

Ndzilo Coal (Pty) Limited

Witrans Colliery

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 30/5/1/1/3/13215 MP)

JUNE 2022

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Report Type: Draft BAR/EMPr
Project Title: Witrand Colliery Mining Permit project.
Compiled for: Ndzilo Coal (Pty) Limited.
Compiled by: P. Sekgukulu, BSc. Hons. Cand.Sci.Nat
Reviewed by: T. Shakwane, B.Sc. Hons. Pr.Sci.Nat and Registered EAP
Version: Draft
Date: June 2022

Disclaimer:

The results and conclusions of this report are limited to the Scope of Work agreed between Geovicon Environmental (Pty) Limited and Ndzilo Coal (Pty) Limited 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.

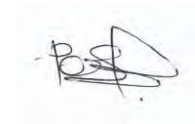
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Declaration:

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.



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EXECUTIVE SUMMARY

Ndzilo Coal (Pty) Limited 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). Ndzilo Coal (Pty) Limited proposes to mine coal on a portion of portion 3 of the farm Witrand 52 IT, situated within Elukwatini (Carolina Magisterial District).

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, Ndzilo Coal (Pty) Limited (Reg. No.: 2019/615422/07) 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 Witrand Colliery, 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

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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 Witrand Mining Permit area as an environmental assessment practitioner. Mr Shakwane is

the environmental assessment practitioner for the environmental impact assessment for the proposed Witrand Mining 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 Witrand Mining Permit Area's 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).
- 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

Ndzilo Coal (Pty) Limited

1.2.2. Name of the Project

Witrand Colliery

1.2.3. Postal Address of Applicant

Ndzilo Coal (Pty) Ltd

PO Box 90512

Garsfontein

Gauteng,

0181

1.2.4. Responsible Person

Mr Mojalefa Douglas Mongwe

1.2.5. Contact Person

Mr. Bongani Zulu

Tel: +27 (12) 472 0253

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

1.3.1. Regional Setting

The Witrand Colliery is situated within the Elukwatini (Carolina Magisterial District) approximately 13 kilometres south west from Carolina town, 23 kilometers north east from Breyten town, and 42 kilometres north west from Chrissiesmeer town. Access to the mine is via a network of unnamed farm roads or mine roads connecting to R36 west of the mining area. See Figure 1, for the regional setting of Witrand Colliery and Table 1 for the distance and directions from the nearest towns to Witrand Colliery.

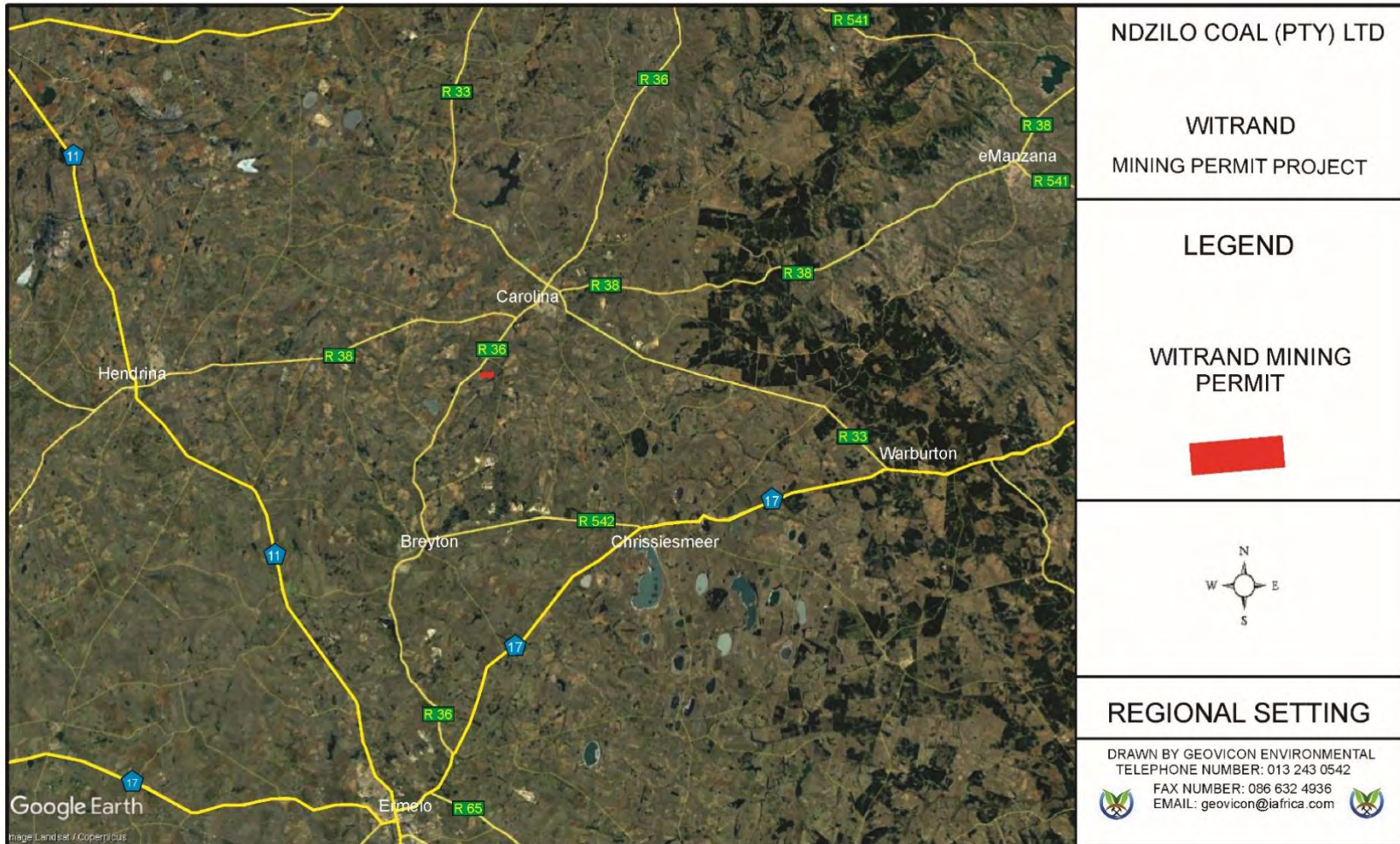


Figure 1: Regional Setting for Witrand Colliery.

1.3.2. Physical Address and Farm Name of the Mining Area

Witrand Colliery is situated on a portion of portion 3 of the farm Witrand 52 IT, south west of Carolina town, Mpumalanga.

1.3.3. Magisterial District & Regional Services Council

- Magisterial District: (Elukwatini) Carolina
- District Municipality: Gert Sibade District Municipality
- Local Municipality: Chief Albert Luthuli Local Municipality

1.3.4. Direction and Distance from Nearest Towns

Table 1: Direction and Distance from nearest towns to the proposed prospecting area.

TOWN	DIRECTION	DISTANCE (KM)
Carolina	South West	13 km
Breyten	North East	23 km
Chriessiesmeer	North West	42 km
Hendrina	South East	45 km

1.3.5. Locality Plan

Refer to Figure 2 for the locality plan of the Witrand Colliery area.



Figure 2: 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 3 below. The land in the area is mainly used for mining activities.

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

FARM NAME AND NUMBER	21 DIGIT SURVEYOR GENERAL CODE	DESCRIPTION OF SUB-DIVISION	SURFACE OWNER
Direct Surface Owner			
Witrand 52 IT	TOIT00000000005200003	Portion 3*	A.J.B Boerdery (Pty) Limited
Immediately Adjacent Surface Owners			
Witrand 52 IT	TOIT00000000005200004	Portion 4	Job Nkosi
Witrand 52 IT	TOIT00000000005200005	Portion 5	Msobo Coal (Pty) Limited
Verkeerdepan 50 IT	TOIT00000000005000007	Portion 7	Msobo Coal (Pty) Limited

***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.

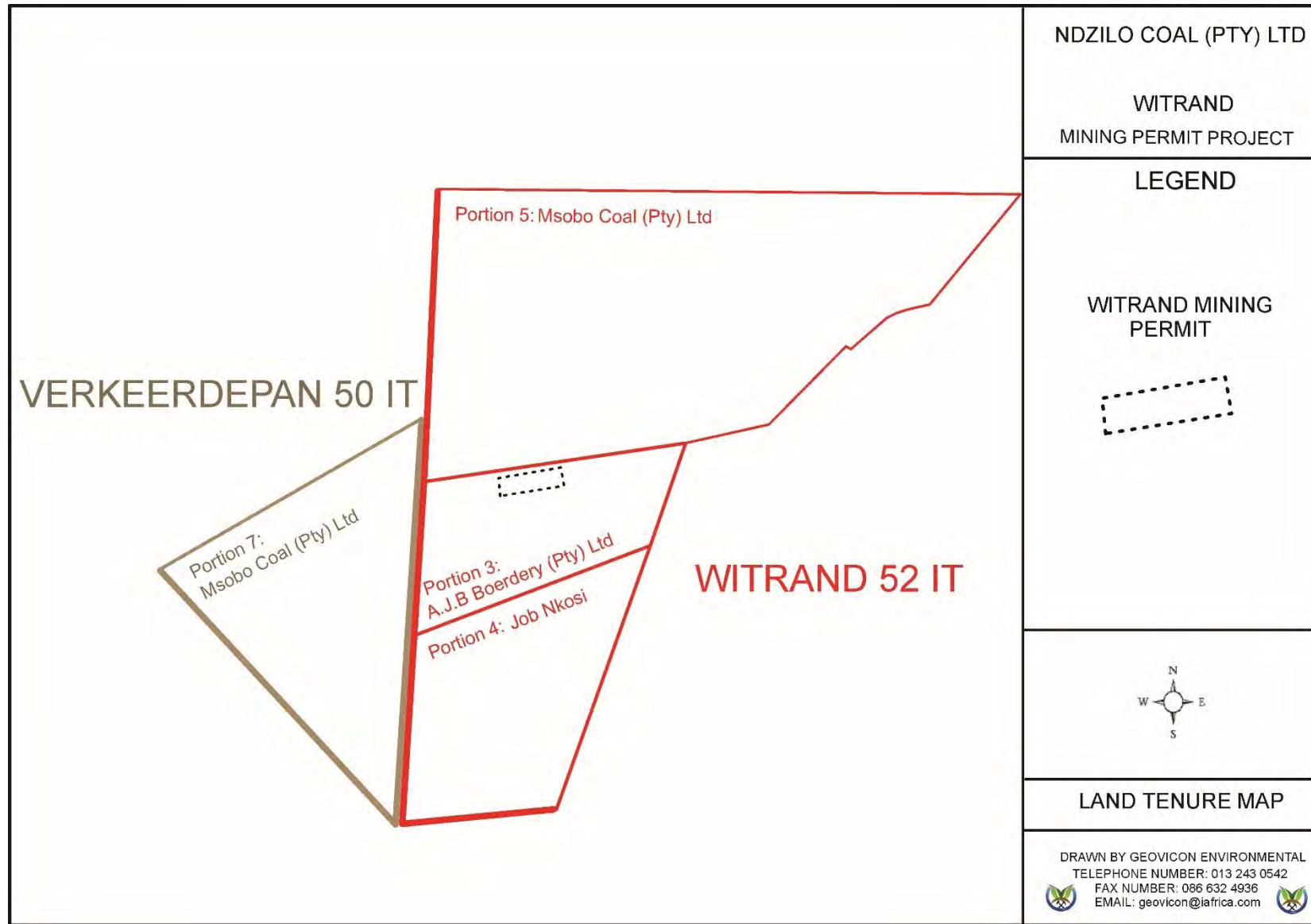


Figure 3: Land Tenure Plan for the Witrand Colliery area.

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 Witrand Colliery 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, Ndzilo Coal (Pty) Limited has submitted an application for an environmental authorisation for all listed activities to be conducted at the proposed Witrand Colliery 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 Witrand Colliery 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 temporarily 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 3 of the farm Witrand 52 IT.

Table 3: Proposed Witrand Colliery 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 m ²	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

2.2.1. Target Minerals

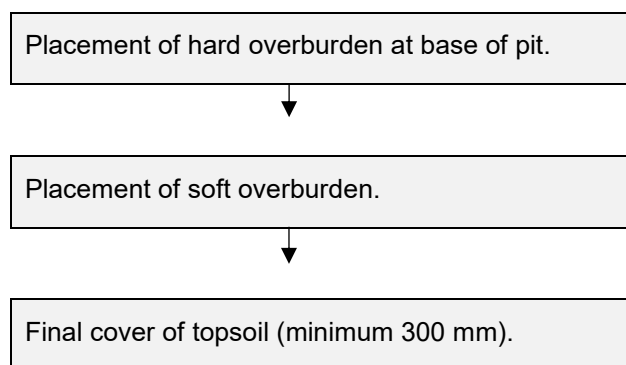
Coal.

2.2.2. Mining Method Used at the Witrand Colliery Area

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 Witrand Colliery opencast area.

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 Witrand Colliery is 2 years (24 months).

2.3. WITRAND COLLIERY SURFACE INFRASTRUCTURE DESCRIPTION

2.3.1. Access

There is a good network of tarred roads connecting the mine with surrounding towns. The R36 provincial 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 potable 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 an 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.

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 4 for the infrastructure layout plan and Figure 5 for box-cuts' layout plan.



Figure 4: Surface layout plan, see attached **Appendix C** for an A3 format.

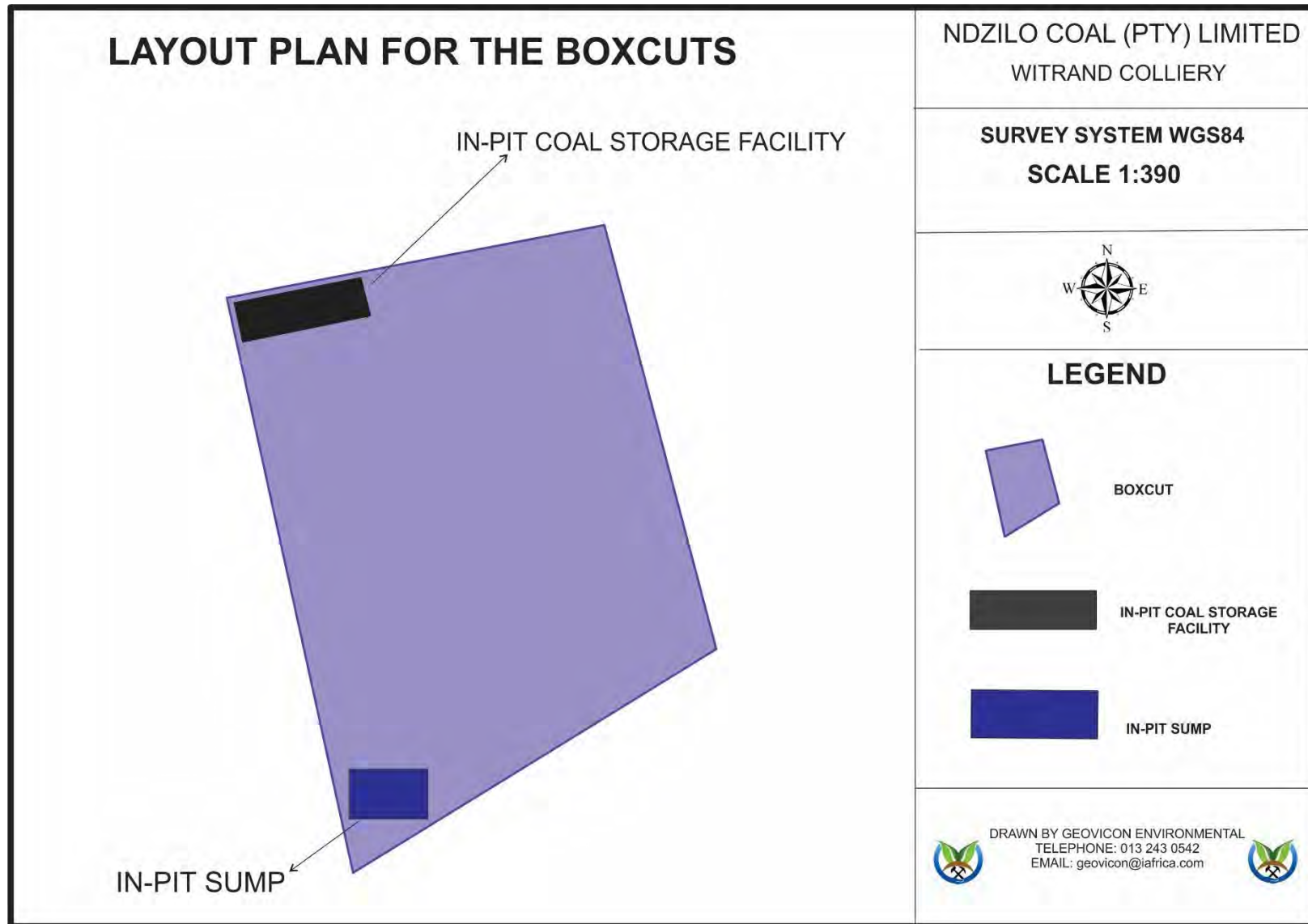


Figure 5: Layout plan for the boxcut.

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 be 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. Witrand Colliery Method Statement

In terms of the DMRE BAR and EMPR template, Ndzilo Coal (Pty) Limited 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

Witrand Colliery 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 Witrand Colliery. 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. Witrand Colliery 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 Ndzilo Coal (Pty) Limited 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 Witrand Colliery.

This project is crucial in ensuring that Ndzilo Coal (Pty) Limited maintains job employment and coal production rates at Witrand Colliery to supply the local and the export markets.

Ndzilo Coal (Pty) Limited 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, Breyten, Chrissiesmeer, Hendrina, 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 Ndzilo Coal (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.

Ndzilo Coal (Pty) Limited intends on undertaking an opencast mining operation namely Witrand Colliery. 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 Witrand Colliery.

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., expansion of the 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 Witrand Colliery the most viable option to accessing the site will be via unnamed farm roads connecting to R36 north of the 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.

Witrand Colliery 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 3 of the farm Witrand 52 IT, 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 the R36 road.

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 give an explanation of 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 Ndziilo Coal (Pty) Limited is applying for an environmental authorisation for the proposed Witrand Colliery. 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 requires 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 Witrand Colliery. 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 started on the 10th of June 2022 and ended on the 11th of July 2022.

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 10th of June 2022, 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 witrand mining permit BAR was placed in Carolina 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 Carolina local 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 Witrand Colliery:

- Department of Mineral Resources and Energy, Mpumalanga Regional Office (Competent Authority),
- Department of Water and Sanitation, Mpumalanga Regional Office (Commenting Authority)
- National Department of Agriculture,
- Mpumalanga Tourism and Parks Agency (Commenting Authority)
- South African Heritage Resources Agency (Commenting Authority)
- Witrand Colliery, immediate land owners and lawful occupiers
- Ward Councillor (Albert Luthuli 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

Witrand mining permit area 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 Witbank 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

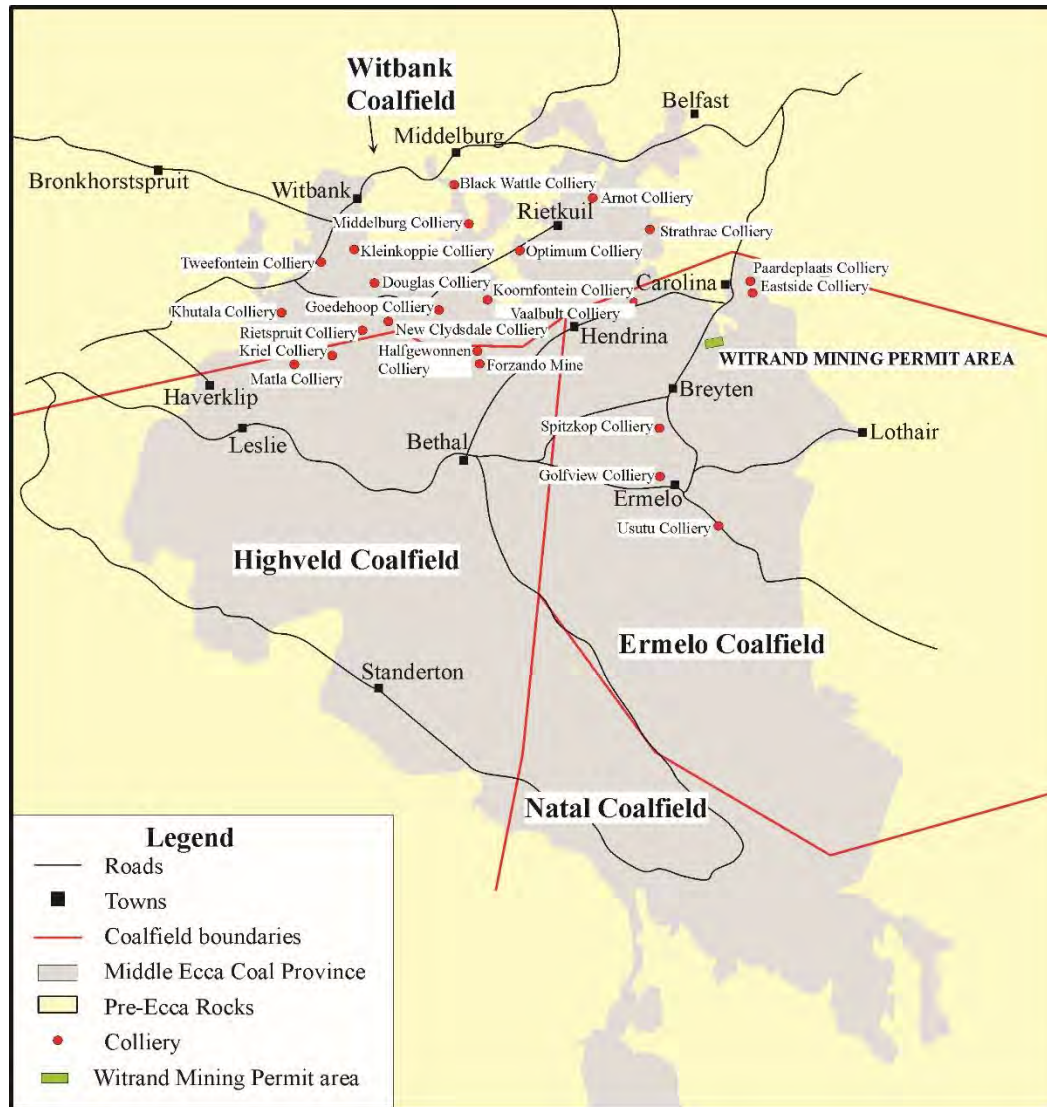


Figure 6: Location of the mining permit area in the identified coalfields of South Africa.

5.4.2. Climate

5.4.2.1. Regional Climate

Witrand mining permit area 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 5.

5.4.2.2. Mean Monthly Rainfall and Evaporation

Table 4: Climatic conditions in the vicinity of Witrand mining permit area – 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 is relatively flat with height of 1670m above mean sea level (Figure 8). The surrounding area is considered undulating and consists of hills and valleys, often with streams in the valleys and pans in the hills.

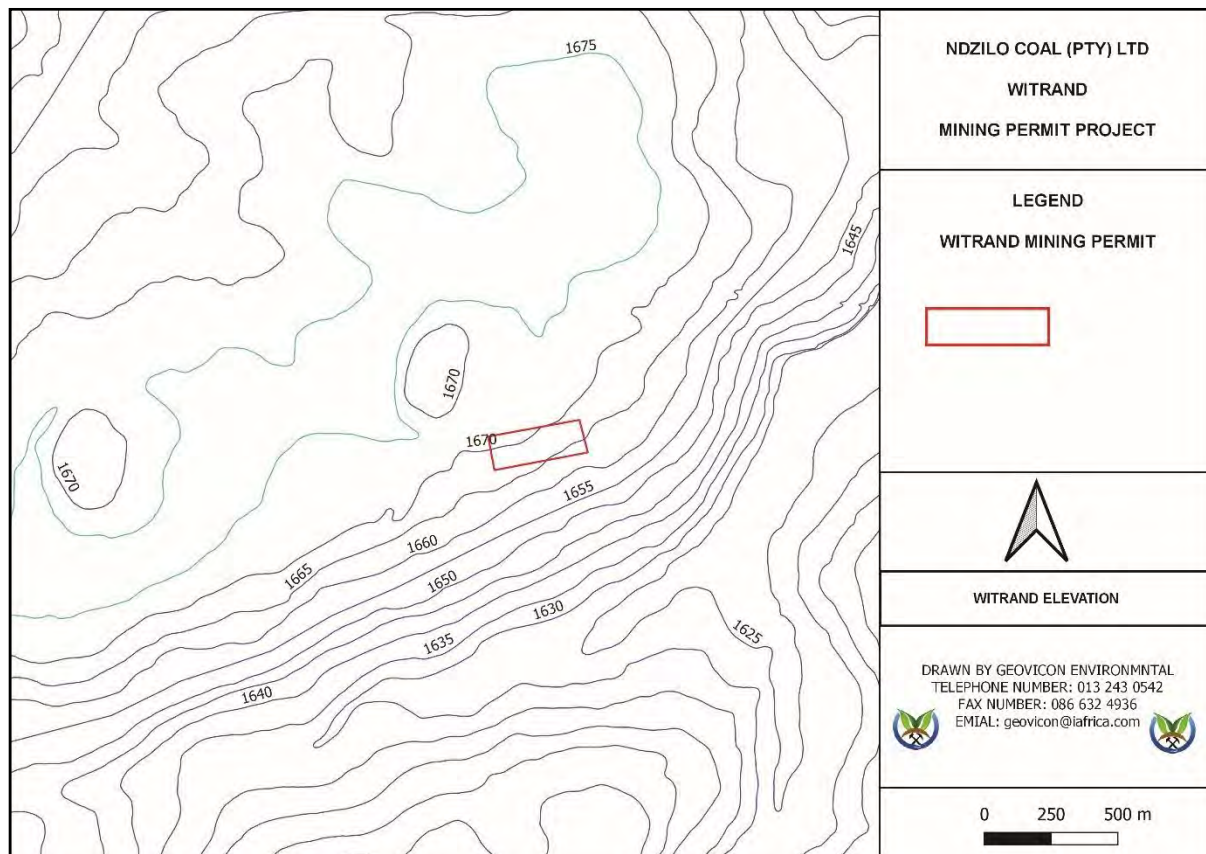


Figure 7: Elevation

5.4.4. Land-Use

The land in the area is mainly used for agricultural purposes. Adjacent land is used for mining purposes. Refer to figure 9 below.

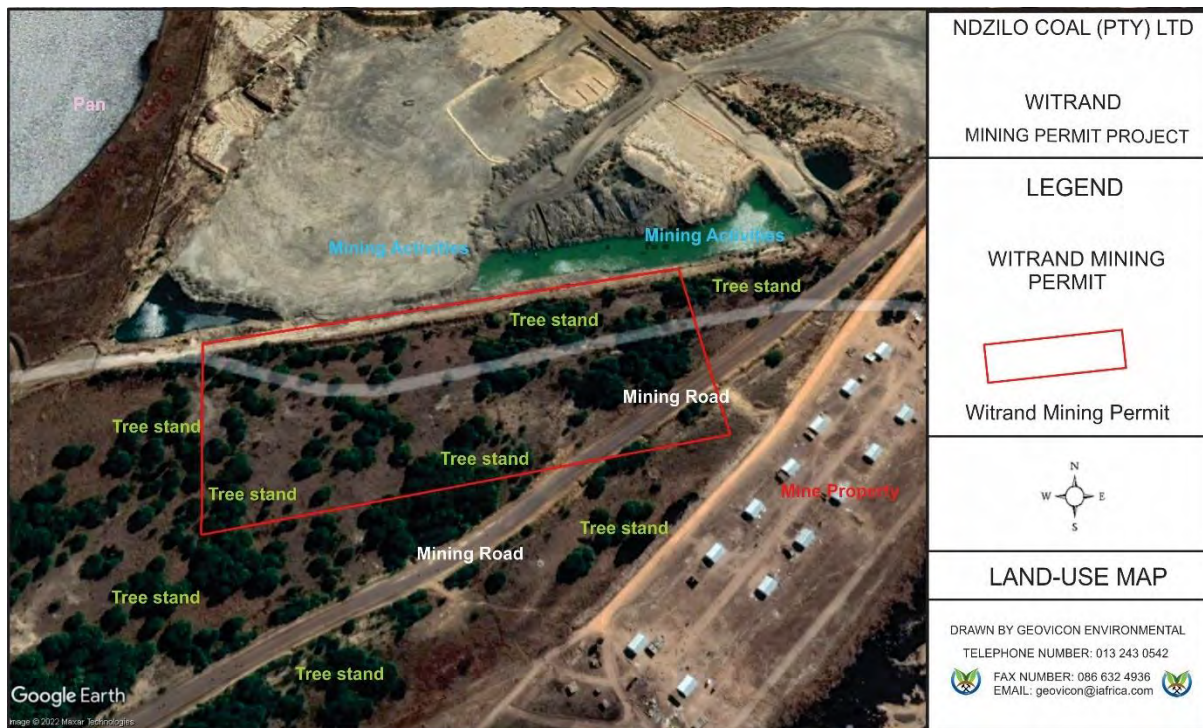


Figure 8: Current Land Use Plan

5.4.5. Archaeological and Cultural importance

According to the National Web Based Environmental Screening Tool Report from the Department of forestry fisheries and the environmental, the Witrand Colliery mining permit area falls within the low archaeological and cultural importance.

5.4.6. Agricultural aspect

The adjacent farms are used for mining activities (i.e., Msobo mine is immediately adjacent to the proposed Witrand mining permit area). The mining permit holder must nonetheless implement the mitigation measures recommended in the EMP to avoid impact on surrounding areas.

5.4.7. Natural Vegetation/Plant Life

The proposed Witrand Colliery area is situated the Eastern Highveld Grassland vegetation type of the Mesic Highveld Grassland bioregion in the Grassland Biome See Figure 9 for a visual indication (South African National Biodiversity Institute – SANBI; VEGMAP 2018).

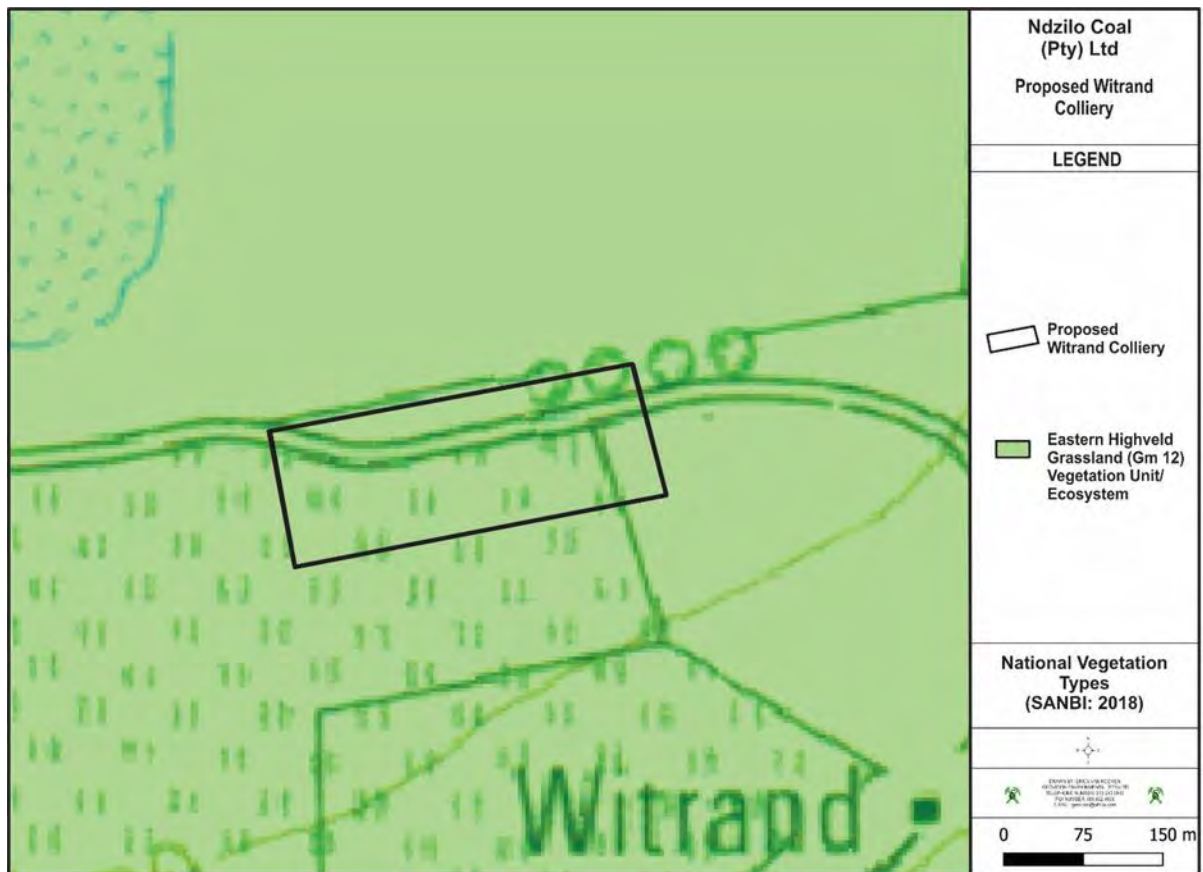


Figure 9: National Vegetation types in the vicinity of the proposed Witrand Colliery area

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)	
<i>Aristida aequiglumis</i>	Three-awn
<i>Aristida congesta</i>	Tassel three-awn
<i>Aristida junciformis</i>	Gongoni three-awn
<i>Brachiaria serrata</i>	Velvet signal grass
<i>Cynodon dactylon</i>	Couch grass
<i>Digitaria monodactyla</i>	One finger grass
<i>Digitaria tricholaenoides</i>	Purple finger grass
<i>Elionurus muticus</i>	Wire grass
<i>Eragrostis chloromelas</i>	Narrow curly leaf
<i>Eragrostis curvula</i>	Weeping love grass
<i>Eragrostis plana</i>	Tough love grass

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

5.4.8. Animal life

Witrand mining permit area 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. All animal species lists mentioned in the tables below have been obtained from the web-accessible Virtual Museum Animal Demography Unit. Witrand mining permit area is situated over the 2630AA quarter degree square grid. The tables below represent the possible occurrence of animal species found within the perimeters of the 2630AA quarter degree square grid and is not restricted to the proposed Witrand mining permit area.

Table 6: List of Mammals species that occur in the 2528DB quarter degree square grid (Mammal map, Animal Demographic Unit).

#	Species code	Family	Scientific name	Common name	Red list category
1	105001		CLASS Mammalia	Unidentified Mammalia	
2	151470	Bathyergidae	<i>Cryptomys hottentotus</i>	Southern African Mole-rat	Least Concern (2016)
5	212190	Bovidae	<i>Antidorcas marsupialis</i>	Springbok	Least Concern (2016)
7	212160	Bovidae	<i>Damaliscus pygargus phillipsi</i>	Blesbok	Least Concern (2016)
8	216020	Bovidae	<i>Oryx gazella</i>	Gemsbok	Least Concern (2016)
14	215700	Bovidae	<i>Sylvicapra grimmia</i>	Bush Duiker	Least Concern (2016)
15	213760	Bovidae	<i>Syncerus caffer</i>	African Buffalo	Least Concern (2008)
19	211020	Cervidae	<i>Dama dama</i>	Fallow Deer	Introduced
20	106250	Chrysochloridae	<i>Amblysomus septentrionalis</i>	Highveld Golden Mole	Near Threatened (2016)
21	207010	Equidae	<i>Equus quagga</i>	Plains Zebra	Least Concern (2016)
22	159760	Erinaceidae	<i>Atelerix frontalis</i>	Southern African Hedgehog	Near Threatened (2016)
23	191660	Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)
25	196100	Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern (2016)
26	196340	Herpestidae	<i>Herpestes sanguineus</i>	Slender Mongoose	Least Concern (2016)

27	197700	Herpestidae	<i>Suricata suricatta</i>	Meerkat	Least Concern (2016)
28	197750	Hyaenidae	<i>Hyaena brunnea</i>	Brown Hyena	Near Threatened (2015)
30	151730	Hystriidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern
31	158240	Leporidae	<i>Lepus saxatilis</i>	Scrub Hare	Least Concern
32	106360	Macroscelididae	<i>Elephantulus brachyrhynchus</i>	Short-snouted Elephant Shrew	Least Concern (2016)
33	106410	Macroscelididae	<i>Elephantulus myurus</i>	Eastern Rock Elephant Shrew	Least Concern (2016)
34	217970	Muridae	<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	Least Concern
35	218020	Muridae	<i>Gerbilliscus brantsii</i>	Highveld Gerbil	Least Concern (2016)
36	147530	Muridae	<i>Mastomys natalensis</i>	Natal Mastomys	Least Concern (2016)
37	150360	Muridae	<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	Least Concern (2016)
38	202070	Mustelidae	<i>Ictonyx striatus</i>	Striped Polecat	Least Concern (2016)
39	107300	Procaviidae	<i>Procavia capensis</i>	Cape Rock Hyrax	Least Concern (2016)
40	163350	Soricidae	<i>Myosorex varius</i>	Forest Shrew	Least Concern (2016)
41	207740	Suidae	<i>Potamochoerus larvatus</i>	Bush-pig	Least Concern (2016)
42	187040	Vespertilionidae	<i>Neoromicia capensis</i>	Cape Serotine	Least Concern (2016)

Table 7: List of Reptile species that occur in the 2528 DB quarter degree square grid (Reptile Map, Animal Demographic Unit)

Species code	Family	Scientific name	Common name	Red list category
1460	Agamidae	<i>Agama aculeata distanti</i>	Distant's Ground Agama	Least Concern (SARCA 2014)
1490	Agamidae	<i>Agama atra</i>	Southern Rock Agama	Least Concern (SARCA 2014)

1410	Chamaeleonidae	<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	Least Concern (SARCA 2014)
4750	Colubridae	<i>Dasypeltis scabra</i>	Rhombic Egg-eater	Least Concern (SARCA 2014)
4640	Colubridae	<i>Philothamnus semivariiegatus</i>	Spotted Bush Snake	Least Concern (SARCA 2014)
3120	Cordylidae	<i>Cordylus vittifer</i>	Common Girdled Lizard	Least Concern (SARCA 2014)
3190	Cordylidae	<i>Pseudocordylus melanotus melanotus</i>	Common Crag Lizard	Least Concern (SARCA 2014)
5210	Elapidae	<i>Elapsoidea sundevallii sundevallii</i>	Sundevall's Garter Snake	
5260	Elapidae	<i>Hemachatus haemachatus</i>	Rinkhals	Least Concern (SARCA 2014)
400	Gekkonidae	<i>Lygodactylus ocellatus</i>	Spotted Dwarf Gecko	Least Concern (SARCA 2014)
3490	Gerrhosauridae	<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Least Concern (SARCA 2014)
4130	Lamprophiidae	<i>Aparallactus capensis</i>	Black-headed Centipede-eater	Least Concern (SARCA 2014)
4360	Lamprophiidae	<i>Lycodonmorphus laevissimus</i>	Dusky-bellied Water Snake	Least Concern (SARCA 2014)
4840	Lamprophiidae	<i>Psammophis crucifer</i>	Cross-marked Grass Snake	Least Concern (SARCA 2014)
4960	Lamprophiidae	<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	Least Concern (SARCA 2014)
4540	Lamprophiidae	<i>Pseudaspis cana</i>	Mole Snake	Least Concern (SARCA 2014)
2000	Scincidae	<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	Least Concern (SARCA 2014)
2450	Scincidae	<i>Trachylepis punctatissima</i>	Speckled Rock Skink	Least Concern (SARCA 2014)
2480	Scincidae	<i>Trachylepis varia sensu lato</i>	Common Variable Skink Complex	Least Concern (SARCA 2014)
3910	Typhlopidae	<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	Least Concern (SARCA 2014)
3850	Typhlopidae	<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	Least Concern (SARCA 2014)
5410	Viperidae	<i>Bitis arietans arietans</i>	Puff Adder	Least Concern (SARCA 2014)

Table 8: List of Fish species that occur in the 2630AA quarter degree grid (Fish Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	752390	Cichlidae	<i>Pseudocrenilabrus philander</i>		
2	730086	Cyprinidae	<i>Cyprinus carpio</i>		

Table 9: List of Frog species that occur in the 2630AA quarter degree grid (Frog Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	370	Bufoidea	<i>Sclerophrys capensis</i>	Raucous Toad	Least Concern
2	330	Bufoidea	<i>Sclerophrys gutturalis</i>	Guttural Toad	Least Concern (IUCN, 2016)
3	660	Hyperoliidae	<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern
4	920	Hyperoliidae	<i>Semnodactylus wealii</i>	Rattling Frog	Least Concern
5	1050	Pipidae	<i>Xenopus laevis</i>	Common Platanna	Least Concern
6	820	Ptychadenidae	<i>Ptychadena porosissima</i>	Striped Grass Frog	Least Concern
7	880	Pyxicephalidae	<i>Amietia delalandii</i>	Delalande's River Frog	Least Concern (2017)
8	890	Pyxicephalidae	<i>Amietia fuscigula</i>	Cape River Frog	Least Concern (2017)
9	400	Pyxicephalidae	<i>Cacosternum boettgeri</i>	Common Caco	Least Concern (2013)
10	940	Pyxicephalidae	<i>Strongylopus fasciatus</i>	Striped Stream Frog	Least Concern
11	950	Pyxicephalidae	<i>Strongylopus grayii</i>	Clicking Stream Frog	Least Concern
12	990	Pyxicephalidae	<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	Least Concern

Table 10: List of Butterfly and Moth species in the 2630AA quarter degree grid (LepiMap, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	459170	Lycaenidae	<i>Aloeides henningi</i>	Hillside russet	Least Concern (SABCA 2013)

2	463680	Lycaenidae	<i>Cacyreus marshalli</i>	Common geranium bronze	Least Concern (SABCA 2013)
3	466640	Lycaenidae	<i>Lepidochrysops ignota</i>	Zulu giant cupid	Least Concern (SABCA 2013)
4	415130	Nymphalidae	<i>Melanitis leda</i>	Common evening brown	Least Concern (SABCA 2013)
5	438050	Nymphalidae	<i>Vanessa cardui</i>	Painted lady	Least Concern (SABCA 2013)
6	403160	Pieridae	<i>Colias electo electo</i>	African clouded yellow	Least Concern (SABCA 2013)

Table 11: List of a Dungbeetle species that occur in the 2630AA quarter degree grid (Dungbeetle Map, Animal Demography Unit)

#	Species code	Family	Scientific name
1	7701060	Scarabaeidae	<i>Chalconotus convexus</i>
2	7701230	Scarabaeidae	<i>Copris amyntor</i>
3	7701250	Scarabaeidae	<i>Copris antares</i>
4	7701780	Scarabaeidae	<i>Copris obesus</i>
5	7702070	Scarabaeidae	<i>Cyptochirus ambiguus</i>
6	7702670	Scarabaeidae	<i>Euoniticellus africanus</i>
7	7702750	Scarabaeidae	<i>Euoniticellus triangulatus</i>
8	7702990	Scarabaeidae	<i>Garreta unicolor</i>
9	7703480	Scarabaeidae	<i>Helicopris hamadryas</i>
10	7703750	Scarabaeidae	<i>Latodrepanus laticollis</i>
11	7703780	Scarabaeidae	<i>Liatongus militaris</i>
12	7704680	Scarabaeidae	<i>Neosisyphus rubrus</i>
13	7704690	Scarabaeidae	<i>Neosisyphus spinipes</i>
14	7704880	Scarabaeidae	<i>Oniticellus formosus</i>
15	7704940	Scarabaeidae	<i>Onitis alexis</i>
16	7704990	Scarabaeidae	<i>Onitis caffer</i>
17	7705600	Scarabaeidae	<i>Onitis viridulus</i>
18	7705790	Scarabaeidae	<i>Onthophagus asperulus</i>

19	7705930	Scarabaeidae	<i>Onthophagus binodis</i>
20	7706370	Scarabaeidae	<i>Onthophagus deterrens</i>
21	7710160	Scarabaeidae	<i>Scarabaeus natalensis</i>
22	7710660	Scarabaeidae	<i>Sisyphus caffer</i>

Table 12: List of Dragonfly and Damselfly species that occur in the 2630AA quarter degree grid (Odanata Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	661180	Chlorocyphidae	<i>Platycypha caligata</i>	Dancing Jewel	LC
2	661210	Chlorocyphidae	<i>Platycypha fitzsimonsi</i>	Boulder Jewel	LC
3	663170	Coenagrionidae	<i>Proischnura rotundipennis</i>	Round-winged Bluet	LC
4	663195	Coenagrionidae	<i>Pseudagrion sp.</i>		
5	663260	Coenagrionidae	<i>Pseudagrion citricola</i>	Yellow-faced Sprite	LC
6	663360	Coenagrionidae	<i>Pseudagrion gamblesi</i>	Great Sprite	LC
7	663560	Coenagrionidae	<i>Pseudagrion salisburyense</i>	Slate Sprite	LC
8	663880	Coenagrionidae	<i>Pseudagrion sublacteum</i>	Cherry-eye Sprite	LC
9	664550	Gomphidae	<i>Ceratogomphus pictus</i>	Common Thorntail	LC
10	660360	Lestidae	<i>Lestes plagiatus</i>	Highland Spreadwing	LC
11	667130	Libellulidae	<i>Crocothemis erythraea</i>	Broad Scarlet	LC
12	667690	Libellulidae	<i>Nesiothemis farinosa</i>	Eastern Blacktail	LC
13	668190	Libellulidae	<i>Palpopleura jucunda</i>	Yellow-veined Widow	LC
14	668670	Libellulidae	<i>Trithemis arteriosa</i>	Red-veined Dropwing	LC
15	668870	Libellulidae	<i>Trithemis dorsalis</i>	Highland Dropwing	LC
16	668890	Libellulidae	<i>Trithemis furva</i>	Navy Dropwing	LC
17	669080	Libellulidae	<i>Trithemis stictica</i>	Jaunty Dropwing	LC
18	669390	Libellulidae	<i>Zygonyx natalensis</i>	Blue Cascader	LC
19	661810	Platycnemididae	<i>Elatoneura glauca</i>	Common Threadtail	LC

Table 13: List of bird species that occur within the 2605-3005 ADU Pentad (SABAP2, web-based application)

Ref	Common_group	Common_species	Genus	Species
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6	Grebe	Little	<i>Tachybaptus</i>	<i>ruficollis</i>
50	Cormorant	Reed	<i>Microcarbo</i>	<i>africanus</i>
54	Heron	Grey	<i>Ardea</i>	<i>cinerea</i>
55	Heron	Black-headed	<i>Ardea</i>	<i>melanocephala</i>
57	Heron	Purple	<i>Ardea</i>	<i>purpurea</i>
60	Egret	Intermediate	<i>Ardea</i>	<i>intermedia</i>
61	Egret	Western Cattle	<i>Bubulcus</i>	<i>ibis</i>
72		Hamerkop	<i>Scopus</i>	<i>umbretta</i>
81	Ibis	African Sacred	<i>Threskiornis</i>	<i>aethiopicus</i>
83	Ibis	Glossy	<i>Plegadis</i>	<i>falcinellus</i>
84	Ibis	Hadada	<i>Bostrychia</i>	<i>hagedash</i>
85	Spoonbill	African	<i>Platalea</i>	<i>alba</i>
88	Goose	Spur-winged	<i>Plectropterus</i>	<i>gambensis</i>
89	Goose	Egyptian	<i>Alopochen</i>	<i>aegyptiaca</i>
94	Shoveler	Cape	<i>Spatula</i>	<i>smithii</i>
96	Duck	Yellow-billed	<i>Anas</i>	<i>undulata</i>
99	Teal	Blue-billed	<i>Spatula</i>	<i>hottentota</i>
105		Secretarybird	<i>Sagittarius</i>	<i>serpentarius</i>
119	Falcon	Amur	<i>Falco</i>	<i>amurensis</i>
130	Kite	Black-winged	<i>Elanus</i>	<i>caeruleus</i>
154	Buzzard	Common	<i>Buteo</i>	<i>buteo</i>
176	Francolin	Grey-winged	<i>Scleroptila</i>	<i>afra</i>
178	Francolin	Red-winged	<i>Scleroptila</i>	<i>levaillantii</i>
185	Spurfowl	Swainson's	<i>Pternistis</i>	<i>swainsonii</i>
189	Quail	Common	<i>Coturnix</i>	<i>coturnix</i>
190	Quail	Harlequin	<i>Coturnix</i>	<i>delegorguei</i>

192	Guineafowl	Helmeted	<i>Numida</i>	<i>meleagris</i>
208	Swamphen	African	<i>Porphyrio</i>	<i>madagascariensis</i>
210	Moorhen	Common	<i>Gallinula</i>	<i>chloropus</i>
212	Coot	Red-knobbed	<i>Fulica</i>	<i>cristata</i>
214	Crane	Grey Crowned	<i>Balearica</i>	<i>regulorum (EN)</i>
223	Korhaan	Blue	<i>Eupodotis</i>	<i>Caerulescens</i>
238	Plover	Three-banded	<i>Charadrius</i>	<i>tricoloris</i>
242	Lapwing	Crowned	<i>Vanellus</i>	<i>coronatus</i>
245	Lapwing	Blacksmith	<i>Vanellus</i>	<i>armatus</i>
247	Lapwing	African Wattled	<i>Vanellus</i>	<i>senegallus</i>
250	Snipe	African	<i>Gallinago</i>	<i>nigripennis</i>
256		Ruff	<i>Calidris</i>	<i>pugnax</i>
264	Sandpiper	Wood	<i>Tringa</i>	<i>glareola</i>
270	Stilt	Black-winged	<i>Himantopus</i>	<i>himantopus</i>
275	Thick-knee	Spotted	<i>Burhinus</i>	<i>capensis</i>
288	Gull	Grey-headed	<i>Chroicocephalus</i>	<i>cirrocephalus</i>
305	Tern	Whiskered	<i>Chlidonias</i>	<i>hybrida</i>
311	Pigeon	Speckled	<i>Columba</i>	<i>guinea</i>
314	Dove	Red-eyed	<i>Streptopelia</i>	<i>semitorquata</i>
316	Dove	Cape Turtle	<i>Streptopelia</i>	<i>capicola</i>
317	Dove	Laughing	<i>Spilopelia</i>	<i>senegalensis</i>
343	Cuckoo	Red-chested	<i>Cuculus</i>	<i>solitarius</i>
352	Cuckoo	Diederik	<i>Chrysococcyx</i>	<i>caprius</i>
361	Owl	Marsh	<i>Asio</i>	<i>capensis</i>
368	Eagle-Owl	Spotted	<i>Bubo</i>	<i>africanus</i>
383	Swift	White-rumped	<i>Apus</i>	<i>caffer</i>

385	Swift	Little	<i>Apus</i>	<i>affinis</i>
387	Swift	African Palm	<i>Cypsiurus</i>	<i>parvus</i>
418	Hoopoe	African	<i>Upupa</i>	<i>africana</i>
419	Wood Hoopoe	Green	<i>Phoeniculus</i>	<i>purpureus</i>
453	Wryneck	Red-throated	<i>Jynx</i>	<i>ruficollis</i>
474	Lark	Spike-heeled	<i>Chersomanes</i>	<i>albofasciata</i>
488	Lark	Red-capped	<i>Calandrella</i>	<i>cinerea</i>
493	Swallow	Barn	<i>Hirundo</i>	<i>rustica</i>
495	Swallow	White-throated	<i>Hirundo</i>	<i>albigularis</i>
502	Swallow	Greater Striped	<i>Cecropis</i>	<i>cucullata</i>
504	Swallow	South African Cliff	<i>Petrochelidon</i>	<i>spilodera</i>
506	Martin	Rock	<i>Ptyonoprogne</i>	<i>fuligula</i>
509	Martin	Brown-throated	<i>Riparia</i>	<i>paludicola</i>
510	Martin	Banded	<i>Riparia</i>	<i>cincta</i>
545	Bulbul	Dark-capped	<i>Pycnonotus</i>	<i>tricolor</i>
564	Wheatear	Mountain	<i>Myrmecocichla</i>	<i>monticola</i>
568	Wheatear	Capped	<i>Oenanthe</i>	<i>pileata</i>
573	Chat	Mocking Cliff	<i>Thamnolaea</i>	<i>cinnamomeiventris</i>
575	Chat	Ant-eating	<i>Myrmecocichla</i>	<i>formicivora</i>
576	Stonechat	African	<i>Saxicola</i>	<i>torquatus</i>
581	Robin-Chat	Cape	<i>Cossypha</i>	<i>caffra</i>
599	Warbler	Willow	<i>Phylloscopus</i>	<i>trochilus</i>
604	Warbler	Lesser Swamp	<i>Acrocephalus</i>	<i>gracilirostris</i>
609	Warbler	Little Rush	<i>Bradypterus</i>	<i>baboecala</i>
629	Cisticola	Zitting	<i>Cisticola</i>	<i>juncidis</i>
631	Cisticola	Cloud	<i>Cisticola</i>	<i>textrix</i>

634	Cisticola	Wing-snapping	<i>Cisticola</i>	<i>ayresii</i>
635	Cisticola	Pale-crowned	<i>Cisticola</i>	<i>cinnamomeus</i>
639	Cisticola	Wailing	<i>Cisticola</i>	<i>lais</i>
646	Cisticola	Levaillant's	<i>Cisticola</i>	<i>tinniens</i>
650	Prinia	Black-chested	<i>Prinia</i>	<i>flavicans</i>
686	Wagtail	Cape	<i>Motacilla</i>	<i>capensis</i>
692	Pipit	African	<i>Anthus</i>	<i>cinnamomeus</i>
703	Longclaw	Cape	<i>Macronyx</i>	<i>capensis</i>
707	Fiscal	Southern	<i>Lanius</i>	<i>collaris</i>
708	Shrike	Red-backed	<i>Lanius</i>	<i>collurio</i>
722		Bokmakierie	<i>Telophorus</i>	<i>zeylonus</i>
734	Myna	Common	<i>Acridotheres</i>	<i>tristis</i>
746	Starling	Pied	<i>Lamprotornis</i>	<i>bicolor</i>
772	Sunbird	Amethyst	<i>Chalcomitra</i>	<i>amethystina</i>
784	Sparrow	House	<i>Passer</i>	<i>domesticus</i>
786	Sparrow	Cape	<i>Passer</i>	<i>melanurus</i>
799	Weaver	Cape	<i>Ploceus</i>	<i>capensis</i>
803	Weaver	Southern Masked	<i>Ploceus</i>	<i>velatus</i>
805	Quelea	Red-billed	<i>Quelea</i>	<i>quelea</i>
808	Bishop	Southern Red	<i>Euplectes</i>	<i>orix</i>
812	Bishop	Yellow-crowned	<i>Euplectes</i>	<i>afer</i>
816	Widowbird	Fan-tailed	<i>Euplectes</i>	<i>axillaris</i>
818	Widowbird	Long-tailed	<i>Euplectes</i>	<i>progne</i>
838	Waxbill	Orange-breasted	<i>Amandava</i>	<i>subflava</i>
843	Waxbill	Common	<i>Estrilda</i>	<i>astrild</i>
844		Quailfinch	<i>Ortygospiza</i>	<i>atricollis</i>

846	Whydah	Pin-tailed	<i>Vidua</i>	<i>macroura</i>
854	Finch	Cuckoo	<i>Anomalospiza</i>	<i>imberbis</i>
857	Canary	Cape	<i>Serinus</i>	<i>canicollis</i>
860	Canary	Black-throated	<i>Crithagra</i>	<i>atrogularis</i>
874	Bunting	Golden-breasted	<i>Emberiza</i>	<i>flaviventris</i>
940	Dove	Rock	<i>Columba</i>	<i>livia</i>
1172	White-eye	Cape	<i>Zosterops</i>	<i>virens</i>
4126	Lark	Eastern Long-billed	<i>Certhilauda</i>	<i>semitorquata</i>
4142	Sparrow	Southern Grey-headed	<i>Passer</i>	<i>diffusus</i>
10877	Pipit	Nicholson's	<i>Anthus</i>	<i>nicholsoni</i>

5.4.9. Surface Water

Witrand mining permit area falls within the Inkomati Water Management Area (Figure 10). The site is located in the quaternary catchment of X11B refer to Figure 11.

Boesmanspruit occurs on the west of the prospecting right area. There are a number of unnamed tributaries flowing near the mining permit area. These streams drain in a northern direction towards the Boesmanspruit dam.



Figure 10: Water management areas.

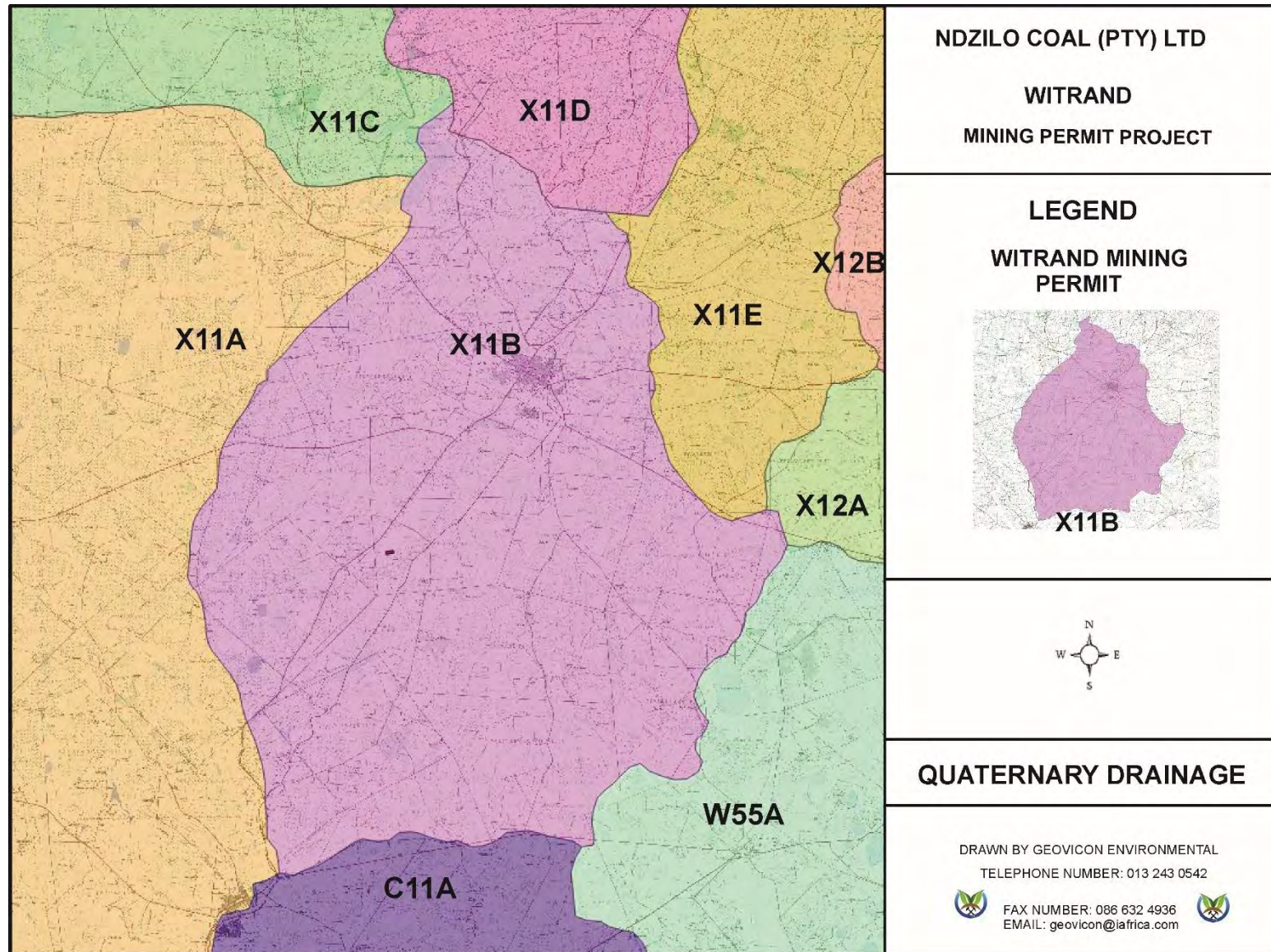


Figure 11: Quaternary drainage

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).

5.4.10. Groundwater

5.4.10.1. 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.

5.4.11. Sensitive Landscapes

Ndzilo Coal (Pty) Limited 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 Witrand Colliery area 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 Witrand Colliery area is situated within a vulnerable ecosystem. 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

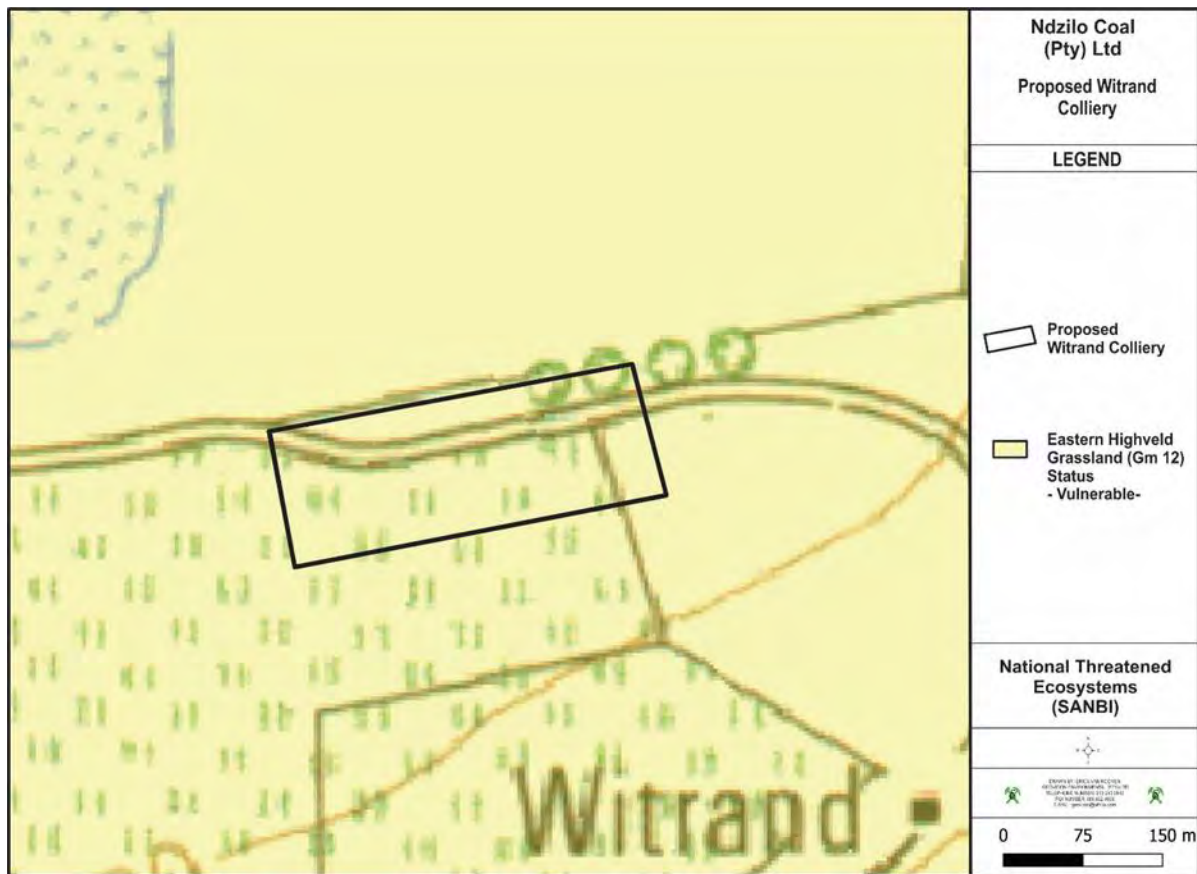


Figure 12: National Threatened Ecosystems in the vicinity of the proposed Witrand Colliery area

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

The proposed Witrand Colliery area is situated in the vicinity of National River Freshwater Ecosystem Priority Areas, namely Fish Freshwater Support Areas. According to the Atlas of Freshwater Ecosystem Priority Areas, Fish Freshwater Support Areas are described as areas (that are not already FEPAs) are sub quaternary catchments that are not in top ecological condition, but are still important for supporting threatened and near-threatened indigenous freshwater fish populations that are of conservation concern.

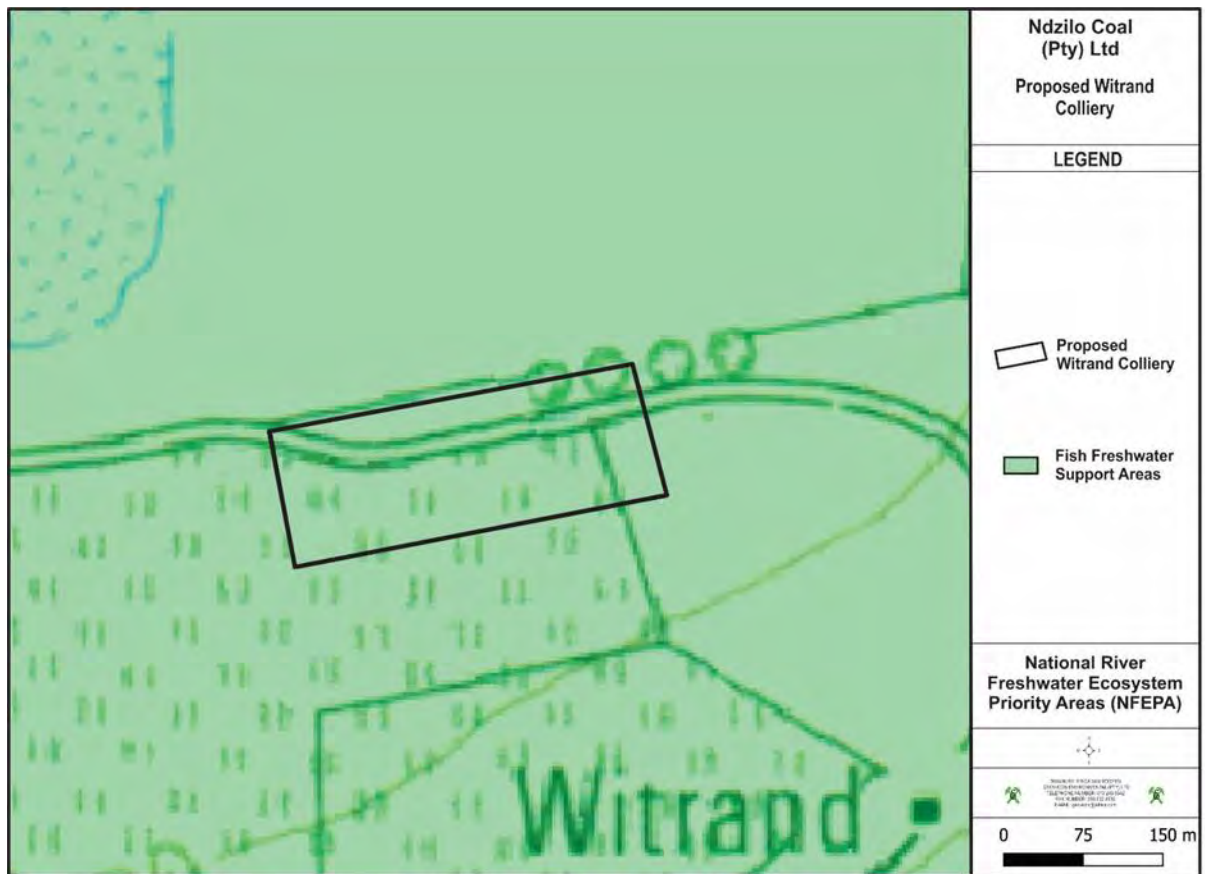


Figure 13: National River Freshwater Ecosystem Priority Areas in the vicinity of the proposed Witrand Colliery area

According to the South African National Biodiversity Institute, GIS-based electronic application, 2018: National Biodiversity Assessment - National Wetlands Map 5, the proposed Witrand Colliery area is situated in the vicinity of the following wetland type, namely depressions/ pans (Figure 14) falling into the Mesic Highveld Grassland, Group 4 wetland vegetation/ ecosystem type (Figure 15).

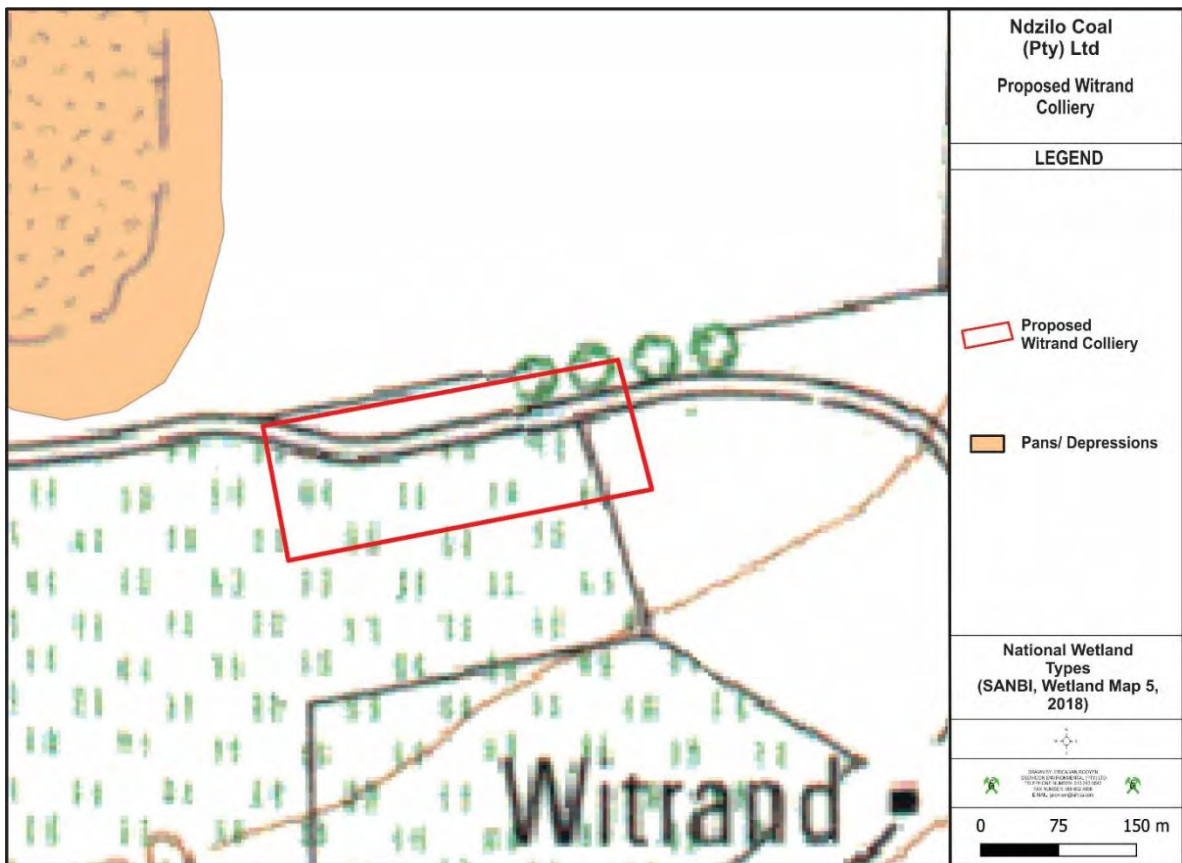


Figure 14: National Wetland Types in the vicinity of the proposed Witrand Colliery area

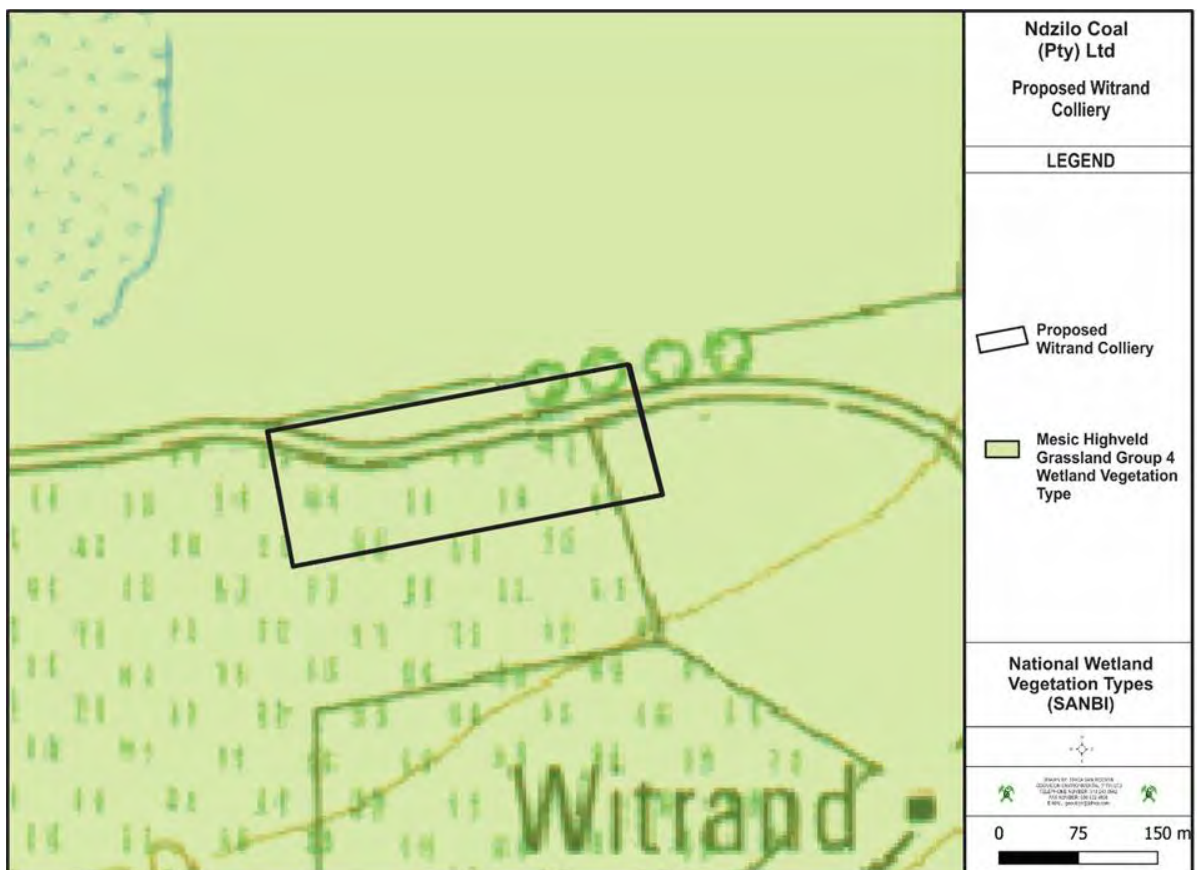


Figure 15: National Wetland Vegetation types in the vicinity of the proposed Witrand Colliery area

According to the Mpumalanga Biodiversity Sector Plan GIS based electronic application (MTPA, 2019), the proposed Witrand Colliery area is situated over terrestrial assessment categories of heavily modified areas, moderately modified old lands, as well as irreplaceable and optimal Critical Biodiversity Areas. See Figure 16 for a visual indication.

The proposed Witrand Colliery area is situated over heavily modified areas and moderately modified old lands. **Heavily modified areas** are described as areas that are currently transformed and where biodiversity and ecological function has been lost to the point that it is not worth considering for conservation at all.

Moderately Modified – Old lands are areas which were modified within the last 80 years but were at some point abandoned, including old mines and old cultivated lands, collectively termed “old lands”; and “Heavily Modified”, meaning areas that are currently transformed and where biodiversity and ecological function has been lost to the point that it is not worth considering for conservation at all.

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. The category of CBA optimal are the areas optimally located to meet both the various biodiversity targets and other criteria defined in the analysis. Although these areas are not ‘irreplaceable’ they are the most efficient land configuration to meet all biodiversity targets and design criteria.

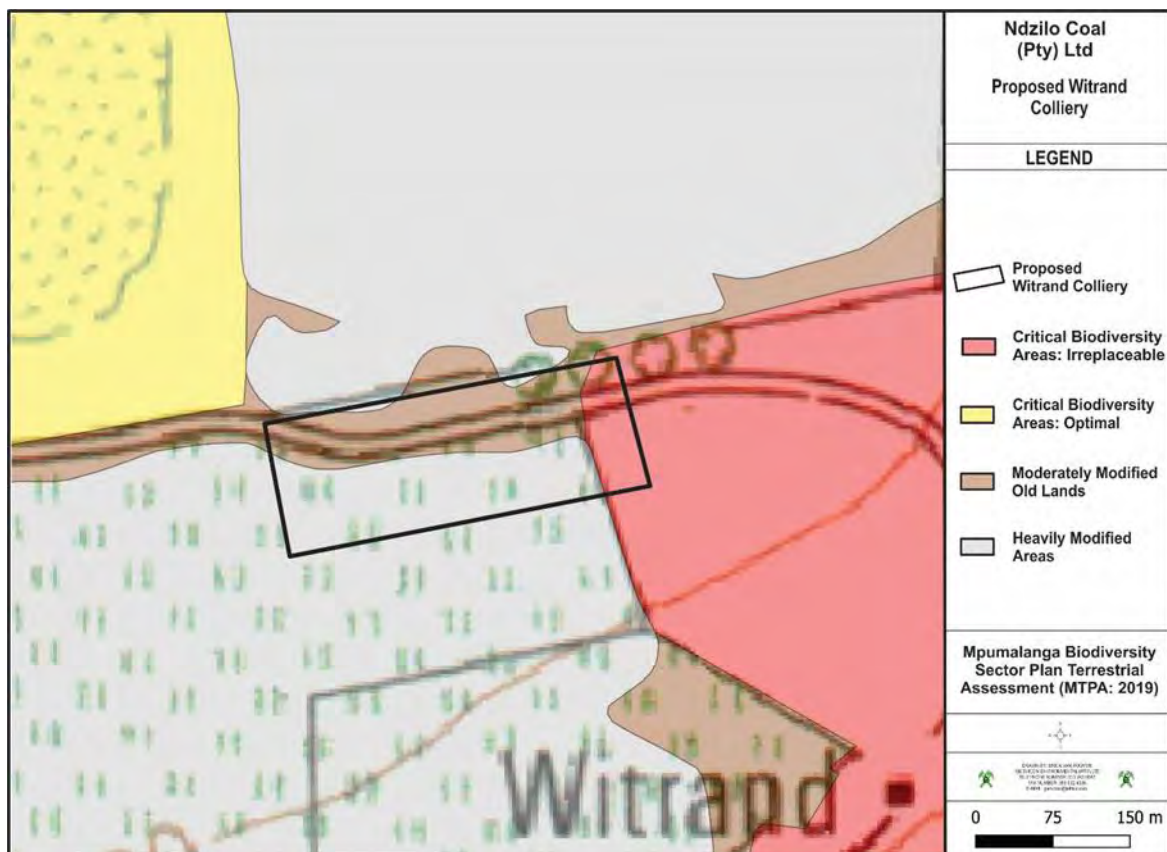


Figure 16: Mpumalanga Biodiversity Sector Plan Terrestrial Assessment for the proposed Witrand Colliery area

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

The proposed Witrand Colliery area is primarily situated over freshwater assessment categories of ecological support areas: wetland clusters, followed by ecological support area: wetlands and ecological support area important sub catchments.

Ecological Support Areas: Wetland Clusters are described as clusters of wetlands embedded within a largely natural landscape that function as a unit, and allow for the migration of species such as frogs and insects between individual wetlands. They also support other ecological processes that operate at a broader, landscape scale.

ESA Wetlands are described as all non-FEPA wetlands. Although not classed as FEPAs, these wetlands support the hydrological functioning of rivers, water tables and freshwater biodiversity, as well as providing a host of ecosystem services through the ecological infrastructure that they provide. The proposed prospecting area is also situated over protected area wetlands

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.

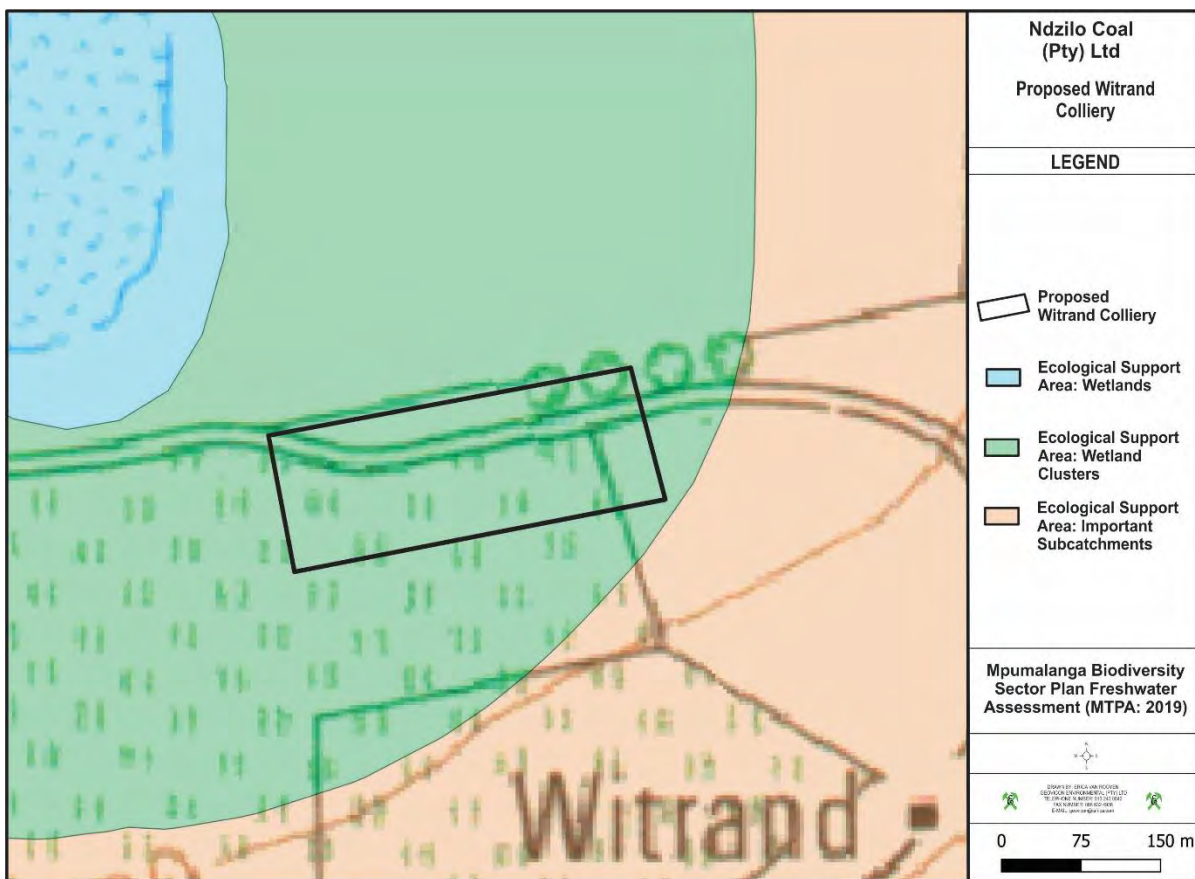


Figure 17: Mpumalanga Biodiversity Sector Plan Freshwater Assessment for the proposed Witrand Colliery area

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

5.4.12. 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.

5.4.13. 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.

5.4.14. Socio-Economic Status

Chief Albert Luthuli Local Municipality is located within the Gert Sibande district municipality, Mpumalanga. The municipality boasts both mining and agricultural sectors that contribute significantly to the local, provincial and national GDP.

5.4.14.1. Population density, growth and location

The mid-year population estimates for 2015 for Mpumalanga Province is estimated at 4 283 900 (7.8% of the total national population) and has remained steady in the period between 2002 and 2015 (Stats SA, Statistics release P0 302, 2016). The population figure for Gert Sibande District was 1 308 129 (Census 2011) and new statistics released by Statistics SA (www.localgovernment.co.za) for 2016 estimate the district's population at 1 445 624.

The Chief Albert Luthuli Local Municipality population was 395 466 in 2011 and increased to 455 228 in 2016 (Stats SA, www.localgovernment.co.za), thus comprising 30.5% of the district. The number of households also increased from 119 874 to 150 420 during this same period. However, the average household size decreased from 3.2% to 3%.

5.4.14.2. Major economic activities and sources of employment

Mining in the Chief Albert Luthuli Local Municipality is the highest contributor to both economic growth and job creation. Given the abundance of coal reserves in Mpumalanga (and being the key mineral within Chief Albert Luthuli Local Municipality); the local space is likely to benefit from the resources abundantly found within the locality; at the expense of agriculture.

The Economy of the municipality is driven by the Mining sector which contributed 50% in 2009 followed by electricity at 12.1% and Finance at 10.8%. Agriculture and manufacturing don't seem to be performing well within the local space.

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, Ndziilo Coal (Pty) Limited 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 was 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 Service. 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 Witrand Colliery 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 14 for the definitions of the criteria and Table 15 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 14: 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
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Short	0 – 5 years
Medium	5 – 50 years
Long	51 – 200 years
Permanent	200 + years

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

Significance and Risk Category	Definition
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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 Witrand Colliery impacts/risks

Table 15: Results of the Environmental Impact Assessment for Witrand Colliery.

6.3.1.1. Construction Phase

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
<p>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.</p> <p>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.</p>								
Construction of haul and access roads, overburden stockpiles, in pit sump and PCD.	All activities will result in the stripping and removal of the topsoil layer, which will disrupt the soil profile.	Soil/Land capability	Without mitigation S L S M M With mitigation S L S L L					Stockpile the removed topsoil on a topsoil stockpile area which is separate from other overburden materials.

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	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					
	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					
			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				

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	The mine's 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 area to shield the said mine infrastructure.
			S	M	S	M	M	
			With mitigation					
			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.	Vegetation	Without mitigation					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.
			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					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	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	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	
	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.
			S	M	S	M	M	
			With mitigation					Limit speed of mine vehicles. Conduct dust suppression.
			S	L	S	L	L	

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.	Noise	Without mitigation S M S M M					Limit mining activities during day time
			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 S M S M M					See mitigation under environmental management section, i.e. air, noise, etc Implementation of the Environmental Awareness Plan for the employees.
			With mitigation S L S L L					
	Potential increase in crime and petty theft.	Social	Without mitigation S M S M M					Discourage squatting & recruitment on the opencast areas.
			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								
	The mining operation will create employment opportunities.	Social	Positive					No mitigation measures
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	Geology	S	L	S	L	L	No mitigation can be undertaken for the predicted impact.
			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 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.
			S	M	S	M	M	
			With mitigation					
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	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	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			
	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	N				
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 Quality	Water	Without mitigation					Divert runoff water away from the initial box-cut to the in-pit water storage facility.
			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								
	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 Quality Water and groundwater	Without mitigation S M S M M					Contain all dirty water from the opencast pit into a polluted water containment facility.
			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 generation of dust. This may ultimately affect the occupants of structures within the impact zone.	Air Quality/Social	Without mitigation S M S M M					Conduct dust suppression daily on dust generating areas. Enforce appropriate speed limits for the mine vehicles.
			With mitigation 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 S M S M M					No structures occur within the distance of 500 m from the mining area, hence blasting is not expected to impact on any structures.
			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								
	This does however not allow Ndzilo Coal (Pty) Limited 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			
		Noise	Without mitigation					

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.		S	M	S	M	M	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.
			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	Social	Without mitigation					
			S	M	S	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
CONSTRUCTION PHASES								
	regard to the blasting, which they envisage will affect structural integrity of their houses.		With mitigation					A structural survey will be done on their houses to identify any cracks or faults present before commencement of the mine
			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 seismograph will be placed at the strategic places to record ground vibration and air blast levels at those places during blasting.
			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					If it can be proven that the blasting has damaged their houses, Ndzilo Coal (Pty) Limited must compensate for the 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								
<p>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.</p> <p>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.</p>								
	Removal and subsequent replacement of material will result in the disturbance of the geological profile.	Geology	With Mitigation S H P M M Without Mitigation S H P M M					No mitigation can be undertaken for this impact.
	Mining will result in the formation of a void, which will alter the local topographical patterns within the immediate mining area.	Topography	With Mitigation S H P M M Without Mitigation S H P M M					Ensure that the rehabilitated areas maintain natural slopes and these areas are free draining.
		Land Capability	With Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Stripping of top, subsoil and hards layers during mining will result in the disruption of the soil profile.		S	M	S	M	L	Stockpiles each overburden material separately.
			Without Mitigation					
			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.
			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 separate 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,
			S	M	S	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
			With mitigation					rehabilitate the area in such that it will allow animals to migrate back to the land.
			S	L	S	L	L	
	There is a risk that mining employees will resort to trapping of wild animals that may still be present on site and surrounding areas.	Animal Life	Without mitigation					No poaching will be allowed on site. Create an environmental awareness plan on biodiversity and educate employees on preserving animals on site.
			S	M	S	M	M	
			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	L	L	
			With Mitigation					
			S	M	S	L	L	
	Water captured within the pit may contain elevated ion concentrations, which may	Groundwater Quantity	Without Mitigation					All dirty water from the mine will be diverted and captured within the pollution control dam.
			S	M	S	L	L	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	impact detrimentally on the environment if allowed to enter the natural environment.		With Mitigation					All mining activities will be undertaken outside the 1:100-year flood line.
			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	Groundwater Quality	Without Mitigation					No management is required.
			S	M	S	L	L	
			With Mitigation					
			S	M	S	L	L	
	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. No privately owned boreholes were identified within the area.	Groundwater Quantity	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 any user affected must be compensated by the mine
			S	M	S	L	L	
			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								
	Carbonaceous material remaining from the removal of run of mine coal may cause acid mine drainage after rehabilitation of the opencast pit. This may cause more harm on the already damaged groundwater regime.	Groundwater Quality	Without Mitigation					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 pit and backfill as fast as possible.
			S	M	S	L	L	
			With Mitigation					
			S	M	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	
	Machine operators in close proximity to machinery will be exposed to noise levels in excess of 85 dB.	Noise	With Mitigation					Issue earplugs to employees and educate on their use and on the effect of noise on their health
			S	L	S	L	L	
			With Mitigation					
			S	L	S	L	N	
		Social	Without Mitigation					

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	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.		S	L	S	M	L	No additional mitigation, refer to applicable sections of the impact assessment
			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	L	L	
			With Mitigation					
			S	L	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								
	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.		S	M	S	M	M	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 blasting expert.
			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 Witrand Colliery 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	

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.										
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.		
			S	M	S	L	L			
			With Mitigation							
	S	M	S	L	L					
	Runoff from the coal stockpiles may contain elevated chemical concentrations, which will impact negatively on the environment if released.	Surface Quality	Water	Without Mitigation					Divert all runoff water from dirty areas to a dirty water storage facility.	
				S	M	S	L			L
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	Ground Quantity	Water	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	L	L			
			With Mitigation							

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	groundwater regime will result in the pollution of groundwater.		S	M	S	L	L	
Operation of other mine infrastructure	During transportation and stockpiling of coal, machinery movement and wind blowing over exposed surfaces will generate diesel fumes, soil and coal dust.	Air Quality	Without Mitigation					Place coal stockpiles such that impacts are limited. Limit the size of the coal stockpiles to the recommended size. Keep mine vehicles in good repair order.
			S	M	S	L	L	
			With Mitigation					
			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					
			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	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	
	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 possible, within one to two days of stockpiling).
			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 Soil Capability/	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	Land Soil Capability/	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							

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	contamination of virgin land (soil and vegetation) due to spillages along the roads.		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	L	L	
	With Mitigation							
	S	M	S	L	L			
	Spillage from the hydrocarbon fluids storage areas (diesel tanks and oil storage areas) in the mining area may result in the contamination of the soils and nearby streams.	Soil/Surface Water Quality	Without Mitigation					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.
			S	M	S	M	M	
	With Mitigation							
	S	M	S	L	L			
		Soil/Ground Water Quality	Without Mitigation					Emergency repairs must be conducted on protected ground e.g., tarpaulins.
			S	M	S	M	M	

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	Spillage of hydrocarbon fluids outside the mining area may result in the contamination of the soils, surface and groundwater.		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 S M S L L					Dirty water must be diverted to dirty water storage facilities.
			With Mitigation S M S L L					
	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.	Air quality	Without Mitigation S M S L L					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	Noise	Without Mitigation S M S L L					Issue employees with earplugs and instruct them how to use the earplugs.

ACTIVITY	NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
			E	P	D	I	S	
OPERATIONAL PHASE								
	levels of noise, which may in the long term be detrimental to their health.		With Mitigation					The mine must through the implementation of the environmental, awareness plan encourages the employees to use these earplugs.
			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					
			S	L	S	L	L	
			With Mitigation					
			S	L	S	L	N	

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.							
Contamination of surface water with silt during rehabilitation.	Surface Water Quality	Without mitigation					Construct and maintain contours/berms around the affected areas.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
Generation of noise	Noise	Without mitigation					Provide earplugs to employees. Ensure that mine machinery used are in good repair.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Generation of dust.	Air Quality	Without mitigation					Dust suppression

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Hydrocarbon spillages may render the infrastructure areas to be of no agricultural value after mining.	Land Capability	Without mitigation					Remove and dispose of all oil, diesel and grease contaminated surfaces and cover with clean topsoil. Work on protected ground (tarpaulins).
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Generation of noise.	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	L	L	
		With mitigation					
		S	L	S	L	N	
Generation of dust	Air Quality	Without mitigation					Conduct dust suppression

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Contamination of surface water with silt generated from the rehabilitated areas.	Surface Water Quality	Without mitigation					Remove carbonaceous build up on the stockpile area and place at the bottom of the opencast pit. Construct contours on rehabilitated areas.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
Hardened bare areas may cause increased runoff and erosion gullies.	Soil	Without mitigation					All hardened areas must be ripped, areas with topsoil scarified and areas without topsoil covered with a layer of topsoil before being seeded
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
	Land Capability	Without mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
Due to prolonged storage of topsoil, the fertility of the topsoil may have been lost, hence resulting poor re-establishment of vegetation on final rehabilitated area.		S	M	S	M	M	Undertake chemical tests to determine the ability of the topsoil to support vegetation, if it is found that the fertility is reduced, fertilisers must be used (under the recommendation of a specialist) to improve the fertility of the topsoil.
		With mitigation					
		S	L	S	L	L	
Machine operators in close proximity to machinery will be exposed to noise levels in excess of 85 dB.	Noise	Without mitigation					Issue employees with earplugs and instruct them how to use the earplugs.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
The movement of mine machinery within the mine surface areas will also create noise, which may be a nuisance to the residents of the neighbouring property.	Noise	Without mitigation					The mine must keep their machinery in good repair.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
Ponding and erosion gullies will result in the failure to revert the mined area to recommended land use after mining.	Land Capability	Without mitigation					Monitor rehabilitated areas. Any signs of ponding must be addressed by levelling as soon as possible.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
Invader species and noxious weeds may colonise the areas prior to the establishment of natural vegetation.	Vegetation	Without mitigation					Progress of establishment of re-vegetation must be monitored regularly. Identified declared invader species or exotic plant species must be removed.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
Rehabilitated areas may show areas of soil erosion, which may remove replaced topsoil.	Soil	Without mitigation					Monitor rehabilitated areas. Any signs of soil erosion must be addressed by levelling as soon as possible.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

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

Ndzilo Coal (Pty) Limited has applied for a mining permit over the Witrand Colliery. The mining operation will involve the systematic removal of coal within the Witrand Colliery. 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 by relatively flat surfaces with pans and spruits such as Boesmanspruit. 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. A significant change on the natural vegetation within the proposed Witrand Colliery, with the fact that the surrounding area is mainly mining activities.

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, Ndzilo Coal (Pty) Limited 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 low and negligible significance.

6.6. ASPECTS FOR INCLUSION AS CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

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

- Ndzilo Coal (Pty) Limited 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.
- Ndzilo Coal (Pty) Limited 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.
- Ndzilo Coal (Pty) Limited 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 Witrand Colliery, the following conditions should form part of the environmental authorisation:

- Ndzilo Coal (Pty) Limited 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.
- Ndzilo Coal (Pty) Limited 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.
- Ndzilo Coal (Pty) Limited 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 Witrand Colliery.

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 will be provided in the final BAR.

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 Ndzilo Coal (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 Witrand Mining area as an environmental assessment practitioner. Mr Shakwane is the environmental assessment practitioner for the environmental impact assessment for the proposed Witrand 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 Witrand 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 Witrand Colliery 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 WITRAND COLLIERY ACTIVITIES

The following actions will be undertaken by Ndziilo Coal (Pty) Limited 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)

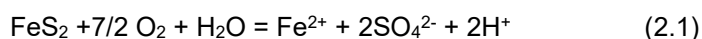
Mobile structures will be used and such structures will be removed from the sites during decommissioning phase.

4.3 POTENTIAL RISK OF ACID MINE DRAINAGE

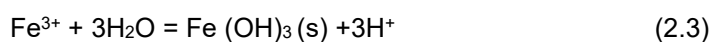
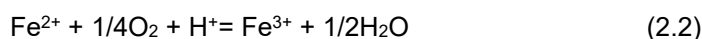
Sulphate is probably the most reliable indicator of pollution emanating from coal mining. Sulphate concentrations can however increase due to mobilisation during the mining process. The chemistry analyses supplied within this report should henceforth serve as baseline water quality throughout of acid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

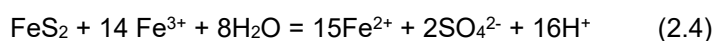


The ferrous iron, (Fe^{2+}) may be oxidised to ferric iron, (Fe^{3+}) if the conditions are sufficiently oxidising, as illustrated by reaction (2.2). Hydrolysis and precipitation of Fe^{3+} may also occur, shown by reaction (2.3). Reactions (2.1), (2.2) and (2.3) predominate at $\text{pH} > 4.5$.



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 ($\text{pH} > 4.5$). 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):



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

No Integrated water use licence application will be submitted to the Department of Water and Sanitation (DWS) for the proposed mining operation.

5. ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 16: Environmental Management Programme for the proposed Witrand Colliery.

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, haul and access roads, box-cut, PCD and diversion trenches.								
<p>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.</p> <p>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.</p>								
Loss of soils, erosion of the soils and impacts on land owner'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.	Stockpile soils in designated areas. Ensure that there is no unnecessary disturbance of the area. Keep the stockpile height at 15 m maximum. Ensure that no erosion of the stockpiles occurs and that soils are stripped with its vegetation.	Appointed contractor and site manager.	Visual monitoring through inspections.	Environmental Control Officer (ECO) during construction.	During construction phase.
			Ensure that excavation of the initial box-cuts has minimum impact on topography. 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, hards material and run of mine coal stockpiling areas) and all soil forms (topsoil) from the initial box-cut area before removing the remaining soil profile (subsoil) and hard overburden material. Stockpile topsoil separately from subsoil and hards overburden.	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.	All topsoil will be removed only in necessary areas. No unnecessary disturbance of natural habitat must be allowed.	Appointed contractor.	Visual monitoring and inspections	ECO monthly.	During construction phase.
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	Minimum depth of topsoil removal will be 300 mm from the stockpiling and the initial box-cut area. This will ensure that the seed bank of the topsoil is as far as possible preserved. The soil must be stripped with its intact vegetation.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
			Ensure that stockpiling of topsoil is conducted in a manner that will not impact on the ability of	All topsoil removed will be stockpiled separately on the designated topsoil stockpile area.	Appointed contractor and site manager.	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
			the area to maintain vegetation cover					
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.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				Poaching and hunting will be prohibited at the mining site. The mine must create biodiversity awareness/education to ensure that the employees and any person rendering a service at the mine including visitors are aware of the importance of preserving biodiversity.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	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.	Construct infrastructure according to design specifications. Implement surface water management strategies.	Appointed contractor and site manager.	Regular inspections.	ECO monthly.	During construction phase.
			Ensure that impacts from diesel spills on surface water quality are minimised.	Remove diesel spills as soon as possible. Keep spill kits on site at all times and educate employees and any other person rendering service at the mine on how to use spill kits and/or report spills to the relevant department or responsible person. Any emergency repairs within the mining area must be conducted on protected ground either a concreted floor or on top of tarpaulin.	Appointed contractor and site manager	Regular inspections.	ECO monthly	During the construction phase
			Ensure that impacts from dirty water captured within the mine, on surface water quality is minimised.	Any dirty water captured within the mine must be diverted to the sump and the mine must construct dirty water and clean water separation structures. Implement a surface water monitoring programme.	Appointed contractor and site manager	Regular inspections	ECO monthly.	During construction phase.
			Ensure that diversion trenches/berms, and initial box-cut are designed and constructed to minimise impacts on ground water.	Any dirty water captured within the mine must be diverted to the sump and the mine must construct dirty water and clean water separation structures. Implement a ground water monitoring programme. Monitoring of all boreholes should commence prior to any construction or mining. Groundwater monitoring (i.e. sampling and water level measurements) should be conducted at quarterly intervals. Groundwater samples should be analysed at a SANAS accredited laboratory for chemical	Appointed contractor and site manager	Regular 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
				and physical constituents generally affected by coal mining and related activities.				
Air pollution through air pollutants' emissions, from the construction site.	Air quality.	Ensure that all operations during the construction phase do not result in detrimental air quality impacts.	Ensure that impacts from dust and diesel fumes generated by machinery on local air quality is minimised	All machinery will be fitted with the correct exhaust systems, which will be maintained and the mine must keep maintenance records.	Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions.	ECO monthly.	During construction phase.
			Ensure that impacts from dust generated by blowing wind on local air quality is minimised.	Water for dust suppression purposes will be obtained from the sump. If dust suppression is not effective, the mine must resort to other dust suppression methods. Speed on access and haul roads will be limited to 40 km/hour.	Appointed contractor and site manager	Regular inspections	ECO monthly	During construction phase
			Ensure that impacts from dust generated by blasting on local air quality is minimised.	Blasting will as far as possible be conducted when wind direction is away from the houses.	Appointed contractor and site manager	Regular inspections.	ECO monthly	During 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. Ensure that machines, vehicles and equipment are well services and maintained so that they do not produce loud noise when being used.	Appointed contractor and site manager.	Use of earplugs will be checked and reported.	Site manager will check the use of the earplugs as regularly as possible.	During construction phase.
			Ensure impacts from noise and vibration generated during blasting are minimised	All residences and structures within a 500-meter radius of the proposed mining operation will be surveyed and a photographic record of these taken to determine a pre-mining condition. An open-door policy will be implemented and the mine will keep a complaint's register which will keep records of all complaints, timeframes and solutions implemented regarding issues raised.	Site manager	Regular Inspection.	Site manager checking as regularly as possible.	During 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.	Blasting holes will be stemmed and a blasting specialist/technician must be appointed to conduct blasting using appropriate explosives.	Appointed contractor and site manager.	Visual monitoring and Inspection.	ECO monthly	During construction phase.
			Ensure that dust generated by wind and movement of machinery is minimised to have minimum visual impacts.	Water for dust suppression purposes will be obtained from the sump. If dust suppression is not effective, the mine must resort to other dust suppression methods. Speed on access and haul roads will be limited to 40 km/hour.	Appointed contractor and site manager.	Visual monitoring and Inspection	ECO monthly	During construction phase.
			Ensure that visual impacts from the	Berms will be constructed around visible parts of the mine to act as visual berms.	Appointed contractor and site manager	Visual monitoring and Inspection.	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
			mining activities are minimized					
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the discovery of any archaeological and cultural is reported and that operational activities does not have detrimental impacts on the heritage sites if any.	The mining operations will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999).	Report any archaeological or cultural discovery and ensure that operation doesn't have detrimental impact on the heritage sites if any.	Appointed contractor.	The site will be monitored for any mining related damages on a regular basis.	ECO monthly.	During 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.	Measures taken will be in line with the company's recruitment policies.	Recruitment will not be undertaken on site and the mine will ensure to create awareness that preference will be given to local people first thus discouraging an influx of job seekers to the area.	Appointed contractor and site manager.	Visual monitoring.	Site manager	During the pre-construction and construction phase.
Impact on the livelihood of the land owners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the land owners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted. Employees will not wonder around the properties without supervision. Fire-fighting measures will be implemented and employees will be educated on how to manage fire-outbreaks on site.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	During the construction.
OPERATIONAL PHASE								
Operation of other mine infrastructure (pollution control facilities/ mine infrastructure complex and use of haul and access roads).								
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.								
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 of the systematic removal of coal, stockpiling and transportation 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 must be conducted on protected ground either a concreted floor or on top of tarpaulin. Any accidental spillage of hydrocarbon fluids must be cleaned as soon as possible. Keep spill kits on site.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During the operational phase of the project.
			Ensure that measures are taken to prevent the severe reduction of land capability due to mining. Ensure that movement and stockpiling of soils do not detrimentally reduce the fertility of the topsoil	Stockpile soils in designated areas. Ensure that there is no unnecessary disturbance of the area. Keep the stockpile height at 15 m maximum. Ensure that no erosion of the stockpiles occurs and that soils are stripped with its vegetation.	Appointed contractor	Regular inspections	ECO monthly	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
			Manage the unmined and rehabilitated land within the mining area.	Rehabilitated areas must be maintained to ensure that as far as possible the rehabilitated areas are reverted to grazing land, ensure that there is no unnecessary disturbance of land and that movement and grazing is restricted within rehabilitated areas until the vegetation is fully established.	Appointed contractor	Regular inspections	ECO monthly.	During the operational phase of the project
			Ensure that vegetation on mined out areas and rehabilitated areas becomes self-sustaining	Maintain the vegetation cover by reseeding or applying fertilizers or conducting any other measures recommended by suitably qualified persons on areas showing sparse or unsatisfactory vegetation cover.	Appointed contractor	Regular inspections.	ECO monthly	During the operational phase of the project.
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	Minimum depth of topsoil removal will be 300 mm from the stockpiling and the initial box-cut area. This will ensure that the seed bank of the topsoil is as far as possible preserved. The soil must be stripped with its intact vegetation.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During the operational phase of the project.
			Ensure that stockpiling of topsoil is conducted in a manner that will not impact on the ability of the area to maintain vegetation cover	All topsoil removed will be stockpiled separately on the designated topsoil stockpile area.	Appointed contractor and site manager	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. Poaching and hunting will be prohibited at the mining site. The mine must create biodiversity awareness/education to ensure that the employees and any person rendering a service at the mine including visitors are aware of the importance of preserving biodiversity.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	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
Exposure of soils may lead to increased silt loads in surface water runoff.	Surface and Ground Water.	Ensure that the systematic removal of coal, stockpiling and transportation does not have detrimental impacts on the surface and ground water environment.	Ensure that diesel spillages do not occur.	Remove diesel spills as soon as possible. Keep spill kits on site at all times and educate employees and any other person rendering service at the mine on how to use spill kits and/or report spills to the relevant department or responsible person. Any emergency repairs within the mining area must be conducted on protected ground either a concreted floor or on top of tarpaulin.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During the operational phase of the project.
			Ensure that runoff reporting into the opencast pit is minimized Ensure that impacts of seepage from the rehabilitated workings on groundwater is minimised	Any dirty water captured within the mine must be diverted to the sump and the mine must construct dirty water and clean water separation structures. Implement a ground and surface water monitoring programme. Construct a pollution control dam designed by a qualified person according to the relevant standards and legislation if the in-pit sumps are not adequate	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly	During the operational phase of the project.
	Groundwater and surface water	Ensure that the systematic removal of coal, stockpiling and transportation does not have detrimental impacts on the surface and ground water environment.	Ensure that mining activities don't have detrimental impact on water sources.	Implement a ground water monitoring programme. Groundwater monitoring (i.e. sampling and water level measurements) should be conducted at quarterly intervals. Groundwater samples should be analysed at a SANAS accredited laboratory for chemical and physical constituents generally affected by coal mining and related activities.	Appointed contractor and site manager.	Monitoring and inspections.	ECO/Service provider quarterly	During the operational phase of the project.
	Groundwater	Ensure that the systematic removal of coal, stockpiling and transportation does not have detrimental impacts on the surface and ground water environment.	Ensure that mining activities don't have detrimental impact on water sources for the downstream users.	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.	Appointed contractor and site manager.	Monitoring and inspections.	ECO/Service provider quarterly	During the operational phase of the project.
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.	All machinery will be fitted with the correct exhaust systems, which will be maintained and in good repair. Enforce a 40km/hour speed limits on site and ensure that dust suppression is undertaken on access and/or haul roads.	Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions.	ECO monthly.	During the operational phase of the project.
			Ensure that impacts from dust generated by blowing wind on local air quality is minimised	Water for dust suppression purposes must be obtained from the sump and used to suppress dust. If dust suppression is not effective, the mine must resort to other dust suppression methods.	Appointed contractor and site manager	Regular inspections	ECO monthly.	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
				Speed on access and haul roads will be limited to 40 km/hour.				
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. Ensure that machines, vehicles and equipment are well services and maintained so that they do not produce loud noise when being used.	Appointed contractor and site manager.	Site checks regularly.	Site manager.	During the operational phase of the project.
			Ensure impacts from noise generated during blasting are minimised	All residences and structures within a 500-meter radius of the proposed mining operation will be surveyed. An open-door policy will be implemented and the mine will keep a complaint's register which will keep records of all complaints, timeframes and solutions implemented regarding issues raised.	Site manager	Use of earplugs will be checked and reported.	Site manager	During the operational phase of the project.
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the discovery of any archaeological and cultural is reported and that operational activities does not have detrimental impacts on the heritage sites if any.	The mining operations will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999).	Report any archaeological or cultural discovery and ensure that operation doesn't have detrimental impact on the heritage sites if any.	Appointed contractor.	The site will be monitored for any mining related damages on a regular basis.	ECO monthly.	During the operational phase of the project.
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 land owners 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.	Appointed contractor and site manager.	Liaison with affected parties.	Site manager as and when necessary.	During the operational phase of the project.
				Keep communication with land owners 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.	Applicant and site manager.	Meetings with the landowners. Minutes of any meeting held with landowners and agreements will be recorded and filed.	Site manager as and when meetings are held.	During the operational phase of the project.
				Ensure that safety measures are implemented to prevent impacts on land owners and occupiers.	Site manager.	Regular checks and inspections.	Site manager	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
Impact on the livelihood of the land owners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the land owners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted. Employees will not wander around the properties without supervision. Fire-fighting measures will be implemented and employees will be educated on how to manage fire-outbreaks on site.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	During the operational phase of the project.
DECOMMISSIONING AND CLOSURE PHASE								
Removal of infrastructure and final rehabilitation of disturbed areas								
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.								
Compaction and contamination of soils within the rehabilitation site.	Soils.	Ensure that the soils in the vicinity of the rehabilitation site is not detrimentally impacted.	Ensure that all areas are kept free of erosion	Ripping will be conducted at right angles to the natural slope.	Appointed contractor.	Regular site check.	Site manager will conduct the inspections monthly.	Throughout the decommissioning and closure phases.
				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	Regular site check.	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.	Erosion maintenance will be undertaken by surface ripping of compacted and eroded areas at right angles to the inherent slope. Ensure that area is free draining and there's no ponding on site.	Appointed contractor.	Regular site check.	Site manager will conduct the inspections.	During decommissioning phase and closure phases.
			Ensure that the vegetation has sufficient time to colonise the area.	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.	Appointed contractor	Regular site check.	Site manager will conduct the inspections.	During decommissioning phase and closure phases.
			Ensure that the vegetation has sufficient time to colonise the area	Rehabilitated areas will be seeded after the first rain. This will ensure that the desired vegetation cover will be achieved.	Appointed contractor.	Regular site check.	Site manager will conduct the inspections.	During decommissioning phase and closure phases.
Pollution of surface water environment.	Surface Water.	Ensure that the rehabilitation of the site does not have detrimental	Ensure that the vegetation has	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.

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
		impacts on the surface water environment.	sufficient time to colonise the area.	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 and closure phases.
	Groundwater and surface water.	Ensure that the systematic removal of coal, stockpiling and transportation does not have detrimental impacts on the surface and ground water environment.	Ensure that mining activities don't have detrimental impact on water sources	Implement a ground water monitoring programme. Groundwater monitoring (i.e. sampling and water level measurements) should be conducted at quarterly intervals. Groundwater samples should be analysed at a SANAS accredited laboratory for chemical and physical constituents generally affected by coal mining and related activities.	Appointed contractor and site manager.	Monitoring and inspections.	ECO/Service provider quarterly	During operational 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 does 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, machinery and equipment 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 if any.	Should heritage sites be identified, they should not be damaged or destroyed by the rehabilitation activities.	Report any archaeological and/or cultural significance discoveries. A hundred-meter buffer will be maintained between any archaeological and cultural important 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 land owners.	Socio-economic aspects.	Ensure that measures are taken to reduce the impact on the livelihood of the land owners.	Measures taken will be in line with the company's social policy.	All personnel entering the properties will be vetted. Fire-fighting measures must be implemented and the workforce must be educated on fire management.	Appointed contractor and site manager.	Site inspections and meetings with the land owners	Site manager	Throughout decommissioning phase.

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 the proposed operations. In view of the above, a rehabilitation plan must be provided to the DMRE in support of the financial provision determined for the proposed operations. Since no disturbance has results on site due to the proposed project no annual rehabilitation plan was compiled.

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 Witrand Colliery 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.

Ndzilo Coal (Pty) Limited has opted to use a financial guarantee to provide for the determined quantum for financial provision. See Table 17 below.

Table 17: Financial provision for Witrand Colliery

"Rules-based" assessment of the quantum for financial provision								
CALCULATION OF THE QUANTUM								
Mine:	Witrand Colliery- NDZILO COAL (Pty) Limited			Location: Mpumalanga				
Evaluators:	O.T Shakwane of Geovicon Environmental (Pty) Limited			Date: 08/06/2022				
No.:	Description:	Unit:	A	B	C	D	E=A*B*C*D	
			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	500.00	R 45.78	1.00	1.10	R 25 179.38	
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	1.00	R 268 200.17	1.00	1.10	R 295 020.19	
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	0.60	R 178 800.11	1.00	1.10	R 118 008.07	
8 (B)	Rehabilitation of processing waste deposits & evaporation ponds (basic)	ha	0.00	R 222 692.31	0.80	1.10	R 0.00	
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic)	ha	0.10	R 646 804.03	0.80	1.10	R 56 918.75	
9	Rehabilitation of subsidised areas	ha	0.00	R 149 733.48	1.00	1.10	R 0.00	
10	General surface rehabilitation	ha	1.00	R 141 639.86	1.00	1.10	R 155 803.84	
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	0.10	R 53 855.46	1.00	1.10	R 5 924.10	
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 0.00	1.00	1.00	R 0.00	
Sub Total 1								
(Sum of items 1 to 15 Above)							R 760 526.12	
Multiply by Weighting factor 2		1.1		R 76 052.61			R 76 052.61	
1	Preliminary and general	Add 12% if subtotal 1 is less than R100,000,000.00						R 91 263.13
2	Contingencies	Add 10% of subtotal 1						R 76 052.61
Sub Total 2								
(Subtotal 1 plus sum of management & contingencies)							R 1 003 894.48	
VAT (15%)							R 150 584.17	
(Subtotal 2 plus VAT)				GRAND TOTAL		R 1 154 478.66		

7. MECHANISM FOR MONITORING COMPLIANCE WITH AND PERFORMANCE 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 Ndzilo Coal (Pty) Limited 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

Ndzilo Coal (Pty) Limited has developed procedures for environmental related emergencies for Witrand Colliery 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 Ndzilo Coal (Pty) Limited 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 Witrand Colliery 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 18).

7.3.5 Responsibilities

Table 18: Responsibilities

Mine Management	Ndzilo Coal (Pty) Limited is responsible for the safety and well-being of employees working at Witrand Colliery 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 Witrand Colliery.

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 Witrand Colliery.

7.3.11 Emergency Response flowchart for Ndzilo Coal (Pty) Limited

The emergency response at Witrand Colliery is undertaken, as shown in Figure 18 below.

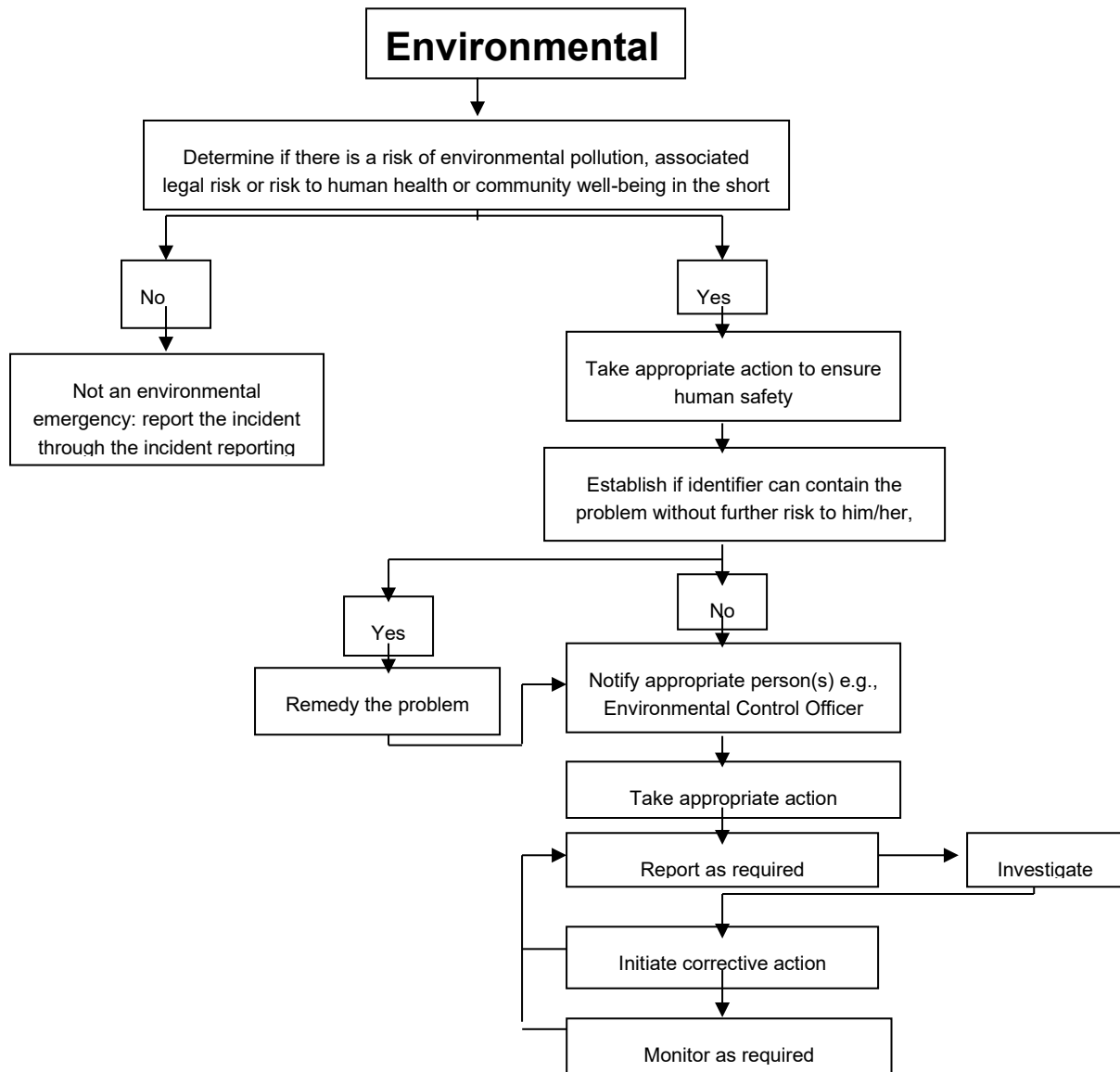


Figure 18: Emergency Response.

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), Witrand Colliery 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 Witrand Colliery) 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 Witrand Colliery 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 Witrand Colliery. 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 19:

Table 19: 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	General awareness of EMP impacts and objectives.	Induction and post-leave training	Continuously
	Controlling work activities to prevent impacts.			
		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. Witrand 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 **Ndzilo Coal (Pty) Limited** 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.....

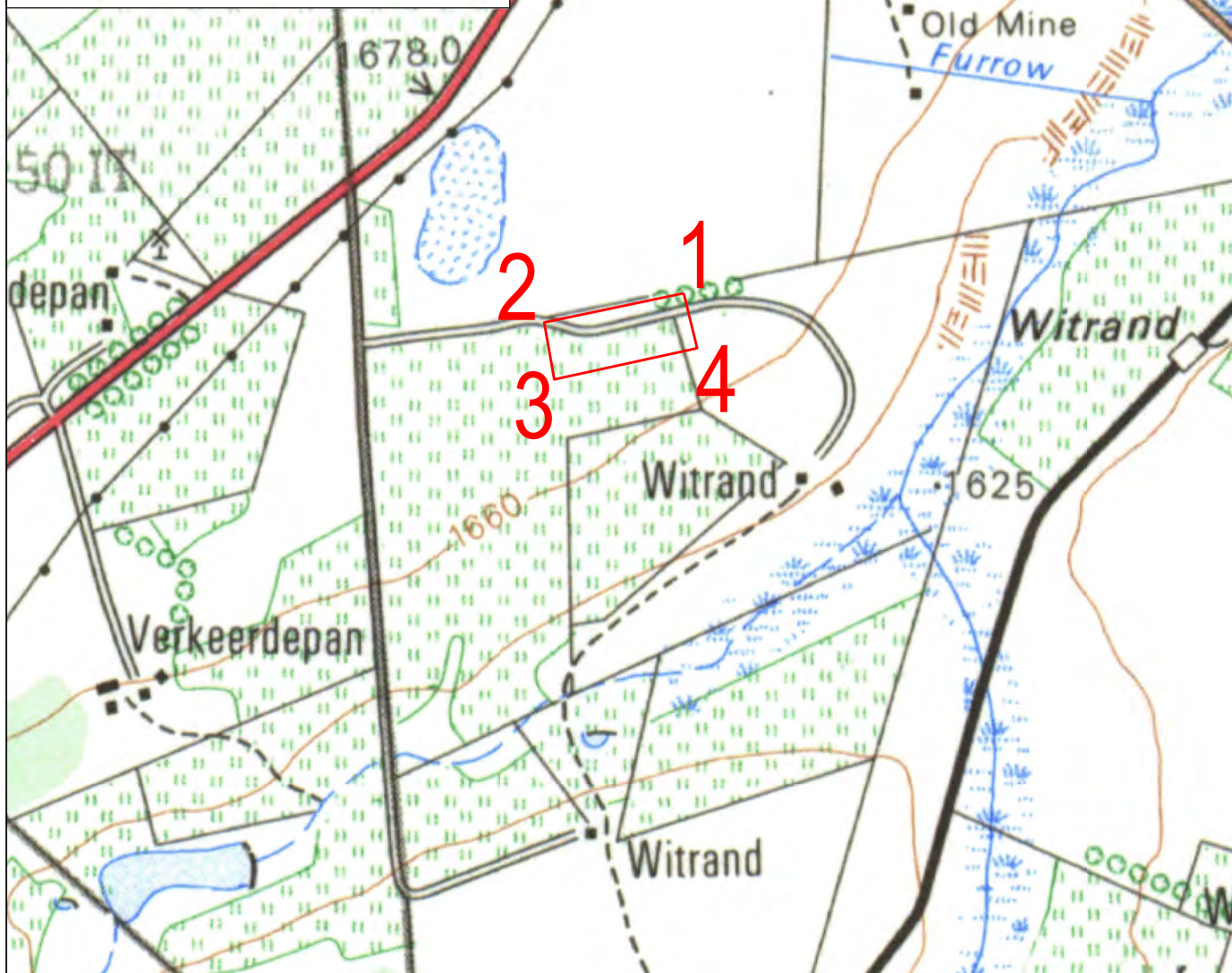
.....
REGIONAL MANAGER

REGION:.....

Appendix A
Regulation 2.2 Plan

PERMIT CO-ORDINATES
WG 31°

POINTS	LAT	LONG
1	-26,1471034°S	30,0558316°E
2	-26,147725°S	30,0524122°E
3	-26,1489838°S	30,0526487°E
4	-26,1483203°S	30,0561494°E
1	-26,1471034°S	30,0558316°E



NDZILO COAL (PTY) LTD
REG NO: 2019/615422/07
APPLICATION FOR MINING PERMIT

Plan compiled in accordance with
Regulation 2(2) of the Mineral & Petroleum
Resources Development Act 2002
(ACT 28 of 2002)

Scale 1 : 420

LEGEND

	PERMIT AREA
	National Freeway, National Route
	Arterial Route
	Main Road
	Secondary Road; Bench Mark
	Other Road; Bridge
	Track and Hiking Trail
	Railway; Station or Siding
	Other Railway; Tunnel
	Embankment; Cutting
	Power Line
	Built-up Area
	Buildings; Ruin
	Post Office; Police Station; Store
	Place of Worship; School; Hotel
	Fence; Wall
	Windpump; Monument
	Communication Tower
	Mine Dump; Excavation
	Trigonometrical Station; Marine Beacon
	Lighthouse and Marine Light
	Cemetery; Grave
	International Boundary and Beacon
	Provincial Boundary
	Game, Nature Reserve & State Forest Boundary
	Perennial River
	Non-perennial River
	Non-perennial Water
	Dry Water Course
	Dry Pan
	Marsh and Vlei
	Pipeline (above ground)
	Water Tower; Reservoir; Water Point
	Coastal Rocks
	Prominent Rock Outcrop
	Erosion; Sand
	Woodland
	Cultivated Land
	Orchard or Vineyard
	Recreation Ground
	Row of Trees



The figure lettered 1-4 AND 1 represent a Permit area in extent of approximately 5 ha, comprising of a portion of portion 3 of the farm WITRAND 52 IT, in the Magisterial district of CAROLINA for which NDZILO COAL (PTY) LTD REG NO. 2019/615422/07 has applied for a permit area in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002, (Act 28 of 2002), but subject to Regulation 17 of the Mine Health and Safety Act, 1996 (Act 29 of 1996), excluding any area within 100 meters of any public road, railway, cemetery, residential area or public area.

SIGNED:
REGIONAL MANAGER
MPUMALANGA PROVINCE

SIGNED:
NDZILO COAL (PTY) LTD
Reg No: 2019/615422/07



Contact : 012 472 0328
Email : info@xakwa.com
tiisetso@xakwa.com

Address : 175 Corobay
Waterkloof Glen
0010

**Appendix B:
Deed's List**

Any personal information obtained from this search will only be used as per the Terms and Conditions agreed to and in accordance with applicable data protection laws including the Protection of Personal Information Act, 2013 (POPI), and shall not be used for marketing purposes.

SEARCH CRITERIA

Search Date	2022/02/16 08:41	Farm Number	52
Reference	-	Registration Division	IT
Report Print Date	2022/03/24 13:55	Portion Number	-
Farm Name	-	Remaining Extent	NO
Deeds Office	Mpumalanga	Search Source	WinDeed Database

PORTION LIST

Portion	Owner	Title Deed	Registration Date	Purchase Price (R)
0	GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA	T8626/2017	2017/07/28	-
1	WILLIE ENGELBRECHT LANDGOED PTY LTD	T29478/1997	1997/04/03	-
3	AJB BOERDERY PTY LTD	T12508/2018	2018/09/28	2 185 000
4	NKOSI JOB	T38403/2001	2001/04/26	130 000
5	MSOBO COAL PTY LTD	T6506/2013	2013/06/28	40 635 013
6	THULA COMMUNICAL PROP ASSOC	T158488/2002	2002/12/12	385 000
7	TRANSNET LTD	T15219/1940	1940/10/15	-
8	TRANSNET LTD	T12307/1939	1939/07/12	-
9	THULA COMMUNICAL PROP ASSOC	T158488/2002	2002/12/12	385 000
10	THULA COMMUNICAL PROP ASSOC	T158488/2002	2002/12/12	385 000

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










Appendix C: Layout Plan

LAYOUT PLAN



SURVEY SYSTEM WGS84
SCALE 1:1580

LEGEND

-  MINING PERMIT BOUNDARY
-  INITIAL BOXCUT
-  OVERBURDEN STOCKPILE - HARDS
-  OVERBURDEN STOCKPILE - SOFTS
-  TOPSOIL STOCKPILE
-  OFFICE COMPLEX (O/C)
-  HAUL ROADS
-  ACCESS ROAD
-  TRENCH
-  CONTOUR LINES
- Alternative infrastructure*
-  RUN OF MINE (R.O.M)
-  POLLUTION CONTROL DAM (PCD)



LAYOUT PLAN FOR THE BOXCUTS

NDZILO COAL (PTY) LIMITED
WITRAND COLLIERY

SURVEY SYSTEM WGS84
SCALE 1:390



LEGEND



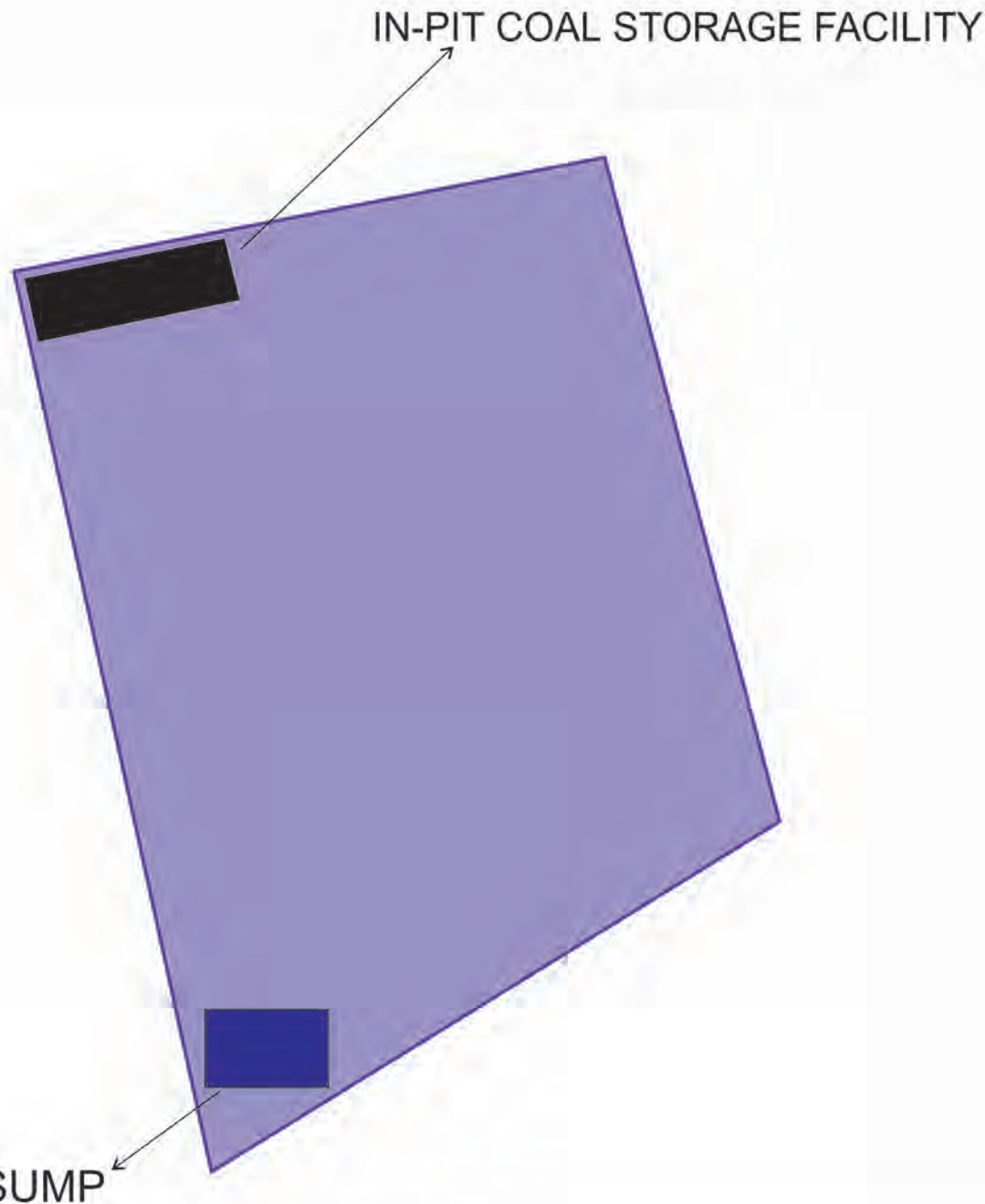
BOXCUT



IN-PIT COAL STORAGE FACILITY



IN-PIT SUMP



DRAWN BY GEOVICON ENVIRONMENTAL
TELEPHONE: 013 243 0542
EMAIL: geovicon@iafrica.com



Appendix D:
**National Web Based Environmental
Screening Tool Report**

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: MP 30/5/1/1/3/13215 MP

Project name: WITRAND COLLIERY

Project title: WITRAND COLLIERY

Date screening report generated: 31/05/2022 16:46:23

Applicant: NDZILO COAL (PTY) LIMITED

Compiler: GEOVICON ENVIRONMNETAL (PTY) LIMITED

Compiler signature:
.....

Application Category: Mining|Prospecting rights

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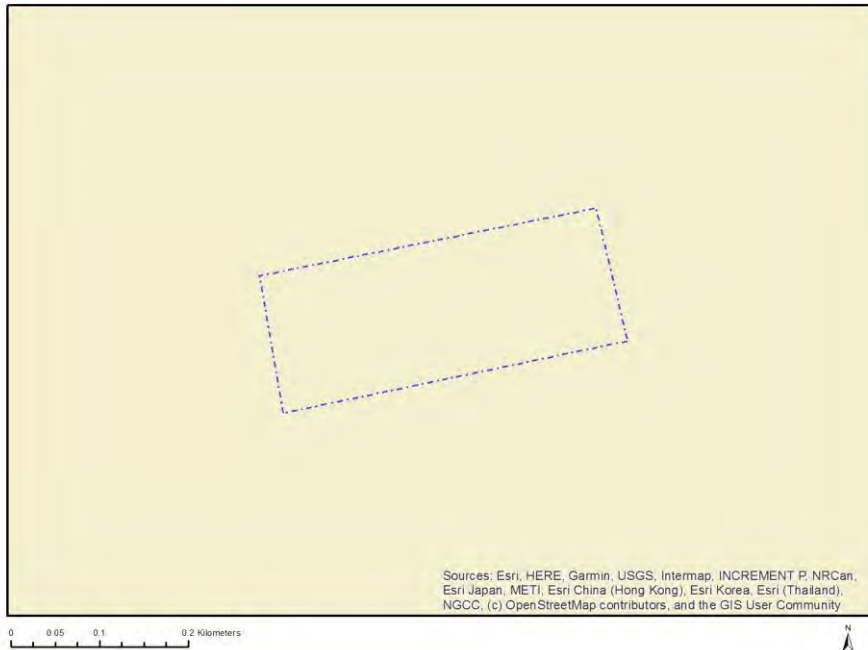
Proposed Project Location	3
Orientation map 1: General location	3
Map of proposed site and relevant area(s)	4
Cadastral details of the proposed site	4
Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area	4
Environmental Management Frameworks relevant to the application	4
Environmental screening results and assessment outcomes	5
Relevant development incentives, restrictions, exclusions or prohibitions	5
Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones	6
Proposed Development Area Environmental Sensitivity	6
Specialist assessments identified	7
Results of the environmental sensitivity of the proposed area	9
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY	9
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY	10
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY	11
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY	12
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY	13
MAP OF RELATIVE DEFENCE THEME SENSITIVITY	14
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY	15
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY	16
MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY	17

Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	WITRAND	52	0	26°8'36.31S	30°4'38.39E	Farm
2	WITRAND	52	3	26°9'3.18S	30°3'18.06E	Farm Portion

Development footprint¹ vertices:

No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

¹ "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

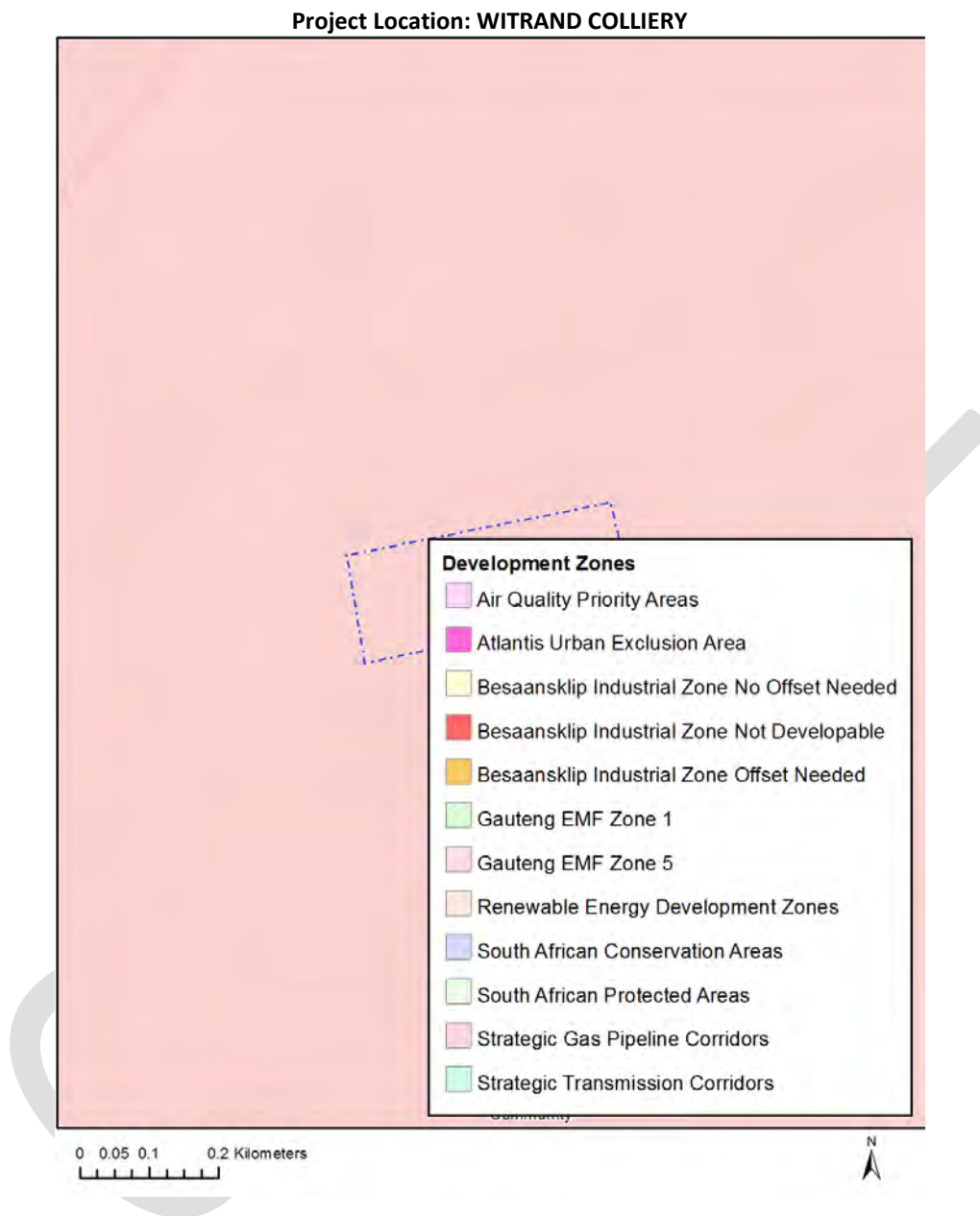
Mining | Prospecting rights.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentive , restriction or prohibition	Implication
Strategic Gas Pipeline Corridors- Phase 8: Rompco Pipeline Corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_GAS.pdf

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme			X	

Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

N o	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
6	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Noise_Impacts_Assessment_Protocol.pdf

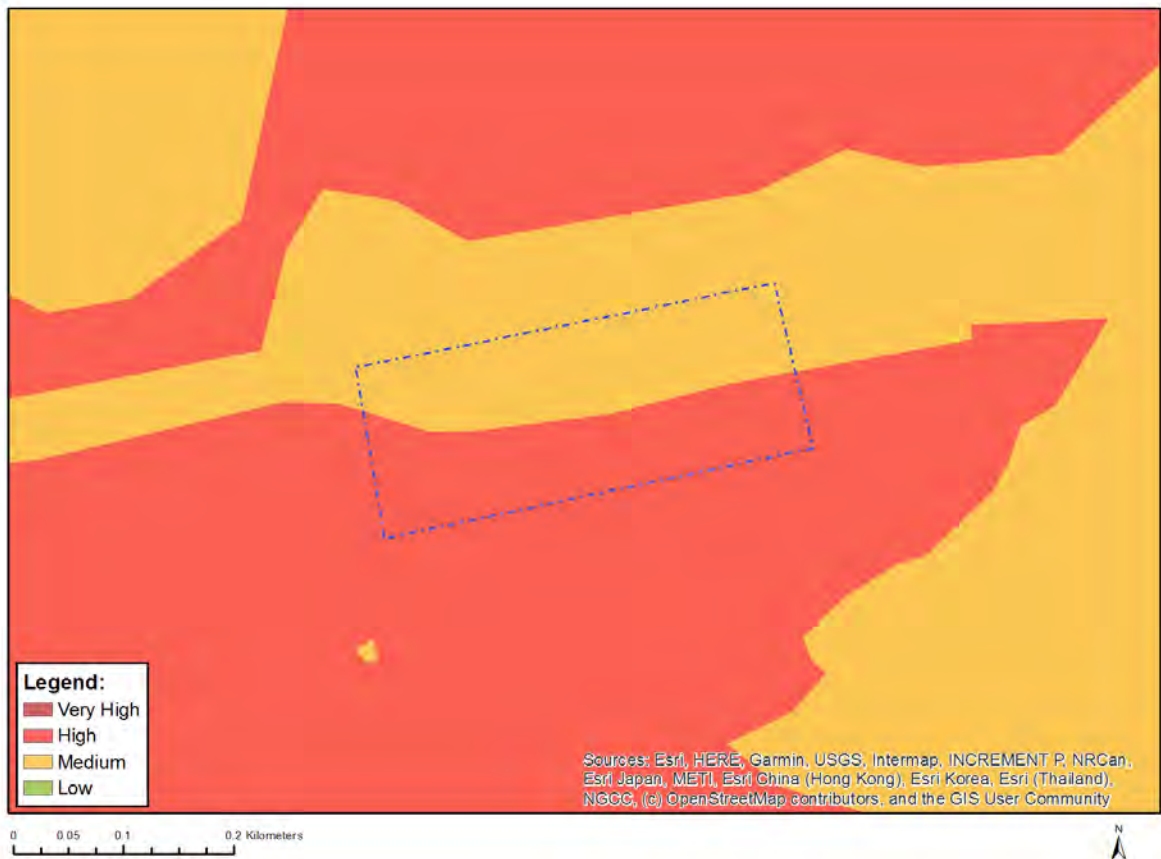
	ment	
7	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf

OFFICIAL

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

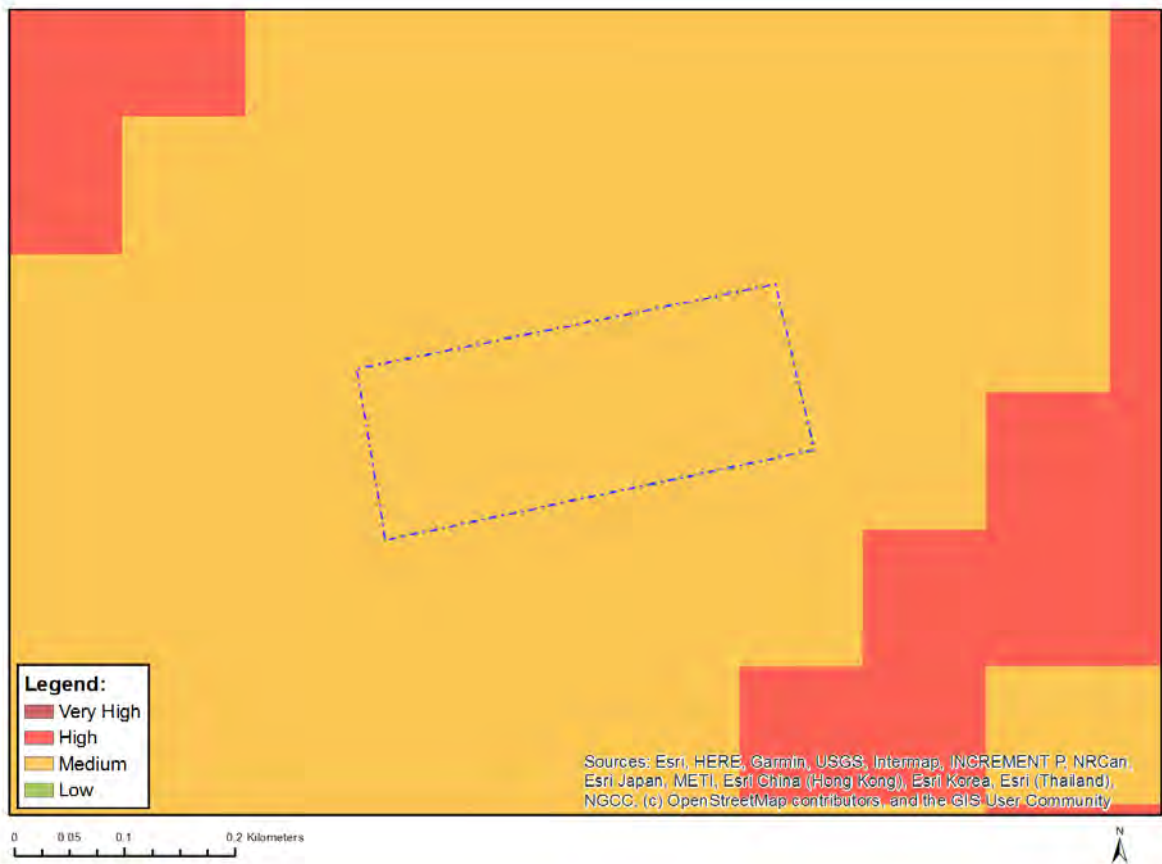


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Old Fields; Land capability; 06. Low-Moderate/07. Low-Moderate/08. Moderate
Medium	Land capability; 06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



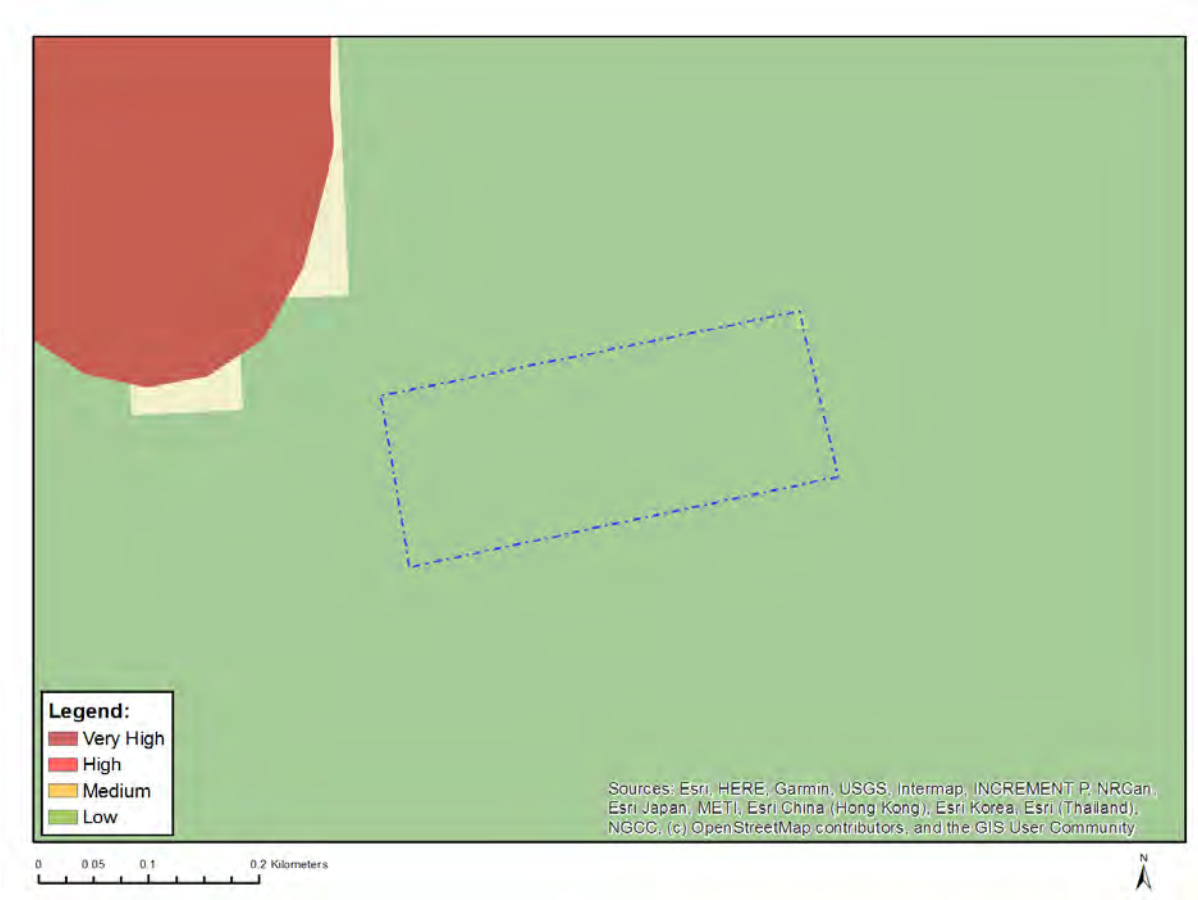
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Mammalia-Chrysospalax villosus
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Hydrictis maculicollis
Medium	Mammalia-Ourebia ourebi ourebi

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

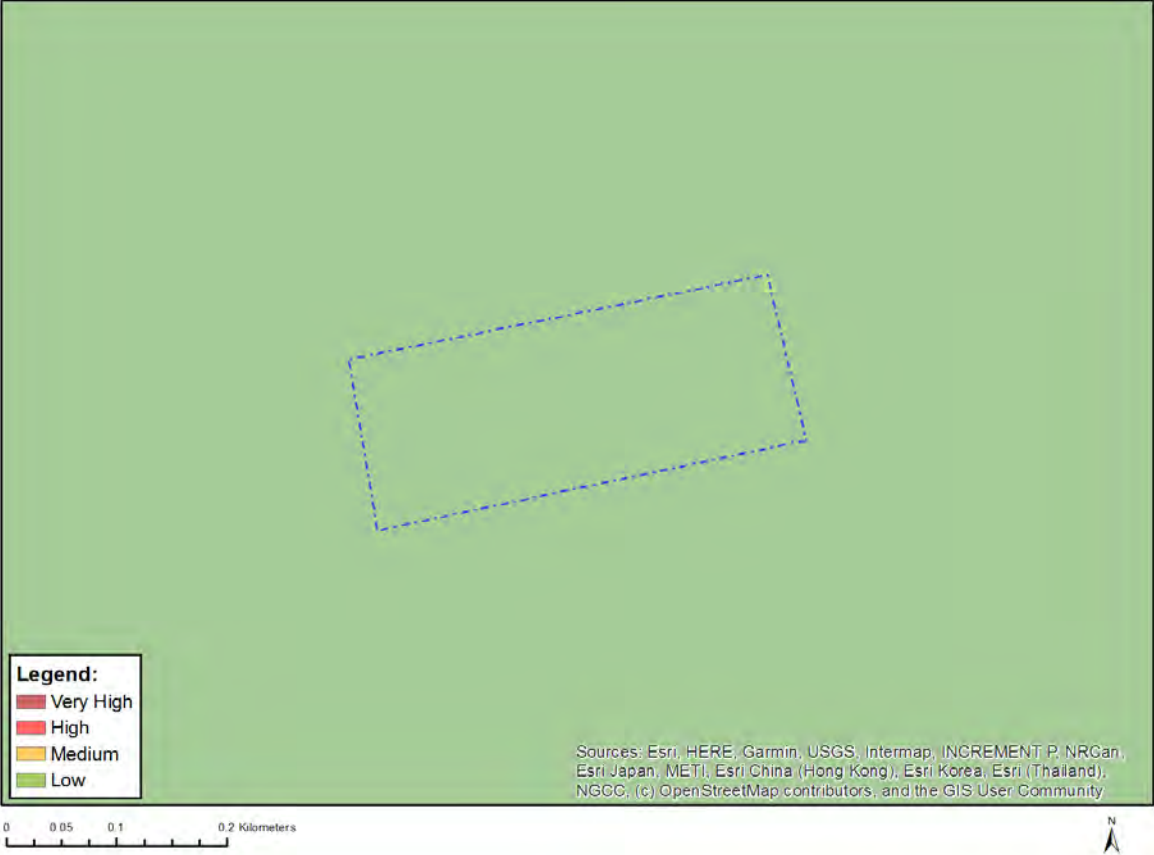


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

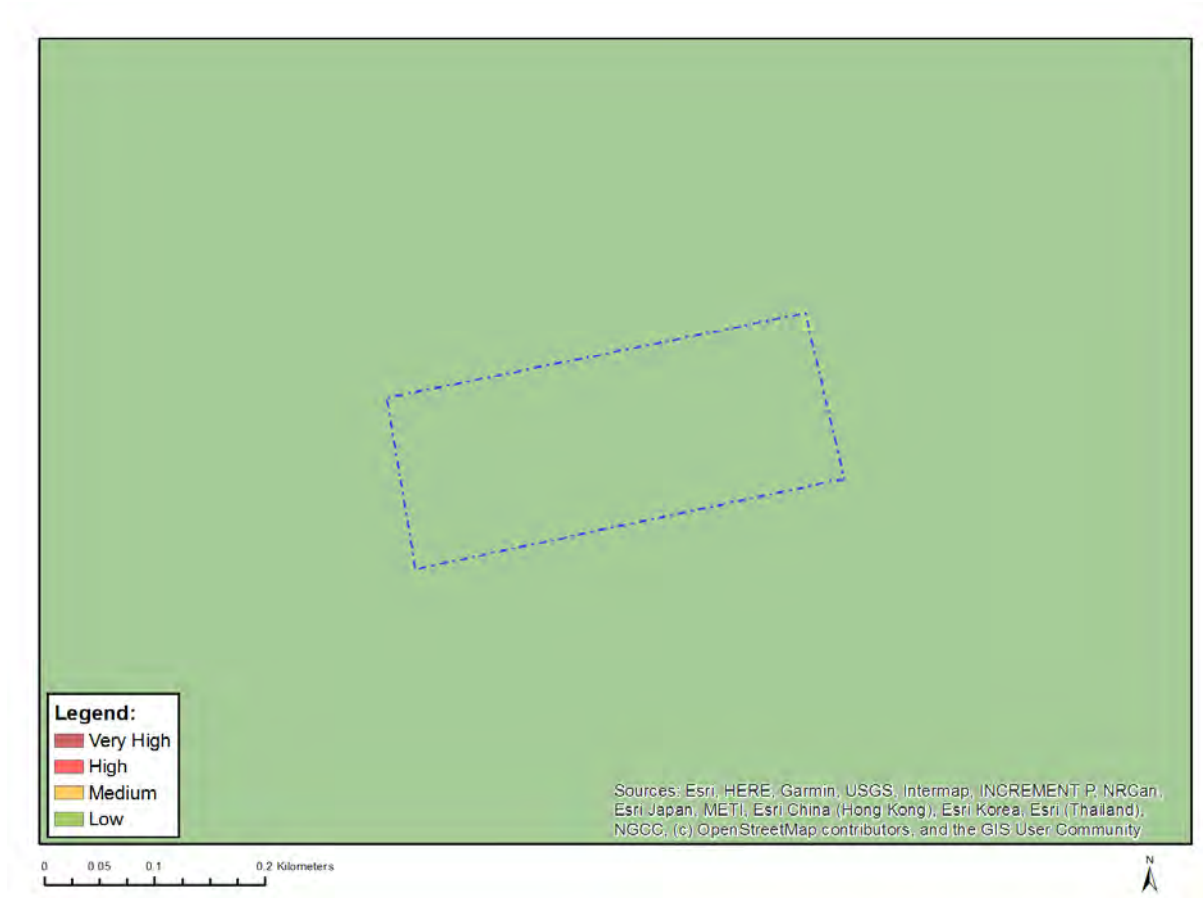


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 8 km of other civil aviation aerodrome

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

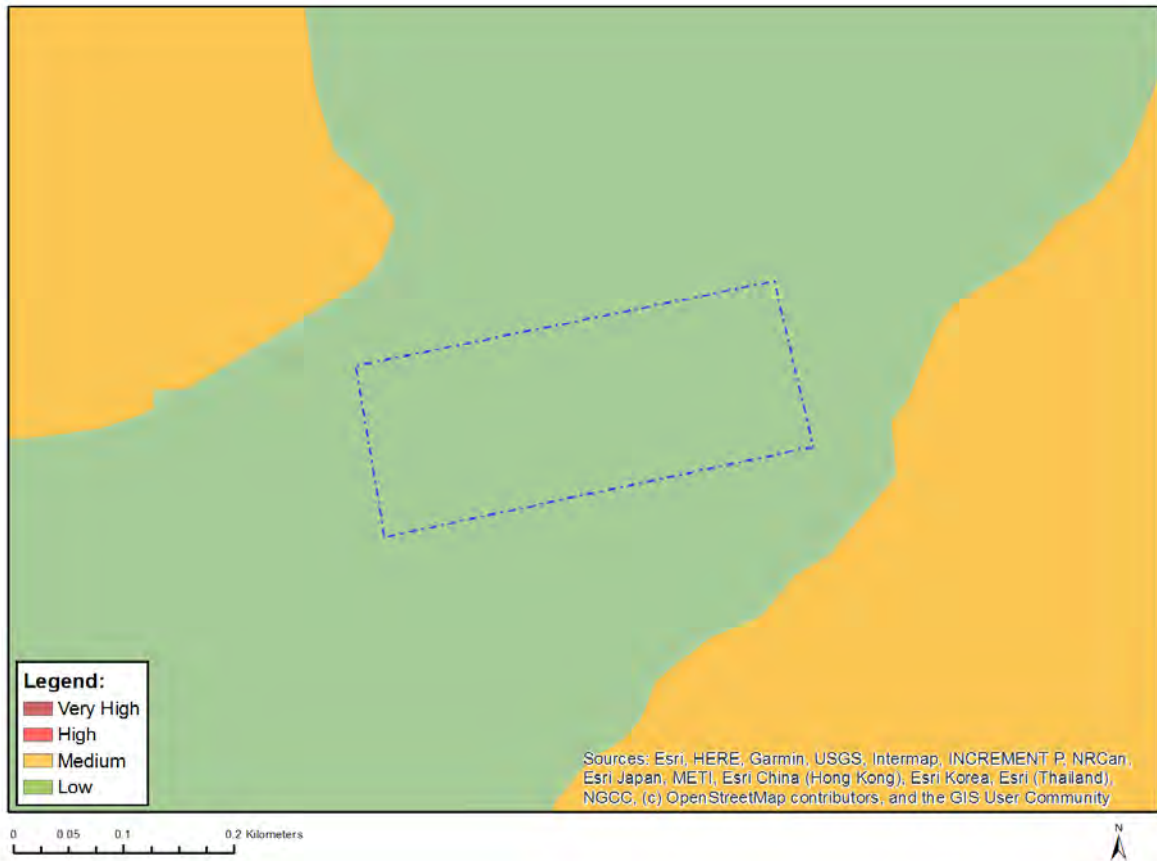


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Critical biodiversity area 1
Very High	Protected Areas Expansion Strategy
Very High	Vulnerable ecosystem

Appendix E:
EAP's Curriculum Vitae

CURRICULUM VITAE

ORNASSIS TSHEPO SHAKWANE (TSHEPO)

PERSONAL DETAIL

ID: 7207085407082

ADDRESS: 68 Pongola Drive

Aerorand West, Middelburg

Mpumalanga

CONTACT: 013 243 0542 / 082 498 1847

E-MAIL: tshepo@geovicon.co.za

CAREER SUMMERY

2004 TO CURRENT: Geovicon Environmental (Pty) Ltd previously Geovicon (Pty) Ltd – Environmental Assessment Practitioner, Owner and Managing Director

As an environmental assessment practitioner I assist my clients to ensure that their operations complies with the external (international, national and local government) and internal environmental requirements. The following are the responsibilities of an environmental manager: developing and implementing environmental strategies and action plans that ensure compliance with the environmental laws; coordinating all aspects of pollution control, waste management, recycling, environmental management, conservation and renewable energy; ensuring the implementation of environmental policies and practices; ensuring compliance with environmental legislation and keeping up to date with new regulations and legislation; liaising with relevant bodies such as state authorities and the public; auditing, analysing and reporting environmental performance to internal personnel and regulatory bodies; development of applications for environmental authorisations, water use licences, waste management licences and atmospheric air emissions licences; carrying out impact assessments to identify, assess and reduce the mine's environmental risks and financial cost; promoting and raising awareness of the impact of environmental issues; developing and implementing environmental management systems to continually improve the impact of the organisation on the environment; coordinating public meetings and consultations on environmental matters; managing relations with clients (board of directors, senior management and internal staff); training staff at all levels in environmental issues and responsibilities; writing environmental reports.

2004: Department of Minerals and Energy, eMalahleni Regional Office - Assistant Director

Evaluate Environmental Impact Assessment reports, Basic Assessment reports, Scoping reports, Environmental Management Programmes/Plans, Closure plans and other technical and Environmental documents. Recommend approval of the Environmental Management Programmes Conduct comprehensive environmental Inspection and environmental audits in line with Minerals Act, 1991 and related regulations. Identify environmental liabilities for mining operations and ensure evaluation of adequacy of financial provision. Investigate and resolve mine environmental related issues, attend to environmental related queries and complaints in mines. Assist public clients through promotion of administrative justice, Environmental, enforcement and investigate illegal mining. Participate in Environmental related forums and meetings. Supervision and management of the subordinates

2002 – 2003: Department of Water Affairs and Forestry (Gauteng Regional Office), Pretoria - Senior Water Pollution Control Officer

Managing Water Quality issue in the Vaal River catchment area; Managing both industrial and mining impacts; reviewing Environmental Impact Assessments, Environmental Management Programmes and Integrated Water Use Licence Applications. Managing junior officers and being involved in policy making processes. Establishment of water quality monitoring network, water quality sampling, environmental compliance inspections, drafting of Water Use License Reports, Making recommendations on decisions to be taken on Environmental Impact Assessments, Environmental Management Programmes and Integrated Water Use Licence Applications and other technical reports.

2001 – 2002: Department of Agriculture, Conservation, Environment and Land Administration (Gauteng Provincial Office), Johannesburg - Environmental Control Officer

Managing the Environmental Impact Assessment authorization processes for industrial and urban development in the Gauteng province; conducting compliance monitoring in accordance with the environmental laws, attending to pollution incidents and investigating public complaints; providing technical support to the directorate during Policy formulation.

2000 – 2001: Department of Water Affairs and Forestry (Mpumalanga Regional Office), Nelspruit - Water Pollution Control Officer

Managing Water Quality issue in the Olifants River catchment area; Managing both industrial and mining impacts; reviewing Environmental Impact Assessments, Environmental Management Programmes and Integrated Water Use Licence Applications.

EDUCATION AND QUALIFICATIONS

B. Sc. (Hons): 1995
University of Durban-Westville

B. Sc.: 1994

University of Durban-Westville

MATRIC: 1991

Imemeza High school, Waterval Boven

PROFESSIONAL DEVELOPMENT

- Environmental Law for Environmental Management
- Environmental Impact Assessment for Practitioners
- Environmental Risk Assessment for Practitioners

PROFESSIONAL REGISTRATIONS

SOUTH AFRICAN COUNCIL FOR NATURAL SCIENTIFIC PROFESSIONS (SACNASP)

(117080)

INTERNATIONAL ASSOCIATION FOR IMPACT ASSESSORS SOUTH AFRICA (IAIASA)

(IAIASA 3847)

SKILLS

- Compilation of Integrated Water Use Licence Application
- Compilation of Integrated Water and Waste Management Plan
- Determination of Financial Provisions for Mines
- Compilation of Basic Assessment Reports
- Compilation of Scoping Reports
- Compilation of Environmental Impact/Risk Assessment Reports
- Compilation of Environmental Management Programme
- Compilation of Mine Closure Plans
- Compilation of Waste Management Plans and Procedures
- Compilation of Water Quality Reports
- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint
- Internet
- Email

University of Durban-Westville



This is to certify that

ORNASSIS TSHEPO SHAKWANE

was this day at a congregation of the University
admitted to the

degree of

Honoris Baccalaureus Scientiae

having complied with the requirements of the
Act, Statute and regulations



Westville, 3 AUG 1996

m. Balitlo
Vice-Chancellor

A. Bremer
Registrar

University of Durban-Westville



This is to certify that

ORNASSIS TSHEPO SHAKWANE

was this day at a congregation of the University
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degree of

Baccalaureus Scientiae

having complied with the requirements of the
Act, Statute and regulations



Westville,

26 MAY 1995

m. Balitelo
Vice-Chancellor

A. Brimer
Registrar

GEREGISTREERDE WOON- EN POSADRES

1. Bewaai die bewys van u GEREGISTREERDE WOON- EN POSADRES in hierdie sakke

2. Indien u van adres verander het, of indien besonderhede van u huidige adres, by straatnaam en/of -nommer, ens. verander het, moet die vorm KENNISGEWING VAN ADRESVERANDERING, wat in die sakke agter in die identiteitsdokument is, gedruk word om die verandering aan te meld en moet dit ingesdien word by di gepos word aan die naaste streek- distrikkantoor van die DEPARTEMENT VAN BINNELANDSE SAKE

REGISTERED RESIDENTIAL AND POSTAL ADDRESS

1. Keep the proof of your REGISTERED RESIDENTIAL AND POSTAL ADDRESS in this pocket.

2. If you have changed your address or, if particulars of your present address, e.g. name of street and/or street number, etc. have been changed, the NOTICE OF CHANGE OF ADDRESS form in the pocket at the back of the identity document must be used to report the change and it must be handed in at or posted to the nearest regional district office of the DEPARTMENT OF HOME AFFAIRS.

I.D. No. 720708 5407 08 2



S. A. BURGER/S. A. CITIZEN

VANUSURNAME
SHAKWANE

VOORNAME/FORENAMES
ORNASSIS TSHEPO

GEBOORTEDISTRIK OF LAND/
DISTRICT OR COUNTRY OF BIRTH

SOUTH AFRICA

GEBOORTEDATUM/
DATE OF BIRTH

1972-07-08

DATUM UITGEREIK
DATE ISSUED

2007-09-21

UITGEREIK OOR GESAAG VAN DIE
DIREKTEUR-GENERAAL:
BINNELANDSE SAKE

ISSUED BY AUTHORITY OF THE
DIRECTOR-GENERAL:
HOME AFFAIRS

