regarding the proposed Bankfontein Colliery C basic assessment process.

1.1.3. Who will Evaluate and Approve the BAR and EMPR?

Before the proposed project can proceed, an EAP must compile an application for an environmental authorisation for the proposed project. An impact assessment (basic assessment process) must be undertaken in support of the application for an environmental authorisation. The basic assessment process will determine the potential environmental impacts that may result from the proposed project and an environmental management programme will be compiled to provide measures for mitigation against the identified impacts. The above-mentioned application must be made to the competent authority and in terms of section 24D (1) of NEMA, the Minister responsible for mineral resources is the responsible competent authority for this application. In view of the above, the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources and Energy (DMRE), Mpumalanga Regional Office for their consideration and decision making.

In the spirit of co-operative governance and in compliance with the requirements of NEMA and the MPRDA, the competent authority may, during the processing for the environmental authorisation application, consult with other organs of state that administers laws that relate to matters affecting the environment relevant to this application. Note that during the public participation process for the proposed project, the EAP will also consult with the below listed state authorities.

The organs of state that are to be consulted may include the following:

- Department of Mineral Resources and Energy, Mpumalanga Regional Office (Competent Authority).
- Department of Agriculture, Land Reform and Rural Development
- Mpumalanga Tourism and Parks Agency (MTPA)
- Department of Water and Sanitation
- South African Heritage Resources Agency (Commenting Authority).

Note; however, that this list is not exhaustive as more organs of state may be identified by the competent authority and EAP during the public participation process.

1.2. DETAILS OF THE APPLICANT

1.2.1. Name of the Applicant

Phure Resources (Pty) Limited

1.2.2. Name of the Project

Bankfontein Colliery C

1.2.3. Postal Address of Applicant

Phure Resources (Pty) Ltd

Postnet Suit MW 347

Private Bag X1838,

Middelburg,

Mpamalanga,

1050

1.2.4. Responsible Person

Mashudu Gangazhe

1.2.5. Contact Person

Mr. Mashudu Gangazhe

Tel: +27 82 432 1006

1.3. DESCRIPTION OF THE PROPERTY (LOCATION OF THE PROJECT)

1.3.1. Regional Setting

The proposed Bankfontein Colliery C is situated within the Magisterial District of Breyten, approximately 26 kilometres south east of Hendrina, 28 kilometres south west of Carolina, 26.5 kilometres west of Chrissiesmeer and 4.5 kilometres north west of Breyten. Access to the proposed mining area is via the R542 provincial road south of the proposed Bankfontein Colliery C that connects to a network of unnamed farm roads. See **Error! Reference source not found.**, for the locality plan of Bankfontein C olliery C and Table 1 for the distance and directions from the nearest towns to the proposed Bankfontein Colliery C.

1.3.2. Physical Address and Farm Name of the Mining Area

Bankfontein Colliery C is situated on a portion of portion 4 of the farm Bankfontein 215 IS, north west of Breyten town, Mpumalanga.

1.3.3. Magisterial District & Regional Services Council

- Magisterial District: Breyten
- District Municipality: Gert Sibande District Municipality
- Local Municipality: Msukaligwa

1.3.4. Direction and Distance from Nearest Towns

Table 1: Direction and Distance from nearest towns to the proposed Bankfontein Colliery C**.**

TOWN	DIRECTION	DISTANCE (KM)
Hendrina	South East	26km
Carolina	South West	28km
Breyten	North West	4.5km
Chrissiesmeer	West	26.5km

1.3.5. Locality Plan

Refer to Figure 1 for the locality plan of the proposed Bankfontein Colliery C.

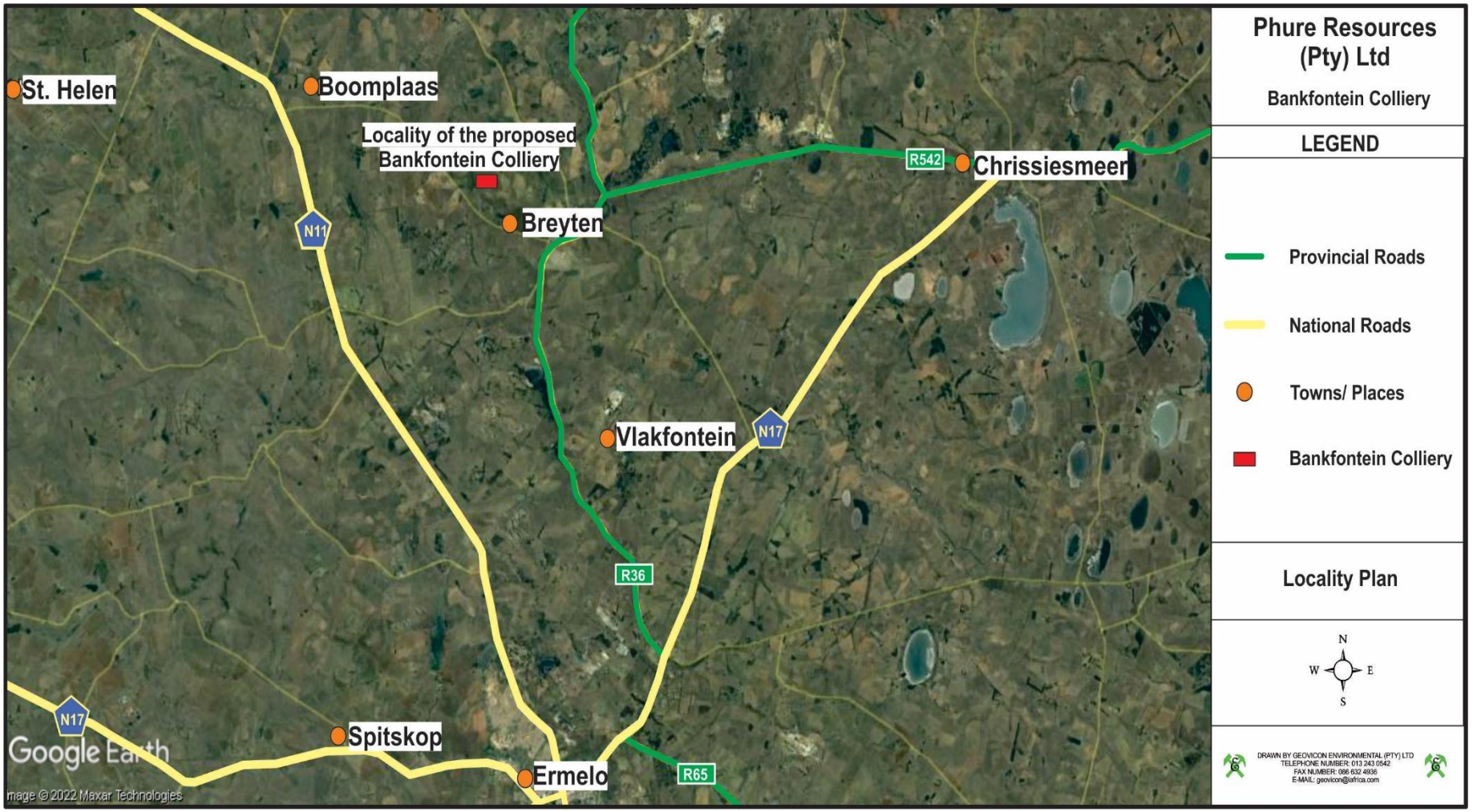


Figure 1: Locality Plan.

1.3.6. Land Tenure and Use of Immediate and Adjacent Land

Land tenure for the properties within and immediately around the mining permit area is indicated on Table 2 and Figure 2 below. The land in the area is mainly used for grazing.

Table 2: Schedule of properties listing surface ownership within and surrounding Bankfontein Colliery C.

FARM NAME AND NUMBER	21 DIGIT SURVEYOR GENERAL CODE	DESCRIPTION OF SUB-DIVISION	SURFACE OWNER
Direct Surface Owner			
Bankfontein 215 IS	T0IS00000000021500004	**Portion 4***	National Government of RSA
Immediately Adjacent Surface Owners			
Bankfontein 215 IS	T0IS00000000021500002	Portion 2	National Government of RSA
Bankfontein 215 IS	T0IS00000000021500006	Portion 6	Bank Appels Boerdery (Pty) Ltd
Klipfontein 241 IS	T0IS00000000024100013	Portion 13	National Government of RSA
Klipfontein 241 IS	T0IS00000000024100015	Portion 15	National Government of RSA

***Portion** on which the mining permit area is applied for, also refer to **Appendix A** regulation 2(2) plan and **Appendix B** Deed's list of direct farm owners.

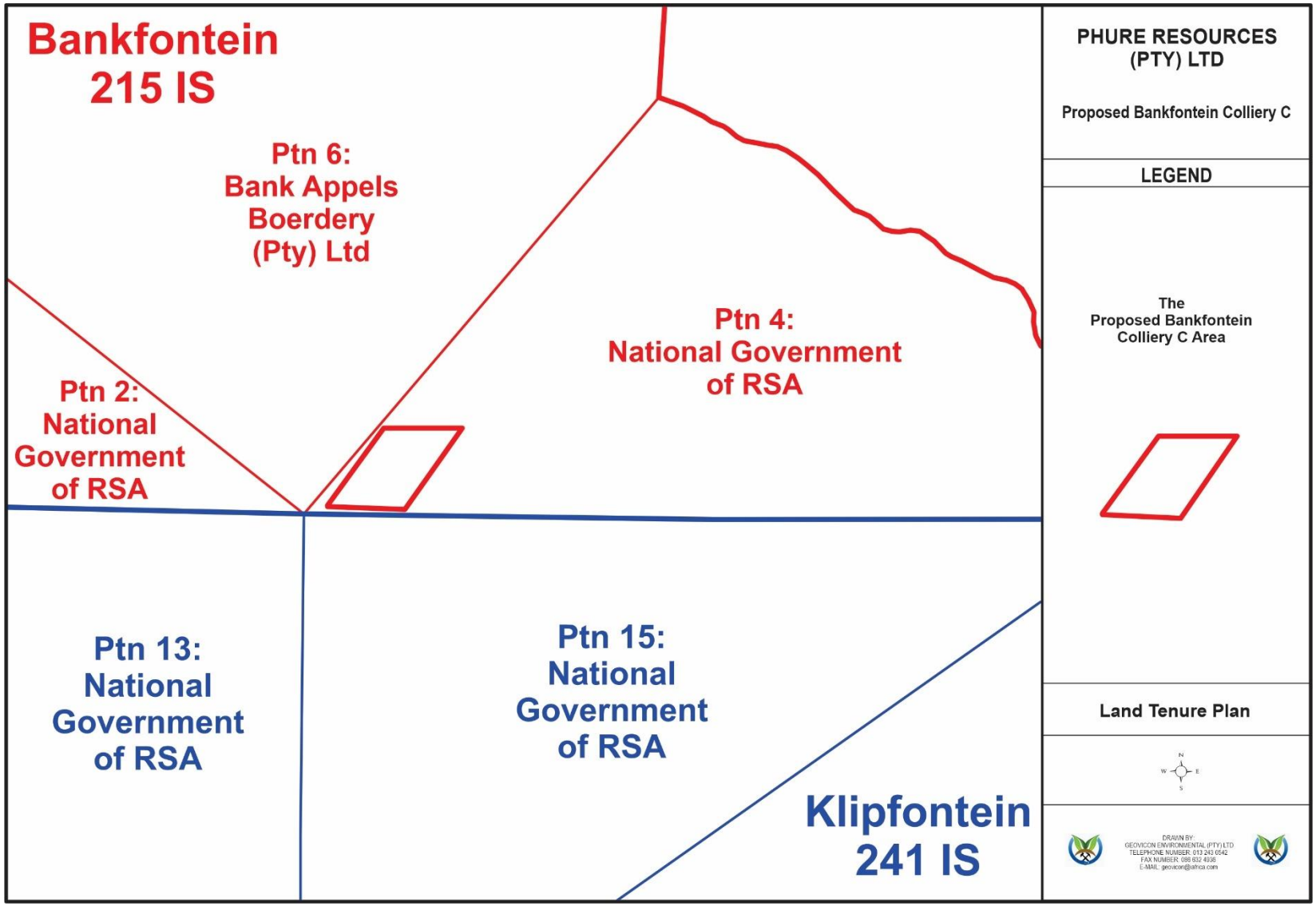


Figure 2: Land Tenure Plan for the Bankfontein Colliery C.

SECTION TWO

Description of the Scope of the proposed Project

2. DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

2.1. LISTED ACTIVITIES AND SPECIFIED ACTIVITIES

In terms of the NEMA, the proposed Bankfontein Colliery C will result in the conducting of activities that are considered as listed activities. In terms of the above-mentioned legislations, none of the above-mentioned listed activities can be conducted without an environmental authorisation. In view of the above, Phure Resources (Pty) Ltd has submitted an application for an environmental authorisation for all listed activities to be conducted at the proposed Bankfontein Colliery C to the competent authority (DMRE). This section will give a description of the listed activities that will be included in the application for an environmental authorisation. Table 3 is compiled as prescribed by the DMRE, EIR and EMPr template and reflects all project activities applied for.

2.2. DESCRIPTION OF THE PROPOSED PROJECT

Surface infrastructure that will be constructed includes, box-cut for the opencast mining activities, overburden material stockpiles. Coal from Bankfontein Colliery C will be transported directly to clients for further processing. Water from the pit will be captured in an in-pit sump and water from the sump will be used for dust suppression. Where the in-pit sump is not sufficient enough to temporary store water; as an alternative, a pollution control dam will be constructed on surface to store water from the opencast pit. These activities will be undertaken on a portion of portion 4 of the farm Bankfontein 215 IS.

Table 3: Proposed Bankfontein Colliery C Listed Activities.

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors,etc…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY (Mark with an X where applicable or affected).**	**APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)**
Excavations Blasting Stockpiles Dam Loading Hauling and transport Water supply boreholes Mobile offices Ablution Crushing and screening plant Stormwater control Berms Roads Pipelines	5 ha	Activity 21	GNR 983
The clearance of an area of 5 hectare for mining	5 ha	Activity 27	GNR 983
The development of a road where the road is wider than 8 meters.	0.35 ha	Activity 24	GNR 983
The construction of storm water channels and water pipelines exceeding 1 km for the conveyance of mine affected water at the proposed project.	0.25 ha	Activity 9	GNR 983
The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for	3.83 ha	Activity 12	GNR 985

maintenance purposes undertaken in accordance with a maintenance management plan.			
The development of a road wider than 4 metres in critical biodiversity areas.	0.35 ha	Activity 4	GNR 985

2.2.1. Target Minerals

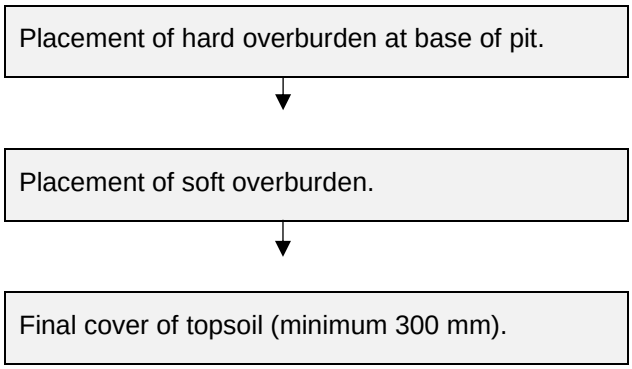
Coal

2.2.2. Mining method to be used at the Bankfontein Colliery C

Mining will be conducted by opencast methods, using truck and shovel lateral rollover mining technique. A competent mining contractor will be contracted to conduct the opencast mining at the proposed Bankfontein Colliery C.

Access to the opencast will be via a ramp to the initial box cut. The ROM coal will be transported by truck via roads.

The soft overburden will be removed by mechanical methods. The hard overburden will be drilled and blasted and then removed by mechanical methods. Coal will be drilled and blasted prior to removal. Replacement of overburden material into the mining pit will be according to the following sequence:



2.2.3. Planned Life of Project

The current estimated life of the proposed Bankfontein Colliery C is 2 years (24 months).

2.3. BANKFONTEIN COLLIERY C SURFACE INFRASTRUCTURE DESCRIPTION

2.3.1. Access

There is a good network of tarred roads connecting the mine with surrounding towns. The R542 provincial road that is situated south of the proposed Bankfontein Colliery C, along with unnamed farm roads that connect to this road will be used to access the site.

2.3.2. Power Generation

Diesel powered vehicles and machinery will be used for the proposed mining permit project.

2.3.3. Water Supply Infrastructure

Water will be required at the proposed mining permit area for the purpose of supplying potable water and for dust suppression. Water will be sourced from a borehole or via a water supplier for portable water, whereas dust suppression water will be obtained from the pit. Alternatively, water may be sourced from the Local Municipality.

2.3.4. Stockpiling facilities

Stockpiling facilities includes overburden stockpiles (Hards and Softs), topsoil stockpile and R.O.M facility.

2.3.5. Workshops and Buildings

Mobile office containers will be utilised. All machinery will be maintained at an offsite workshop. Should emergency repairs be required the repairs will be conducted on site on areas covered with tarpaulins.

Refer to Figure 3 for the infrastructure layout plan and Figure 4 for box-cuts' layout plan.

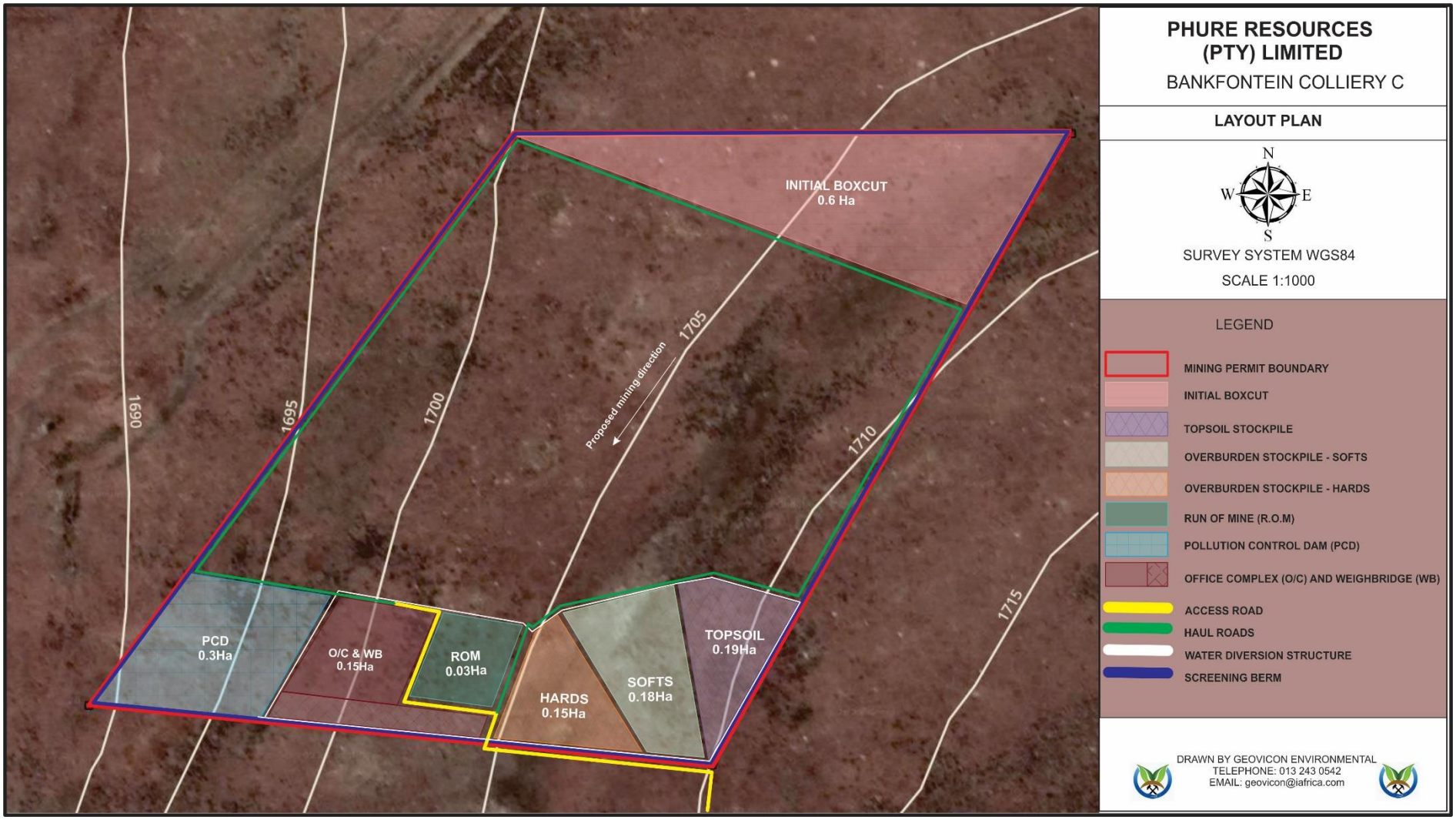


Figure 3: Surface layout plan, see attached **Appendix C** for an A3 format.

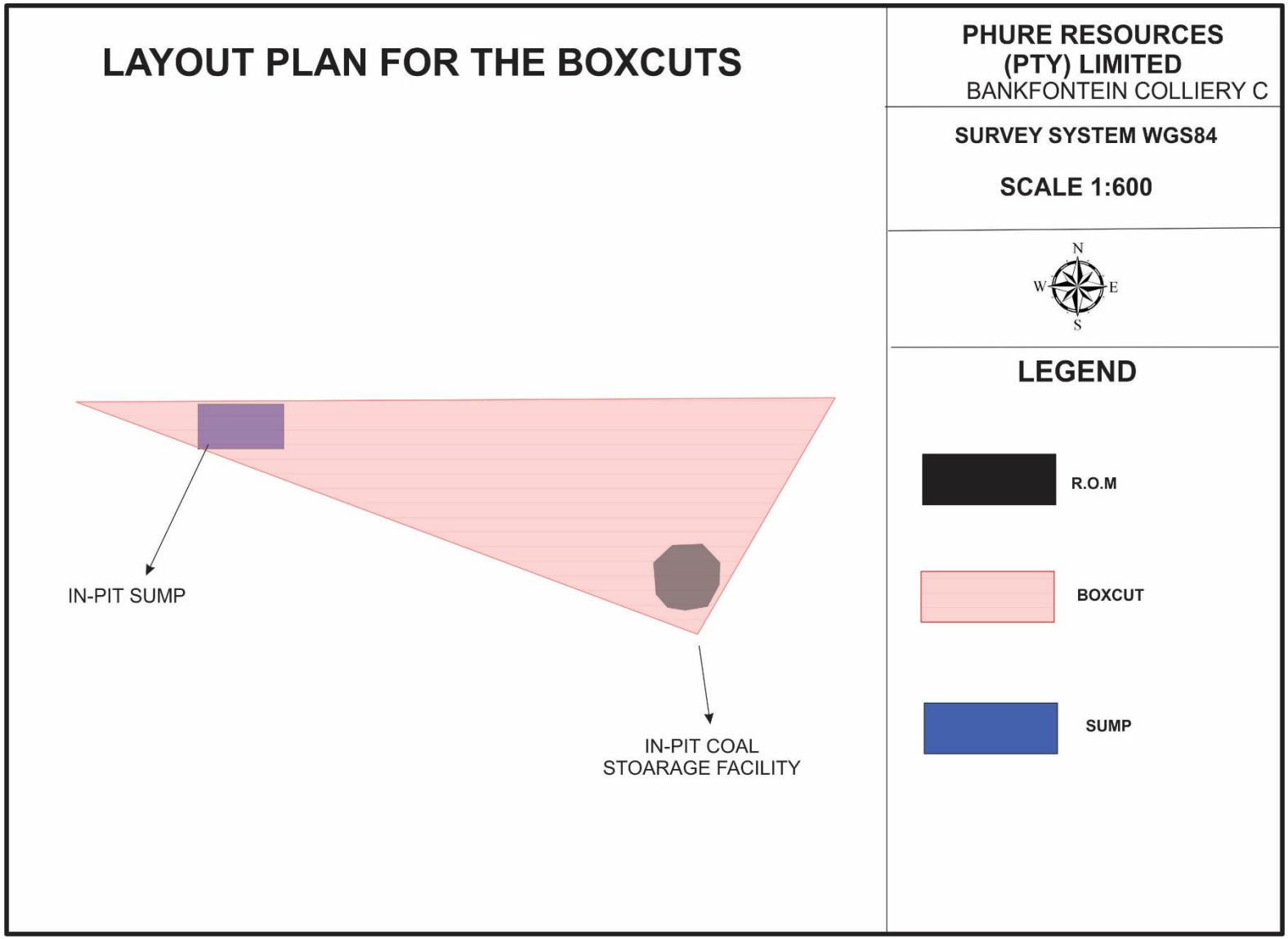


Figure 4: Layout plan for the boxcut.

2.3.6. Waste Management

2.3.6.1. Waste Identification and Management

The proposed mining operation will generate the following waste types i.e.: electronic waste, hazardous waste, general waste, recyclable waste and sewage waste. A waste management procedure will be compiled and implemented by the mine, which will ensure that a waste inventory that may contain all waste including waste not indicated in section of the report is compiled and filed.

Hazardous Waste

Hazardous waste is any waste that contains elements or compounds that may have a detrimental impact on health and the environment if not disposed or handled correctly. This waste generally consists of oil, grease, chemicals, paints, their containers and any materials/substances contaminated by these.

General Waste

This is waste that does not contain any hazardous materials. Note that domestic waste, which will be generated from the proposed project, is considered as general waste. Domestic waste includes plastics, discarded food waste, cans, cardboard and packaging, polystyrene, building rubble, etc.

Electronic Waste

This waste includes products nearing the end of their "useful life" and may include computers, VCR's radio's, copiers and fax machines and telephones.

Recyclable Waste

This waste include material that is collected on the mine for reselling, re-use or recycling purposes. Recyclable materials are divided into the following:

- Scrap metals;
- Papers;
- Used printer cartridges etc.

2.3.6.2. Waste Management Facilities

Hazardous Waste

Hazardous waste will be collected in drums for storage. The removal of the drums or any other appropriate receptacle will be undertaken by a waste disposal company, for disposal at a registered licensed waste disposal site. The drums will be placed on protected concreted ground. Chemical toilets will be used for the management of sewage waste generated on site and will be maintained by a suitable contractor. Skips will be used to temporary store scrap materials and a reputable scrap collector will deployed to collect scrap.

General Waste

The general waste that will be generated is domestic waste and will be collected in drums and disposed of at a registered domestic waste disposal site.

2.3.7. Bankfontein Colliery C Method Statement

In terms of the DMRE BAR and EMPR template, Phure Resources (Pty) Ltd must describe the methods and technology to be employed for the proposed project. In view of the above, a method statement for each phase of the proposed project has been provided. This identifies all actions, activities or processes associated with the proposed mining operation.

2.3.8. Construction Phase

The following mine surface infrastructures will be established, namely:

- Access and haul roads
- Office containers
- In-pit Sump
- Material stockpiles (topsoil, softs, hards and ROM)
- Box-cut

2.3.9. Operational Phase

During the operational phase, coal will be mined in a systematic manner to remove the available coal seams. All overburden material removed will be stockpiled in such a manner that concurrent rehabilitation can be undertaken by replacing the said material in the correct sequence into the mined-out cuts.

Water Pollution Management Facilities

The proposed Bankfontein Colliery C will operate on the strategy of maximising the utilisation of “dirty water” in the mining area and will have a policy of zero discharge of contaminated water. The water accumulated in the pit will be pumped into the sump. The water from the in-pit sump and the pit will be utilised to suppress dust in areas where dust may emanate. Where the in-pit sump is not sufficient enough to store water, as an alternative, a pollution control dam will be constructed on surface to store water from the opencast pit. Furthermore, a sump collecting water around the stockpiling area will be developed, this sump will be operated empty and will be kept dry, water from this sump will be utilized for dust suppression.

Potable water Plant

There will be no potable water treatment plant at the proposed Bankfontein Colliery C. Drinking water will be obtained from the nearby water supplier or borehole.

Transport

Mine officials and senior skilled employees will use their own vehicles for all transport requirements. Where necessary a bus services will be made available to transport other employees from their residences to their working place. Normal light delivery vehicles will be utilised to transport employees to the opencast mining areas.
A number of haul roads will be constructed around the mine for the transportation of coal from the opencast areas and coal from the pit will be transported by trucks.

Housing

No houses or hostels will be established on the mining areas.

Storm water management

Overburden material will be used as berms to divert storm water away from the mining areas. Bankfontein Colliery C will practice a policy of clean and dirty water separation where dirty water is contained and stored in the in-pit sump and the sump in the stockpiling area and this water will be re-used for dust suppression.

2.3.10. Decommissioning phase

Infrastructure areas

The retention or demolition of mine infrastructure presents a significant cost and should be considered at the purchasing and planning stages. The market value of infrastructure will change over the life of the operation and the degree to which the infrastructure is maintained during the operational period should reflect the intended post-closure use. The decommissioning phase should be considered during upgrades of mine infrastructure, with the aim to remove upon closure. The following should be available during decommissioning of infrastructure:

- A list of the areas and mine infrastructure that require decommissioning;
- A description of strategy, timing, and the techniques preferred to remove and dispose of mine's infrastructure;
- Consultation with Interested and Affected Parties in regards to retention of mine's infrastructure.

Monitoring and reporting

The water quality monitoring program will be continued, until it can be shown that water quality (surface and groundwater) is both stable and within acceptable guidelines and limits, as determined by the relevant State Departments. Frequency of monitoring will remain monthly for the surface water monitoring points and three-monthly for groundwater monitoring points for the first three years after closure. Thereafter, the frequency for surface water monitoring points will decrease to 3-monthly and the groundwater monitoring points to 6-monthly. This will again be reviewed after a further 2 years.

Long term stability

Rehabilitation will be ongoing during the operational phase. The shaping of the pits will allow for the re-establishment of natural runoff patterns.

2.3.11. Final Rehabilitation

No roads will remain in place after the decommissioning phase. Note that the access and haul roads will be graded during this phase, in order to remove any fine carbonaceous material build-up on the roads during mining activities. The said roads will then be ripped to the depth of 300 mm, at 90° to the inherent slope, and seeded with a recommended seed mix. Any carbonaceous material removed from the said roads will be dumped in the final void before the said voids are leveled. After leveling the said voids, the areas will be seeded and conform to the rest of the rehabilitated areas.

2.3.12. After Closure Phase

The rehabilitated area will be monitored until closure of the site. After the decommissioning of the site and if it can be determined that the site is stable, an environmental authorisation for the decommissioning of the site and a closure certificate will be applied for in terms of the relevant laws.

SECTION THREE

Policy and legislative context

3. POLICY AND LEGISLATIVE CONTEXT

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

Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) states that everyone has the right:

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

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

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

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

In terms of Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being. In addition, people have the right to have the environment protected, for the benefit of present and future generations, through applicable legislations and other measures that prevent pollution, ecological degradation and promote conservation and secure ecological sustainable development through the use of natural resources while prompting justifiable economic and social development. The needs of the environment, as well as affected parties, should thus be integrated into the overall project in order to fulfil the requirements of Section 24 of the Constitution. In view of the above, a number of laws pertaining to environmental management were promulgated to give guidance on how the principles set out in section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) would be met. Below are laws applicable to the proposed project that were promulgated to ensure that section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) is complied with.

3.2. NATIONAL ENVIRONMENTAL MANAGEMENT ACT

Section 24(1) of the NEMA states:

“In order to give effect to the general objectives of integrated environmental management laid down in this Chapter [Chapter 5], the potential consequences for or impacts on the environment of listed activities or specified activities must be considered, investigated, assessed and reported on to the competent authority or the Minister of the Department of Mineral Resources, as the case may be, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of this Act.”

In order to regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto, Regulations (EIA Regulations, 2014) were promulgated. These Regulations took effect from the 4th of December 2014.

In addition to the above, Section 28 of the NEMA includes a general “Duty of Care” whereby care must be taken to prevent, control and remedy the effect of significant pollution and environmental degradation. This section stipulates the importance to protect the environment from degradation and

pollution irrespective of the operations taking places or activities triggered / not triggered under GNR 983, GNR 984 and GNR 985.

In view of the above, an environmental impact assessment is being undertaken to comply with the requirements of the NEMA and the NEMA EIA Regulations, 2014. The NEMA EIA Regulations of December 2014 determines requirements to be met in order to obtain an environmental authorisation. This report has therefore been compiled in compliance with the above regulations.

3.3. NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT

The National Environmental Management: Air Quality Act (Act No.39 of 2004) (NEM: AQA) focuses on reforming the law regulating air quality in South Africa in order to protect the environment through the provision of reasonable measures protecting the environment against air pollution and ecological degradation and securing ecological sustainable development while promoting justifiable economic and social developments. This Act provides national norms and standards regulating air quality management and control by all spheres of government. These include the National Ambient Air Quality Standards (NAAQS) and the National Dust Control Regulations (NDCR). The standards are defined for different air pollutants with different limits based on the toxicity of the pollutants to the environment and humans, number of allowable exceedances and the date of compliance of the specific standard.

On 22 November 2013 the list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage was published under GN R893 in Governmental Gazette No 37054, in terms of Section 21(1)(b) of the NEM: AQA.

The proposed will not trigger any of the activities listed under the above-mentioned Regulations, however Phure Resources (Pty) Ltd must ensure that emissions from their activities complies with the standards as set in the above-mentioned regulations.

3.4. THE NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) focuses on the protection and management of South Africa's heritage resources. The governing authority for this act is the South African Heritage Resources Agency (SAHRA). In terms of the NHRA, historically important features such as graves, trees, archaeology and fossil beds are protected as well as culturally significant symbols, spaces and landscapes. Section 38 of the NHRA stipulates the requirements a developer must undertake prior to development. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of development are proposed.

A HIA is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required.

Measures will be undertaken to ensure that requirements in terms of the HIA are complied with where necessary.

3.5. NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (ACT 10 OF 2004) (NEMBA)

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) provides for the management and protection of South Africa's biodiversity within the framework established by NEMA. The Act aims to legally provide for biodiversity conservation, sustainable, equitable access and benefit sharing and provides for the management and control of alien and invasive species to prevent

or minimize harm to the environment and indigenous biodiversity. The Act imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. The Act encourages the eradication of alien species that may harm indigenous ecosystems or habitats. The NEMBA ensures that provision is made by the site developer to remove any aliens which have been introduced to the site or are present on the site.

The NEMBA also provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value.

The Act supports South Africa's obligations under sanctioned international agreements regulating international trade in specimens of endangered species, and ensures that the utilization of biodiversity is managed in an ecological sustainable way.

The BAR and EMPR has been complied to ensure that all applicable requirements prescribed in the NEMBA are complied with.

3.6. MPUMALANGA NATURE CONSERVATION ACT (ACT 10 OF 1998)

The Mpumalanga Nature Conservation Act, No. 10 of 1998, aims to consolidate and amend the laws relating to nature conservation within the province and to provide for matters connected therewith. Provincial legislation relevant to biodiversity conservation comprises of two Provincial Acts, the Mpumalanga Nature Conservation Act (Act 10 of 1998) and the Mpumalanga Tourism and Parks Agency Act (Act 5 of 2005). In relation to nature conservation, the province has developed the Mpumalanga Biodiversity Sector Plan (MBSP). This plan has been jointly developed by the Mpumalanga Tourism and Parks Agency (MTPA) and the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). The MBSP takes its mandate from the South African Constitution, the National Biodiversity Act (10 of 2004) and the Mpumalanga Nature Conservation Act 10 of 1998. Areas identified under the MBSP as sensitive were identified and where applicable measures will be proposed for ensuring that the areas are not degrade by the proposed project activities.

3.7. MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA): ACT 28 OF 2002

The Department of Mineral Resources and Energy (DMRE) is responsible for regulating the mining and minerals industry to achieve equitable access to the country's resources and contribute to sustainable development. The Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) requires that an EIA be conducted and that the EMP be drafted for the mitigation of impacts identified during the environmental impact assessment for a mining project. During December 2014, the "One Environmental System" was implemented by Government which initiated the streamlining of the licensing processes for mining, environmental authorisations and water use. Under the One Environmental System, The Minister of Mineral Resources, will issue environmental authorisations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) for mining and related activities. The Minister of Environmental Affairs will be the appeal authority for these authorisations. In view of the above the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources as the competent authority.

3.8. NATIONAL WATER ACT (NWA): ACT NO. 36 OF 1998

The National Water Act (Act No. 36 of 1998) (NWA) is the primary regulatory legislation, controlling and managing the use of water resources as well as the pollution thereof in South Africa. The NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water

for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. The National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Further, an industry can only be entitled to use water if the use is permissible under the NWA. The enforcing authority on water users is the Department of Water and Sanitation (DWS).

Further, Regulation 704 of the NWA deals with the control and use of water for mining and related activities aimed at the protection of water resources.

Measures will be undertaken to ensure that requirements in terms of the NWA and the GN 704 are complied with where necessary.

3.9. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT NO. 59 OF 2008)

The National Environmental Management: Waste Act (NEMWA) requires that all waste management activities must be licensed. According to Section 44 of the NEMWA, the licensing procedure must be integrated with an EIA process in terms of the NEMA.

The objectives of NEMWA involve the protection of health, wellbeing and the environment. The NEMWA provides measures for the minimisation of natural resource consumption, avoiding and minimising the generation of waste, reducing, recycling and recovering waste, and treating and safely disposing of waste.

Measures will be undertaken to ensure that requirements in terms of the NEMWA are complied with where necessary.

3.10. EIA GUIDELINES

A number of national and provincial EIA guidelines were published by different departments. These guidelines are mainly aimed at assisting relevant stakeholders by providing information and guidance and giving recommendations on a number of aspects relating to the environmental impact assessment process. The guidelines can be used by the competent authority, applicant and the EAP during the EIA process. It is therefore important that the EAP and the person compiling a specialist report must have relevant expertise when conducting the environmental impact assessments.

A number of guidelines were consulted during the compilation of this report and these include amongst them the following i.e., Guidelines on the Need and Desirability, Department of Environmental Affairs and Tourism Integrated Environmental Management Guidelines, Department of Water and Sanitation's Best Practice Guidelines and the Western Cape Provincial Department of Environmental Affairs and Development Planning Guidelines on Public Participation.

SECTION FOUR

Need and desirability of the proposed activities

4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

4.1. MOTIVATION FOR THE NEED AND DESIRABILITY OF THE PROJECT

In terms of the EIA Regulations the need and desirability of any development must be considered by the relevant competent authority when reviewing an application. The need and desirability must be included in the reports to be submitted during the environmental authorisation application processes.

The section of the BAR and EMPr will indicate the need and desirability for the approval of the BAR and EMPr for the proposed Bankfontein Colliery C.

This project is crucial in ensuring that Phure Resources (Pty) Ltd maintains job employment and coal production rates at the proposed Bankfontein Colliery C to supply the local and the export markets.

Phure Resources (Pty) Ltd expects that substantial benefits from the project will accrue to the immediate project area, the sub-region and the province of Mpumalanga. These benefits must be offset against the costs of the project.

The potential benefits of the proposed project are:

- Highly significant benefits to the province of Mpumalanga in terms of the long-term coal supply. Long-term coal supply contracts bring about needed job creation and other local, provincial and national socio-economic benefits.
- Potential reduction in crime as a result of job creation.
- Local growth in the economy of the towns of Carolina, Hendrina, Breyten and surrounding areas, and for local businesses.
- Economic benefits for contractors and other suppliers of goods and services.
- Economic opportunities and other potential benefits for land owners from compensation for impacts.

Through the life of mine employees will be developed in terms of skills development and career progression; small businesses will be established and sustained and the mine will support community infrastructure development and poverty eradication.

This BAR recommends that Phure Resources (Pty) Limited, and also its contractors, follow the approach of maximising and enhancing benefits rather than merely focussing on reducing or avoiding negative impacts, and that all opportunities for additional benefits to local land owners be actively pursued.

Based on the environmental assessment conducted as described in this Report, there are no environmental impacts associated with the proposed project that cannot be mitigated.

SECTION FIVE

Motivation for the preferred development footprint

5. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT

5.1. CONSIDERATION OF ALTERNATIVES

The National Environmental Management Act 107 of 1998, Environmental Impact Assessment Regulations, 2014 requires environmental reports (Scoping Report and Environmental Impact Assessment Report) to identify alternatives for projects applied for. In terms of the above-mentioned regulations an alternative in relation to a proposed activity, refers to different means of meeting the general purpose and requirements of the activity, which may include alternatives to (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; (e) the operational aspects of the activity; and (f) the option of not implementing the activity.

Phure Resources (Pty) Ltd intends on undertaking an opencast mining operation namely Bankfontein Colliery C. A number of alternatives were considered for the proposed mining operation. This section of the report will highlight the alternatives considered for the mining operation activities at the proposed Bankfontein Colliery C.

5.1.1. Location Alternatives

The location of the proposed development is the most suitable due to its ideal location in terms of the requirements for coal mining. Therefore, no alternatives in relation to the location of the mine were considered.

5.1.2. Design/ Layout Alternatives

Site layout alternatives considered include the following i.e.:

Dirty water dams:

Two alternatives were considered i.e., in-pit water storage and surface pollution control dam. Due to space limitation (5 ha mining permit area) the in-pit water storage was decided upon. A pollution control dam will; however, be considered and constructed should the in-pit storage facility not be sufficient for the water generated during mining. The third alternative includes building the PCD outside the mining permit area due to space limitation.

Access:

Two alternatives were considered i.e., existing road and constructing a new road. Since the proponent would like to limit their pollution footprint, the existing access road was decided upon. Should permission for using the existing road not be obtained, a new road will be designed and constructed for access to the mining permit area.

Coal stockpiling facility:

Two alternatives were considered i.e., in pit coal storage and surface coal storage. Due to space limitation (5 ha mining permit area) the in-pit coal storage was decided upon. A surface coal storage facility will however be considered and constructed should the in-pit storage facility not be sufficient for the coal generated during mining. The third alternative includes building the coal storage facility outside the mining permit area due to space limitation.

Topsoil and overburden stockpiling facility:

Two alternatives were considered i.e., placing the stockpiling facilities outside the mining permit area and placing the stockpiling facilities inside the mining permit area. Due to space limitation (5 ha mining areas), placing the stockpiling facilities outside the mining permit area was decided upon. Placing stockpiling facilities within the permit area will be considered if the first alternatives is rejected by the competent authority.

5.1.3. Transport Alternatives

In terms of the proposed Bankfontein Colliery C the most viable option to accessing the site will be via unnamed farm roads connecting to R542 south of the proposed mining permit area.

5.1.4. No Go Option

Should the project not commence, the following will result i.e.:

The mine will not commence, which will result in the potential labour force losing their employment opportunity and all support that the mine would have provided to the local businesses will also cease.

The proposed Bankfontein Colliery C has supply contracts for the type of materials that is available in these reserves, hence should the mine not commence, and the mine will not be able to honour their supply contracts. This will have serious impacts on the ability of the mine continue with their business.

Accordingly, the consequences of not proceeding with the proposed project will have a detrimental impact on the current and future labour force, the surrounding previously disadvantaged communities, the owners of the mine, and the coal export market. This may ultimately have an impact on the region as a whole, due to a loss of revenue and taxes.

5.2. Concluding Statement

Based on the above, the proposed coal mining operation which is situated on a portion of portion 4 of the farm Bankfontein 215 IS, with the surface infrastructure placed within the 5-ha mining permit boundary and an in-pit water and coal storage facility is preferred. This area will be accessed via unnamed farm roads connecting to R542 south of the proposed mining permit area.

5.3. Details Of The Public Participation Process Followed and Results Thereof

Public participation is the cornerstone of any EIA process. The principles of the NEMA govern many aspects of EIA's, including public participation. The general objectives of integrated environmental management laid down in the NEMA include to "ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment". The National Environmental Management Principles include the principle that "The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured", which basically means that the person responsible for the application (EAP) must ensure that provision of sufficient and transparent information on an ongoing basis to stakeholders are made to allow them to comment, and to ensure that the participation of previously disadvantaged people like women and the youth are undertaken.

In terms of the EIA Regulations, 2014, when applying for environmental authorisation, the Environmental Assessment Practitioner managing the application must conduct at least a public participation process where all potential or registered interested and affected parties, including the competent authority, are given a period of at least 30 days to submit comments on each of the basic assessment reports, environmental management programme report, scoping report and environmental

impact assessment report, and where applicable the closure plan. In this case a Basic Assessment Report (BAR) is considered.

This section of the BAR and EMPR will explain the public participation process taken in order to comply with the above-mentioned requirements. A number of public participation guidelines were published in a bid to assist persons responsible for the environmental authorisation applications. As much of the available guidelines were used in determining the public participation process, in guiding the public participation process of the proposed project.

Geovicon Environmental (Pty) Ltd on behalf of Phure Resources (Pty) Ltd is applying for an environmental authorisation for the proposed Bankfontein Colliery C. The application for the environmental authorisation is undertaken in terms of the process as laid out in part 2 of Chapter 4 under the NEMA EIA Regulations, 2014. The above-mentioned regulations require that an applicant for an environmental authorisation submit a BAR and EMPR to the competent authority after having subjected the reports to a public participation process.

In view of the above, a public participation process was initiated for the proposed Bankfontein Colliery C. The public participation process for the proposed project was designed to provide sufficient and accessible information to interested and affected parties (I&APs) in an objective manner to assist them to:

- raise issues of concern and make suggestions for enhanced benefits;
- contribute local knowledge and experience;
- verify that their issues have been captured;
- verify that their issues have been considered in the technical investigations; and
- comment on the findings of the EIA.

The following were conducted in undertaking of the public participation process for the proposed project.

5.3.1. Registration and BAR Phase

The public participation process commenced with the provision of potential Interested and affected parties (I&AP's) 30 days to register as interested and affected parties and to comment on the draft BAR and EMPR.

The registration and commenting process starts on the 6th of April 2023 and ends on the 9th of May 2023.

5.3.1.1. Notification of potential interested and affected parties

The following methods of notification were used to notify the potential interested and affected parties of the opportunity to register during the public participation process for the proposed project:

The following methods of notification were used to notify the potential interested and affected parties of the opportunity to register during the public participation process for the proposed project:

- On the 6th of April 2023, a notice was posted in the Highvelder Newspaper which was distributed in host and surrounding town of the proposed prospecting area, informing the public that the draft Bankfontein Colliery C Mining Permit BAR was placed in Breyten public library. The notices were compiled in compliance with the requirements of Regulation 41(3) of the EIA Regulations, 2014.

- Written notices were sent to all surface owners and lawful occupiers of the land on which the proposed mining project will be undertaken.
- Site notices inviting the public to register as interested and affected parties were also used to inform the public about the project.
- The draft BAR and EMPr was also submitted to all the commenting authorities for their comments.
- A copy of the draft BAR and EMPr was placed in the Breyten public library for perusal by public.

5.3.1.2. Registered Interested and Affected Parties

The following are currently registered as interested and affected parties for the Bankfontein Colliery C:

- Department of Mineral Resources and Energy, Mpumalanga Regional Office (Competent Authority),
- Department of Water and Sanitation, Mpumalanga Regional Office (Commenting Authority)
- Department of Agriculture, Land Reform and Rural Development
- Mpumalanga Tourism and Parks Agency (Commenting Authority)
- South African Heritage Resources Agency (Commenting Authority)
- Bankfontein Colliery C, immediate land owners and lawful occupiers
- Ward Councillor (Msukaligwa Local Municipality)

5.3.1.3. Proof of Consultation

Proof of the above-mentioned consultation and results; thereof, will be included in the final BAR and EMPr.

5.3.1.4. Finalisation of Interested and Affected Party Database

On expiry of registration period, the database of interested and affected parties will be finalised. All parties who indicated the interest of being registered as interested and affected parties will be added to the list of interested and affected parties.

Note: All organs of state, which have jurisdiction in respect of any aspect of the proposed project and the competent authority are automatically registered as interested and affected parties.

5.3.2. Draft Basic Assessment Report

This draft BAR and EMPr is made available for commenting to all relevant stakeholders during the above-mentioned registration phase of the proposed project's public participation process.

5.3.2.1. Comments, Issues and Responses on the Draft Basic Assessment Report

The comments and issues that will be raised by the interested and affected parties will be addressed and included in the final BAR and EMPr.

5.4. ENVIRONMENTAL ATTRIBUTES (BASELINE INFORMATION)

5.4.1. Geology

5.4.1.1. Regional Geology

The proposed Bankfontein Colliery C falls within the Ermelo Coalfield. The mining permit area is situated in close proximity to current small- and large-scale operating collieries, which have an impressive history of exploration and mining activities, associated with them. The geology, sedimentary deposition and mineralogy of the coal seams within the Ermelo Coalfield are well understood.

Ermelo Coalfield

The Ermelo coalfield extends from Carolina in the north to Dirkiesdorp in the south and includes the districts of Hendrina, Breyten, Davel, Ermelo, and Morgenzon encompassing a surface area of approximately 11 250 km2. The Ermelo Coalfield has a somewhat arbitrary boundary with the Witbank and Highveld coalfields to the west, and the Klipriver and Utrecht coalfields to the south, whilst the eastern and northern boundaries are delineated by pre-Karoo basement outcrop.

The coal seams present within the Carolina – Breyten sector are alphabetically numbered from the top as follows; A, B, C, D and E seams. The A and D seams are generally too thin (< 0,6 meters) to be of economic importance. The B seam generally attains a thickness of between 2,0 – 3.7 m and consists of alternating layers of poor and good quality coal with generally high ash content. The C seam can attain a thickness of between 0,6 and 2,0 meters and is generally the target seam within the Ermelo area. The E seam is generally well developed in the Carolina – Breyten sector of the Coal Province and may attain a thickness of 3.0 meters.

Description and distribution of the coal seams within the Ermelo sector.

The coal seams present within the Carolina – Breyten sector are alphabetically numbered from the top as follows; A, B, C, D and E seams. The A and D seams are generally too thin (< 0,6 meters) to be of economic importance. The B seam generally attains a thickness of between 2,0 – 3.7 m and consists of alternating layers of poor and good quality coal with generally high ash content. The C seam can attain a thickness of between 0,6 and 2,0 meters and is generally the target seam within the Ermelo area. The E seam is generally well developed in the Carolina – Breyten sector of the Coal Province and may attain a thickness of 3.0 meters.

The host rocks of the coal seams vary from fine-grained laminated and micaceous to coarse and gritty sandstones with alternating zones of shale and shaly sandstone. The total thickness of the Middle Ecca is up to 170 meters and the main coal zone within it, up to 85 meters. The thickness of the partings between seams A and B, B and C, and C and D are 30 – 60 meters, 6 – 9 meters, and about 12 meters respectively.

The A seam

The A seam occurs in isolated outliers in the sector. Although of moderate quality, it has no reported economic importance. It occurs usually as an interbanded shaly coal seam with a thickness of 1 meter.

The B seam

The B seam may be split into seam bands and occurs as three discrete leaves. These are designated as the BX, B and B1 seams (also locally known as the B upper, B, and B1 seams).

The BX seam (B Upper) attains a thickness of approximately 1 meter and is separated from the B seam by a thin shale or sandstone (~ 0,4 m) parting. This seam consists of dull coal with occasional bright bands.

The B seam varies in thickness from 1 – 2,7 meters. This seam consists of a bright-banded coal of good quality and low ash content within the Carolina area.

The C seam

The C seam is a complex seam, consisting of several plies separated by partings of variable thickness.

Traditionally the C seam group is subdivided into the C Upper and C Lower seams. The C Upper seam may be split into two seams.

The C Upper seam

This seam is well developed over the sector. However, it is usually a complex seam of two or three plies, split by in seam sandstones, siltstones or mudstones of variable extent and thickness. In the Carolina – Breyten sector, the seam is more complex, due to the proximity of large channel fill sandstones. A further complication is the occurrence of a thin, although laterally persistent seam (locally known as the B1). This thin seam may either be separated from the C Upper by a thin parting, or may gradually migrate up the sequence to the base of the B seam. The upper portion of the C Upper seam is typically of poor quality and may be torbanitic over large areas. The lower portion of the seam is of good quality coal and consists of vitrain and durian bands.

The C Lower seam

The C Lower seam is usually thin and seldom greater than 0.6 m in thickness. The floor of the seam is usually sandstone or interbedded sandstone and shale, whilst the roof is generally interbedded carbonaceous shale.

The upper portion of the seam is generally of good quality, with interbanded vitrain and durian bands. The lower portion of the seam normally becomes more torbanitic towards the base.

D seam

The D seam seldom attains a thickness greater than 0.6 m and thus is usually too thin to be of economic importance. The overlying and underlying sediments are predominantly sandstones with minor siltstone intercalations. The coal is vitrainitic with occasional durian bands.

E seam

The E seam is well developed and is of economic significance. It attains a thickness of over three meters (although thinning to a maximum thickness of 1.2 meters within the Carolina area). The roof and floor of the seam are generally composed of competent sandstone. The seam consists of predominantly bright banded (vitrainitic) coal.

Figure 5 below indicates the location of mining permit area in the identified coalfields of South Africa.

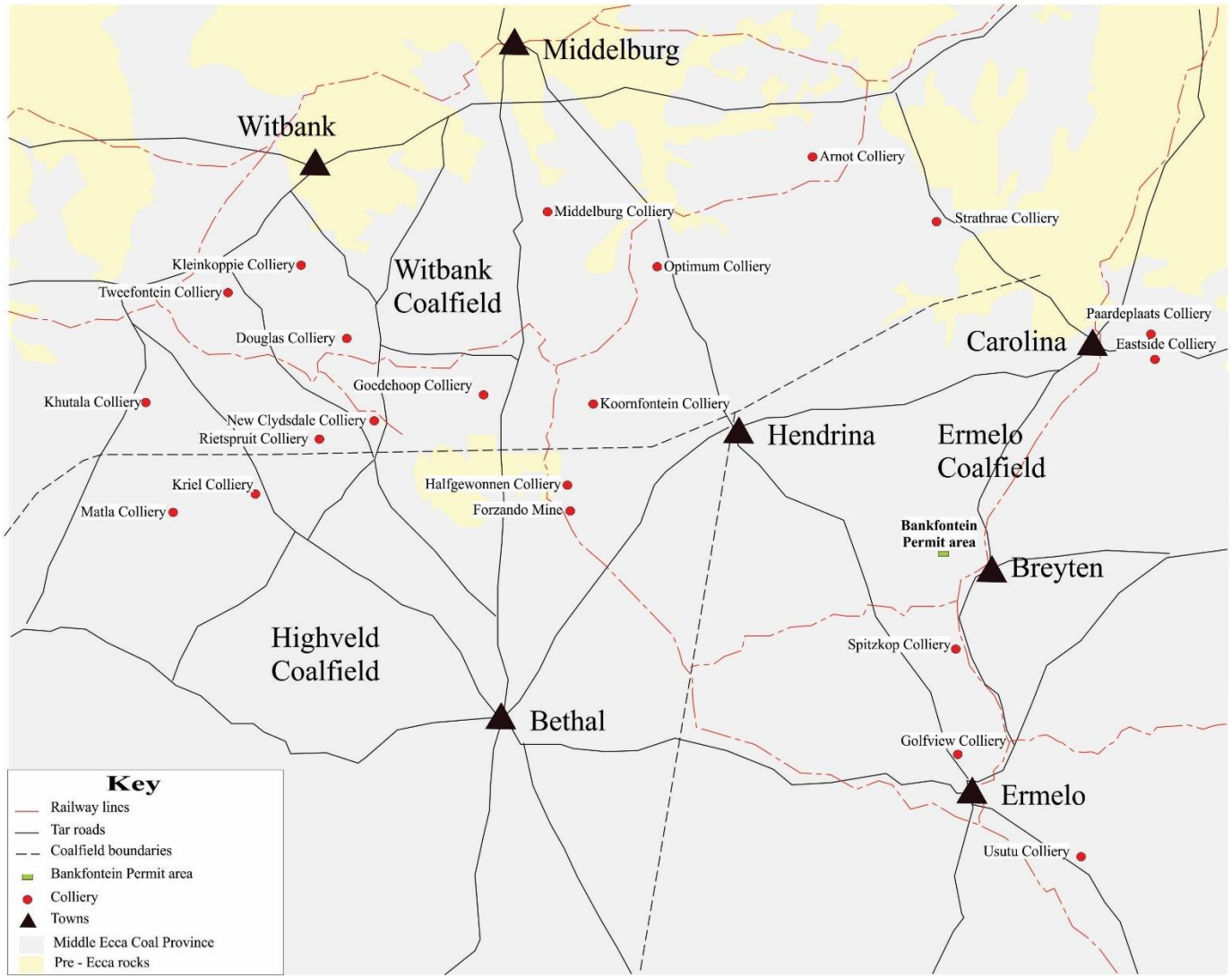


Figure 5: Location of the mining permit area in the identified coalfields of South Africa.

5.4.2. Climate

5.4.2.1. Regional Climate

The proposed Bankfontein Colliery C falls within the summer rainfall region of South Africa, in which more than 80% of the annual rainfall occurs from October to March. Eighty five percent of the rain falls during summer thunderstorms occurring every 3 - 4 days in summer. They occur in the form of conventional thunderstorms, are usually of short duration and high intensity and accompanied by lightning, strong winds, and sometimes hail. The gross annual “A” pan evaporation for the region, measured at Carolina, is 1725,9 mm.

Temperatures in this climatic zone are generally mild, although low minimal can be experienced during the winter months due to clear night skies. Temperatures can vary between 32,5°C (maximum) to 1,7°C (minimum) in summer and 21,9°C (maximum) to –6°C (minimum) in winter. Frost characteristically occurs in the winter months.

The annual prevailing wind direction, during the day, summer and winter months, is north-westerly, while during the equinoctial period (March to May) and during night time, the prevailing winds are from the east.

Climatic data were obtained from the South African Weather Bureau weather recording stations (Carolina). All precipitation, evaporation and temperature data are presented in Table 4.

5.4.2.2. Mean Monthly Rainfall and Evaporation

Table 4: Climatic conditions in the vicinity of Bankfontein Colliery C – Carolina**.**

Month	Rainfall (mm)	Temperature (°C)			A-pan Evaporation (mm)
		Mean	mean max	Mean min	
January	153,0	18,9	24,5	13,4	188,0
February	86,0	18,4	23,8	12,9	160,5
March	64,0	17,6	23,2	12,0	155,1
April	51,0	15,0	21,0	9,0	122,8
May	12,0	12,1	19,0	5,2	113,0
June	6,0	9,0	16,2	1,8	95,5
July	4,0	9,7	17,1	2,4	106,6
August	11,0	11,9	19,4	4,5	144,5
September	30,0	14,8	22,2	7,5	179,6
October	80,0	16,3	22,8	9,6	190,4
November	140,0	17,3	23,1	11,4	174,8
December	119,0	18,4	24,1	12,8	195,1
Total	**756,0**				**1725,9**
Average	**63,0**	**15,0**	**21,4**	**8,5**	**143,83**

Monthly Mean Wind Direction and Speed

No data on the wind patterns is available for the mine. Owing to the location of the site, the gentle undulating topography and the non-existence of mountain ranges, no localised wind systems (topographically induced) will be generated.

Extreme weather conditions

The area is prone to host extreme events on a regular basis. These events include the following:

- The area is prone to drought conditions.

- Regular frost occurs during the winter months.
- Rainfall occurs as scattered thunderstorms.
- Strong gusty winds prior to and during thunderstorms.

5.4.3. Topography

The elevation of the surrounding area ranges from 1668 m above sea level to 1713 m above sea level. The surrounding area is considered undulating and consists of hills and valleys, often with streams in the valleys and pans in the hills.

5.4.4. Land-Use

The land in the proposed mining area and adjacent land is mainly used for grazing. Refer to figure 6 below for a visual indication.

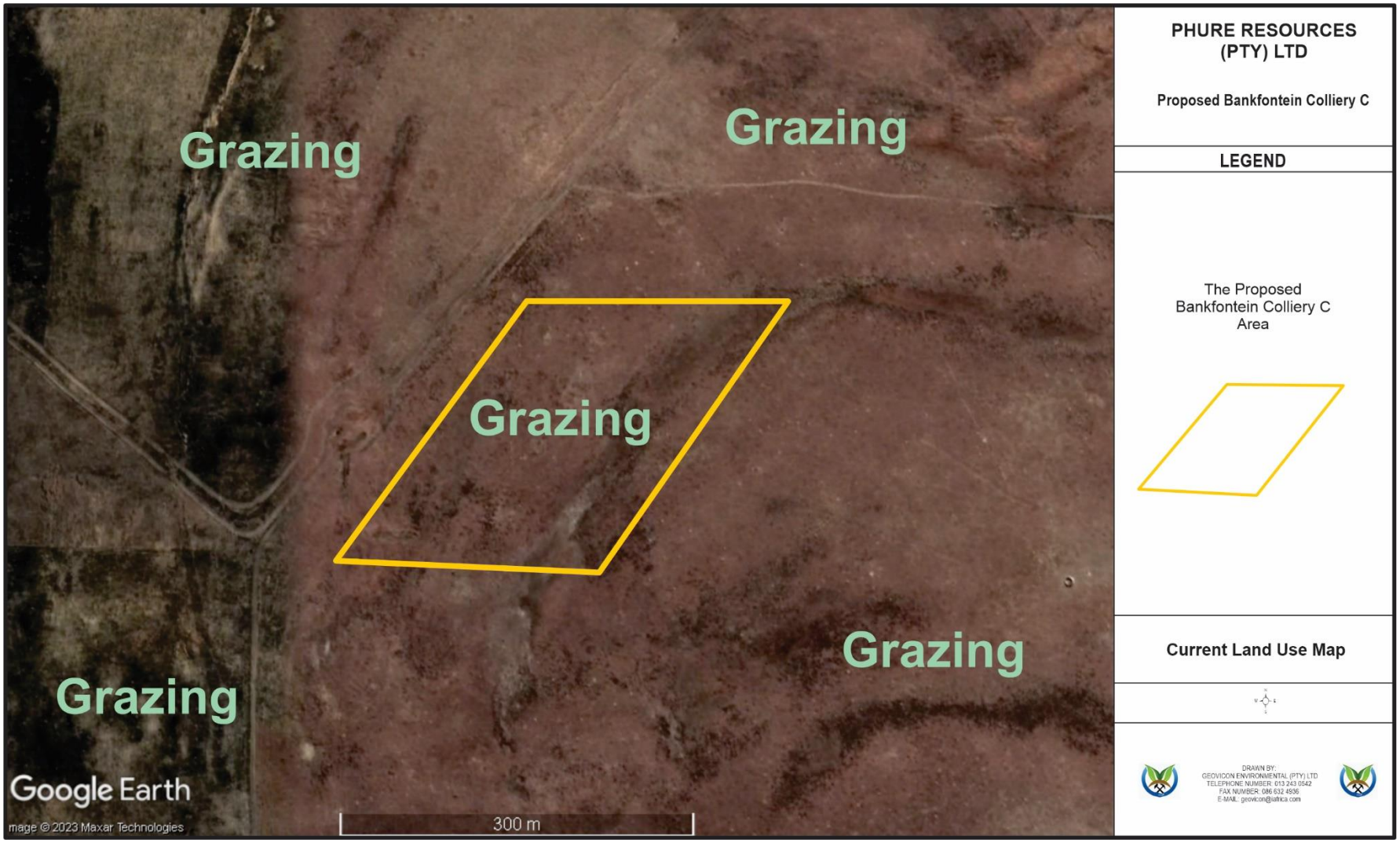


Figure 6: Current Land Use Map

5.4.5. Natural Vegetation/Plant Life

The proposed Bankfontein Colliery C is situated the Eastern Highveld Grassland (Gm 12) vegetation type of the Mesic Highveld Grassland bioregion in the Grassland Biome See Figure 7 for a visual indication (South African National Biodiversity Institute – SANBI; VEGMAP 2018).

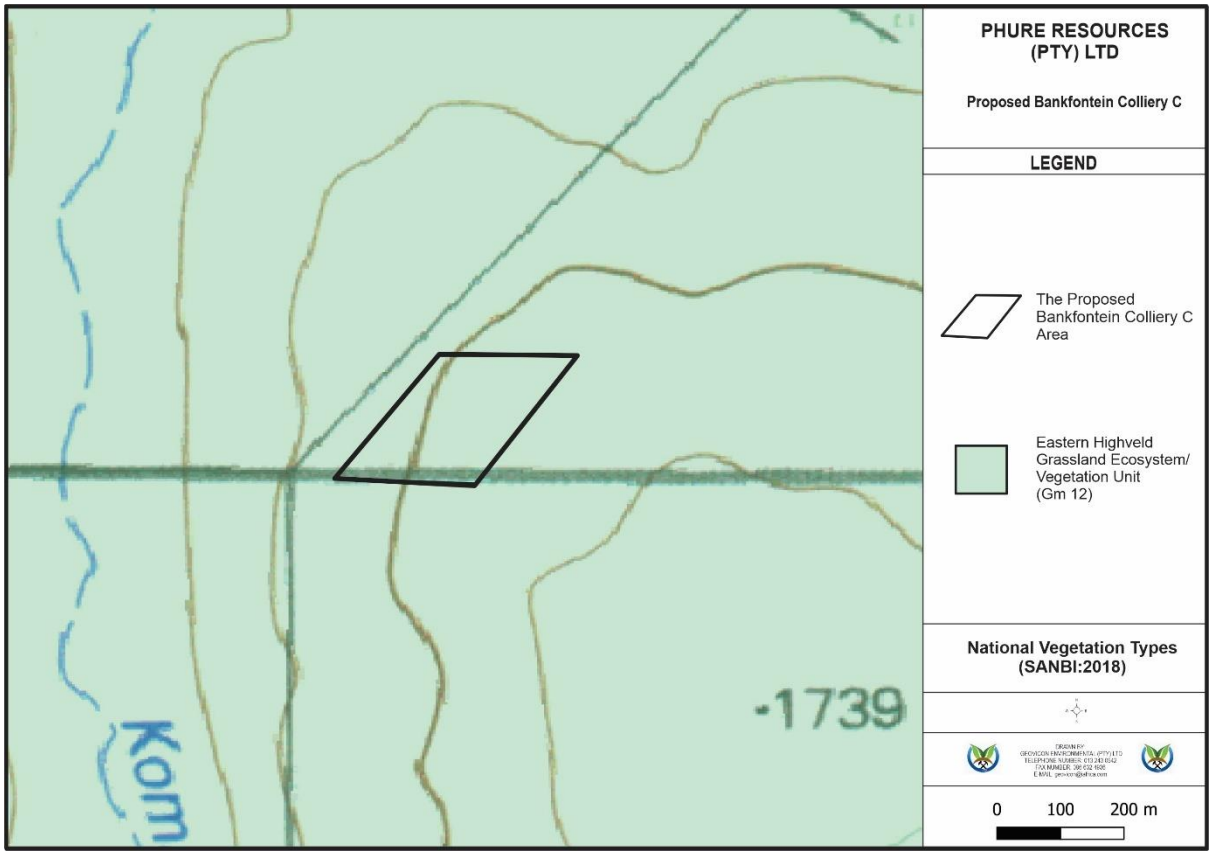


Figure 7: National Vegetation types in the vicinity of the proposed Bankfontein Colliery C

Mucina & Rutherford (2006) describes the vegetation that represent the above-mentioned vegetation types. The list of the dominant taxa in the Eastern Highveld Grassland vegetation unit / ecosystem is shown in table 5 below.

Table 5: List of vegetation types that occur within the Eastern Highveld Grassland vegetation ecosystem

SCIENTIFIC NAME	COMMON NAME
Graminoids (Grass like plants)	
Aristida aequiglumis	Three-awn
Aristida congesta	Tassel three-awn
Aristida junciformis	Gongoni three-awn
Brachiaria serrata	Velvet signal grass
Cynodon dactylon	Couch grass
Digitaria monodactyla	One finger grass
Digitaria tricholaenoides	Purple finger grass
Elionurus muticus	Wire grass
Eragrostis chloromelas	Narrow curly leaf

Eragrostis curvula	Weeping love grass
Eragrostis plana	Tough love grass
Eragrostis racemosa	Narrow heart love grass
Eragrostis sclerantha	Love grass
Heteropogon contortus	Spear grass
Loudetia simplex	Common russet grass
Microchloa caffra	Pincushion grass
Monocymbium ceresiiforme	Boat grass
Setaria sphacelata	Bristle grass
Sporobolus africanus	Ratstail dropseed
Sporobolus pectinatus	Dropseed
Themeda triandra	Red grass
Trachypogon spicatus	Giant spear grass
Tristachya leucothrix	Trident grass
Tristachya rehmannii	Trident grass
Herbs (Forbs, plants)	
Berkheya setifera	Rasperdissedoring
Haplocarpa scaposa	Tonteldoosbossie
Justicia anagalloides	-
Pelargonium luridum	-
Acalypha angustata	Copper leaf
Chamaecrista mimosoides	Fishbone cassia
Dicoma anomala	Maagbitterwortel
Euryops gilfillanii	-
Euryops transvaalensis	-
Helichrysum aureonitens	-
Helichrysum caespititium	Speelwonderboom
Helichrysum calicomum	-
Helichrysum oreophilum	-
Helichrysum rugulosum	-
Ipomoea crassipes	-
Geophytic herbs	
Gladiolus crassifolius	-
Haemanthus humilis	-
Hypoxis rigidula	Kaffertulp
Ledebouria ovatifolia	-
Succulent herbs	
Aloe ecklonis	Ecklone’s aloe
Low shrubs	
Anthospermum rigidum	-
Stoebe plumose	-

5.4.6. Animal life

Bankfontein Colliery C is situated in the Eastern Highveld Grassland ecosystem, therefore the animal species that are likely to occur within the ecosystem, primarily inhabits the grassland habitat. In accordance with the above-mentioned land uses certain species can occur within and in the surrounding areas of the mining permit area.

5.4.7. Surface Water

Bankfontein Colliery C falls within the Inkomati Water Management Area. The site is located in the quaternary catchment of X11A refer to Figure 8. The Komatirivier flows to the north of the proposed mining permit area. There are a number of unnamed tributaries flowing near the mining permit area. These streams drain in a northern direction towards the Komati River. Table 6 below indicate a summary of quaternary catchment X11A.

Table 6: Summary of the above-mentioned Quaternary Catchment

	X11A
Drains into	Komati River
Size in km^2	678
Mean annual precipitation (mm)	687,70
Evaporation (mm)	1869,90
Mean annual surface runoff (mm)	55,60

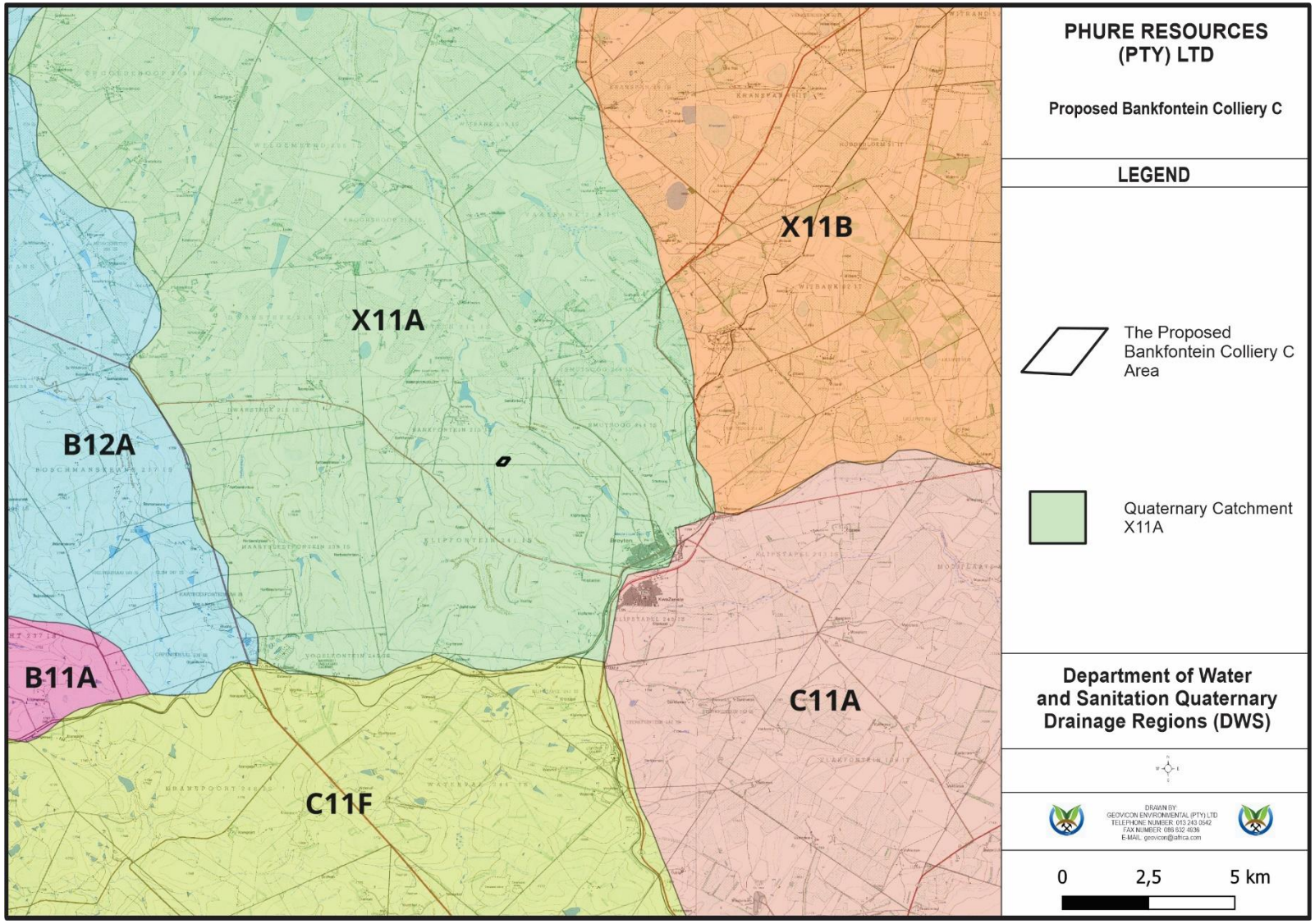


Figure 8: Quaternary drainage region associated with the proposed Bankfontein Colliery C

River diversions
No river diversions are planned for the mining activities covered by this report.

Water Use

The likely downstream users were determined by examining aerial photography and literature surveys.

The downstream users were therefore considered in the stream. The downstream usage classes are evaluated below:

- Domestic users –local inhabitants may consume this river water and will likely also use the water for laundry.
- Recreational users – it is likely that local inhabitants will swim in the streams.
- Industrial users – there are mining and industrial activities downstream of the proposed operations. However, these operations are not sensitive to poor quality water.
- Aquatic users – the catchments are heavily impacted by agriculture and mining, and sensitive aquatic users are unlikely to be present.
- Irrigation users – the river water might to be used for small-scale or informal irrigation.
- Livestock – the river water is likely to be used for drinking by livestock.

Water Authority

The catchment area is government water-controlled catchment. The authority in charge is the Department of Water and Sanitation (Mpumalanga Regional Office).

5.4.8. Groundwater

5.4.8.1. Aquifer classification.

According to literature the Karoo Supergroup sediments typically act as secondary aquifers (intergranular and fractured rock aquifers). However, the multi-layered weathering system present on these rocks could prove to have up to two aquifer systems present in the form of a shallow, regolith aquifer with a weathered, intergranular soft rock base associated with the contact of fresh bedrock and the weathering zone; and a fractured bedrock aquifer. These aquifer systems are discussed below.

Saturated Zone

In the saturated zone, at least four aquifer types may be inferred from knowledge of the geology of the area:

- A shallow aquifer formed in the weathered zone, perched on the fresh bedrock.
- An intermediate aquifer formed by fracturing of the Karoo sediments.
- Aquifers formed within the more permeable coal seams and sandstone layers.
- Aquifers associated with the contact zones of the dolerite intrusives.

Although these aquifers vary considerably regarding geohydrological characteristics, they are seldom observed as isolated units. Usually, they would be highly interconnected by means of fractures and intrusions. Groundwater will thus flow through the system by means of the path of least resistance in a complicated manner that might include any of these components.

Shallow perched aquifer

A near surface weathered zone is comprised of transported colluvium and *in-situ* weathered sediments and is underlain by consolidated sedimentary rocks (sandstone, shale and coal). Groundwater flow patterns usually follow the topography, often coming very close to surface in topographic lows,

sometimes even forming natural springs. Experience of Karoo geohydrology indicates that recharge to the perched groundwater aquifer is relatively high, up to 3% of the Mean Annual Precipitation (MAP).

Fractured Karoo rock aquifers

The host geology of the area consists of consolidated sediments of the Karoo Supergroup and consists mainly of sandstone, shale and coal beds of the Vryheid Formation of the Ecca Group. Most of the groundwater flow will be along the fracture zones that occur in the relatively competent host rock. The geology map does not indicate any major fractures zones in this area, but from experience it can be assumed that numerous major and minor fractures do exist in the host rock. These conductive zones effectively interconnect the strata of the Karoo sediments, both vertically and horizontally into a single, but highly heterogeneous and anisotropic unit.

Aquifers associated with coal seams

The coal seam forms a layered sequence within the hard rock sedimentary units. The margins of coal seams or plastic partings within coal seams are often associated with groundwater. The coal itself tends to act as an aquitard allowing the flow of groundwater at the margins.

Aquifers associated with dolerite intrusive

Dolerite intrusions in the form of dykes and sills are common in the Karoo Supergroup, and are often encountered in this area. These intrusions can serve both as aquifers and aquifuges. Thick, unbroken dykes inhibit the flow of water, while the baked and cracked contact zones can be highly conductive. These conductive zones effectively interconnect the strata of the Ecca sediments both vertically and horizontally into a single, but highly heterogeneous and anisotropic unit on the scale of mining. These structures thus tend to dominate the flow of groundwater. Unfortunately, their location and properties are rather unpredictable. Their influence on the flow of groundwater is incorporated by using higher than usual flow parameters for the sedimentary rocks of the aquifer.

Unsaturated zone

Although a detailed characterization of the unsaturated zone is beyond the scope of this study, a brief description thereof is supplied.

The unsaturated zone in the proposed mining area is in the order of between 1 and 20 meters thick and consists of colluvial sediments at the top, underlain by residual sandstone/siltstone/mudstone of the Ecca Group that becomes less weathered with depth.

According to the Parsons Classification system, the aquifer could be regarded as a minor aquifer system, but also a sole aquifer system in some cases where groundwater is the only source of domestic water.

5.4.9. Sensitive Landscapes

Phure Resources (Pty) Ltd recognises that all streams and wetlands should be treated as sensitive landscapes. To this extent, Geovicon Environmental (Pty) Ltd an independent consultant, undertook a desktop study over the Bankfontein Colliery C to determine the presence of any sensitive areas. In addition to this, a National Web Based Environmental Screening Tool Report was also generated for the mining permit area in question and is attached as **Appendix D**. According to the study there are sites that resembles sensitive landscapes which were identified in close proximity to the site.

The proposed Bankfontein Colliery C is situated within a vulnerable ecosystem, namely the Eastern Highveld Grassland Ecosystem (refer to figure 9). According to Government Notice 1002, (Government Gazette No. 34809 9 December 2011), vulnerable ecosystems are considered threatened ecosystems since it is ecosystems that have a high risk of undergoing significant degradation of ecological structure,

function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems

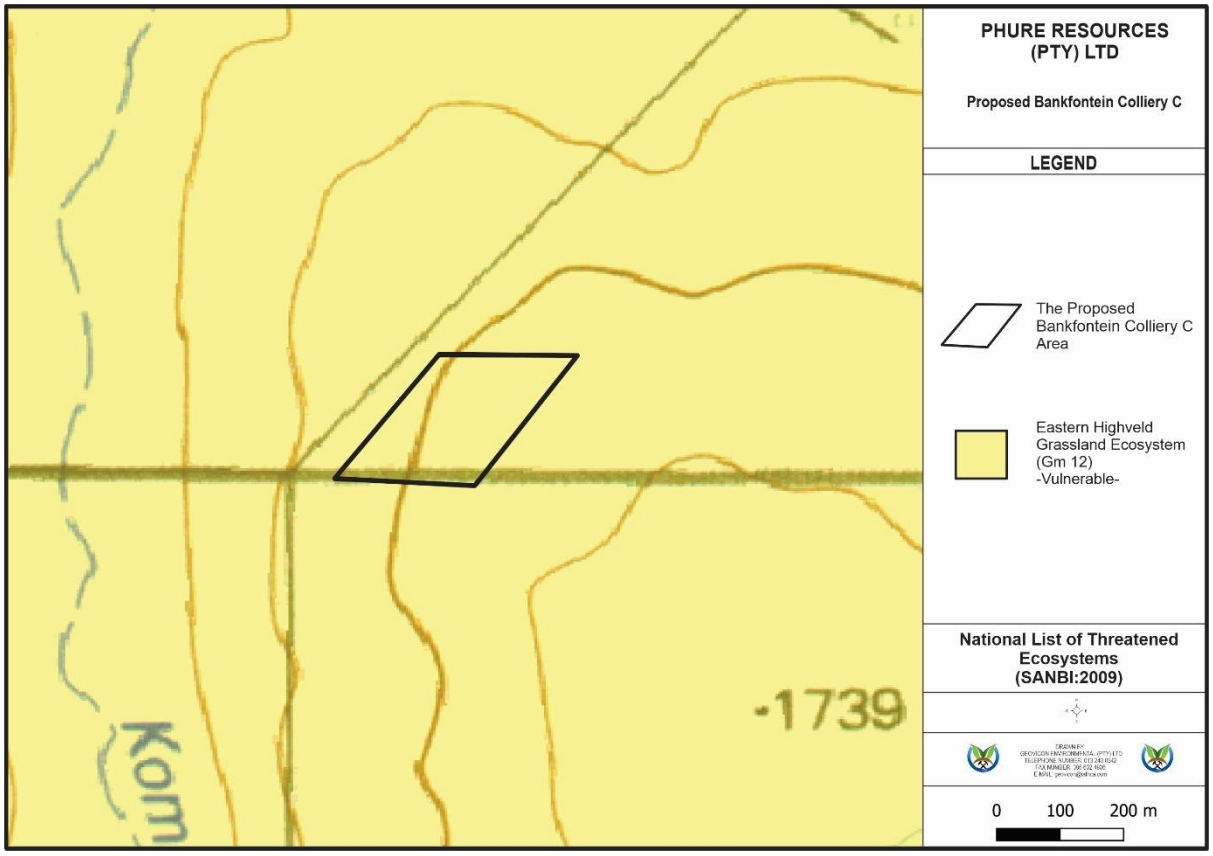


Figure 9: National Threatened Ecosystems in the vicinity of the proposed Bankfontein Colliery C

The proposed Bankfontein Colliery C is not situated in the vicinity of any strategic water source areas of South Africa.

The proposed Bankfontein Colliery C is situated in the vicinity of a National River Freshwater Ecosystem Priority Area, namely a Freshwater Ecosystem Priority Area (FEPA) (refer to figure 10). According to the Atlas of Freshwater Ecosystem Priority Areas, FEPAs are described as the river reach that is required to meet biodiversity targets for river ecosystems and threatened fish species. In managing the condition of a FEPA, it is important to manage not only the river itself, but also the network of streams and wetlands as well as land-based activities in the sub-catchment that supports the river FEPA. A proportion of tributaries and wetlands need to remain healthy and functional in order for the FEPA to be kept in a good ecological condition. This requires that management activities are focussed on maintaining water quantity and quality and the integrity of natural habitat in the sub-catchment.

Figure 10: National River Freshwater Ecosystem Priority Areas in the vicinity of the proposed Bankfontein Colliery C

According to the South African National Biodiversity Institute, GIS-based electronic application, 2018: National Biodiversity Assessment - National Wetlands Map 5, the proposed Bankfontein Colliery C is not situated in the vicinity of any wetlands, however there are wetlands in the surrounding area (Figure 11).

The proposed Bankfontein Colliery C is situated in the Mesic Highveld Grassland, Group 4 wetland vegetation/ ecosystem type (Figure 12).

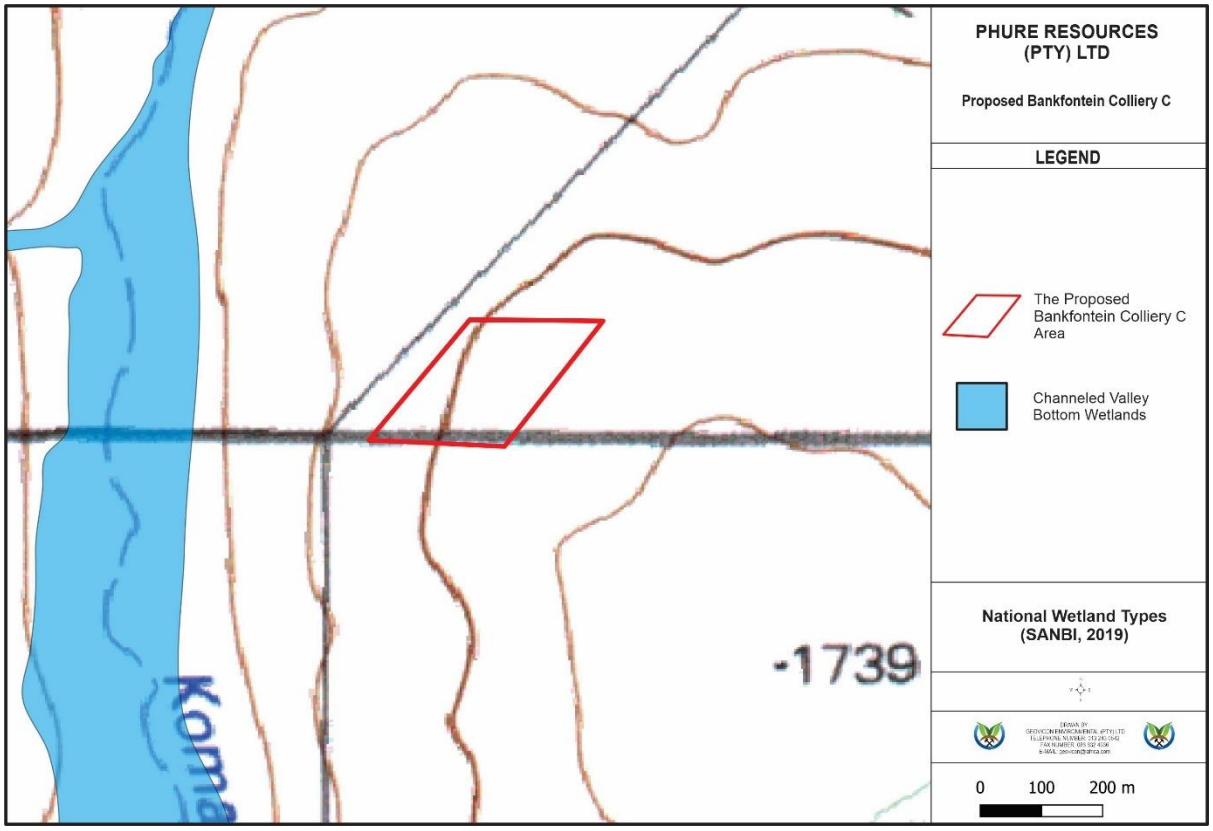


Figure 11: National Wetland Types in the vicinity of the proposed Bankfontein Colliery C

Figure 12: National Wetland Vegetation types in the vicinity of the proposed Bankfontein Colliery C

According to the Mpumalanga Biodiversity Sector Plan GIS based electronic application (MTPA, 2019), the proposed Bankfontein Colliery C is situated over terrestrial assessment categories of irreplaceable Critical Biodiversity Areas. See Figure 13 for a visual indication.

According to the MBSP Handbook (2015) **Critical Biodiversity Areas (CBAs)** are described as all areas required to meet biodiversity pattern and process targets; Critically Endangered ecosystems, critical linkages (corridor pinch-points) to maintain connectivity; CBAs are areas of high biodiversity value that must be maintained in a natural state. Critical Biodiversity Areas are further subdivided into categories CBA irreplaceable and CBA optimal areas. The category of CBA Irreplaceable includes: (1) Areas required to meet targets and with irreplaceability values of more than 80%; (2) Critical linkages or pinch-points in the landscape that must remain natural; (3) Critically Endangered Ecosystems.

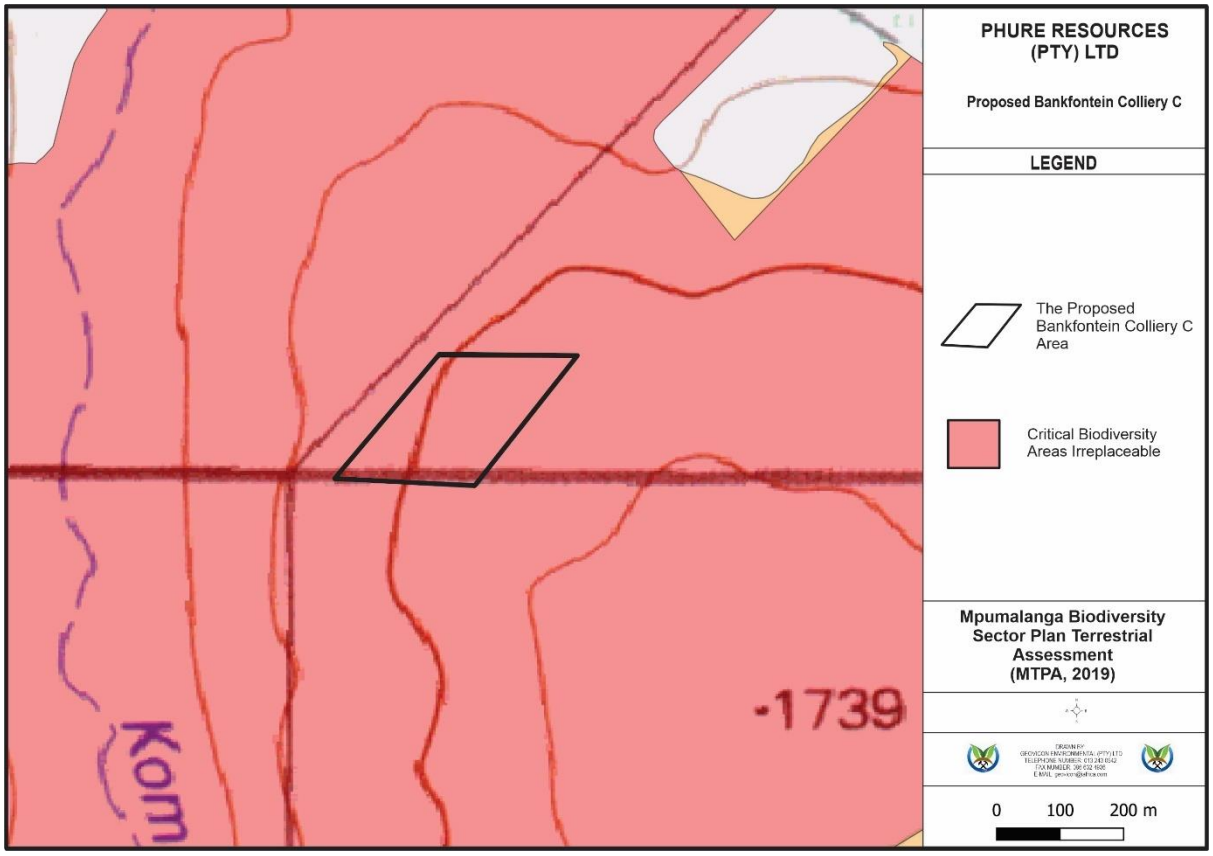


Figure 13: Mpumalanga Biodiversity Sector Plan Terrestrial Assessment for the proposed Bankfontein Colliery C

According to the Mpumalanga Biodiversity Sector Plan GIS -based electronic application the proposed Bankfontein Colliery C is situated over the following freshwater assessment categories:

The proposed Bankfontein Colliery C is primarily situated over freshwater assessment categories of ecological support area important sub catchments (figure 14).

According to the MBSP Handbook (2015) **Ecological Support Areas Important sub -catchments** are described as sub-catchments that either contain river FEPAs and/or Fish Support Areas.

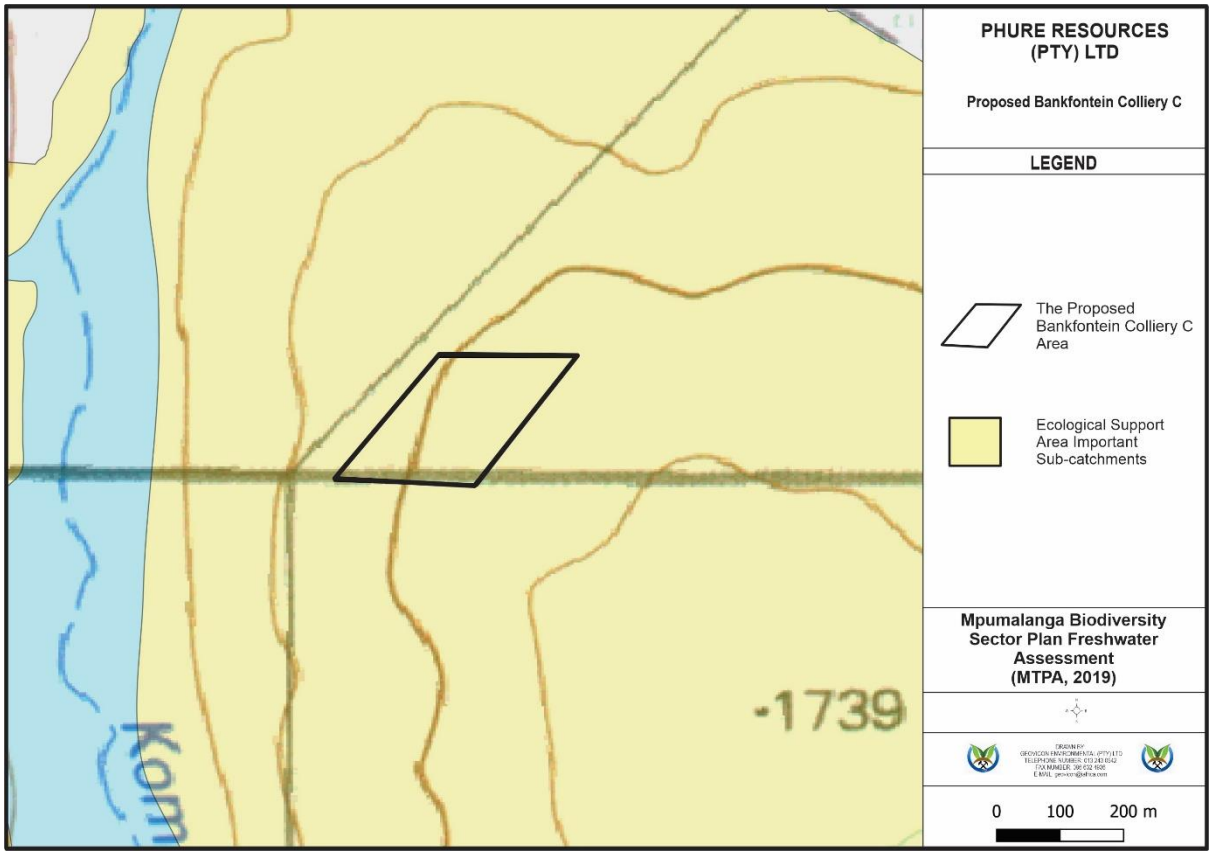


Figure 14: Mpumalanga Biodiversity Sector Plan Freshwater Assessment for the proposed Bankfontein Colliery C

The proposed Bankfontein Colliery C is not situated in the vicinity of either South African Conservation Areas or South African Protected Areas.

5.4.10. Air Quality

Emissions inventory: Construction

Heavy construction is a source of dust emissions that may have substantial temporary impact on local air quality. Building and road construction are two examples of construction activities with high emissions potential. Emissions during the construction of a building or road can be associated with land clearing, drilling and blasting, ground excavation, cut and fill operations (i.e., earth moving), and construction of a particular facility itself. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing meteorological conditions. A large portion of the emissions results from equipment traffic over temporary roads at the construction site.

The temporary nature of construction differentiates it from other fugitive dust sources as to estimation and control of emissions. Construction consists of a series of different operations, each with its own duration and potential for dust generation. In other words, emissions from any single construction site can be expected (1) to have a definable beginning and an end and (2) to vary substantially over different phases of the construction process. This is in contrast to most other fugitive dust sources, where emissions are either relatively steady or follow a discernible annual cycle. Furthermore, there is often a need to estimate area-wide construction emissions, without regard to the actual plans of any individual construction project.

The quantity of dust emissions from construction operations is proportional to the area of land being worked and to the level of construction activity. By analogy to the parameter dependence observed for other similar fugitive dust sources, one can expect emissions from heavy construction operations to be positively correlated with the silt content of the soil (that is, particles smaller than 75 micrometres [µm] in diameter), as well as with the speed and weight of the average vehicle, and to be negatively correlated with the soil moisture content.

Emissions inventory: Mining

Initial operations involve the removal of top- and subsoil with front-end loaders and bull dozers. The exposed overburden, the earth between the topsoil and the coal seam will be levelled and if required, drilled and blasted. The overburden material will be removed down to the coal seam by shovel and truck operation. The topsoil and overburden material will be stockpiled in designated areas on-site for later use in the reclamation processes.

The uncovered coal seam will be drilled and blasted if required. A shovel or front-end loader will load the broken coal onto haul trucks for transport to a temporary storage pile.

During mine reclamation, which proceeds continuously throughout the life of the mine, material from the overburden spoils piles will be used to fill mined-out areas. Topsoil will be placed on the graded spoils, and the land will be prepared for re-vegetation by furrowing, mulching, etc.

5.4.11. Noise

The proposed project area is surrounded by predominantly mining and agricultural activities. Potential noise sources from the area may therefore be emanating from these various sources. The proposed project may contribute towards noise levels through the mining activities with the use of associated infrastructure.

5.4.12. Socio-Economic Status

Msukaligwa Local Municipality (MLM) is located within the Gert Sibande district municipality, Mpumalanga. The municipality is spatially covering an area of 6016 km^2 which comprises 18.9% of the total land mass of Gert Sibande District Municipality. The Municipality comprises seven admin units/towns which are:

- Davel/KwaDela
- Ermelo/Wesselton
- Breyten/KwaZanele
- Chrissiesmeer/KwaChibikhulu
- Warburton/Nganga
- Lothair/Silindile
- Sheepmoor.

5.4.12.1. Population density, growth and location

Msukaligwa population dynamics is based on statistics derived from Statistics South Africa 2011 census and 2016 Community Survey data, the Gert Sibande District Municipality and other sources. The population of Msukaligwa grew by 15 231 persons between 2011 and 2016 at an annual growth of 2.2% to 164 608 persons making it the 4th largest population in Gert Sibande District in 2016.

The Census (2011) and Community Survey (2016) indicate that there was a decrease in population of those aged between 5 – 14. The youth population contributes 41.2% of the total population of Msukaligwa, being the largest group in the population. According to the 2016 Community Survey data, as compared with the previous two Census data, a drop in a number of females can be observed as females contribute 49.9% and males 50.1% of the total population of Msukaligwa municipality. Female headed households are at 37.8% and child headed household of ages 10-17 years is 0.6% in 2016. Between the ages of 45-49 years, the population cohort remained relatively the same thus showing signs of slowing down and this seems to indicate this population is showing signs of slowing down.

Spatially the population is concentrated in the towns and settlements of Msukaligwa. Close to 60% of the total population in Msukaligwa lives in the main node of Ermelo / Wesselton, followed by 10% in Breyten / KwaZanele. Around 16% of the population lives across the rural wards.

5.4.12.2. Major economic activities and sources of employment

The economic growth rate for Msukaligwa was at 3.0% per annum on average over the period 1996 to 2017 and forecasted average annual GDP growth for 2017-2022 relatively low at 1.3%. The contribution of Msukaligwa to the Mpumalanga economy was around 4.3%, making it the fifth largest local economy in the province. It is the second largest economy in the district, contributing around 15.5%.

The municipality comprises a number of sectors that contribute to the regional economy and providing employment to the people of Msukaligwa and surrounding areas. The leading industries in terms of employment being Trade (including industries such as tourism), Community Services and Agriculture and Mining.

SECTION SIX

Environmental impact assessment

6. ENVIRONMENTAL IMPACT ASSESSMENT

6.1. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOLLOWED

6.1.1. Approach to Environmental Impact Assessment

The term 'environment' is used in the broadest sense in an EIA. It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

An Environmental Impact Assessment is a good planning tool. It identifies the environmental consequences of a proposed project from the beginning and helps to ensure that the project, over its life cycle, will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

6.1.2. Environmental Impact Assessment Process Followed

Under Section 24 of the National Environmental Management Act (NEMA), the Minister promulgated the regulations pertaining to environmental impact assessments (EIA Regulations, 2014) under Government Notice No. 326 in Government Gazette 38282 of 4 December 2014. These EIA regulations repealed the 2010 EIA regulations and therefore any process relating to environmental authorisations must be undertaken under the EIA Regulations, 2014.

Chapter 4 of the EIA Regulations, 2014 deals with the provisions for application for environmental authorisation. In view of the above, Phure Resources (Pty) Ltd is obliged to comply with provisions of Chapter 4 for the intended environmental authorisation application for the activities (listed activities) within the proposed project.

Part 2 of chapter 4 of the EIA Regulations, 2014 contemplate process to be undertaken for the application for environmental authorisation for the proposed project, which is the BAR process. The process to be followed is describe below.

6.1.2.1. Pre-application consultation with the Competent Authority

In terms of section 24D (1) of the National Environmental Management Act, 1998 (Act 107 of 1998), the Minister responsible for mineral resources is the competent authority for environmental matters relating to mining and associated activities. In view of the above, the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources (DMRE), Mpumalanga Regional Office for their consideration and decision making.

6.1.2.2. BAR Phase

In compliance with Regulation 19 of the EIA Regulations, 2014, the BAR and EMPR will be submitted to the competent authority within 90 days after the acknowledgement of the environmental authorisation application.

As part of the public participation, the draft BAR and EMPR will be made available to the commenting authority, potential registered interested and affected parties for their comment for a period of 30 days during the EIA phase.

6.1.2.3. Information Gathering

Environmental baseline data has been obtained via desktop studies, pertaining to surface water, geohydrological data, topographical analyses, soil surveys, vegetation surveys, wetland surveys and geological conditions. Weather data was acquired from the World Weather Online. The data accumulated and analysed is sufficient to gain a baseline indication of the present state of the environment. The use of this baseline study for impact assessments is thus justified and reliable conclusions could be made.

6.1.2.4. Decision on the BAR application

In compliance with Regulation 20 of the EIA Regulations, 2014, the competent authority (DMRE) will within 107 days of receipt of the BAR and EMPR grant or refuse the environmental authorisation.

6.2. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

The following prediction and evaluation of impacts is based on the proposed Bankfontein Colliery C and associated activities.

The evaluation distinguishes between significantly adverse and beneficial impacts and allocates significance against national regulations, standards and quality objectives governing:

- Health & Safety;
- Protection of Environmentally Sensitive Areas;
- Land use; and
- Pollution levels.

Irreversible impacts are also identified. See Table 7 for the definitions of the criteria and Table 8 for the results of the environmental impact assessment for the mining permit area.

The significance of the impacts is determined through the consideration of the following criteria:

Probability	:	likelihood of the impact occurring
Area (Extent)	:	the extent over which the impact will be experienced.
Duration	:	the period over which the impact will be experienced.
Intensity	:	the degree to which the impact affects the health and welfare of humans and the environment (includes the consideration of unknown risks, reversibility of the impact, violation of laws, precedents for future actions and cumulative effects).

Table 7: The above criteria are expressed for each impact in tabular form according to the following definitions:

Probability	Definition
Low	There is a slight possibility (0 – 30%) that the impact will occur.
Medium	There is a 30 –70% possibility that the impact will occur.
High	The impact is definitely expected to occur (70% +) or is already occurring.
Area (Extent)	Definition

Small	0 – 40 ha
Medium	40 – 200 ha
Large	200 + ha

Duration	Definition
Short	0 – 5 years
Medium	5 – 50 years
Long	51 – 200 years
Permanent	200 + years

Intensity	Definition
Low	Does not contravene any laws.
	Is within environmental standards or objectives.
	Will not constitute a precedent for future actions.
	Is reversible.
	Will have a slight impact on the health and welfare of humans or the environment.
Medium	Does not contravene any laws.
	Will not constitute a precedent for future actions.
	Is not within environmental standards or objectives.
	Is not irreversible.
	Will have a moderate impact on the health and welfare of humans or the environment.
High	Contravene laws.
	May constitute a precedent for future actions.
	Is not within environmental standards or objectives.
	Is irreversible.
	Will have a significant impact on the health and welfare of humans or the environment.

Significance and Risk Category	Definition
Negligible	The impact/risk is insubstantial and does not require management
Low	The impact/risk is of little importance, but requires management

Medium	The impact/risk is important; management is required to reduce negative impacts to acceptable levels
High	The impact/risk is of great importance, negative impacts could render options or the entire project unacceptable if they cannot be reduced or counteracted by significantly positive impacts, and management of these impacts is essential
Positive (No risk identified)	The impact, although having no significant negative impacts, may in fact contribute to environmental or economical health

6.3. RESULTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

6.3.1. Assessment of the Bankfontein Colliery C impacts/risks

Table 8: Results of the Environmental Impact Assessment for Bankfontein Colliery C.

6.3.1.1. Construction Phase

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
Activity 21 of listing notice 1: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including association infrastructures, earthworks, directly related to the extraction of the mineral resource. **Activity 27 of listing notice 1**: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for the undertaking of a linear activity or maintenance purposes undertaken in accordance with a maintenance management plan.								
Construction of haul and access roads, overburden stockpiles and in pit sump.	All activities will result in the stripping and removal of the topsoil layer, which will disrupt the soil profile.	Soil/Land capability	Without mitigation					Stockpile the removed topsoil on a topsoil stockpile area which is separate from other overburden materials.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The stripping of topsoil will result in the reduction of the land capability of the area.	Land capability	Without mitigation					Strip soils with intact vegetation to retain the soil characteristics and reuse soil during rehabilitation.
			S	M	S	M	M	
			With mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
			S	L	S	L	L	
	All activities will result in the removal of the topsoil layer, which will result in the loss of natural vegetation cover.	Natural vegetation	Without mitigation					The topsoil removed from successive cuts must be used to cover the disturbed areas and these areas must then be seeded with a recommended seed mix to ensure natural vegetation remaining in the soil (seed bank) is re-established.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The formation of overburden stockpiles will result in topographical highpoints, which will alter the local topographical patterns of the immediate area.	Topography	Without mitigation					Ensure that as little space as possible is used for the construction of stockpiling facilities for the overburden material.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The constructed workshop, mine infrastructure and overburden stockpiles may be visible from the nearby roads	Topography	Without mitigation					Visual berms will be constructed around the visible parts of the mining permit area to shield the said mine infrastructure.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
		Vegetation	Without mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	All activities will result in the removal of the topsoil layer, which will result in the loss of natural vegetation cover		S	M	S	M	M	All topsoil material to be stockpiled separately at appropriate height. Note that the topsoil will retain its seed bank if stripped with intact vegetation and stockpiled properly.
			With mitigation					
			S	L	S	L	L	
	Surface water emanating from the construction site will contain increased amount of silt, which will contaminate the surface water environment	Surface Water Quality	Without mitigation					Ensure that the dam is designed by a suitably qualified person who will ensure that the dam covers as little space as possible whilst complying with the relevant legal requirements. The mine will be designed and constructed such that all dirty water is drained or pumped to the dam.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Surface water emanating from the construction site will contain increased amount of silt, which will contaminate the surface water environment	Surface Water Quality	Without mitigation					Construct berms along the stockpiles and disturbed area to reduce the levels of silt that may report to the nearby stream.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	This phase is not expected to influence the groundwater levels. With the exception of lesser oil and diesel spills, there are also no activities expected that could influence regional groundwater quality. It is important to note that there is large	Groundwater	Without mitigation					Water management facilities should be designed to intercept and contain as much contaminated runoff and/or seepage as possible.
			S	M	S	M	M	
			With mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	existing underground mining in the area and that the proposed opencasts will intercept these mines.		S	L	S	L	L	Apply effective storm water management principles to ensure that clean runoff is maximised and diverted to the receiving water resource, while contaminated runoff is minimised and contained for reuse within the operation. Proper storage, handling and monitoring of fuel and chemicals used on site to minimize the risk of spillages to the environment.
	Movement of vehicles over exposed areas will result in the generation of dust. Generated dust will migrate towards the predominant wind direction.	Air Quality	Without mitigation					Conduct dust suppression on haul and access roads on a regular basis. Monitor the dust fall out concentration
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Machinery used will generate fumes and noise that may have detrimental effects on the surrounding air quality environment and health of the employees and residents of nearby houses.	Air Quality	Without mitigation					Ensure that the used mine vehicles' exhaust systems are in good repair order. Limit speed of mine vehicles. Conduct dust suppression
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
		Noise	Without mitigation					Limit mining activities during day time

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	Noise generated from construction activities may add to the current noise levels. This may have impacts on local residents.		S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Adjacent landowners may be impacted on by dust, noise, vibration, visual impacts and nuisance generated during the construction phase of the proposed opencast areas.	Social	Without mitigation					See mitigation under environmental management section, i.e. air, noise, etc Implementation of the Environmental Awareness Plan for the employees.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Potential increase in crime and petty theft.	Social	Without mitigation					Discourage squatting & recruitment on the opencast areas
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The mining operation will create employment opportunities.	Social	Positive					No mitigation measures
Construction of a pollution control dam and	The construction of the pollution control dam and its associated infrastructure will result in the change	Topography	Without mitigation					The construction activities of the pollution control dam and its associated
			S	H	M	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
associated infrastructure	of the current land surface, which will result in the change in the local drainage patterns.		With mitigation					infrastructure will be undertaken within the approved footprint areas.
			S	L	S	L	L	
	The construction phase for the pollution control dam and its associated infrastructure will lead to erosion of soil resources due to altered surface dynamics, the presence of hardened surfaces and general degradation of soil resources, which could result in the loss of land capability. During the construction phase, when surfaces become compacted and temporarily devoid of vegetation, soil erosion by runoff water can be expected. It is likely that the microbiological properties of the soil underneath the large impervious surfaces to be constructed will be negatively affected by lack of oxygen and lack of replenishment of organic matter. Changes in microbial communities may also result from acidification of the soil.	Soils, land capability and land use	Without mitigation					The entire area will be monitored regularly for erosion as part of the road maintenance procedure. In cases where erosion does occur, action plans should be implemented to apply mitigation. The construction will be undertaken within the approved footprint area. Excess soils will be stockpiled at the topsoil stockpiling areas, which will not be more than five meters high.
			S	S	S	M	M	
			With mitigation					
			S	S	S	L	L	
	During the construction of the pollution control dam and its associated infrastructure for the proposed project, topsoil will be stripped and civil works will be undertaken as part of the preparation of the area for the construction of infrastructure. These activities may result in bare areas, which will result in the erosion of soils during rainfall events, with elevated suspended solids reporting in the runoff	Surface Water Quality	Without mitigation					Minimise the extent of hardened surfaces, to retain surface runoff in stilling ponds or retention facilities and to release these in a controlled manner including energy dissipation to avoid erosion to the receiving streams or wetland areas.
			S	H	S	M	M	
			With mitigation					
			S	M	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	water, which may ultimately enter the nearby watercourses. This may subsequently also result in erosion gullies along the runoff patterns, which will result in offsite impacts such as increased sedimentation of the receiving water environments.							Install/construct the construction stormwater management system prior to the onset of vegetation clearing activities on the surface infrastructure footprints. No mining activities will be allowed outside of the authorised areas. Ensure that no equipment is washed in the streams and washing will be undertaken at the mine's workshop area. All construction vehicles will be well maintained and inspected for hydrocarbon leaks weekly. Construction of the infrastructures will be limited to designated boundaries and according to designs. In order to reduce the potential impacts associated with the introduction of contaminants dissolved or suspended in the runoff from construction sites, where practically possible, no runoff will be introduced into wetlands. All construction must be undertaken in line with the approved method statement and civil design reports and drawings.

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
								Areas that are stripped will be optimised to limit unnecessary stripping. Storm water from upslope of the stripped areas will be diverted around these areas to limit the amount of storm water flowing over from these areas. Divert clean water around the cleared area and install erosion protection measures and energy dissipaters at points of discharge. Where practically possible, the major earthworks will be undertaken during the dry season (roughly from April to August) to limit erosion due to rainfall runoff. Cleared areas outside direct development footprint will be re-vegetated and seeded (where necessary) as soon as possible following disturbance. Regular monitoring and inspections at rehabilitated sites will be undertaken to ensure successful rehabilitation.
	Noise generated from construction activities may add to the current noise levels. This may have	Noise	Without mitigation					Construction crew will conduct toolbox talks to educate their employees and
			S	M	S	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	impacts on surrounding property owners and occupiers.		With mitigation					ensure that they are aware of the legislation regarding noise. The construction companies will be wary of noise levels is working near receptors and due to construction activities. The Environmental Co-ordinator keep continuous communication with receptors regarding noises and potential loud noise events. A contact line will be made available to receptors should a valid noise complaint arise whereby receptors could lodge a complaint (and documented). Should a valid noise complaint be lodged, it is advised that the Environmental co-ordinator contact an acoustical consultant with experience in noise monitoring to evaluate the complaint. Onsite noise measurements will be considered on a frequent basis, to help identify any fault or loud equipment that may require enclosures or maintenance. It will be conducted at a frequency determined by the project team or environmental coordinator.
			S	L	S	L	L	
		Groundwater Quality	Without mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	During the construction of the pollution control dam and its associated infrastructure, hydrocarbon fluids (diesel, petrol and oils) and other chemicals may spill onto the ground resulting in the potential pollution of surface and groundwater environments. Limited lowering of the water table may be evident adjacent to the shaft.							Used oil will be removed immediately after vehicle servicing. With mitigation All material with potential to pollute will be stored in secure facilities. All hydrocarbon liquids will be stored in leak and corrosion resistant containers. These containers will be placed in bunded areas. The containers used for the storage of hydrocarbon liquids will be maintained in good condition. Mine machinery will be repaired at designated areas fit for purpose. No maintenance outside the dedicated areas will be allowed unless it is an emergency repairs which must be on a protected ground or by use of drip trays. All spillages will be contained and the affected areas remedied. Where necessary, sufficient supply of absorbent fibre will be kept at site to contain accidental spills. Training for the waste storage facilities will be conducted for employees working with waste (hydrocarbon liquid), including contractors' employees.

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
								Credible waste collectors will be used for the removal of waste from the site to a registered waste disposal facility.
	Construction activities will involve the clearing of large areas of soil, as well as the movement of soil. This will expose large areas and large volumes of soil to erosion by wind and water, which will likely be aggravated by an increase in surface runoff from bare soil areas and concentration of flows. Sediment could be transported downslope via surface runoff to the adjacent wetland areas, leading to increased turbidity with resultant impacts on aquatic habitats, including loss of sensitive species, as well as increased sediment deposition in wetlands, leading to habitat degradation as these areas become colonised by alien and pioneer species. Severe sedimentation could also impact of flow distribution within the wetlands.	Sensitive Landscape	Without Mitigation					Implement storm water management plan. Reduce the extent of bare surfaces wherever possible by rehabilitating and revegetating them. Design of surface infrastructure areas will be optimised to minimise the size of the development footprint and to avoid encroachment into wetland habitat. Emergency servicing of construction vehicles will take place only in dedicated areas. All disturbance footprints will be separated from adjacent wetlands by a fence, either a security fence or as minimum a five-strand cattle fence (ideally not utilising barbed wire). The purpose of the fence is to clearly demarcate the infrastructural areas from the wetland areas and prevent accidental vehicle and construction machinery access to these areas. Locate all temporary stockpiles, constructor's camps, laydown areas,
			M	H	M	M	M	
			With Mitigation					
			S	L	M	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
								ablution facilities etc. within the fenced off shaft footprint area. All construction staff will be educated on the sensitivity of wetland areas and should be made aware of all wetland areas in close proximity to the construction sites. Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities. Such a plan will aim to minimise the transport of sediment off site. Sediment traps and sediment barriers should be installed where necessary, and stormwater discharge points should be protected against erosion and incorporate energy dissipaters. All disturbed areas outside the direct development footprints will be rehabilitated and re-vegetated as soon as possible. The construction servitudes will be regularly inspected for waste or littering and clean-up operations initiated if required. No loss of wetland habitat will be permitted outside of the authorised areas.
		Geology	S	L	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
Excavation of an initial box-cut	The excavation of the initial box-cut (including the in pit water and coal storage facilities) will result in the disturbance of the geological profile		With mitigation					No mitigation can be undertaken for the predicted impact.
			S	L	S	L	L	
	The excavation of the initial box cut (including the in-pit water and coal storage facilities) will result in the formation of topographical voids, which will impact on the local topographical patterns	Topography	Without mitigation					Use material from the following cuts to backfill the voids created by the construction of the initial box-cut and the in-pit water and coal storage facilities
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The stripping of soil layers during the excavation of the initial box-cut (including the in-pit water and coal storage facilities) will result in the loss of topsoil. This will further impact on the land use and land capability	Soil/Land Capability	Without mitigation					Stockpile topsoil to appropriate height hence reducing loss of fertility. Use stockpiled topsoil for rehabilitation of the backfilled opencast pit, hence rehabilitated areas can be used for other purposes.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The excavation of the initial box-cut (including the in-pit water and coal storage facilities) will result in the removal of natural vegetation due to the stripping of topsoil	Vegetation	Without mitigation					The topsoil removed from successive cuts must be used to cover the disturbed areas and these areas must then be seeded with a recommended seed mix to ensure natural vegetation remaining in the soil (seed bank) is re-established.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	Animal burrows and habitats will be destroyed by the activities. This will further result in the migration of animals away from the areas of disturbance.	Animal life	Without mitigation					Rehabilitation of the disturbed areas will encourage the migration of animals back into the destroyed areas.
			S	L	S	L	L	
			With mitigation					
			S	L	S	L	L	
	Rain and runoff water may enter the initial box-cut and the in pit water and coal storage facility). This will result in the loss of clean runoff water that could report to the nearby water body	Surface Water Quality	Without mitigation					Divert runoff water away from the initial box-cut to the in-pit water storage facility and.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Contamination of the clean water by the remaining coal and carbonaceous material may result if clean runoff water is allowed to enter the mining pit, which could impact negatively on the surrounding surface water environment if released.	Surface Water Quality	Without mitigation					Contain all dirty water from the opencast pit into a polluted water containment facility.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
		Groundwater	Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	This phase is not expected to influence the groundwater levels. With the exception of lesser oil and diesel spills, there are also no activities expected that could influence regional groundwater quality. It is important to note that there is large existing underground mining in the area and that the proposed opencasts will intercept these mines.		S	M	S	H	H	Before operation, a plan that includes explicit consideration of closure and rehabilitation issues must be prepared and approved. Water management facilities should be designed to intercept and contain as much contaminated runoff and/or seepage as possible. Apply effective storm water management principles. Monitoring boreholes as discussed in the following sections will be required in strategic locations near the pollution source, to obtain information on the groundwater regime as well as for future monitoring purposes. Construct detailed water and salt balances. Institute detailed monitoring systems that are capable of detecting pollution at the earliest possible stage.
			With Mitigation					
			S	L	S	L	L	
	The stripping of soils from the initial box-cut will result in the exposure of soils causing the generation of dust during windy periods. Movement of mine vehicles will also result in the	Air Quality/Social	Without mitigation					Conduct dust suppression daily on dust generating areas. Enforce appropriate speed limits for the mine vehicles.
			S	M	S	M	M	
			With mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	generation of dust. This may ultimately affect the occupants of structures within the impact zone.		S	L	S	L	L	
	Ground vibration and air blast levels from blasting may affect surrounding structures. A distance of 500 meters from the blast is generally accepted as the area of possible negative impact from blasting.	Social/Land Capability	Without mitigation					No structures occur within the distance of 500 m from the mining permit area, hence blasting is not expected to impact on any structures.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	This does however not allow Phure Resources (Pty) Ltd to blast irresponsibly. Irresponsible blasting may still affect the structures within the surrounds of the mine e.g., fly rock may be problematic if blasting is not done properly.	Social/Land Capability	Without mitigation					Conduct blasting according to a blast design designed by a basting expert. This will ensure that the vibration and air blast are within the acceptable limits.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Dust and noxious fumes may be generated during blasting that can affect the neighbouring residents and road users.	Social/Land Capability	Without mitigation					Proper stemming, and delay blasts when prevailing wind is blowing towards the area of concern. Conduct blasting according to a blast design by a blasting expert. A blaster with appropriate qualifications must be used for blasting. This will ensure that the generation of excessive dust and fumes are prevented.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	Machine operators in close proximity to machinery and employees in the opencast pit will be exposed to high noise during blasting and operation of mine machinery. These noise levels will attenuate to acceptable levels within a short distance (500 m). Note that no significant noise increases are expected within a 500 m radius of the activities.	Noise	Without mitigation					Ensure that the mine employees are issued with earplugs and that they are instructed to use them. Educate employees on the dangers of hearing loss due to mine machinery.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	The initial box-cut will be visible from the surrounding area.	Social	Without mitigation					Use the topsoil from the initial box-cut to construct a visual berm around visible areas of the mine.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	During individual consultations with the adjacent landowners, raised issues with regard to the blasting, which they envisage will affect structural integrity of their houses.	Social	Without mitigation					A structural survey will be done on their houses to identify any cracks or faults present before commencement of the mine
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	During individual consultations with the adjacent landowners, raised issues with regard to the	Social	Without mitigation					A seismograph will be placed at the strategic places to record ground vibration

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	blasting, which they envisage will affect structural integrity of their houses.		S	M	S	M	M	and air blast levels at those places during blasting.
			With mitigation					
			S	L	S	L	L	
	During individual consultations with the adjacent landowners, raised issues with regard to the blasting, which they envisage will affect structural integrity of their houses.	Social	Without mitigation					If it can be proven that the blasting has damaged their houses, Phure Resources (Pty) Ltd must compensate for their damages.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	

6.3.1.2. Operational Phase

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
Activity 21 listing notice 1: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including association infrastructures, earthworks, directly related to the extraction of the mineral resource. **Activity 27 of listing notice 1**: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for the undertaking of a linear activity or maintenance purposes undertaken in accordance with a maintenance management plan.								
Systematic removal of target coal seams at opencast mining areas	Removal and subsequent replacement of topsoil and subsoil material for access to the target coal will result in the disturbance of the geological profile.	Geology	With Mitigation					No mitigation can be undertaken for this impact. The Coal will however be replaced by the overburden material in the mined out opencast pits.
			S	H	P	M	M	
			Without Mitigation					
			S	H	P	M	M	
	Opening of the coal during mining will result in the formation of a void, which will alter the local topographical patterns within the immediate mining permit area.	Topography	With Mitigation					Ensure that the rehabilitated areas maintain natural slopes and these areas are free draining.
			S	H	P	M	M	
			Without Mitigation					
			S	H	P	M	M	
	Stripping of top- and subsoil layers during mining will result in the disruption of the soil profile. The soils' physical, chemical and biological properties may be altered due to loss of topsoil through erosion, stockpiling of	Land Capability	With Mitigation					Systematic removal of coal from the opencast pit.
			S	M	S	M	L	
			Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	soils and mixing of deep and surface soils during handling, stockpiling and subsequent placement.		S	M	M	M	M	
	The impact on soils may lead to reduction in the land capability and use.	Land Capability	Without mitigation					Chemical analyses must be conducted to check the properties of soils and a soil specialist must be appointed who will recommend remediation measures that must be undertaken to restore soil properties. This must be done du
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Opencast mining will result in the removal of the topsoil layer, which will result in the loss of vegetation cover. Mining operation may result in the ingress of alien invasive species.	Vegetation	Without mitigation					Create an alien and invasive eradication plan. Stockpile topsoil with its intact vegetation to retain soil properties.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
	Disturbance to and/or exclusion of animals currently occupying/utilising the site.	Animal Life	Without mitigation					No unnecessary disturbance of land must be undertaken. Where possible, avoid the distraction of animal habitat. Moreover, rehabilitate the area in such that it will allow animals to migrate back to the land.
			S	M	S	M	M	
			With mitigation					
			S	L	S	L	L	
		Animal Life	Without mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	There is a risk that mining employees will resort to trapping of wild animals that may still be present on site and surrounding areas.		S	M	S	M	M	No poaching will be allowed on site. Create an environmental awareness plan on biodiversity and educate employees on preserving animals on site.
			With mitigation					
			S	L	S	L	L	
	Formation of a void during mining will result in loss of MAR within the catchments. Surface run-off may result in soil erosion over rehabilitated areas.	Surface Water Quality	Without Mitigation					Ensure that the operational coal covers as little space as possible during mining; hence rehabilitation must be conducted concurrently with mining to ensure that the mined areas are returned to free draining surfaces. Establish vegetation as soon as possible after completion of the soil placement and profiling.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	Water captured within the pit may contain elevated ion concentrations, which may impact detrimentally on the environment if allowed to enter the natural environment.	Groundwater Quantity	Without Mitigation					All dirty water from the mine will be diverted and captured within the opencast pit. All mining activities will be undertaken outside the 1:100-year flood line.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	Since no mining will be undertaken within the 1:100-year flood line, no wetland is expected to be physically affected by the proposed mine's dewatering.	Groundwater Quality	Without Mitigation					Surrounding boreholes used by residents must be monitored on a quarterly basis. This will determine the extent of the dewatering cone from the opencast pit and
			S	M	S	L	L	
			With Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
			S	M	S	L	L	any user affected must be compensated by the mine
	During the operational phase, it is expected that the main impact on the groundwater quantity will be dewatering of the surrounding aquifer and loss of groundwater contribution to catchment base flow. Water entering the mining pit will have to be pumped out to enable mining activities to continue. This may cause a lowering of the groundwater table in and around the mine and hence loss of groundwater to catchment base flow.	Groundwater Quality	Without Mitigation					Identify and where possible, maximise areas of the mine that will result in clean storm water runoff. Ensure that clean storm water is only contained if the volume of the runoff poses a risk and should be released into natural watercourses under controlled conditions. Ensure the minimisation of contaminated areas, reuse of dirty water wherever possible and planning to ensure that clean areas are not lost to the catchment unnecessarily. Every effort should be made to maximise the clean area and minimise the dirty area. Pumped out water must be contained and used for dust suppression. Mining must be undertaken concurrently with rehabilitation. Only three cuts must be operational at any time during mining, hence reducing the extent of the cone of depression.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	Carbonaceous material remaining from the removal of run of mine coal may cause acid mine drainage after rehabilitation of the	Groundwater Quality	Without Mitigation					Reduce the exposure of the carbonaceous material to free oxygen. This will be achieved by placing the carbonaceous
			S	M	S	H	H	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	opencast pit. This may cause more harm on the already damaged groundwater regime.		With Mitigation					material at the bottom of the opencast pit and backfill as fast as possible.
			S	M	S	L	L	
	The flow in the aquifer will be directed towards the mine at this stage and very little groundwater pollution is thus expected. Additionally, current contaminated groundwater could also flow into the mine, temporary diverting the existing contaminant plume, which will have added pressure on the operation to contain more water from the surrounding workings. It must eb noted that the surrounding opencast workings may have resulted in the dewatering of the workings within the proposed mining permit area.	Groundwater Quality	Without Mitigation					Ensure that seepage losses from storage facilities (such as polluted dams) are minimised and overflows are prevented. Ensure that all possible sources of dirty water have been identified and that appropriate collection and containment systems have been implemented and that these do not result in further unnecessary water quality deterioration. Rehabilitation should be planned to promote free drainage and to minimise or eliminate ponding of storm water. On-going rehabilitation as mining operations progress is required.
			S	M	S	H	H	
			With Mitigation					
			S	L	S	L	L	
	During mining, fine coal, coal and soil dust may accumulate in the workings. This may have health impacts on the employees.	Human Health	Without Mitigation					Employees must be issued with dust masks and instructed to use them. Dust suppression must be undertaken at the opencast pit and all areas where dust may emanate.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
		Noise	With Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Machine operators in close proximity to machinery will be exposed to noise levels in excess of 85 dB.		S	L	S	H	H	Issue earplugs to employees and educate on their use and on the effect of noise on their health
			With Mitigation					
			S	L	S	L	L	
	Some of the social impacts on neighbouring parties relate to noise, visual, air quality deterioration etc. and have been addressed earlier in this section of the impact assessment.	Social	Without Mitigation					No additional mitigation, refer to applicable sections of the impact assessment
			S	L	S	M	M	
			With Mitigation					
			S	L	S	L	L	
	The proposed project will create much needed employment opportunities, which can be enhanced by employing members of the local communities. Capital and operating expenditure on the proposed Coal will benefit the local economy both directly through local buying and indirectly through salaries earned by employees in the area	Social	Positive					No Mitigation Measures
	Potential socio-economic impacts of the mining operation include threat of increase in crime and petty theft	Socio economic aspects	Without Mitigation					Through the environmental awareness plan the employees will be made aware of the impact crime will have on the surrounding farmers and the environment.
			S	L	S	M	M	
			With Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
			S	L	S	L	L	
	Blasting of the overburden and coal seams will result in the generation of dust, which may contain fine coal. The dust will migrate towards the wind direction, The dust will also settle on the surrounding vegetation cover. This dust cloud may impact negatively on the nearby residents and wetland areas.	Air Quality	Without Mitigation					During blasting, minimum explosives will be used and the blasting holes will be stemmed. Despite the above, blasting must be done according to a blast design by a basting expert.
			S	M	S	M	M	
			With Mitigation					
			S	S	S	L	L	
	During blasting, noise levels may reach in excess of 130 dBA. Noise, ground vibration and air blast levels from blasting may affected surrounding structures. A distance of 500 meters from the blast is generally accepted as the area of possible negative impact from blasting.	Noise	Without Mitigation					Monitor noise levels to ensure that the required noise levels are maintained within the surrounding areas.
			S	M	S	M	M	
			With Mitigation					
			S	S	S	L	L	
	Visual impacts may result from the proposed Bankfontein Colliery C opencast operation	Visual	Without Mitigation					Ensure that a visual berm is constructed on any visible parts of the proposed mining operation.
			S	M	S	M	M	
			With Mitigation					
			S	S	S	L	L	
Operation of a pollution control dam	Erosion as a result of run-off and compaction. Contamination as a result of spillages from the operational activities.	Soils, Land Use and Land Capability.	Without mitigation					The footprint of the pollution control dam and associated infrastructure/facilities will
			M	H	M	H	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
and associated infrastructure			With mitigation					be maintained to be within the approved perimeters. Areas with erosion gullies and sedimentation build up will be rehabilitated. Areas with compaction will be ripped and seeded. The stockpiled topsoil will be maintained to have good vegetation cover. Bare areas where no further activities will take place will be identified and re-vegetated with a recommended seed mix. The stockpiled topsoil will be maintained to be within the approved height of five meters.
			S	L	M	L	L	
	Storm water and seepage generated from these dirty areas will likely be contaminated and have a detrimental effect on the water quality in the local streams. These impacts will be most acute during the dry season when stream flows are low.	Surface Water	Without mitigation					Contaminated shallow seepage and storm water run-off from the dirty water areas will be collected and routed to a lined PCD. The PCD water levels will be kept within operating levels and levels constantly monitored. The PCD will be operated empty as far as practicable and cannot fulfil the same role as a water storage dam, unless specifically designed to fulfil both purposes. All drains that collect the wash water and storm water will be maintained regularly. These should be free of debris and silt.
			M	H	M	H	M	
			With mitigation					
			S	L	M	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
								All diversion canals, trenches and conduits will be designed to convey run-off from a 50-year design storm. The wash bays, hydrocarbon storage facilities and workshops will be equipped with oil separators to remove hydrocarbons from wash down water. All vehicles will be well maintained and inspected for hydrocarbon leaks weekly. Wash bay discharge water will flow through an oil separator. Fuel depots and refuelling areas will be bunded. Chemicals will be stored in a central secure area. Regular training on the responsible handling of chemicals will be undertaken. If contract plant is being used, responsible handling of chemicals and vehicle maintenance will be a key performance objective of the plant contractor.
	Pollution of the groundwater regime by leakage and seepage from the PCD and their storm water diversion structures.	Groundwater	Without mitigation					Monitoring of water (shallow groundwater) and waste storage facilities is imperative to manage the risk of spillage and leakage. Operate and manage the dirty water structures (PCD, dirty water diversion
			M	H	M	H	M	
			With mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
			S	L	M	L	L	trenches, and water pipelines) such that it does not leak, seep or discharge dirty water into the groundwater regime. The pollution control will be lined with an HPDE liner and the trenches will be concrete lined. The PCD will be constructed to have leak detection system. The PCD will be designed to have a leak collection system with a pump with sufficient capacity to remove all leaked seepage water. The areas will be monitored for any spillages and spillages must be cleaned up immediately and the contaminated soil disposed of at the suitable area.
	Deterioration of water quality within the wetland areas and destruction of the wetlands. Decreased flow within wetlands adjacent to the PCD footprint.	Sensitive Landscapes	Without mitigation					Measures such as storm water diversion trenches, channels and silt traps will be used for the diversion and collection of clean and dirty water. The silt trap will be operated empty as possible. Monitor the stretch of the dirty water trenches and water pipelines for spillages/leaks and where such spillages/leaks occur, the area should be remedied as soon as possible. All water management infrastructure on site will be inspected at least twice per year, ideally just before the start of the wet season and then again during the middle of
			M	H	M	H	M	
			With mitigation					
			S	L	M	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
								the wet season, for any damage or obstructions. Obstructions will be cleared and damage repaired immediately to ensure optimal operation of the infrastructure. Implement the surface water management plan that will ensure effective clean and dirty water separation. Implement and maintain dirty water infrastructure around all sources of potential dirty water. Regular inspections of all water management infrastructures will be undertaken and detailed records of such inspections maintained. Minimise extent of dirty water areas. Ensure all clean water is diverted around dirty water areas and allowed to re-enter the environment. Implement dust suppression within areas where dust may be generated and areas of heavy vehicle traffic. Implement dust suppression on haul trucks. All areas involving the handling of carbonaceous material and coal will be

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
								considered dirty water areas and should be isolated from the surrounding catchment. No run-off from the coal stockpile will be discharged to the environment. The topsoil stockpile will be located within a clean water area and no contaminated water will come into contact with the topsoil stockpiles. Side slopes of the topsoil stockpiles will be kept as low as possible and should ideally be vegetated to minimise sediment loss and colonisation by alien/weed vegetation. The PCD will be lined and designed according to industry best practice. Should leakage or discharges occur, clean-up and rehabilitation of the affected areas will be undertaken as soon
Operation of the coal stockpile area	The stockpiling of the coal will result in the formation of a topographical highpoint.	Topography	Without Mitigation					The coal at the coal stockpiles will be removed as soon as possible and the area rehabilitated during the decommissioning phase. Rehabilitate the opencast pit concurrently with mining.
			S	M	S	L	L	
			With Mitigation					
			S	M	S	L	L	
			Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Runoff from the coal stockpiles may contain elevated chemical concentrations, which will impact negatively on the environment if released.	Surface Water Quality	S	M	S	M	M	Divert all runoff water from the coal stockpiles area to the in-pit sump.
			With Mitigation					
			S	M	S	L	L	
	Rain water entering the coal stockpiling areas will come into contact with coal resulting in the contamination of the water. Allowing the water to seep into the groundwater regime will result in the pollution of groundwater.	Ground Water Quantity	Without Mitigation					Use compacted material for the construction of the foundation of the coal stockpile areas and allowing the drainage from the area to report to the in-pit sump.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	There will be flow of groundwater seepage from the overburden stockpiles and this flow may be of contaminated nature and may contaminate the surrounding groundwater environment. Due to the presence of old mine workings, no borehole use for domestic purposes would be present within the stockpiles area of influence. Contaminated water will most probably seep into the old workings, which will drain to the active opencast workings.	Ground Water Quality	Without Mitigation					Prevent the erosion or leaching of materials from any residue stockpile. Water quantity and quality data should be collected on a regular, ongoing basis during mine operations to recalibrate and update the mine water management model, to prepare monitoring and audit reports, to report to the regulatory authorities against the requirements of the IWWMP and other authorisations and as feedback to stakeholders in the catchment.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
Operation of other mine infrastructure	During transportation and stockpiling of coal, machinery movement and wind blowing over	Air Quality	Without Mitigation					Place coal stockpiles such that impacts are limited. Limit the size of the coal stockpiles
			S	M	S	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	exposed surfaces will generate diesel fumes, soil and coal dust.		With Mitigation					to the recommended size. Keep mine vehicles in good repair order.
			S	M	S	L	L	
	The dust will during windy days form dust clouds and migrate towards the wind direction, which will eventually settle on vegetation cover and surrounding property. This dust cloud may impact negatively on the nearby residents and on the natural vegetation cover.	Vegetation	Without Mitigation					Conduct dust suppression on the roads within the stockpiling area and limit the vehicle activity as much as possible on these roads
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	The coal stockpiles may be visible from a certain distance resulting in a visual impact.	Visual	Without Mitigation					Use visual berms to shield visible parts of the mine.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	The presence of the coal stockpiles will have an impact on the neighbouring landowners due to the dust and noise generated from the operation of the coal stockpiling areas. Note however, that the coal from the mine will be wet resulting in limited generation of dust if removed soon enough.	Social	Without Mitigation					Conduct dust suppression. Maintain the mine vehicles in good order. Limit the activity within the coal stockpiling area. Conduct dust and noise monitoring and undertake recommendations from the results of such monitoring. Remove coal from the stockpile as soon as possible (if
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
								possible, within one to two days of stockpiling).
	The transportation of coal and overburden material (top soils, sub soils and hards) along the haul roads may result in the contamination of virgin land (soil and vegetation) due to spillages along the roads.	Land Capability/ Soil	Without Mitigation					Trucks to obey maximum speed limit to be set by the mine. Construct spillage control measures such as berms along the roads. All roads to be inspected regularly for any spillages. Any spillages will be removed as soon as it is practically possible.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	The transportation of coal and overburden material (top soils, sub soils and hards) along the haul roads may result in the contamination of virgin land (soil and vegetation) due to spillages along the roads.	Land Capability/ Soil	Without Mitigation					Trucks transporting coal to the destined clients must cover the coal with tarpaulins to prevent spillages along the roads.
			S	M	S	L	L	
			With Mitigation					
			S	M	S	L	L	
	Leaking oils and fluids from trucks will result in the contamination of soils along the haul and access roads.	Land Capability/ Soil	Without Mitigation					Maintain mine vehicles in good repair order. Emergency repairs to be conducted on protected ground e.g., areas covered with tarpaulins. All roads to be inspected regularly for any spillages. Any spillages will be removed as soon as it is practically possible.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
			Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Spillage from the hydrocarbon fluids storage areas (diesel tanks and oil storage areas) in the mining permit area may result in the contamination of the soils and nearby streams.	Soil/Surface Water Quality	S	M	S	M	M	Any accidental spillages to be collected and remedied as soon as possible. Mine must always have oil spill remediation kits at the mine. All new hydrocarbons must be stored on demarcated areas and use thereof must be recorded. All old hydrocarbons must be recycled or disposed of properly.
			With Mitigation					
			S	M	S	L	L	
	Spillage of hydrocarbon fluids outside the mining permit area may result in the contamination of the soils, surface and groundwater.	Soil/Ground Water Quality	Without Mitigation					Emergency repairs must be conducted on protected ground e.g., tarpaulins.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	Runoff water from the haul/access roads will contain elevated levels of hydrocarbons and coal contaminated silt loads respectively, which will impact negatively on the environment if released.	Surface Water	Without Mitigation					Hydrocarbons must be separated from the water and silt before their disposal.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
		Air quality	Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Use of haul and access roads will result in the generation of dust, which may impact negatively on neighbouring landowners, employees and the nearby roads.		S	M	S	M	M	Haul roads must be graded regularly to remove any layer of coal material from the vehicles. Conduct dust suppression on the roads Maintain the roads on a regular basis.
			With Mitigation					
			S	M	S	L	L	
	Employees working in close proximity to mine machinery will be exposed to high levels of noise, which may in the long term be detrimental to their health.	Noise	Without Mitigation					Issue employees with earplugs and instruct them how to use the earplugs.
			S	M	S	M	M	
			With Mitigation					
			S	M	S	L	L	
	Employees working in close proximity to mine machinery will be exposed to high levels of noise, which may in the long term be detrimental to their health.	Noise	Without Mitigation					The mine must through the implementation of the environmental, awareness plan encourages the employees to use these earplugs.
			S	L	S	M	M	
			With Mitigation					
			S	L	S	L	L	

6.3.1.3. Decommissioning and Closure Phases

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	**P**	**D**	**I**	**S**	
DECOMMISSIONING AND CLOSURE PHASES							
Decommissioning of mining (Site Rehabilitation)							
Activity 21 listing notice 1: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including association infrastructures, earthworks, directly related to the extraction of the mineral resource.							
As large excavations are backfilled, there is a potential for the creation of dangerous excavations and steep embankments, which will need to be backfilled and landscaped.	Topography	Without mitigation					All backfilled areas must be levelled and levelled areas monitored for any settlement depressions, which must be rectified as soon as possible.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
During the decommissioning phase disturbed surface will be removed of carbonaceous build-up material and rehabilitated. Thus run off from the removed carbonaceous material could cause pollution of the nearby water environment and may cause erosion.	Surface Water Quality	Without mitigation					Divert all runoff to pollution control structures. Note that the pollution control structure will remain until it can proven that the area does not generate any polluted water.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
After closure, the water table will rise in the mine to reinstate equilibrium with the surrounding groundwater systems. However, the mined areas will have a slightly larger hydraulic conductivity compared to the pre-mining situation. Following the closure of the opencasts and the cessation of the dewatering it is assumed to lead to groundwater rebound. The influx of water into the mine void will decrease over time due to the change in groundwater gradient as a result of the rise in water level within the opencasts. Once the normal groundwater flow conditions have been re-instated, polluted water could potentially migrate away from the mining areas. As some coal and discards will remain in the mine, this outflow will be contaminated as a result of acid or neutral mine drainage. As sulphate is normally a significant solute in such drainage, it can be modelled as a conservative (non-reacting) indicator of mine drainage pollution.	Groundwater Quantity and Quality	Without Mitigation					The post-closure groundwater management of the opencast should be done in two phases: • Phase 1: Immediately after closure The acid producing material should be placed as low in the pits as possible, followed by the non-acid generating material. Rapid flooding should be done by diverting storm water channels and pumping of available groundwater into the pit until the acid producing material is inundated by the water. • Phase 2: After Rapid Flooding The final backfilled opencast topography should be engineered such that runoff is directed away from the opencast areas. The final layer (just below the topsoil cover) should be as clayey as possible and compacted if feasible, to reduce recharge to the opencasts. Natural berms should then be constructed to allow free drainage of surface water around the rehabilitated pit.
		M	M	L	H	H	
		With Mitigation					
		M	L	L	L	L	
Hydrocarbon spillages may render the infrastructure areas to be of no agricultural value after mining.	Land Capability	Without mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
The above impacts, if not controlled, may result in the mine not attaining the planned after mining land use, hence not allowing the intended after mining land use to be undertaken.		S	L	S	M	M	Remove and dispose of all oil, diesel and grease contaminated surfaces and cover with clean topsoil. Work on protected ground (tarpaulins).
		With mitigation					
		S	L	S	L	L	
Noise will be generated during the hauling and loading of material by trucks on site. This noise may exceed operational noise levels but will be short lived.	Noise	Without mitigation					Issue earplugs to employees. Ensure that machinery, equipment and vehicles are regularly serviced. Monitor noise levels in the surrounding communities.
		S	L	S	M	M	
		With mitigation					
		S	L	S	L	N	
As this phase will involve additional traffic such as trucks removing materials, significant dust may be generated on the areas being worked.	Air Quality	Without mitigation					Undertake dust suppression on the areas that generates excessive dust.
		S	L	S	M	M	
		With mitigation					
		S	L	S	L	N	
If the placement of removed overburden material is not done properly, it may impact on the after mining planned soil		Without mitigation					All hardened areas must be ripped, areas with topsoil scarified and areas without

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
distribution, which will impact on the functioning of the soils and vegetation distribution after mining. Compaction of soil during replacing, by heavy mechanical equipment may occur. The above impacts, if not controlled, may result in the mine not attaining the planned after mining land use, hence not allowing the intended after mining land use to be undertaken.		S	M	S	M	M	topsoil covered with a layer of topsoil before being seeded. Construct contours on the placed soil layers at intervals that will help to prevent erosion of the placed soils. Implement a soil management strategy. This will ensure that the soils at the mining area are protected during replacement of the removed soils. Undertake the seeding of the rehabilitated areas as per specialist's recommendation.
		With mitigation					
		S	L	S	L	L	

6.4. SUMMARY OF SPECIALIST REPORTS

For this basic assessment, no specialist report was conducted, only the desktop assessment analysis of the environmental aspects was conducted. The baseline information is summarized in section 5.4 above.

6.5. ENVIRONMENTAL IMPACT STATEMENT

Phure Resources (Pty) Ltd has applied for a mining permit over the Bankfontein Colliery C area. The mining operation will involve the systematic removal of coal within the Bankfontein Colliery C. A conventional opencast mining method will be used for the mining of coal. After mining has ceased the mined-out area will be backfilled, shaped and seeded.

6.5.1. Description of affected environment

The proposed project is situated in area characterised characterised by a gentle undulating plateau with streams such as Komati. A variety of soil types were identified within the project area, which include well-drained, deep Hutton or Clovelly soils. The land uses over the project area correspond to the soils found in the area and include mainly grazing.

6.5.2. Summary of key findings of the environmental impact assessment

During the proposed mining operation impacts may only occur on soils, natural vegetation, surface water, groundwater, sensitive landscapes, air quality, noise, and visual aspects should the mining method statement not be adhered to, Phure Resources (Pty) Ltd will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from to low and negligible significance.

6.6. ASPECTS FOR INCLUSION AS CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

In authorising the proposed Bankfontein Colliery C, the following conditions should form part of the environmental authorisation:

- Phure Resources (Pty) Ltd may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.
- Phure Resources (Pty) Ltd will not undertake any new activity that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- The EMPR must be implemented fully at all stages of the proposed project.
- Phure Resources (Pty) Ltd must limit night-time operations. This would be relevant for all work taking place at night within 150 m from the closest receptors in this community. If night work is conducted, such must be conducted in agreement with the land owners and affected parties (lawful land occupier and labours).

6.7. DESCRIPTION OF ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The EIA Regulations, 2014 outline specific requirements that a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures must be provided in the BAR.

The assessments undertaken are based on conservative methodologies and these methods attempts to determine potential negative impacts that could occur on the affected environmental aspects. These impacts may however be of smaller magnitude than predicted, while benefits could be of a larger extent than predicted.

This section outlines various limitations to the specialist studies that have been undertaken and indicates, where appropriate, the adequacy of predictive methods used for the assessment. This has been done to provide the authorities and interested and affected parties with an understanding of how much confidence can be placed in this impact assessment.

The impact assessment has investigated the potential impact on key environmental media relating to the specific environmental setting for the site. A number of desktop assessment were undertaken and result thereof and are presented in this report.

The information provided in this BAR and EMPR is therefore considered sufficient for decision-making purposes.

6.8. REASONED OPINION AS TO WHETHER THE PROPOSED PROJECT SHOULD OR SHOULD NOT CONTINUE

6.8.1. Reason why the activity should be authorised or not

According to the impact assessment undertaken for the proposed project, the key impacts of the project are on water, dust, noise and close-by community.

The project will also have positive impacts due to the employment to be created although for a short term.

The public will also be requested for their comments. These comments will be addressed as far as possible to the satisfaction of the interested and affected parties.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPR. In consideration of the programmes and plans contained within the EMPR, layouts and method statements compiled for the project, which is assumed will be effectively implemented, there will be significant reduction in the significance of potential impacts.

Based on the above, it is therefore the opinion of the EAP that the activity should be authorised.

6.8.2. Conditions that must be included in the authorisation

In authorising the proposed Bankfontein Colliery C, the following conditions should form part of the environmental authorisation:

- Phure Resources (Pty) Ltd may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.
- Phure Resources (Pty) Ltd will not undertake any new activity that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- The EMPR must be implemented fully at all stages of the proposed project.
- Phure Resources (Pty) Ltd must limit night-time operations. This would be relevant for all work taking place at night within 150 m from the closest receptors in this community. If night work is

conducted, such must be conducted in agreement with the land owners and affected parties (lawful land occupier and labours).

6.9. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION

Based on the mining method statement, the environmental authorisation should be given for period of two years.

6.10. UNDERTAKING

The signed undertaking will be presented to the DMRE on execution of the proposed Bankfontein Colliery C.

6.11. FINANCIAL PROVISION

According to the EIA Regulations, 2014, where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts must be provided in the BAR and EMPr. The financial provision for the proposed area has only been provided under the relevant section of the EMPr.

6.12. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Aside from the BAR and EMPR no other information has been requested by the competent authority.

6.13. OTHER MATTERS REQUIRED IN TERMS OF SECTION 24 (4) (A) AND (B) OF THE ACT

Any matter required in terms of the above section of the Act will be complied together with Phure Resources (Pty) Limited.

PART B

Environmental Management Programme

1. DETAILS OF THE EAP

EAP: Mr. Ornassis Tshepo Shakwane

Professional registration:

SACNASP: 117080

EAPASA: 2019/1763

IAIA Membership No.: 3847

Company: Geovicon Environmental (Pty) Limited

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1.1. EXPERTISE OF THE EAP WHO PREPARED THE BAR AND EMPR

Geovicon Environmental (Pty) Limited is a geological and environmental consulting company. The company was formed during 1996, and currently has more than 20 years' experience in the geological and environmental consulting field. Geovicon Environmental (Pty) Limited has successfully completed consulting areas in the Mining sector (coal, gold, base metal and diamond), Quarrying sector (sand, aggregate and dimension stone), industrial sector and housing sector. Geovicon Environmental (Pty) Limited has undertaken contracts within all the provinces of South Africa, Swaziland, Botswana and Zambia. During 2001 Geovicon Environmental (Pty) Limited entered the field of mine environmental management and water monitoring.

Geovicon Environmental (Pty) Limited is a Black Economically Empowered Company with the BEE component owning 60% of the company. Geovicon Environmental (Pty) Limited has three directors i.e. O.T Shakwane, J.M. Bate and T.G Tefu.

Mr. O.T Shakwane obtained his BSc (Microbiology and Biochemistry) from the University of Durban Westville in 1994, and completed his honours degree in Microbiology in 1995. Mr O.T Shakwane has also completed short courses on environmental law and environmental impact assessment with the University of North West's Centre for Environmental Management. He has worked with the three state departments tasked with mining and environmental management i.e. Department of Water and Sanitation (Gauteng and Mpumalanga Region), Department of Mineral Resources (Mpumalanga Region) and Department of Agriculture, Conservation and Environment (Gauteng Region). Mr. Shakwane has been in the consulting field since 2004 and has completed various areas similar to the proposed Bankfontein Colliery C area as an environmental assessment practitioner. Mr Shakwane is the environmental assessment practitioner for the environmental impact assessment for the proposed Bankfontein Colliery C Mining Permit area.

Over the past years Geovicon Environmental (Pty) Limited has formalised working relationships with companies that offer expertise in the following fields i.e., Geohydrology, Civil and Geotechnical

Engineering, Geotechnical Consultancy, Survey and Mine Planning and Soil & Land Use Consultancy. Geovicon Environmental (Pty) Limited is an independent consulting company, which has no interest in the outcome of the decision regarding the Bankfontein Colliery C Mining Permit Area's basic assessment process. Curriculum Vitae of the EAP is attached as **Appendix E.**

2. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

The requirements to describe the aspects of the activity are covered in the environmental management programme and are included in PART A of the document under section 1. The reader is; therefore, referred to section 1 of PART A of this document.

3. COMPOSITE MAP

The map superimposing the proposed project, its associated structures and infrastructure on the environmental sensitivities of the preferred site will be provided on approval of the EMPR. Note that all areas that must be avoided due to their environmental sensitivity will be indicated in the Layout Plan.

4. DESCRIPTION OF THE MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

4.1 GENERAL CLOSURE PRINCIPLES AND OBJECTIVES

The following are the closure objectives, general principles and objectives guiding closure of the Bankfontein Colliery C area closure planning:

- Rehabilitation of areas disturbed as a consequence of mining to a land capability that will support and sustain a predetermined post-closure land use;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment of final landforms that are stable and safe in the long run;
- Establishment and implementation of measures that meet specific closure related performance objectives;
- Monitoring and maintenance of rehabilitated areas forming part of site closure to ensure the long-term effectiveness and sustainability of measures implemented.

4.2 MANAGEMENT OF ENVIRONMENTAL DAMAGE, ENVIRONMENTAL POLLUTION AND ECOLOGICAL DEGRADATION CAUSED BY THE BANKFONTEIN COLLIERY C ACTIVITIES

The following actions will be undertaken by Phure Resources (Pty) Ltd to ensure that the closure objectives are attained.

4.2.1 Infrastructure Areas

- All infrastructure and equipment used during the mining operation will be removed from the site.

- All haul roads that were used for access during mining will be allowed to re-establish to its pre-mining condition. Should unsatisfactory results be noted, the area will be physically rehabilitated.
- All rehabilitated areas will be maintained for a period of 2 years, where after the frequency will be reassessed. Where necessary, vegetation cover will be maintained by annual application of fertiliser.
- Maintenance with respect to erosion will be conducted on a minimum three-monthly basis if and where required.

4.2.2.1 Buildings (Offices, Workshops and Stores)

Mobile structures will be used and such structures will be removed from the sites during decommissioning phase.

4.3 POTENTIAL RISK OF ACID MINE DRAINAGE

Sulphate is probably the most reliable indicator of pollution emanating from coal mining. Sulphate concentrations can however increase due to mobilisation during the mining process. The chemistry analyses supplied within this report should henceforth serve as baseline water quality throughout of acid mine drainage (AMD) formation.

The reactions of acid and sulphate generation from sulphide minerals are discussed according to the three-stage stoichiometric example of pyrite oxidation after James, (1997) and (Ferguson & Erickson, 1988) in which one mole of pyrite oxidized forms two moles of sulphate:

Reaction (2.1) represents the oxidation of pyrite to form dissolved ferrous iron, sulphate and hydrogen. This reaction can occur abiotically or can be bacterially catalysed by *Thiobacillus ferrooxidans*.

$$FeS_2 + 7/2\ O_2 + H_2O = Fe^{2+} + 2SO_4^{2-} + 2H^+ \qquad (2.1)$$

The ferrous iron, (Fe^{2+}) may be oxidised to ferric iron, (Fe^{3+}) if the conditions are sufficiently oxidising, as illustrated by reaction (2.2). Hydrolysis and precipitation of Fe^{3+} may also occur, shown by reaction (2.3). Reactions (2.1), (2.2) and (2.3) predominate at pH > 4.5.

$$Fe^{2+} + 1/4O_2 + H^+ = Fe^{3+} + 1/2H_2O \qquad (2.2)$$

$$Fe^{3+} + 3H_2O = Fe(OH)_3(s) + 3H^+ \qquad (2.3)$$

Reactions (2.1) to (2.3) are relatively slow and represent the initial stage in the three-stage AMD formation process.

Stage the life of the proposed mining operations. The following few paragraphs contains a brief overview 1 will persist as long as the pH surrounding the waste particles is only moderately acidic (pH > 4.5). A transitional stage 2 occurs as the pH decreases and the rate of Fe hydrolyses (reaction 2.3) slows, providing ferric iron oxidant. Stage 3 consists of rapid acid production by the ferric iron oxidant pathway and becomes dominant at low pH, where the Fe^{2+} (ferric iron) are more soluble (reaction 4):

$$FeS_2 + 14\ Fe^{3+} + 8H_2O = 15Fe^{2+} + 2SO_4^{2-} + 16H^+ \qquad (2.4)$$

Without the catalytic influence of the bacteria, the rate of ferrous iron oxidation in an acid medium would be too slow to provide significant AMD generation. As such the final stage in the AMD generation process occurs when the catalytic bacteria *Thiobacillus ferrooxidans* have become established.

Reactions (2.2) and (2.4) then combine to form the cyclic, rapid oxidation pathway mainly responsible for the high contamination loads observed in mining environments.

4.4 STEPS TAKEN TO INVESTIGATE, ASSESS AND EVALUATE THE IMPACTS OF THE ACID MINE DRAINAGE

The identification of the monitoring parameters is crucial and depends on the chemistry of possible pollution sources. They comprise a set of physical and/or chemical parameters (e.g., groundwater levels and predetermined organic and inorganic chemical constituents). Once a pollution indicator has been identified it can be used as a substitute to full analysis and therefore save costs. The use of pollution indicators should be validated on a regular basis in the different sample position. The parameters should be revised after each sampling event; some metals may be added to the analyses during the operational phase, especially if the pH drops.

4.5 ENGINEERING AND DESIGNS SOLUTIONS TO BE IMPLEMENTED TO AVOID OR REMEDY ACID MINE DRAINAGE

Mining should aim to remove as much of the coal seam (acid generating material) as possible.
Separate acid generating material and non-acid generating material, as characterised by geochemical sampling and analyses, should be separated during mining.
Manage in-pit seepage and rainfall through a collection and storage system. Water stored in pit should be utilised locally for dust suppression, as far as possible. Excess pit water should be pumped to surface to be incorporated into the mine water balance.
The size of un-rehabilitated areas (pit, spoils, and un-vegetated areas) that produce contaminated runoff should be minimised.
Rehabilitation should be planned to promote free drainage and to minimise or eliminate ponding of storm water. On-going rehabilitation as mining operations progress is required.
The clean and dirty water flow areas on a mine site should be identified.
Engineer the final backfilled opencast topography such that runoff is directed away from the opencast areas.
The final layer (just below the topsoil cover) should be as clayey as possible and compacted if feasible, to reduce recharge to the opencasts.

4.6 MEASURES TO REMEDY RESIDUAL OR CUMULATIVE IMPACTS FROM ACID MINE DRAINAGE

Remove as much coal from the opencasts as possible, as pyritic material that is the main cause of acid mine drainage, is associated with the coal.

Place remaining acid producing material as low as possible in the pit to ensure fast flooding of the material. All mined areas should be flooded as soon as possible to bar oxygen from reacting with remaining pyrite.

4.7 VOLUMES AND RATES OF WATER USE REQUIRED FOR THE PROPOSED PROJECT

The volumes and rates of water use required for the mining operation will be assessed during the mining activities.

4.8 WATER USE LICENCE APPLICATION

The applicant must apply for the Integrated water use licence to the Department of Water and Sanitation (DWS) for the proposed mining operation if water use activities are triggered.

5. ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 9: Environmental Management Programme for the proposed Bankfontein Colliery C.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
CONSTRUCTION PHASE								
Construction of mine infrastructure (office and workshop complex, haul and access roads, diversion trenches and pollution control dam/in-pit dam/sump)								
Loss of soils, erosion of the soils and impacts on landowner's livelihood.	Soils, Topography Land Use and Land Capability.	To ensure that the activities in the development of the mining area and associated infrastructure do not have detrimental impacts on the soils, land use and land capability.	Ensure that stockpile construction have minimum impact on topography	Topsoil stockpiled to a height of no more than four meters and in free-draining areas to minimise waterlogging and soil erosion losses. Any topsoil below the 300 mm depths to be stockpiled separately from the topsoil. Locate and manage soil stockpiles so that re-handling is minimised. Min machinery that will limit soil compaction will be used during stockpile construction.	Appointed contractor and site manager.	Visual monitoring through inspections.	Environmental Control Officer (ECO) during construction.	During construction phase.
			Ensure that excavation activities has minimum impact on topography	Designed position and dimensions of surface infrastructure surveyed before excavation to ensure that the extent of disturbance is limited to the approved area.	Appointed contractor.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
			Ensure that movement and stockpiling of soils do not detrimentally reduce the fertility of the topsoil	Remove on average a layer of 300 mm of topsoil from the infrastructure areas and stockpile areas (subsoil overburden, hard material and run of mine coal stockpiling areas) before removing the remaining soil profile (subsoil). Stockpile topsoil separately from subsoil. Supervise soil stripping to ensure different soils are not mixed.	Appointed contractor and the applicant site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
			Ensure that soil movement is conducted to have minimum impact on the viability of the soils.	Strip and replace soils in one process wherever possible. Preferably, use a shovel and truck fleet for the stripping and replacement of soils. Ensure that stockpiled soil is only used for its intended purpose/s.	Appointed contractor.	Visual monitoring and inspections.	ECO monthly.	During construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Loss of natural vegetation in the affected areas.	Flora.	To ensure that the establishment of the mining area and associated infrastructure/equipment do not have detrimental impact on the area's flora.	Ensure that the removal of topsoil is conducted such that the impacts on the area's ability to maintain a natural vegetation cover is minimised. Ensure that stockpiling of topsoil is conducted in a manner that will not impact on the ability of the area to maintain vegetation cover	Minimum depth of topsoil removal will be 300 mm from the stockpiling and infrastructure areas. This will ensure that the seed bank of the topsoil is as far as possible preserved. Pre-stripping of virgin ground will be limited to the preceding cuts. No unnecessary pre-stripping of preceding cuts will be conducted. All topsoil removed will be stockpiled separately on the designated topsoil stockpile area.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and inspections. Visual monitoring and inspections.	ECO monthly. ECO monthly.	During construction phase. During construction phase.
Migration of animal life due to disturbance caused proposed project	Animal Life	Ensure that the animal life within in the project is not affected by the proposed project	Maintenance of the current status on animal life within the project area	Establishment of the site will be undertaken according to the mining method statement. Poaching will be prohibited at the mining site.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and inspections. Visual monitoring and inspections.	ECO monthly. ECO monthly.	During construction phase. During construction phase.
Deterioration of water quality in in the nearby steams and within the groundwater regime.	Surface and Ground Water.	Ensure that the establishment of the project and its associated infrastructure does not have detrimental impact on nearby stream and the groundwater regime.	Ensure that construction of mine infrastructure has the least possible impact on the surface water runoff patterns, and thus loss of MAR within all catchments. Ensure that impacts from hydrocarbon liquid spills on surface water quality are minimised.	Construct infrastructure according to design specifications and approved extent. The stripped areas will be demarcated with berms such that all silted water runoff is diverted to a paddock where silt will be settled before allowing the clean water to runoff to the nearby stream. Note that this does not include the acid mien water or water displaying acid mine drainage tendencies. All infrastructure will be constructed to be more than 100 meters away from the nearby stream. All hydrocarbon liquids will be handled (stored and dispatched) within properly designed and constructed facilities. This will either be bunded areas or facilities manufactured to contain hydrocarbon liquid without spilling. Any dirty water captured within the mine will be diverted via the storm water diversion	Appointed contractor and site manager. Appointed contractor and site manager. Appointed contractor and site manager.	Regular inspections. Monitoring of the surrounding water resources. Regular inspections. Monitoring of the surrounding water resources. Regular inspections. Monitoring of the	ECO monthly. ECO monthly. ECO monthly.	During construction phase. During construction phase. During construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
			Ensure that impacts from dirty water captured within the mine, on surface water quality is minimised. Ensure that diversion trenches/berms, the pollution control dam and in-pit sump are designed and constructed to minimise impacts on ground water.	trenches to an in-pit sump and/or a pollution control dam. Excavation of the in-pit sump to be undertaken such that as much coal as possible is removed and only sandstone walls are used. Any remaining coal and carbonaceous material to be moved away from the in-pit sump. Should a pollution control dam be constructed, the dam will be constructed in line with an approved civil designs drawing and will be in line with the requirements of the regulations under GN 704.	Appointed contractor and site manager. Appointed contractor and site manager.	surrounding water resources. Regular inspections. Monitoring of the surrounding water resources.	ECO monthly.	During construction phase.
Deterioration of water quality in in the nearby steams and within the groundwater regime.	Ground Water	Ensure that the establishment of the project and its associated infrastructure does not have detrimental impact on groundwater.	Ensure that impacts from dirty water captured within the mine is minimised. Ensure that diversion trenches/berms, the pollution control dam and in-pit sump are designed and constructed to minimise impacts on ground water.	Water management facilities should be designed to intercept and contain as much contaminated runoff and/or seepage as possible. Apply effective storm water management principles to ensure that clean runoff is maximised and diverted to the receiving water resource, while contaminated runoff is minimised and contained for reuse within the operation. Proper storage, handling and monitoring of fuel and chemicals used on site to minimize the risk of spillages to the environment.	Appointed contractor, site manager and Environmental Co-ordinator/Office. Appointed contractor, site manager and Environmental Co-ordinator/Office. Appointed contractor, site manager and Environmental Co-ordinator/Office.	Regular inspections. Regular inspections.	ECO monthly. ECO monthly. ECO monthly.	During construction phase.
Air pollution through air pollutants' emissions, from the construction site.	Air quality.	Ensure that not all operations during the construction phase result in detrimental air quality impacts.	Ensure that impacts from dust and diesel fumes generated by machinery on local air quality is minimised Ensure that impacts from dust generated	All machinery will be fitted with the correct exhaust systems, which will be maintained in good repair. All area generating significant dust will be dust suppressed using mine affected water.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions.	ECO monthly. ECO monthly.	Throughout the construction phase. Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
			by blowing wind on local air quality is minimised Ensure that impacts from dust generated by blasting on local air quality is minimised.	Water for dust suppression purposes will be obtained from the in-pit sump or pollution control dam. Speed on access and haul roads will be limited to 40 km/hour. Blasting will as far as possible be conducted when wind direction is away from the houses.	Appointed contractor and site manager.	Regular inspections. Ambient air quality will be monitored. Regular inspections.	ECO monthly.	Throughout the construction phase.
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the construction sites will not have detrimental effects on the mine employees and surrounding communities/land owners.	Ensure that noise impacts on machine operators and/or residences are minimised.	Machine operators will be issued with earplugs, and instructed how to use them. Construction will be undertaken such that noise impacts on the nearby industrial park (northwest of the mine) and residential area (south west of the mine) is minimal. The noise levels will be monitored to ensure that ambient noise standards are met.	Appointed contractor and site manager. Appointed contractor and site manager	Use of earplugs will be checked and reported. Ambient noise monitoring will be undertaken Regular Inspection.	Site manager will check the use of the earplugs as regularly as possible. Ambient noise monitoring will be undertaken twice every year.	Throughout the construction phase. Throughout the construction phase.
Impacts on the Visual Aspects	Visual Aspects.	Ensure that the impacts on the overall visual aesthetic to the residences and landowners in the vicinity of the permit mining area.	Ensure that visual impacts from the generation of dust are minimized. Ensure that visual impacts from the mining activities are minimized.	All area generating significant dust will be dust suppressed using mine affected water. Topsoil berms will be constructed around visible parts of the mine to act as visual berms.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and Inspection. Visual monitoring and Inspection.	ECO monthly ECO monthly	Throughout the construction phase. Throughout the pre-construction an construction phase.
Impact from the influx of job seekers and employment of farm labourers.	Socio-economic aspects.	Ensure that measures are taken to discourage influx of job seekers and employment of farm labourers.	Measures taken will be in line with the company's recruitment policies.	Local labour and contractors will be appointed. This will ensure that economic spin-offs that result due to employment benefit the local community. The mine will ensure that the creation of unrealistic expectations is prevented by communicating the period of the construction phase to the local communities and the communities will be informed that few new positions will be created. Local councillors and recognised community forums/groups will be involved in the above communication. The mine will adhere to its procurement strategy, which aims to increase local content of the project to its maximum.	Appointed contractor and site manager.	Visual monitoring.	Site manager	Throughout the pre-construction an construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Impact on the livelihood of the landowners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the landowners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted and checked for criminal records. Employees will not wonder around the properties without supervision. Measures will be taken to avoid the spread of veld fires by the applicant's workforce. Sitting, designing and construction of the access road will be undertaken such that it complies with the relevant laws. The access road must be capable of accommodating heavy vehicles traveling in both directions. The road will be wide enough (10m) to allow two heavy vehicles to use the access road safely.	Appointed contractor and site manager.	Site inspections and meetings with the landowners and relevant regulators.	Site manager	Throughout the pre-construction an construction phase.
Construction of the pollution control dam and associated infrastructure								
The construction phase for the above-mentioned infrastructure will lead to compaction and erosion of soil resources due to altered surface dynamics, the presence of hardened surfaces and general degradation of soil resources, which could result in the loss of land capability. It is likely that the microbiological properties of the soil underneath the large impervious surfaces to be constructed will be negatively affected by lack of oxygen and lack of replenishment of organic matter. Changes in microbial communities may also result from acidification of the soil.	Soils, land capability and land use	To ensure that the construction of the above-mentioned activities does not have detrimental impacts on the soils.	The construction of the above-mentioned activities will be conducted according to the approved detailed design plan.	The entire area will be monitored regularly for erosion as part of the road maintenance procedure. In cases where erosion does occur, action plans should be implemented to apply mitigation. The construction activities will be conducted within the approved footprint area. Excess soils will be stockpiled at the topsoil stockpiling area, which will not be more than five meters high. Excess soils will be stockpiled at the topsoil stockpiling area, which will not be more than five meters high.	Appointed contractor and ECO. Appointed contractor and ECO. Appointed contractor, Mine engineer and ECO. Appointed contractor and ECO. Appointed contractor and ECO.	The area will be monitored for compaction and erosion and record of monitoring will be kept. The area will be monitored for compaction and erosion. Results of action plans if compaction and erosion was noted, will be kept on site and implemented. Areas of disturbance inspected against the approved design specifications of the roads. Inspections will be conducted to ensure that the excess soils are stockpiled at the approved footprint area and that they not exceed the height of five meters.	The ECO will monitor the areas for compaction and erosion every three months. The ECO will monitor the area for compaction and erosion every three months. The ECO will ensure that action plans, if erosion and compaction was noted, are proposed and implemented. The ECO will undertake monthly inspections. ECO will conduct inspections on a monthly basis. ECO will inspect the seeding monthly.	Throughout the construction phase. Throughout the construction phase. Throughout the construction phase. Throughout the construction phase. During rainy season after stockpiling of topsoil.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
				The stockpiled topsoil will be seeded with a recommended seed mix to ensure that a good vegetation cover is achieved, should the natural seedbank not provide sufficient cover. No mixing of the topsoil material with subsoil, softs and hard overburden material will be allowed.	Appointed contractor and ECO.	The seeding will be monitored by inspection. Undertake regular inspections to confirm correct placement of the removed soils.	ECO will undertake the inspection monthly and Site manager daily.	During the stripping and stockpiling of topsoil.
The construction of the above-mentioned infrastructures will result in the change of the current land surface, which will result in the change in the local drainage patterns.	Topography	Ensure that the constructions of the above-mentioned infrastructures do not result in permanent alteration of the topographical patterns.	The disturbed areas will be rehabilitated according to the approved rehabilitation plan.	The construction activities of the above-mentioned infrastructure will be undertaken within the approved footprint areas.	Appointed contractor, Mine engineer and ECO.	Areas of disturbance inspected against the approved design specifications.	The ECO will undertake monthly inspections.	Throughout the construction phase.
During the construction of the surface infrastructure for the proposed project, topsoil will be stripped and civil works will be undertaken as part of the preparation of the area for the construction of infrastructure. These activities may result in bare areas, which will result in the erosion of soils during rainfall events, with elevated suspended solids reporting in the runoff water, which may ultimately enter the nearby watercourses. This may subsequently also result in erosion gullies along the runoff patterns, which will result in offsite impacts such as increased	Surface Water	To ensure that the runoff water from the construction activities does not adversely affect clean water environment.	Management of the storm water will comply with the requirements of the regulations under the GN704 and as far as possible with the requirements of the relevant DWS Best Practice Guidelines.	Minimise the extent of hardened surfaces, to retain surface runoff in stilling ponds or retention facilities and to release these in a controlled manner including energy dissipation to avoid erosion to the receiving wetland areas.	Appointed contractor and ECO.	The area will be monitored for compaction and erosion and record of monitoring will be kept.	The ECO will undertake monthly inspections.	Throughout the construction phase.
				Install/construct the construction stormwater management system prior to the onset of vegetation clearing activities on the surface infrastructure footprints.	ECO and mine manager.	The area will be monitored for compaction and erosion. Results of action plans if compaction and erosion was noted, will be kept on site and designs approved by relevant authorities.	The ECO will inspect the areas on monthly basis.	Throughout the construction phase.
				No mining activities will be allowed outside of the authorised areas.	Appointed contractor, Mine engineer and ECO.	Monitoring of water quality at, only if there is evidence that activities may have impacted on water bodies. ECO will conduct inspections.	The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Ensure that no equipment is washed in the streams and washing will be undertaken at the mine's workshop area.	Appointed contractor, Mine engineer and ECO.	Areas of disturbance will be inspected to determine areas that need rehabilitation.	The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				All construction vehicles will be well maintained and inspected regularly for hydrocarbon leaks.	Appointed contractor, Mine engineer and ECO.		ECO will update records annually	Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
sedimentation of the receiving water environments.				Construction of the infrastructures will be limited to designated boundaries and according to designs.	Appointed contractor, Mine engineer and ECO.	Rehabilitated areas will be inspected and records of inspection will be kept.	The ECO will undertake monthly inspections. The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				In order to reduce the potential impacts associated with the introduction of contaminants dissolved or suspended in the runoff from construction sites, where practically possible, no runoff will be introduced into wetlands.	Appointed contractor and ECO.	ECO will conduct inspections to ensure that the construction activities are contained within the approved footprint areas and runoff reports to the designated facility.	The ECO will inspect the areas and conduct review on a monthly basis.	Throughout the construction phase.
				All construction must be undertaken in line with the approved method statement and civil design reports and drawings.	Appointed contractor and ECO.	ECO will conduct inspections and review of documents to ensure that the facilities are constructed according to the approved method statement, civil design reports and drawings.	The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Areas that are stripped will be optimised to limit unnecessary stripping.	Appointed contractor and ECO.	ECO will conduct inspections to ensure that all construction activities are contained within the approved footprint areas and no unnecessary clearance of vegetation is noted.	The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Storm water from upslope of the stripped areas will be diverted around these areas to limit the amount of storm water flowing over from these areas.	Appointed contractor and ECO.	ECO will conduct inspections to ensure that the storm water from upslope of the stripped areas is diverted around these areas.	Mine engineer as and when required, ECO will undertake the inspections weekly and Site manager daily during the construction of the storm water management structures.	Throughout the construction phase.
				Design and implement a construction stormwater management plan.	Appointed contractor and ECO.	Inspect and approve the construction of clean storm water diversion structures on completion of the construction.	ECO will undertake the monitoring monthly.	Throughout the construction phase.

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						Construction undertaken in accordance to the designs approved by relevant authorities. Monitoring of water quality at, only if there is evidence that activities may have impacted on water bodies. ECO will conduct inspections.		
				Divert clean water around the cleared area and install erosion protection measures and energy dissipaters at points of discharge.	Appointed contractor and ECO.		The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Where practically possible, the major earthworks will be undertaken during the dry season (roughly from April to August) to limit erosion due to rainfall runoff.	Appointed contractor and ECO.		ECO on a monthly basis.	Throughout the construction phase.
				Cleared areas outside direct development footprint will be re-vegetated and seeded (where necessary) as soon as possible following disturbance	Appointed contractor and ECO.	Areas of disturbance will be inspected to determine areas that need rehabilitation.	Rehabilitated areas will be inspected on a monthly basis and records of inspection will be kept.	Throughout the construction phase.
				Regular monitoring and inspections at rehabilitated sites will be undertaken to ensure successful rehabilitation.	ECO.	Rehabilitated areas will be inspected and records of inspection will be kept.		Throughout the construction phase.
Construction activities will involve the clearing of large areas of soil, as well as the movement of soil. This will expose large areas and large volumes of soil to erosion by wind and water, which will likely be aggravated by an increase in surface runoff from bare soil areas and concentration of flows. Sediment could be transported downslope via surface runoff to the adjacent wetland areas,	Sensitive Landscape	Ensure that the establishment of the mine infrastructure do not have detrimental impacts on the wetlands identified within the project study area.	Maintain or improve the current PES and EIS of the remaining wetlands within the project study area in accordance with the water use licence conditions. The areas to be rehabilitated will be in compliance with relevant rehabilitation guidelines.	Implement storm water management plan. Reduce the extent of bare surfaces wherever possible by rehabilitating and revegetating them.	ECO, Mining Contractor ECO, Mining Contractor	The areas will be inspected to ensure that the storm water plan is implemented.	Inspections will be undertaken by the ECO on a monthly basis.	Throughout the construction phase.
				Design of surface infrastructure areas will be optimised to minimise the size of the development footprint and to avoid encroachment into wetland habitat.	Appointed contractor, Mine engineer and ECO.	ECO will conduct inspections to ensure that all construction activities are contained within the approved footprint areas and no unnecessary clearance of vegetation is noted.	Inspections will be undertaken by the ECO on a monthly basis. The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Emergency servicing of construction vehicles will take place only in dedicated areas.	ECO	Inspections will be conducted to ensure that emergency servicing of equipment's is undertaken in dedicated areas that are equipped with drip trays.	Inspections will be undertaken by the ECO on a monthly basis.	Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
leading to increased turbidity with resultant impacts on aquatic habitats, including loss of sensitive species, as well as increased sediment deposition in wetlands, leading to habitat degradation as these areas become colonised by alien and pioneer species. Severe sedimentation could also impact of flow distribution within the wetlands.				All construction staff will be educated on the sensitivity of wetland areas and will be made aware of all wetland areas in close proximity to the construction sites. All disturbed areas outside the direct development footprints will be rehabilitated and re-vegetated as soon as possible.	Appointed contractor and ECO. Appointed contractor and ECO.	Records of training will be kept. Areas of disturbance will be inspected to determine areas that need rehabilitation.	ECO on a monthly basis. records quarterly.	Throughout the construction phase. Throughout the construction phase.
During the construction of the above-mentioned surface infrastructure, hydrocarbon fluids (diesel, petrol and oils) and other chemicals may spill onto the ground resulting in the potential pollution of surface and groundwater environments.	Groundwater	Ensure that the groundwater regime is not detrimentally affected by the establishment of the mining infrastructures.	Groundwater quality in the vicinity of the site will not deteriorate beyond groundwater water quality targets set by the authorities.	Used oil will be removed immediately after vehicle servicing. All material with potential to pollute will be stored in secure facilities. Mine machinery will be repaired at designated areas fit for purpose. No maintenance outside the dedicated areas will be allowed unless it is an emergency repairs which must be on a protected ground or by use of drip trays.	ECO ECO ECO and mine manager.	Inspections will be conducted to ensure that used oil is removed on site to the licenced waste disposal facility and records of removal will be kept on site. Inspections will be conducted to ensure that all material with potential to pollute are stored in secure facilities (existing workshop and stores). ECO will conduct inspections to ensure that all machinery equipment's are serviced at the workshop areas. Inspections will be conducted to ensure that emergency servicing of equipment's is undertaken in dedicated areas that are equipped with drip trays.	Inspections will be undertaken by the ECO on a monthly basis. Inspections will be undertaken by the ECO on a monthly basis. The ECO will inspect the areas on a monthly basis.	Throughout the construction phase. Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
				All hydrocarbon liquids will be stored in leak and corrosion resistant containers. These containers will be placed in bunded areas. The containers used for the storage of hydrocarbon liquids will be maintained in good condition.	ECO and mine manager.	ECO will conduct inspections to ensure that all hydrocarbon liquids are stored in leak and corrosion resistant containers and in a concrete surface. Proof of the above will be kept and proof of maintenance thereof.	The ECO will inspect the areas on a monthly basis.	Throughout the construction phase.
				Credible waste collectors will be used for the removal of waste from the site to a registered waste disposal facility.	Appointed contractor and ECO.	Volumes of waste collected will be recorded in accordance with existing mine systems.	Appointed contractor and ECO will keep record of waste collected.	Throughout the construction phase.
Construction of the Initial Box cut								
Disturbance of the geological profile	Geology	To ensure that the construction of the initial box cut does not have detrimental impacts on the geology	Replacement of the opencast voids with removed overburden material	Use removed material to backfill the opencast voids. All remaining carbonaceous material will be placed at the bottom of the mining pits and should be covered with the rest of the remaining overburden material. This will reduce the exposure of the carbonaceous material to free oxygen, hence limiting the formation of acid mine generation.	ECO and Mining Contractor	Measuring volumes of overburden removed and replaced. Check the volumes against volumetric assessment done by mine surveyor.	Surveyor and Monthly	Throughout Construction Phase
Formation of topographical voids	Topography	To ensure that the construction of the initial box cut does not have detrimental impacts on the local topographic patterns	The initial box cut will be excavated to comply with the safety standards set in the Mine Health and Safety Act, 1996 (Act 26 of 1996), the mine's health and safety policies, relevant operational procedures	Use material from the successive cuts to backfill the voids created by the construction of the initial box cut. Note that since concurrent rehabilitation will be used at the mine, only three to four cuts will at all times be open at the opencast mining area.	ECO and Mining Contractor	Measuring volumes of overburden removed and replaced. Check the volumes against volumetric assessment done by mine surveyor.	Surveyor and Monthly	Throughout Construction Phase
Degradation of topsoil	Soils	To ensure that the construction activities does not have detrimental impacts on the soils	Ensure that the handling (stripping and stockpiling) of the soils are undertaken in accordance with the	Topsoil stripping will conduct a suitable distance ahead of mining to avoid soil loss and contamination from throw/blast rock. Subsoil will be stripped separately from the topsoil.	ECO and Mining Contractor	Monitor for compaction and erosion	Every three months by ECO	During the first month During and after the soil stripping process.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
			applicable rehabilitation guidelines.	Stripping will be supervised to ensure different soils are not mixed. Stockpile the stripped soils in designated stockpile areas. Locate and manage soil stockpiles so that re-handling is minimised. Ensure stockpiles are placed in free draining areas to minimise waterlogging and soil erosion losses. Stockpile topsoil to heights that will ensure maintenance of a maximum level of biological activity.				During and after the completion of the stockpiles.
Removal of natural vegetation due to the stripping of topsoil and disturbance of faunal habitat	Terrestrial Ecology	Ensure that the activity does not impacts detrimentally on the terrestrial ecological features ate the study area	The management of the impact will comply with the mine's mine closure/rehabilitation plan.	Development and implementation of a rehabilitation plan, concurrent to the mining operation; areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be disturbed further. Clearing of vegetation should be minimized and avoided where possible. The areas to be developed must be specifically demarcated to prevent movement of workers into, especially high sensitive areas and the surrounding.	ECO, Mining Contractor and relevant environmental specialist.	Biodiversity and rehabilitation monitoring.	Once during the construction phase by a suitably qualified environmental specialist.	Throughout Construction Phase
Deterioration of water quality in the west and east unnamed streams	Surface Water	To ensure that the runoff water from the mine access and haul roads during construction does not adversely affect clean water environment.	Management of the storm water will comply with the requirements of the regulations under the GN704 and as far as possible with the requirements of the relevant DWS Best Practice Guidelines.	Areas that are stripped should be optimised to limit unnecessary stripping. Storm water from upslope of the stripped areas should be diverted around these areas to limit the amount of storm water flowing over from these areas. The timing of the topsoil stripping should be optimised to limit the time between stripping and construction. Where practical constraints exist and areas need to be left stripped for long periods, contour ploughing, or ripping could reduce run-off and hence reduce erosion. Dry season construction is preferable where practical. An appropriate seed mix should be designed by a vegetation specialist.	ECO and Mining Contractor.	Site inspections and surface water monitoring.	Monthly by an independent environmental specialist.	Throughout Construction Phase
Deterioration of groundwater quality	Groundwater.	Ensure that the groundwater regime is not detrimentally affected by the carbonaceous material	Groundwater quality in the vicinity of the site will not deteriorate beyond groundwater	Deterioration of water quality must be prevented wherever possible and minimised where complete prevention is not possible. Mining will where possible commenced at an unmined area. This will allow minimum	ECO, Mining Contractor and relevant environmental specialis.t	Groundwater quality and quantity monitoring. This will include monitoring of any situation for excess water from the	Quarterly by an environmental specialist.	Throughout Construction Phase

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
		excavated from the project site.	water quality targets set by the authorities.	seepage water collection at the initial box cut. An in-pit sump designed and constructed to contain water from the mine will be used at the initial box cut. The sump will be assessed for its ability to contain water from the pit and should more capacity be required; a pollution control dam will be constructed. The initial box cut will be assessed for use as a temporary handling facility for any excessive water that may be emanating from the underground mine areas. The mine must investigate and develop a long-term water management strategy for the management of water from the mined out underground workings that are connected to the mining permit areas. This strategy must ensure that the management of water from the mining permit areas together with the prospecting right area (future mining right area) are undertaken such that the nearby water resources are protected. Water users affected by the mine must be provided with water of a quality that does not cause significant user, water quality, product quality or process related problems (scaling etc.). The plan must be sustainable over the life cycle of the mine and over different hydrological cycles.		mined out underground workings steer at the initial box cut.		
Deterioration of water quality in in the nearby steams and within the groundwater regime.	Ground Water	Ensure that the operation of opencast workings do not have detrimental impact on groundwater.	Ensure that impacts on groundwater from opencast workings are minimised.	Before operation, a plan that includes explicit consideration of closure and rehabilitation issues must be prepared and approved. Monitoring boreholes will be required in strategic locations near the pollution source, to obtain information on the groundwater regime as well as for future monitoring purposes. Construct detailed water and salt balances. Institute detailed monitoring systems that are capable of detecting pollution at the earliest possible stage.	Appointed contractor, site manager and Environmental Co-ordinator/Office. Environmental Co-ordinator/Office. Environmental Co-ordinator/Office.	Management meetings. Monitoring of boreholes. Regular inspections.	ECO monthly. ECO monthly. ECO monthly.	Throughout Construction Phase

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Wetland destruction and loss of habitat.	Wetlands	Ensure that the establishment of the proposed Mining Project do not have detrimental impacts on the wetlands identified within the project study area.	Maintain or improve the current PES and EIS of the remaining wetlands within the project study area in accordance with the water use licence conditions. The areas to be rehabilitated will be in compliance with relevant rehabilitation guidelines.	Implementation of a rehabilitation plan, concurrent to the mining operation; No loss of wetland habitat should be permitted. Demarcated recommended buffer over the mining plan. Signpost the identified wetlands and their buffers as environmentally sensitive area and keep all mining related activities and general access out of this area; Avoid mining or constructing any more roads within the identified wetlands without due environmental and water use authorisation. Landscape and re-vegetate all unnecessarily denuded areas as soon as possible.	ECO, Mining Contractor and relevant environmental specialist	The affected wetlands will be assessed.	Annually by an environmental specialist.	Throughout Construction Phase
Air pollution through air pollutants' emissions, from the construction site.	Air quality.	Ensure that all operations during the pre-construction and construction phase of the mining project do not result in detrimental air quality impacts.	The mine project will be constructed such that the ambient air quality does not exceed the National Air Quality Standards.	Conduct dust suppression daily using water from the pollution control dam. If the use of the water from the pollution control dam does not field satisfactory results chemicals will be used for the suppression of dust from the roads and other dust generation areas. Enforce appropriate speed limits for the mine vehicles. Implement a dust and noxious gas minimisation strategy where necessary.	Appointed contractor and ECO.	Visual inspections of areas with possible dust emissions such as unpaved roads and transfer points will be conducted on a monthly basis. Ambient dust fall monitoring will be conducted.	ECO weekly and site manager daily. Environmental specialist monthly	Throughout the construction phase.
Increased ground vibration and air blasts.	Ground vibration and air blast.	Ensure that the ground vibration levels and air blasts do not have detrimental effects on surrounding structures.	The ground vibration and air blast from the development of the adit will not exceed the United States Bureau of Mines (USBM) criteria for safe blasting for ground vibration and recommendations on air blast.	Best practises must be used during blasting to ensure that the ground vibration and air blast pressure is within acceptable limits. Undertake a full risk assessment in order to address the aspects and to put proper controls in place. Proper stemming and use of stemming material. Blasts can be delayed when prevailing wind is blowing towards the area of concern and not leaving blasts standing for long periods of time.	Appointed blasting contractor and/or mine blaster	Blasting holes will be inspected before any blasting is conducted. Seismic monitoring will be conducted during and after every blast.	Mine blaster will undertake the inspection before and after every blast.	When blasting during the construction phase of the operation.
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the mining project construction site will not have detrimental effects	The noise levels from the mining project site will be managed and measures will be	Ensure routeing has less impacts on sensitive receptors.	Appointed contractor and ECO.	Undertake ambient noise monitoring programme.	Environmental specialist twice a year.	Throughout the construction phase.

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		on the mine employees and surrounding communities.	taken to ensure that noise levels are below the National Noise Control Regulations, SANS10103:2008 guidelines and the International Finance Corporation (World Bank) guidelines.	Limit vehicle speed within the mining right areas; Ensuring all equipment in use is maintained and equipped with the OEM's required muffler/exhaust/silencer; Consider the acoustic rating of equipment when selecting equipment; Minimise site and plant activities after hours; Limiting the number of activities that take place simultaneously in close proximity to sensitive receptor's; and maintaining a healthy consultative relationship with sensitive receptor's in order to facilitate the sharing of knowledge and possible complaints as well as proposed corrective/preventative actions between parties.		Speed checking will be conducted. Visual inspections Regular inspections.	Safety Officer will conduct speed checking as regularly as possible. ECO monthly.	
Visual impacts on the surrounding communities and road users from the construction site.	Visual aspects.	Ensure that all operations during the pre-construction and construction phase of the proposed project do not result in detrimental visual impacts on surrounding properties, communities and road users.	Measures will be undertaken by the mine to ensure that the visual aspects from the site are complying with the relevant visual standards and objectives.	Use the perimeter berms and topsoil as a visual screen from the surrounding communities. Ensure that the initial box cut, successive cuts and the associated stockpiles and surface infrastructure are removed or rehabilitated during the decommissioning phase of the mine. Where possible areas disturbed by construction activity, must be suitably topsoiled and vegetated as soon as is possible. The progressive rehabilitation measures will allow for the maximum growth period before the completion of the project. Limit areas of disturbance to areas where infrastructure or facilities will be constructed or placed. Where possible, the existing vegetation will be supplemented with indigenous plant species to increase the effectiveness of the visual buffer.	Mine engineer and the ECO. Mine engineer and the ECO. Mine engineer and the ECO. Mine engineer and the ECO.	The constructed perimeter berms will be inspected for compliance with the design specifications. The slopes will be inspected for compliance with the construction method statement and designs. Areas of disturbance will be inspected to determine areas that need rehabilitation. Areas of disturbance inspected against the approved design specifications of the project.	Mine Engineer and ECO on a monthly basis. Mine Engineer and ECO on a monthly basis. Mine Engineer and ECO on a monthly basis. Mine Engineer and ECO on a monthly basis.	Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
				Dust suppression will be undertaken at all areas that will be affected by construction activities and where dust will be generated. Existing large trees that fall outside the earthworks area must be retained. Note that the alien plant eradication will supersede this commitment.	Mine engineer and the ECO. Mine engineer and the ECO.	See monitoring under air quality. Inspection of the site will be conducted.	Mine Engineer and ECO on a monthly basis. Mine Engineer and ECO on a monthly basis.	
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the development of the mine does not have detrimental impacts on heritage sites.	The construction will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the heritage specialist.	Controls and monitoring should be aimed at the possible unearthing of such features. If any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.	ECO, mining contractor and heritage specialist.	Inspection by mining contractor and ECO.	Weekly by both ECO and mining contractor.	Throughout the pre-construction and construction phase
Impact from the influx of job seekers and employment of farm labourers.	Socio-economic aspects.	Ensure that measures are taken to discourage influx of job seekers and employment of farm labourers.	Measures taken will be in line with the company's recruitment policies.	Local labour and contractors will be appointed. This will ensure that economic spin-offs that result due to employment benefit the local community. The mine will ensure that the creation of unrealistic expectations is prevented by communicating the period of the construction phase to the local communities and the communities will be informed that few new positions will be created. Local councillors and recognised community forums/groups will be involved in the above communication. The mine will adhere to its procurement strategy, which aims to increase local content of the project to its maximum.	Appointed contractor and site manager.	Visual monitoring.	Site manager	Throughout the pre-construction and construction phase.
Impact on the livelihood of the landowners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the landowners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted and checked for criminal records Employees will not wonder around the properties without supervision. Measures will be taken to avoid the spread of veld fires by the applicant's workforce.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	Throughout the pre-construction and construction phase.
OPERATIONAL PHASE								

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Operation of other mine infrastructure (pollution control facilities/ mine workshop complex, overburden stockpiles and use of haul and access roads).								
Soil profile disruption, contamination of soils, destruction of natural vegetation and loss of land use.	Soils, Natural Vegetation, Land Use and Land Capability.	Ensure that the operation and maintenance of the mine infrastructure do not have detrimental impacts on the soils, natural vegetation and current land use.	Ensure that the operation of the mine infrastructure has minimum impact on the soil.	Any emergency repairs within the mining area outside the workshops must be conducted on protected ground.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During the operational phase of the project.
				Any accidental spillage of hydrocarbon fluids outside the workshop areas must be reported and appropriated measures (environmental emergency procedures) taken to clean the spills.	Appointed contractor.	Visual monitoring and inspections.	ECO monthly.	During the operational phase of the project.
				All hydrocarbon fluids will be stored within bunded areas or facilities suitably manufactured for storage of dangerous goods without spilling to the environment. The usage of the fluids will be undertaken within the bunded areas.	Appointed contractor.	Visual monitoring and inspections.	ECO monthly.	During the operational phase of the project.
Migration of animal life due to disturbance caused proposed project	Animal Life	Ensure that the animal life within in the project is not affected by the proposed project	Ensure that loss of indigenous fauna is minimised.	Ensure that environmental education of mine staff takes place at all levels to limit unnecessary damage to habitats and/or disturbance of fauna. Educate employees on dangers of trapping endangered species during the mine's environmental awareness plan implementation.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During operational phase.
Exposure of soils may lead to increased silt loads in surface water runoff.	Surface and Ground Water.	Ensure that the operation and maintenance of the mine infrastructure do not have detrimental impacts on the soils, natural vegetation and current land use.	Ensure that diesel spillages do not occur. Ensure that impacts of seepage from the rehabilitated workings on groundwater is minimised.	Ensure that all possible sources of dirty water have been identified and that appropriate collection and containment systems have been implemented and that these do not result in further unnecessary water quality deterioration.	Appointed contractor, site manager and Environmental Co-ordinator/Office	Regular inspections.	ECO monthly.	During operational phase.
				Separated diesel and oils will be disposed of in accordance to relevant legislation.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During operational phase.
				All clean and dirty water management facilities will be operated and maintained in line with the relevant regulations and guidelines. Water contained in the dirty water facilities will not impact detrimentally the	Appointed contractor and site manager.	Visual monitoring and inspections. As and when necessary, a suitably qualified engineer must be appointed to audit	ECO monthly.	During operational phase.

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				nearby water resources (surface water and ground water resources). Ensure that seepage losses from storage facilities (such as polluted dams) are minimised and overflows are prevented.		all water management facilities.		
Generation of dust and fuel fumes by vehicular movement.	Air quality.	Ensure that the air quality in the vicinity of the mining sites and sites' access routes are not detrimentally altered.	Ensure that impacts from dust and diesel fumes generated by machinery on local air quality is minimised. Ensure that impacts from dust generated by blowing wind on local air quality is minimised	All machinery will be fitted with the correct exhaust systems, which will be maintained and in good repair. Apply approved dust suppression/curbing material on roads if water dust suppression is insufficient.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions. . Regular inspections.	ECO monthly. ECO monthly.	Throughout the operational phase. During operational phase.
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the operational site will not have detrimental effects on the mine employees and surrounding communities/land owners.	Ensure that noise impacts on machine operators and/or residences are minimised.	Machine operators will be issued with earplugs, and instructed how to use them.	Appointed contractor and site manager.	Site checks regularly.	Site manager.	During operational phase.
Safety, intrusion and livelihood impacts on the landowners and occupiers.	Socio-economic aspects.	Ensure that the mining operation does not significantly disrupt the daily living and movements of the landowners and occupiers.	The mine will ensure that all safety standards are met and that access to landowners and occupiers are not detrimentally affected.	Announce any road closures and other disruptions and maintain roads used for the operation in good order. Keep communication with landowners and land occupiers open during the operational phase of the project. Ensure that negotiations on compensation are undertaken before the mining can commence. This will include any other conditions that the landowner may deem necessary for the mining operation. Ensure that safety measures are implemented to prevent impacts on landowners and occupiers.	Appointed contractor and site manager. Applicant and site manager. Site manager.	Liaison with affected parties. Meetings with the landowners. Minutes of any meeting held with landowners and agreements will be recorded and filed. Regular checks and inspections.	Site manager as and when necessary. Site manager as and when meetings are held. Site manager.	Throughout the operational phase. Throughout the operational phase. Throughout the operational phase.

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Impact on the livelihood of the landowners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the landowners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted and checked for criminal records Employees will not wonder around the properties without supervision. Measures will be taken to avoid the spread of veld fires by the applicant's workforce.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	Throughout the pre-construction an construction phase.
Operation of a pollution control dam and associated infrastructure								
Contamination as a result of spillages from the operational activities.	Soils, Land Use and Land Capability.	Ensure that the above-mentioned infrastructures are operated such that they do not have detrimental impacts on the surround areas' soils.	The soils in the vicinity of the clean and dirty water managements will be suitable for natural vegetation growth and to support the current land use and the biodiversity of the affected areas.	Areas with erosion gullies and sedimentation build up will be rehabilitated. Areas with compaction will be ripped and seeded. The stockpiled topsoil will be maintained to have good vegetation cover. Bare areas where no further activities will take place will be identified and re-vegetated with a recommended seed mix. The stockpiled topsoil will be maintained to be within the approved height of five meters.	ECO ECO ECO	Inspection of the affected areas during rehabilitation. Inspection of the site for any stockpile misuse. Monitor the vegetation distribution on the stockpiled topsoil.	ECO officer will conduct the inspections quarterly. Mine ECO will monitor the area annually. ECO will undertake monthly inspections.	Throughout the operational phase. Throughout the operational phase. Throughout the operational phase.
Storm water and seepage generated from these dirty areas will likely be contaminated and have a detrimental effect on the water quality in the local streams. These impacts will be most acute during the dry season when stream flows are low.	Surface Water	To ensure that the runoff water from the above-mentioned activities does not adversely affect clean water environment.	Management of the storm water will comply with the requirements of the regulations under the GN704 and as far as possible with the requirements of the relevant DWS Best Practice Guidelines	The PCD will be operated and maintained in accordance with regulations under the Government Notice 704 of the NWA. The PCD water levels will be kept within operating levels and levels constantly monitored. The PCD will be operated empty as far as practicable and cannot fulfil the same role as a water storage dam, unless specifically designed to fulfil both purposes. All drains that collect the wash water and storm water will be maintained regularly. These should be free of debris and silt. All diversion canals, trenches and conduits will be designed to convey run-off from a 50-year design storm. Surface water monitoring will be conducted to observe any water quality deterioration from the mining activities.	ECO and Mining Contractor. ECO	Inspections will be undertaken against the GNR 704 and records kept on site. Surface water results will be reviewed to identify any surface water contamination.	ECO will undertake monthly inspections. ECO to review the results on a monthly basis.	Throughout the operational phase. Throughout the operational phase.

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				Should the surface monitoring indicate water quality contamination, the mine must investigate and identify action plans to remediate the impact.	ECO	Surface water results will be reviewed to identify any surface water contamination and action plans, should contamination occur, will be implemented to reduce the impacts.	ECO to review the results on a monthly basis.	Throughout the operational phase.
Pollution of the groundwater regime by leakage and seepage from the PCD and their storm water diversion structures.	Groundwater	Ensure that the PCD and their storm water diversion structures facilities do not result in the worsening of the groundwater pollution.	Ground water in the vicinity of the dirty water management structures will comply with the water quality parameter targets recommended standards.	Monitoring of water and waste storage facilities is imperative to manage the risk of spillage. Monitoring of water (shallow groundwater) and waste storage facilities is imperative to manage the risk of spillage and leakage. Operate and manage the dirty water structures (PCD, and water pipelines) such that it does not leak, seep or discharge dirty water into the groundwater regime. The pollution control will be lined with an HPDE liner and the trenches will be concrete lined. The PCD will be constructed to have leak detection system. The PCD to be designed to have a leak collection system with a pump with sufficient capacity to remove all leaked seepage water. The areas will be monitored for any spillages and spillages will be cleaned up immediately and the contaminated soil disposed of at the suitable area. Develop a groundwater monitoring to determine (and confirm) extent of pollution plumes. This programme will ensure that shallow groundwater regime is monitored.	ECO and appointed contractor. ECO and appointed contractor.	Inspections will be undertaken and records kept on site. Monitoring results will be kept for recommendation purposes.	ECO will undertake monthly inspections. ECO will keep records of the monitoring when monitoring is required.	Throughout the operational phase. Throughout the operational phase.
Deterioration of water quality within the affected wetlands and destruction of the wetlands.	Sensitive Landscapes	Ensure that the operation of facilities do not result in the destruction of the remaining wetlands and deterioration of its water quality.	The transportation of clean and dirty water and the disposal of mine water at the PCD and the management of the facilities will be	Ensure that effective clean and dirty water separation are undertaken. Measures such as storm water diversion trenches, channels and silt traps will be used for the diversion and collection of clean and dirty water. The silt trap will be operated empty as possible.	ECO and Mining Contractor.	Inspections will be undertaken and records kept on site.	ECO will undertake monthly inspections.	Throughout the operational phase.

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			conducted such that the PES and EIS of the wetlands are maintained or improved.	Monitor the stretch of the dirty water trenches and water pipelines for spillages/leaks and where such spillages/leaks occur, the area will be remedied as soon as possible. Implement the surface water management plan that will ensure effective clean and dirty water separation.	ECO and appointed contractor.	Implement of the surface water management plan will be monitored and records kept for audit purposes.	ECO will undertake monthly monitoring.	Throughout the operational phase.
				Regular inspections of all water management infrastructures will be undertaken and detailed records of such inspections maintained.	ECO and Mining Contractor.	Inspections will be undertaken and records kept on site.	ECO will undertake monthly inspections.	Throughout the operational phase.
				Should leakage or discharges occur, clean-up and rehabilitation of the affected areas will be undertaken as soon as possible following the event.	ECO.	Inspection of the entire areas will be undertaken.	ECO will undertake monthly inspections.	Throughout the operational phase.
Systematic removal of the target coal seam by opencast mining methods								
Disruption of geological profile	Geology	Ensure that the disruption of the geological profile do not results detrimental effects to the environment.	Undertake the mining and rehabilitation in line with the relevant mining and rehabilitation guidelines	Use removed overburden to replace the overburden material in the mined out opencast pits during rehabilitation of the opencast pit.	ECO and Mining Contractor	Measuring volumes of overburden removed and replaced. Check the volumes against volumetric assessment done by mine surveyor.	Surveyor and Monthly	Throughout Operational Phase
Formation of topographical voids	Topography	To ensure that the systematic removal of the target coal seams do not have detrimental impacts on the local topographic patterns	The opencast workings will be operated to comply with the safety standards set in the Mine Health and Safety Act, 1996 (Act 26 of 1996), the mine's health and safety policies, relevant operational procedures	Use material from the successive cuts to backfill the voids created by the construction of the initial box cut. Note that since concurrent rehabilitation will be used at the mine, only three to four cuts will at all times be open at the opencast mining area.	ECO and Mining Contractor	Measuring volumes of overburden removed and replaced. Check the volumes against volumetric assessment done by mine surveyor.	Surveyor and Monthly	Throughout Operational Phase
Degradation of topsoil and loss of land capability	Soils, Land Use and Capability	To ensure that the systematic removal of the target coal seams does not have detrimental impacts on the soils	Ensure that the stripping and stockpiling of the soils are undertaken in accordance with the applicable	Implement a soil management strategy for the mining area. This will ensure that the soils at the mining area are protected during stripping and stockpiling of the encountered soils.	ECO and Mining Contractor	Monitor for compaction and erosion.	Every three months by ECO	Throughout Operational Phase

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			rehabilitation guidelines.	Assign proper storm water management plans. Replacing of topsoil restore the suitable land capability.		Monitor progress of rehabilitation at the opencast workings.	Weekly by ECO	
Removal of natural vegetation due to the stripping of topsoil and disturbance of faunal habitat	Terrestrial Ecology	Ensure that the activity does not impacts detrimentally on the terrestrial ecological features ate the study area	The management of the impact will comply with the mine's biodiversity management plan and closure plan for the mine.	Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and dumps especially. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated; Noise reduction measures must be installed for all machines, vehicles and equipment. Appropriate silencers to control potentially disrupting noises to be fitted. The noise impact assessment must advise;	ECO, Mining Contractor and relevant environmental specialist ECO, Mining Contractor and relevant environmental specialist	Biodiversity monitoring. Ambient monitoring	Annually by suitably qualified environmental specialist. Annually by suitably qualified environmental specialist.	Throughout Operational Phase
Reduction in the catchment yield	Surface Water Quantity	Ensure that the loss in the catchment yield is kept minimal	As much of storm water runoff to report to the nearby stream as possible.	All clean storm water runoff during flood events will be diverted away from the opencast areas. Rainfall water entering the opencast pits during flood events will be removed with the use of pumps with sufficient pumping capacity. The water will be pumped into the in-pit sump, initial box cut (used for containment of excess water) or pollution control dam, which will be designed and constructed to be able to handle water from the 1:50 year flood event. The opencast pit must be designed and planned to be outside the 1:100-year flood line or 100 meters away from the affected streams and such that it can be maintained safe during high rainfall events. The mine will develop an emergency procedure for evacuating employees in case the volumes of water captured in the pit are beyond the capacity of the pumping systems.	ECO and the appointed contractor. ECO and the appointed contractor. ECO and the appointed contractor. ECO and the appointed contractor.	Mine water balance will be updated to determine the catchment yield during the operational phase. Mine water balance will be updated to determine the catchment yield during the operational phase. Mine water balance will be updated to determine the catchment yield during the operational phase. Mine water balance will be updated to determine the catchment yield during the operational phase. Environmental specialist.	Environmental specialist on an annual basis Environmental specialist on an annual basis Environmental specialist on an annual basis Environmental specialist on an annual basis Environmental specialist on an annual basis.	Throughout Operational Phase
Deterioration of water quality in the west and east unnamed streams	Surface Water Quality	To ensure that the water from the opencast workings does not adversely affect clean water environment.	Management of the storm water will comply with the requirements of the	Contaminated shallow seepage and storm water run-off must be collected and routed to into the in-pit sump, initial box cut (used for containment of excess water) or pollution	ECO and Mining Contractor	Surface Water Monitoring	Monthly by an independent environmental specialist.	Throughout Operational Phase

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
			regulations under the GN704 and as far as possible with the requirements of the relevant DWS Best Practice Guidelines.	control dam. The facilities must be operated in accordance with Government Notice 704 of the South African National Water Act. Water reuse from the facilities must be maximised.	ECO and Mining Contractor	Surface Water Monitoring		
Deterioration of water quality within the affected wetlands and destruction of the wetlands	Wetland Ecology	Ensure that the systematic removal of the target coal seams do not result in the destruction of the remaining wetlands and deterioration of its water quality.	The systematic removal of the target coal seams will be conducted in compliance with the requirements of the GN704 regulations and the conditions stipulated in the water use licence	Implement storm water management plan; Reduce the extent of bare surfaces wherever possible by rehabilitating and re-vegetating them; Promote infiltration wherever possible (e.g., with semipermeable paving bricks), and operate the mine to be within the approved buffer from the wetland areas.	ECO, mining contractor and wetland specialist appointed by the mine. ECO, mining contractor and wetland specialist appointed by the mine.	Inspections and audits (monitoring) conducted at the affected wetland areas. Environmental inspection	ECO and wetland specialist annually ECO weekly	Throughout the operational phase of the project
Deterioration of groundwater.	Groundwater	Ensure that management of mineral residue stockpiles.	The quality of the groundwater around the stockpiles will comply with the target as set in the water use licence or the catchment water quality objectives.	Prevent the erosion or leaching of materials from any residue stockpile. Water quantity and quality data should be collected on a regular, ongoing basis during mine operations to recalibrate and update the mine water management model, to prepare monitoring and audit reports, to report to the regulatory authorities against the requirements of the IWWMP and other authorisations and as feedback to stakeholders in the catchment.	ECO and mining contractor. ECO and mining contractor.	Regular checks and inspections. Groundwater monitoring.	ECO weekly. Quarterly by an independent environmental specialist.	Throughout the operational phase of the project.
Deterioration of groundwater.	Groundwater	Ensure that systematic removal of the target coal seams do not result in the contamination of the groundwater.	The quality of the groundwater around the mine will comply with the target as set in the water use licence or the catchment water quality objectives.	Surrounding boreholes i.e. monitoring and boreholes used by residents (if identified during mining) must be monitored on a quarterly basis to determine the extent of the dewatering cone from the mining workings. Mining must be undertaken concurrently with rehabilitation. Water seeping into the opencast pits must be removed into the in-pit sump, initial box cut (used for containment of excess water) or pollution control dam as soon as possible.	ECO and mining contractor. ECO and mining contractor. ECO and mining contractor.	Groundwater monitoring. Environmental inspections. Regular checks and inspections.	Quarterly by an independent environmental specialist. ECO weekly. ECO weekly.	During the operational phase of the project.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
				Reduce the exposure of the carbonaceous material to free oxygen. This will be achieved by placing the carbonaceous material at the bottom of the opencast pits and backfill as soon as possible thereby reducing the potential of exposure to free oxygen and hence reducing the possibility of acid mine drainage. A long-term water management strategy as indicated in the construction phase must be implemented.	ECO and mining contractor. ECO and mining contractor.	Regular checks and inspections. Regular checks and inspections.	ECO weekly. ECO weekly.	
Air pollution through air pollutants' emissions and spontaneous combustion from the mining site.	Air quality.	Ensure that all operations do not result in detrimental air quality impacts.	The systematic removal of the target coal seams will be conducted such that the ambient air quality does not exceed the National Air Quality Standards.	Wet suppression using water carts will be conducted at areas with excessive dust emissions, which will include used open spaces and unpaved roads and any other areas with potential to generate excessive dust. Chemical surfactants will be considered should water suppression not yield satisfactory results. Traffic will be restricted to demarcated areas and traffic volumes and speeds within the active site will be controlled. Employees must be issued with dust masks and instructed to use them. Covering of burning areas in the high wall, with soil material to prevent spontaneous combustion. Rehabilitation of mined out areas as soon as possible to limit spoils areas from spontaneous combustion risk.	Appointed contractor, ECO and Safety Officer. Appointed contractor, ECO and Safety Officer. Appointed contractor, ECO and Safety Officer. Appointed contractor, ECO and Safety Officer. Appointed contractor, ECO and Safety Officer.	Visual inspections of areas with possible dust emissions such as unpaved roads and transfer points will be conducted on a monthly basis. Ambient dust fall and PM monitoring (including recommended additional monitoring points) will be conducted as part of the existing monitoring programme. Meetings with farmers will be arranged.	ECO/safety officer weekly and site manager daily. Monthly by an independent environmental specialist.	During the operational phase of the project.
Increased ground vibration and air blasts.	Ground vibration and air blast.	Ensure that the ground vibration levels and air blasts do not have detrimental effects on surrounding structures.	The ground vibration and air blast from the development of the adit will not exceed the United States Bureau of Mines (USBM) criteria for safe blasting for	Minimum explosives will be used and the blasting holes will be stemmed. This will be done in order to ensure that levels of ground vibration and air blast are within acceptable limits, hence not induce damage to nearby property. Reduced charge mass per delay limit as specified by a suitably qualified blaster, will be used.	Appointed blasting contractor and/or mine blaster	Blasting holes will be inspected before any blasting is conducted.	Mine Engineer will undertake the inspection before and after every blast.	When blasting during the operational phase of the operation.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
			ground vibration and recommendations on air blast.	A log of blasting must be maintained and the following will be complied with i.e.: Blasting may only take place between 06h00 and 18h00. Notify people within 1 km radius 1hr prior to blasting. Monitor and review noise levels – amend where necessary. Address all complaints logged. Undertake a risk assessment.	Appointed blasting contractor and mine blaster or geologist.	Mine engineer will check that that the log is maintained.	Mine Engineer will undertake the inspection before and after every blast.	When blasting during the operational phase of the operation.
				A blast design by a blasting expert, which must include closing of private roads at a safe point and preferably, where traffic can access an alternative route, will be implemented by the mine when blasting is undertaken.	Appointed blasting contractor and mine blaster or geologist.	The mine engineer will ensure that the blasting designs are compiled and approved by a blaster before blasting.	Mine Engineer will undertake the monitoring action before every blast.	When blasting during the operational phase of the operation.
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the site will not have detrimental effects on the mine employees and surrounding communities.	The noise levels from the site will be managed and measures will be taken to ensure that noise levels are below the National Noise Control Regulations, SANS10103:2008 guidelines and the International Finance Corporation (World Bank) guidelines.	The topsoil berms/stockpiles and overburden stockpiles will be used as a sound barrier around noisy parts of the adit complex. This will control noise towards the informal settlement. Limit the maximum speed on the haul roads, subject to risk assessment. Ensure that the mine employees are issued with earplugs and that they are instructed to use them. Educate employees on the dangers of hearing loss due to mine machinery noise. Any deviation detected by the noise monitoring results must be addressed.	Appointed contractor, ECO and safety Officer Appointed contractor, ECO and safety Officer Appointed contractor, ECO and safety Officer Appointed contractor, ECO and safety Officer Appointed contractor, ECO and safety Officer	Undertake ambient noise monitoring programme. Speed checking will be conducted. Use of earplugs will be checked and reported. Use of earplugs will be checked and reported. Use of earplugs will be checked and reported.	Environmental specialist will undertake the monitoring annually. Safety Officer will conduct speed checking as regularly as possible. Safety Officer will; check the use of the earplugs as regularly as possible. Safety Officer will; check the use of the earplugs as regularly as possible.	Throughout the operational phase.
Impact on employment.	Socio-economic aspects.	Ensure that the positive impacts on employment are sustained.	Employment at the proposed site will be conducted in compliance with mine recruitment policies.	Local labour and contractors will be appointed. This will ensure that economic spin-offs that result due to employment benefit the local community.	Community Liaison Officer.	Records of recruitment will be kept for audit purposes.	Human Resources Manager will keep records after recruitment.	Throughout the operational phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Impact from the influx of job seekers.	Socio-economic aspects.	Ensure that measures are taken to discourage influx of job seekers.	Measures taken to control influx of job seekers will be in line with the mine's safety and security standards.	The mine will ensure that the creation of unrealistic expectations are prevented by communicating the period of the construction phase to the local communities and the communities will be informed that few new positions will be created. Local councillors will be involved in the above communication.	Community Liaison Officer.	Number of job seekers will be monitored and meetings held by, and with the communities, will where possible, be attended by the mine.	Community Liaison Officer and Safety officer will monitor the number of job seekers weekly and will attend meetings as and when these are held.	Throughout the operational phase.
Impacts on the local economy during the construction phase.	Socio-economic aspects.	Ensure that the positive impacts on local economic aspects are sustained.	The mine will ensure that the implementation of the measures are in line with the mine's targets committed to in the mine's local economic development plan or procurement strategy.	The mine will adhere to its procurement strategy, which aims to increase local content of the project to its maximum. As much of the construction material and service requirements as possible will be sourced from suitably qualified supplies and contractors in Witbank and the surrounds. The mine must comply with the requirements as guided by the Mining Charter with regards to SMME development and the mine's procurement policy.	Community Liaison Officer. Appointed contractor. Procurement Officer.	The procurements will be monitored against the mine's procurement strategy. Providers for services, capital goods and consumables will be checked against the procurement targets. Audits against the requirements of the Mining Charter will be conducted.	Procurement Officer will monitor the procurement regularly. Procurement Officer will check how the mine performs against the targets monthly. Procurement Officer will undertake the audits quarterly.	Throughout the operational
Disruption in daily living and movement patterns.	Socio-economic aspects.	Ensure that the disruption in daily living and movements is not detrimental to the local communities.	The mine will ensure that all mine safety standards are met.	Announce road closures and other disruptions; Erect signboards (if required) indicating access restrictions to the construction site; Non compliances will be managed according to the mine's complaints procedure Limit all activities to the development footprint of the proposed construction site;	Safety Officer. Safety Officer. Safety Officer. Safety Officer.	Keep records of the number of announcements made to this effect. Inspections conducted at the site. Records of non-compliances and redress measures taken recorded and filed for audit purposes. Inspection of the construction activities against the management	Safety Officer will populate records monthly. Safety Officer will conduct inspections monthly. Safety Officer will keep all information on non-compliance and measures taken to redress the situation. ECO will undertake the inspections monthly.	As and when necessary Throughout the operational phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
						action will be undertaken monthly.		
				Maintain fence used to fence off the development footprint;	Appointed contractor.	Inspection will be undertaken.	ECO will conduct the inspections monthly.	
				Keep communication with neighbouring landowners, land occupiers and the public (interested and affected parties) open during the construction phase of the project.	Environmental Officer and Community Liaison Officer.	Minutes of any meeting held with landowners will be recorded and minutes filed for audit purposes.	ECO will keep the minutes as and when meetings are held.	
		Ensure that the mine for protection of mine employees takes security measures.	Mine's safety and security standards will be adhered to at all times during the construction phase.	Keep local SAPS informed of the construction and its progress.	Safety Officer. Protection Officer	Communication with SAPS recorded and filed.	Community Liaison Officer will communicate with the SAPS regularly.	Throughout the operational phase.
				Use local labour with no criminal records.	Human Resource Officer.	Recruitment records kept for audit purposes.	Human Resource Manager will keep records after recruitment.	When recruiting employees.
Increase in already high criminal activities due to the construction activities.	Socio-economic aspects.			Limit access to the site to employees and visitors with access permits.	Safety Officer.	Register all employees reporting for duty and visitors reporting to the project area.	Human Resource Manager will ensure that records of employees reporting for duty and visitors are kept and updated monthly.	During the pre-operational phase.
				Safety and security measures will be undertaken to comply with the current mine safety standards. These may include fencing, installation of CCTV cameras, 24-hour security guards, random security checks and access control.	Safety Officer.	Measures taken will be recorded and filed.	Safety Officer will keep records.	During the operational phase.
DECOMMISSIONING AND CLOSURE PHASE								
Removal of infrastructure and final rehabilitation of disturbed areas								

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Compaction and contamination of soils within the rehabilitation site.	Soils and Topography.	Ensure that the soil in the vicinity of the rehabilitation site is not detrimentally impacted.	Ensure that all areas are kept free of erosion	Rehabilitate to ensure the following i.e. • All areas must be backfilled and levelled. Levelled areas will be monitored for any settlement depressions, which must be rectified as soon as possible. • Ripping of hardened areas will be conducted at right angles to the natural slope. • Construct contours on the placed soil layers at intervals that will help to prevent erosion of the placed soils. • Implement a soil management strategy to ensure that the soils at the mining area are protected during replacement of the removed soils. • Undertake the seeding of the rehabilitated areas as per specialist's recommendation. Storm water diversion channels will be kept in place. All stockpiled soil will be chemically analysed prior to use. Dependent on the analysis obtained, fertiliser will be added as per analysis recommendation report prior to use for rehabilitation.	Appointed contractor. Appointed contractor. Appointed contractor.	Regular site check. Regular site check. Regular site check.	Site manager will conduct the inspections monthly. Site manager. ECO will conduct the inspections monthly.	Throughout the decommissioning and closure phases.
Re-instatement of, land capability, land use and topographical patterns.	Land Capability, Land Use and Topography.	Ensure that the rehabilitation of the site re-instate the soil productivity, land capability, land use and topographical patterns	Ensure that all areas are kept free of erosion. Ensure that the vegetation has sufficient time to colonise the area. Ensure that the vegetation has sufficient time to colonise the area	Erosion maintenance will be undertaken by surface ripping of compacted and eroded areas at right angles to the inherent slope. After this initial period, the rehabilitated areas will be assessed to determine the colonisation of the area and recommendations obtained as to when cultivation/grazing can commence. Rehabilitated areas will be seeded after the first rain. This will ensure that the desired vegetation cover will be achieved.	Appointed contractor. Appointed contractor. Appointed contractor.	Regular site check. Regular site check. Regular site check.	Site manager will conduct the inspections. Site manager will conduct the inspections. Site manager will conduct the inspections.	During decommissioning phase. During decommissioning phase. During decommissioning phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Pollution of surface water environment.	Surface Water.	Ensure that the rehabilitation of the site does not have detrimental impacts on the surface water environment.	Ensure that the vegetation has sufficient time to colonise the area.	Dirty water diversion trenches will be kept in place until all dirty areas are rehabilitated.	Appointed contractor.	Regular site check.	Site manager will conduct the inspections.	Throughout the decommissioning and closure phases.
				All haul roads and stockpiling areas will be graded and ripped. Ripping to be at right angles to the natural slope.	Appointed contractor.	Regular site check.	Site manager will conduct the inspections.	Throughout the decommissioning phase.
				The storm water diversion trenches will be kept intact and maintained until such time that it can be proven that the rehabilitated area is maintenance free and self-sustaining.	Appointed contractor.	Site inspections will be conducted.	Site manager will conduct the inspections	Throughout the decommissioning phase.
Air pollution from rehabilitation site.	Air quality.	Ensure that rehabilitation do not have detrimental impacts on air quality.	Ensure that the vegetation has sufficient time to colonise the area	Dust suppression will be on going during working day. Water will be obtained from the sump in the pit.	Appointed contractor.	Visual inspections of areas with possible dust emissions will be conducted	ECO will conduct inspections monthly.	Throughout the decommissioning phase.
				All machines will be fitted with the correct exhaust systems.	Site manager and appointed contractor.	Site inspections will be conducted.	Site manager will conduct inspections monthly.	Throughout the decommissioning phase.
Generated noise from the rehabilitation site.	Noise.	Ensure that the rehabilitation activities do not have detrimental impacts on people.	To ensure that the rehabilitation personnel's health is not adversely affected by noise generation.	All rehabilitation activities will cease at 18h00 to ensure that no third party is impacted on during the night-time hours.	Appointed contractor and site manager.	Regular site check.	Site manager.	Throughout the decommissioning phase.
				Vehicles will be serviced regularly. Broken exhaust systems will be replaced.	Site manager and appointed contractor.	Regular site check.	Site manager.	Throughout the decommissioning phase.
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the rehabilitation does not have detrimental impacts on heritage sites.	Should heritage sites be identified, they should not be damaged or destroyed by the rehabilitation activities.	A hundred meter buffer will be maintained between any site and the rehabilitation site.	Appointed contractor and the site manager.	The sites will be monitored for any rehabilitation related damages.	ECO will monitor the site monthly.	Throughout the decommissioning phase.
Impact on the livelihood of the landowners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the landowners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted and checked for criminal records Measures will be taken to avoid the spread of veld fires by the applicant's workforce.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	Throughout the pre-construction an construction phase.
AFTER CLOSURE PHASE								

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
Residual impacts of the mined out areas on groundwater.	Surface and Groundwater.	Ensure that the decommissioned opencast workings do not result in detrimental surface and groundwater impacts.	The groundwater around the decommissioned opencast workings will comply with the water quality standards to be provided by the DWS on closure.	The numerical and geochemical model needs to be updated against monitored data during the post-closure phase. The post-closure groundwater management of the opencast should be done in two phases: • Phase 1: Immediately after closure The acid producing material should be placed as low in the pits as possible, followed by the non-acid generating material. Rapid flooding should be done by diverting storm water channels and the water inundates pumping of available groundwater into the pit until the acid producing material. • Phase 2: After Rapid Flooding The final backfilled opencast topography should be engineered such that runoff is directed away from the opencast areas. The final layer (just below the topsoil cover) should be as clayey as possible and compacted if feasible, to reduce recharge to the opencasts. Natural berms should then be constructed to allow free drainage of surface water around the rehabilitated pit. Should monitoring indicate the passive methods employed during the rehabilitation of the opencast are ineffective and the decant water quality is unacceptable for release the following can be implemented. Passive Method: Should low volumes of water be encountered (< 5 ℓ/s) an interception trench can be designed. Active method: Should high volumes of water be encountered (> 5 ℓ/s), Treatment strategies may include a greater or lesser degree of water treatment in order to render the water suitable for reuse. If there is still a residual water management problem, then	Mine Environmental Co-ordinator.	Groundwater quality will be monitored around the rehabilitated proposed Opencast Mining Project Area.	Mine Environmental Co-ordinator.	Throughout the closure phase until it can be proven that the water quality has stabilised and will not cause significant impacts on the surrounding environment and water users.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency for Monitoring	Time period for Management Action
				the operation could evaluate and negotiate options with DWA for the discharge of such water to the water resource.				

6. FINANCIAL PROVISION

Section 24 P of NEMA requires an applicant applying for an environmental authorisation related to mining to comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts before the Minister responsible for mineral resources issues the environmental authorisation. The above-mentioned financial provision may be in the form of a bank guarantee, trust fund or cash.

6.1 DESCRIPTION OF CLOSURE OBJECTIVES AND EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE DESCRIBED BASELINE ENVIRONMENT

The closure objectives for the proposed project as detailed under section 4.1 of the EMPR, were determined in consideration of physical (infrastructure), biophysical (environmental) and socio-economic measures as well as alignment to the closure components provided by the Department of Mineral Resources and Energy (DMRE). See section 4.1 for the closure objectives.

6.2 CONFIRMATION THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNERS AND INTERESTED AND AFFECTED PARTIES

The draft BAR and EMPR is made available to the interested and affected parties during the public participation process for the proposed project. Note that the consultation of interested and affected parties included the owners of the properties directly affected by the proposed project and owners of land immediately adjacent the proposed project area.

The above confirms that the land owners and interested and affected parties will be consulted regarding the environmental objectives in relation to the closure of the proposed project.

6.3 REHABILITATION PLAN FOR THE PROPOSED PROJECT

In terms of Regulation 23 of NEMA EIA Regulations, 2014, an EMPr must address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of mining operations. In view of the above, a rehabilitation plan must be provided to the DMRE in support of the financial provision determined for mining operations. This section details the rehabilitation plan for the proposed Bankfontein Colliery C.

The aim of rehabilitation is to return the land disturbed by all mining activities to at least the pre-mining use and ensure that residual and latent impacts at the closure of the mine are minimal. Objectives associated with rehabilitation include:

The closure objectives and targets for Bankfontein Colliery C are as follows:

- Rehabilitation of areas disturbed as a consequence of mining to a land capability that will support and sustain a predetermined post-mine closure land use;
- Removal of all infrastructure that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from mine-affected areas;
- Reinstatement of self-sustaining ecosystems over the rehabilitated infrastructure and mining affected areas, requiring minimum on-going maintenance to facilitate a walk away situation;
- Establishment of final landforms that are stable and safe in the long run;

- Management of mine-affected water to prevent long-term risk of contamination of surface and underground water sources, which include where possible treatment of mine-affected water to;
- Prevention of acid mine drainage;
- Monitoring and maintenance of rehabilitation areas and water treatment processes forming part of mine closure to ensure the long-term effectiveness and sustainability of measures implemented.
- Regarding closure targets for Bankfontein Colliery C, the mine will ensure that the rehabilitation of disturbed areas, removal of infrastructure, management of rehabilitated areas and management of mine affected water and water leaving the mining area is undertaken such that it ensures compliance with all relevant standards as published by the relevant state authorities.

6.3.1 Infrastructure Areas

- Whenever possible, buildings and their infrastructure will not be demolished but left for after mining use.
- All steel works and structures will be removed so that the land can be returned to as near as practically possible to its original state. Steel will be sold as scrap metal.
- All rehabilitated areas will be shaped to be free draining without concentrating flow such that erosion occurs, fertilised and a mixture of indigenous and pasture grasses will be planted. Following this rehabilitation, the infrastructure areas will have a capability similar to the pre-mining environment.
- All rehabilitated areas will be maintained for a period of 3 years, where after the frequency will be reassessed. Vegetation cover will be maintained by annual application of fertiliser combined with biennial cutting or burning for the first three years. After this period, fertilizer will be applied as and when required. This will be determined by monitoring the basal cover and fertilizer levels against Phure Resources Proprietary Limited standards.
- Maintenance with respect to erosion will be conducted on a minimum three-monthly basis if and where required. This frequency will be reassessed after a 3-year period. The final rehabilitated surface will be stable, self-sustaining and erosion-free.
- All roads not required for residential or farming purposes and water pipelines will be removed and the ground restored as above.

6.3.2 Roads

The NEMA require all infrastructure associated with the mining operation to be removed and the surface on which it was situated to be returned, as close as is practically possible, to the original land use.

<u>Roads</u>

- Access roads to the proposed Bankfontein Colliery C will be rehabilitated. All gravel roads will be graded to remove coal material. The roads will be cross-ripped to 300 mm at right angles to the natural slope, fertiliser added as per soil requirements and vegetated with a seed mix of indigenous and pasture grasses. Maintenance will be conducted on the rehabilitated areas as indicated in the policy statement.
- Where the road (service road) crosses wetland areas, the affected area will be top soiled with wetland soils (preferably soils removed from the site and stockpiled) and the area vegetated with a seed mix of indigenous and wetland grasses.

- Where buildings and associated infrastructure will be left intact for non-mine use post closure, all access roads to the residential areas will be left in-situ. In this case, ownership and thus maintenance of these roads will be transferred to a third party.
- Note that if the ownership of the areas is not transferred to a third party, the buildings, roads and access roads will be removed, the areas rehabilitated and maintained as per point 1 above.

6.3.3 Coal Crushing and Screening Plant

The bulk of the activity in removing the plant will be the dismantling and removal of the plant and the demolition and disposal of concrete floor structures. The entire area will be shaped to prevent erosion and promote free-runoff.

The entire area will be ripped to a minimum depth of 300 mm at right angle to the inherent slope.

Fertiliser will be applied to the rehabilitated area as per soil requirements and vegetated with a seed mix of indigenous and pasture grasses.

Maintenance will be conducted on the rehabilitated areas as indicated in the Policy statement.

6.3.4 Buildings (Offices and Stores)

The bulk of the activity in rehabilitating the stores and administration area will be the removal of the temporary prefabricated structures. All scrap metals will be cleared from the area and sold.

The actions as stipulated above will apply to all prefabricated temporary structures.

If any soils are contaminated with hydrocarbons, they will be bio-remediated.

6.3.5 General Overall Rehabilitation Procedures

The above areas will all be rehabilitated according to the following principals:

- All areas will be cleared of potentially contaminating material, which will be disposed of at an appropriate waste facility.
- Areas will be filled to attain adequate topographical levels similar to that of pre-mining. The areas will be contoured to ensure adequate drainage and prevent pooling or ponding of water.
- Where pooling or ponding of water occurs, the areas will be revisited and graded and filled as necessary.
- Soils that were removed and stockpiled need to be re-assessed prior to and during rehabilitation. This is necessary to ensure nutrients are adequate.
- The rehabilitated areas will be sampled and the necessary lime and fertiliser requirements applied prior to re-vegetation. Any area profiled and top soiled will be vegetated within the same growing season. These areas will be vegetated with the prescribed seed mix, which will reflect the original biome type. The seed mixture should as a minimum, be made up according to the specifications of the specialist study. Rehabilitation should be done as soon as possible to reduce risk of soil erosion and to increase habitat availability for fauna as soon as possible.
- Once areas have been rehabilitated and seeded, access to these areas should be restricted.
- Rehabilitated areas will be monitored for vegetation cover and alien invasive encroachment on a 6-monthly basis. Areas of failed growth will be fertilised (if necessary) and re-seeded. All exotic and invasive vegetation should be removed.

- Erosion and pooling of water / impaired surface water flow will be monitored on a monthly basis during the rainy season and/or after each heavy rainfall event, any areas of concern will be addressed immediately. Where erosion gullies are noted, hale bales, gabion baskets or stick energy dissipaters are to be installed, and storm water control structures will be reviewed.
- The status of biodiversity and land management will be monitored on an annual basis and specialist recommendations applied.
- Groundwater and surface water monitoring will continue during the decommissioning, closure and post-closure phases.
- Maintenance and monitoring will continue for a period of at least 4 years following closure.

6.4 COMPATIBILITY OF THE REHABILITATION PLAN WITH THE CLOSURE OBJECTIVES

The rehabilitation plan will be drafted to be compatible with the closure objectives.

6.5 DETERMINATION OF THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT

The pecuniary provision for Bankfontein Colliery C will be determined based on the requirements of Chapter 2.4.1. of the Guideline document for the evaluation of the quantum of closure-related financial provision provided by a Mine, revision 1.6, September 2004, DMRE.

6.6 METHOD OF PROVIDING FOR THE FINANCIAL PROVISION

According to Regulation 8 of the Regulations pertaining to the financial provision for mining, exploration, mining or production operations (GNR 1147), an applicant or holder of a right or permit must make financial provision by one or a combination of the following:

- financial guarantee from a bank registered in terms of the Banks Act, 1990 (Act No. 94 of 1990) or from a financial institution registered by the Financial Services Board as an insurer or underwriter;
- deposit into an account administered by the Minister responsible for mineral resources; *or*;
- contribution to a trust fund established in terms of applicable legislation.

Phure Resources (Pty) Ltd has opted to use a financial guarantee to provide for the determined quantum for financial provision. The amount determined as financial Provision for the first year is R 1 323 632.51, see Table 10 below.

Table 10: Financial provision for Bankfontein Colliery C

"Rules-based" assessment of the quantum for financial provision							
CALCULATION OF THE QUANTUM							
Mine:	PHURE RESOURCES (PTY) LIMITED	**Location:**	Magisterial District of Middelburg, Mpumalanga Province.				
Evaluators:	O.T Shakwane of Geovicon Environmental (Pty) Limited	**Date:**	04/04/2023				
			A	**B**	**C**	**D**	**E=A*B*C*D**
No.:	**Description:**	**Unit:**	**Quantity**	**Master rate**	**Multiplication factor**	**Weighting factor 1**	**Amount (Rands)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
1	Dismantling of processing plant & related structures	m^3	0.00	R 18.36	1.00	1.10	R 0.00
2 (A)	Demolition of steel buildings & Structures	m^2	0.00	R 255.82	1.00	1.10	R 0.00
2 (B)	Demolition of reinforced concrete buildings & structures	m^2	0.00	R 376.99	1.00	1.10	R 0.00
3	Rehabilitation of access roads	m^2	3456.00	R 45.78	1.00	1.10	R 174 039.90
4 (A)	Demolition & rehabilitation of electrified railway lines	m	0.00	R 444.30	1.00	1.10	R 0.00
4 (B)	Demolition & rehabilitation of non electrified railway lines	m	0.00	R 242.34	1.00	1.10	R 0.00
5	Demolition of housing &/or administration facilities	m^2	0.00	R 511.63	1.00	1.10	R 0.00
6	Opencast rehabilitation including final voids & ramps	ha	0.66	R 268 200.17	1.00	1.10	R 194 713.32
7	Sealing of shafts, adits & inclines	m^3	0.00	R 137.33	1.00	1.10	R 0.00
8 (A)	Rehabilitation of overburden & spoils	ha	0.55	R 178 800.11	1.00	1.10	R 108 174.06
8 (B)	Rehabilitation of processing waste deposits & evaporation ponds (basi	ha	0.00	R 222 692.31	0.80	1.10	R 0.00
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidi	ha	0.30	R 646 804.03	0.80	1.10	R 170 756.26
9	Rehabilitation of subsided areas	ha	0.00	R 149 733.48	1.00	1.10	R 0.00
10	General surface rehabilitation	ha	0.66	R 141 639.86	1.00	1.10	R 102 830.54
11	River diversions	ha	0.00	R 141 639.86	1.00	1.10	R 0.00
12	Fencing	ha	0.00	R 161.56	1.00	1.10	R 0.00
13	Water management	ha	0.30	R 53 855.46	1.00	1.10	R 17 772.30
14	2 to 3 years of maintenance & aftercare	ha	5.00	R 18 849.42	1.00	1.10	R 103 671.79
15 (A)	Specialist study	SUM	0.00	R 200 000.00	1.00	1.00	R 0.00
15 (B)	Specialist study	SUM	0.00	R 1 000 000.00	1.00	1.00	R 0.00
						Sub Total 1	
						(Sum of items 1 to 15 Above)	**R 871 958.17**
	Multiply by Weighting factor 2	1.1		R 87 195.82			R 87 195.82
1	Preliminary and general	Add 12% if subtotal 1 is less than R100,000,000.00					R 104 634.98
2	Contingencies	Add 10% of subtotal 1					R 87 195.82
						Sub Total 2	
						(Subtotal 1 plus sum of management & contingencies)	**R 1 150 984.79**
						VAT (15%)	R 172 647.72
		(Subtotal 2 plus VAT)			**GRAND TOTAL**		**R 1 323 632.51**

7. MECHANISM FOR MONITORING COMPLIANCE WITH AND PERFOMAMCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREOF

7.1 INSPECTIONS AND MONITORING

During the impact assessment, potential impacts on the environment were identified. Mitigation measures were also specified for prevention and management of the impact so as to minimise their effect on the environment. This section will describe how the mine intends to ensure that the mitigation measures are being undertaken and that their effectiveness is proven.

A monitoring programme has been developed for the identified impacts and their mitigation measures. This monitoring programme will be undertaken and results thereof used to determine the effectiveness of the mitigation measures. The ECO will have an overall responsibility for ensuring that all monitoring is conducted according to the approved EMPR.

7.2 MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREOF

As part of the general terms and conditions for a mining permit, and in order to ensure compliance with the environmental management programme and to assess the continued appropriateness and adequacy of the environmental management programme Phure Resources (Pty) Ltd will:

- Conduct monitoring on a continuous basis
- Conduct performance assessments of the environmental management programme annually
- Compile and submit a performance assessment report to the minister in which compliance with the approved environmental management programme is demonstrated

The performance assessment report will as a minimum contain the following:

- Information regarding the period applicable to the performance assessment
- The scope of the assessment
- The procedure used for the assessment
- The interpreted information gained from monitoring the approved environmental management programme
- The evaluation criteria used during the assessment
- The results of the assessment

Recommendations on how and when non-compliance and deficiencies will be rectified

7.3 PROCEDURE FOR ENVIRONMENTAL RELATED EMERGENCIES AND REMEDIATION

Phure Resources (Pty) Ltd has developed procedures for environmental related emergencies for Bankfontein Colliery C which is explained in more detail below. Note that these procedures will be revised by the responsible person. The date of commencement of the revised procedures will always be indicated to prevent confusion.

7.3.1 Introduction

An effective, comprehensive, well considered and tested environmental emergency preparedness and response plan has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk. The aim is to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them. However, the emergency preparedness and response should be reviewed and revised where necessary.

7.3.2 What is an Environmental Emergency?

An environmental emergency is an unplanned event, which has the potential to result in a significant adverse environmental impact and/or could result in legal liability to Phure Resources (Pty) Ltd in terms of environmental legislation requirements. The following define most likely potential environmental emergencies:

- Hydrocarbon spills or leaks
- Surface fires, including veld fires
- A chemical spill
- Transportation accidents
- Other environmental emergencies requiring special services

7.3.3 Purpose of the procedure

To provide guidance to all mine employees and contractors in the event of an environmental emergency at Bankfontein Colliery C and related to its activities.

This procedure is developed so as to provide guidance to ensure that:

Danger to the environment, personnel, contractors and the non-employee is minimised.

- Legal liability is managed and minimised.
- Public relations are effectively managed during and following emergencies.
- Reporting is effective and corrective/follow-up actions are implemented.

7.3.4 Who should use these procedures?

This procedure contains information relevant to all employees and contractors of the mine. It is the responsibility of all employees to familiarise themselves with the contents of this procedure. Furthermore, mine management should ensure that all contractors have access to this procedure and the requirements contained herein (See Table 11).

7.3.5 Responsibilities

Table 11: Responsibilities

Mine Management	Phure Resources (Pty) Ltd is responsible for the safety and well-being of employees working at Bankfontein Colliery C as well as the protection of the environment from unnecessary negative impacts. The management of the Colliery has a responsibility to initiate a warning process should an emergency occur or should something at the Colliery deteriorate in an uncontrolled manner presenting a risk to employees, the public or the environment.

Local Government(s)	Local governments have the responsibility to warn residents of a hazardous situation, these warnings must be based on information provided by the Colliery.
All employees, contractors and other relevant parties	All employees, contractors and other relevant parties should ensure that they are familiar with this procedure.

7.3.6 Notification process

There are six main steps in managing an emergency, from the identification of the situation to final close off. They are as follows:

- Find and identify
- Ensure human safety
- Reporting
- Containment and clean-up
- Corrective action
- Monitoring

7.3.7 Emergency equipment and supplies

There is a directory of emergency equipment and other supplies on site as well as person/s responsible for the equipment.

7.3.8 Communication systems

Communication is critical during an emergency on site so that efforts to manage the situation are coordinated to produce the desired results. The communication channels that are available on site include:

- Internal phone line system
- Hand held radios
- Cellular phones

7.3.9 Training

The mine management ensures that employees are trained regarding potential emergencies that may occur at Bankfontein Colliery C.

7.3.10 Review of procedure

To ensure that the procedure is adequate, management will review the procedure at any time deemed necessary and change the emergency procedures at Bankfontein Colliery C.

7.3.11 Emergency Response flowchart for Phure Resources (Pty) Limited

The emergency response at Bankfontein Colliery C is undertaken, as shown in Figure 15 below.

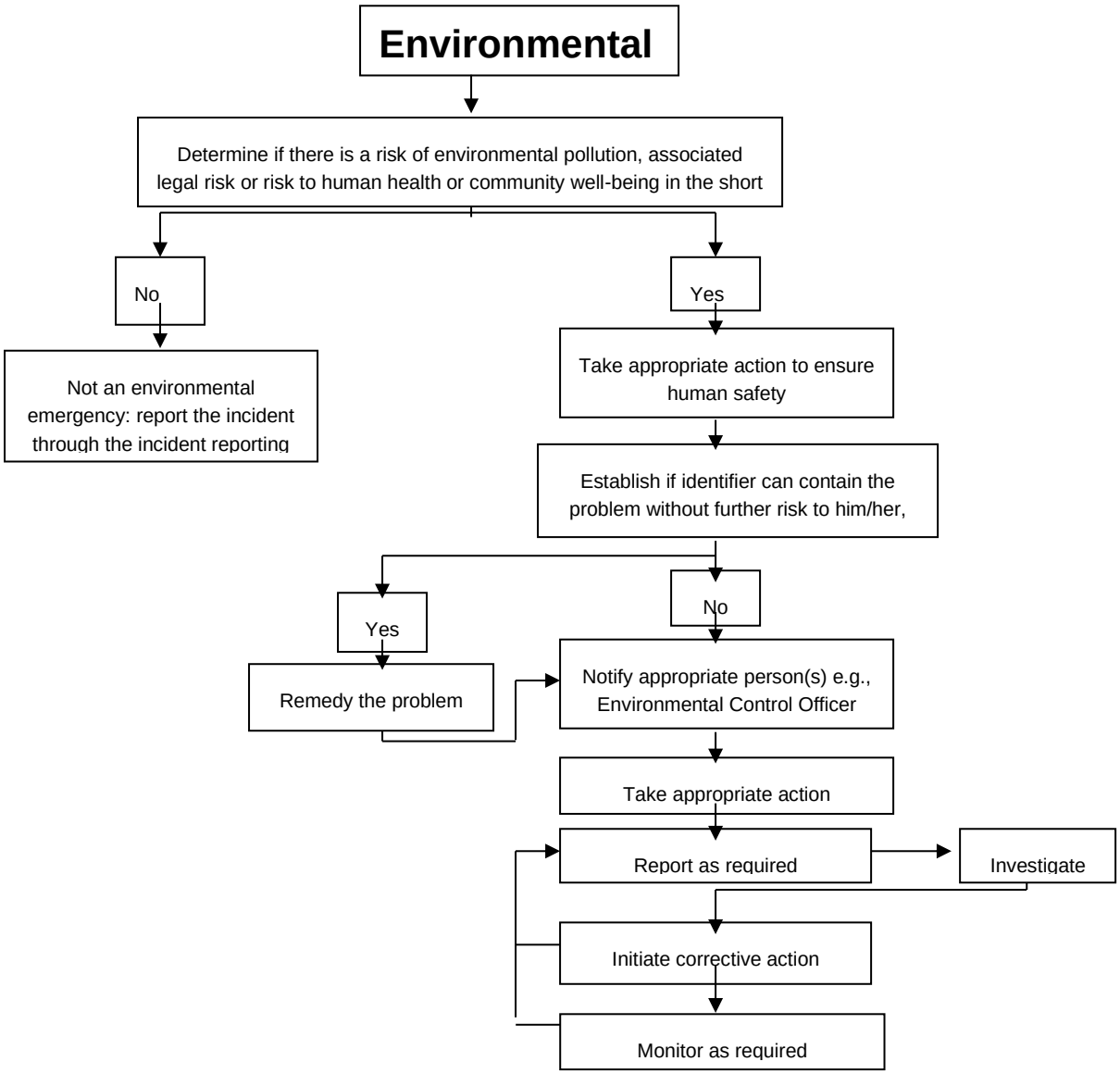

Figure 15: Emergency Response.

7.4 ENVIRONMENTAL AWARENESS PLAN

In terms of section 39(3)(c) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), Bankfontein Colliery C must compile and implement an environmental awareness plan. The above-mentioned environmental awareness plan must describe the manner in which the site manager (in this case Bankfontein Colliery C) will inform their employees of any environmental risk which may result from their work and the manner in which the environmental risks will be addressed to avoid pollution or/and degradation of the environment. This document, therefore concerns the details of the environmental awareness plan for Bankfontein Colliery C as required by the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

7.4.1 Objectives and Legal Requirements

The following are the objectives of the environmental awareness plan

- To identify the necessary training needs for different categories of employees in the mine
- To train all employees on environmental issues on the mine

The following legislation apply to this environmental awareness plan

- Employment Equity Act, 1998 (Act 55 of 1998)
- National Environmental Management Act, 198 (Act 77 of 1998)
- Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

7.4.2 Manner of informing employees of risks to avoid pollution and degradation of the environment

The identification of environmental training and environmental awareness needs are derived from an analysis of the type of role different categories of employees play at Bankfontein Colliery C. The following categories are considered, *viz*:

- Senior Management
- Middle management (Environmental Officers)
- Supervisors
- Operators
- Visitors and contractors

Each of these categories have different responsibilities and therefore have different knowledge requirements and environmental awareness training needs, to obtain that knowledge. The different categories and environmental awareness and training needs are summarised below in Table 12:

Table 12: Environmental Awareness Matrix.

Occupation Category	EMP Responsibility	Required knowledge and output	Training required	Interval
Senior management	Managing	Understand the EMP objectives	Induction and post-leave awareness/training	Annually
		Knowledge of the Colliery's significant impacts and risks.	EMP Workshops	Once off
		Review the EMP actions	EMP objectives and actions /Management reviews	Annually
		Knowledge of EMP Procedures (awareness and emergency)	Specific training program on EMP	Once off, refresh annually
Middle and Junior management	Implementing and daily management	Knowledge of Colliery's significant environmental impacts	EMP Review workshops	Annually
		Setting of EMP objectives for environmental improvement	EMP Review workshops	Annually
		Knowledge of EMP procedures (awareness and emergencies)	Specific training programmes on EMP	Once off, refresh annually
	Adhering to procedures to control impacts	Understand EMP objectives	Induction and post-leave training	Annually
		Knowledge of significant impacts	Induction and post-leave training	Annually
		Knowledge of procedures (awareness and emergency)	EMP Review workshop	Annually
Plant and machine operators, assemblers and elementary occupations	Executing assigned EMP actions Controlling work activities to prevent impacts.	General awareness of EMP impacts and objectives.	Induction and post-leave training	Continuously
		Understand environmental requirements relating to work	Induction and post-leave training	Annually

Occupation Category	EMP Responsibility	Required knowledge and output	Training required	Interval
		activities and consequences of not following requirements		
		Knowledge of procedures	Training and information sharing	Continuously
Visitors and contractor	Managing and controlling daily actions to prevent or control impacts	Basic awareness of EMP	Induction or specific modules/ awareness programme	Once off, annual review if applicable
		Environmental requirements of work activities	Induction or specific awareness programme	Once off, annual review if applicable
		Knowledge of procedures	Training and information sharing	Continuously
		Understanding environmental consequences of personal actions and performance.	Induction or specific modules/ awareness programme	Once off, annual review if applicable
		Compliance to procedures	Induction or specific awareness programmes.	
Personnel requiring specific training and awareness identified on site by management, Environmental Officer, training department, etc.	Managing and controlling daily actions to prevent impacts	Examples include but are not limited to: Waste management Hazardous chemical handling	Specific training programme on EMP procedures.	As required

7.4.3 Induction for all employees, including contractors

All employees (including contractor employees) undergo induction. Bankfontein Colliery's induction includes training and awareness on environmental issues on the Colliery and is compulsory for all new employees. The induction programme as mentioned above, have an environmental management component. On an annual basis the environmental section of the induction gets updated. Consideration is given to the following:

- Significant environmental impacts as identified in the EMP
- Procedures: environmental awareness and emergency procedures
- Trends in incidents
- Trends in audit findings

7.4.4 General environmental awareness training

General awareness training is offered to operators, processors and the other various sections of the mine during the safety toolbox talks. This is conducted on rotational basis. New environmental awareness topics are determined and new topics are introduced after all the shifts have received training/awareness on the current topic. The following is undertaken to ensure that the above awareness training is conducted.

- A monthly environmental awareness topic for discussion is distributed to all mine sections. These topics are discussed at the safety toolbox talks, by SHE (Safety, Health and Environmental) representative and environmental officers if available.
- The topics are displayed on the notice boards of all mine sections.
- Ad hoc environmental awareness sessions to various departments/sections are conducted on request. The presentations focus on the environmental issues relevant to individual tasks.

7.4.5 Provision for job specific environmental awareness training

Job specific training is developed to address urgent training needs as identified /required. The training material focus on the following:

- Waste prevention and control (implementation of the waste management procedure).
- Water management (Leaking pipes and taps)
- Hydrocarbon and chemical spill reporting and clean-up
- Storing and handling of chemicals
- Rehabilitation
- Dust management on the mine

Supervisory staff within specific mine sections are equipped with the necessary knowledge and information to guide their employees on environmental aspects applicable in performing a specific task.

7.4.6 Competency training

Management (training official/environmental officer) is responsible for the environmental awareness training of middle management and supervisors. This training is conducted through workshops. If required, external organisations may be requested to provide training to selected employees (e.g., EMP auditing).

Competence and the effectiveness of training and development initiatives as described in the matrix, are determined through the following:

- Trend analysis and reporting
- Analysis of work areas during visits and audits
- Trend analysis of monthly incidents (or zero tolerance if available) as recorded per mine section.

7.4.7 Review of awareness and training material

The content of all awareness and training material will be updated at least once a year.

7.4.8 Roles and responsibilities

In the case where there is no training department on site, a responsible person should be identified (Mine manager, Environmental Officer or Consultant) to ensure that the objective of this procedure is met.

7.5 UNDERTAKING TO COMPLY

I, ..., the undersigned and duly authorised thereto by **Phure Resources (Pty) Ltd** have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager.

Signed at .....……..... this.....day of…….....20.....

..... **.....**

Signature of applicant **Designation**

APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

Signed at……this.....day of…….....20.....

.....……..

REGIONAL MANAGER

REGION:……