mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Contrarians Pty Ltd

TEL NO: 073 733 7453

FAX NO: 010 005 3254

POSTAL ADDRESS: P O Box 50260, Johannesburg, 1683
PHYSICAL ADDRESS:

FILE REFERENCE NUMBER SAMRAD: MP 30/5/1/1/3/ 12632 MP

FILE REFERENCE NUMBER SAMRAD: 12632 MP

Compiled in terms of Appendix 1, Appendix 4 of the Environmental Impact Assessment Regulations, 2014 (Government Notice No. R 983) (EIA Regulations, 2014 as Amended in 2017) and Submitted as contemplated in Regulation 19 of Chapter 4 of the EIA Regulations, 2014 as amended

For

The application for an Environmental Authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Environmental Impact Assessment Regulations 2017, Government Notice R326 - Government Notice R983 - Listing Notice 1 of 2014, as amended in 2017.

Important Notice

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a mining or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

Objective of the basic assessment process

The objective of the basic assessment process is to, through a consultative process–

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:

  (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

  (ii) the degree to which these impacts—

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

  (i) identify and motivate a preferred site, activity and technology alternative;

  (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and

  (iii) identify residual risks that need to be managed and monitored.

ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
DBAR	Draft Basic Assessment Report
DEAT	Department of Environment, Agriculture and Tourism
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IWULA	Integrated Water Use Licence Application /
IWMMP	Integrated Waste Water Management Plan
LED	Local Economic Development
MAE	Mean Annual Evaporation
MAP	Mean annual Precipitation
MAR	Mean Annual Runoff
MHSA	Mine Health and Safety Act
MPRDA	Minerals and Petroleum Resources Development Act, 2002
NEMA	National Environmental Management Act, 1998
NDP	National Development Plan
PPP	Public Participation Process
PPE	Personal Protective Equipment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environmental

EXECUTIVE SUMMARY

Contrarians (Pty) Ltd has applied for an Environmental Authorisation for proposed Mining activities for Coal on a 5ha of portion 19 of the afrm Elandspruit 291 JS and portion 17 of the Rietfontein 314 JS in the magisterial district of Middleburg, Mpumalanga Province, South Africa. The application has been lodged in terms in terms of Section 23 of the Mineral and Petroleum Resources Development Act (MPRDA), 2008 (Act No. 23 of 2008) to the Department of Mineral Resources (DMR), Mpumalanga Province (Mpumalanga Regional Department). See APPENDIX A: MAPS for the Regulation 2(2) plan for this proposed mining permit application.

In terms of the NEMA (Act 107 of 1998) and EIA regulations of 2014 as amended, the proposed mining activities triggers a Listed Activity 21 and Activity 27 of Listing Notice 1 (GNR 327) and the applicant cannot proceed without an Environmental Authorisation for the mentioned listed activities. Envirostep (Pty) Ltd has been appointed by Contrarians (Pty) Ltd as an independent Environmental Assessment Practitioner to undertake the Environmental Impact Assessment for the proposed mining permit. The purpose of the studies is to identify and assess all the possible impacts that may arise from the implementation of the proposed project and to find the most effective ways of enhancing environmental benefits and mitigating potential impacts to encourage sustainable development within the area. The Public Participation Process was announced in the local newspaper (Middleburg observer-25/06/2021) and the registration process for Interested and Affected Parties (IAPs) has been ongoing. The following process wil be undertaken as part of the public participation process:

- Publication of a Newspaper advertisement in the Middleburg observer Newspaper;
- Erecting site notices at visible and accessible entry points in and around the proposed project area was done on the 22nd of June 2021;
- Directly notifying affected I& APs and Stakeholders representing various sectors of society by distributing information via e-mail, hand delivery of documents, meetings, postal and telephonically started on the 22nd of May 2021.

The proposed mining activities will be undertaken over a period of Two (2) years and the activities to be carried out includes invasive and non-invasive methods. Non-invasive method will include desktop studies and data acquisition, whereas Invasive methods will include excavation, stockpiling, loading, hauling, processing and transportation within the mining area. Other stages will involve geological modelling and analyses of metallurgical test work and resource estimation.

Potential risks and key issues identified will be based on consultation with I&APs, through an internal process based on similar projects, current state of the environment of the site, and a site visit. A summarised description of the surrounding land use is provided to ensure that all environmental aspects are highlighted. A description of the biophysical and social environment is also included in the report, to ensure that all potential risks and issues are taken into consideration in all phases of the proposed project.

All environmental data (i.e. surface and ground water qualities and quantities, topographical analyses, soil, vegetation, wetland, and geological conditions including socio-economic aspects) including the historic land uses that has been used in this report has been obtained through desktop studies. Weather data was acquired from the Climate Data Online, 2018. The data accumulated and analysed is therefore deemed insufficient to gain a baseline indication of the present state of the environment. The data will only be deemed sufficient once the public participation, site impact assessment has been completed. The use of this baseline data for determining the potential impacts associated with this project is thus justified, and reliable conclusions couldn't be made yet. The impacts that could arise during and after the proposed activities at the Goudmyn Project will be determined and ranked according to their significance.

The findings and conclusions of this document (DBAR and EMPr), which concerns assessment of environmental impacts and a programme for management of the impacts for the proposed mining activities at the Contrarians Project site, was compiled in terms of the EIA Regulations of 2014 for review by interested and affected parties including the competent authority. Based on the desktop study in respect of impact assessment, several recommendations are already made to mitigate significant negative impacts as well as to maximize positive impacts that will result from the proposed project.

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PART A

SCOPE OF ASSSSMENT AND BASIC ASSESSMENT REPORT

1. Contact Person and correspondence address

1.1. Details of

1.1.1. Details of the EAP

Name of The Practitioner: Thabelo Teressa Nelwamondo
Tel No.: 081 760 7362
Fax No. : 086 604 5465
e-mail address: tmatshisevhe@gmail.com

1.1.2. Expertise of the EAP.

(a) The qualifications of the EAP

BSc Hons in Environmental Management and Cerificate in Environmental Compliance and Enforcement.

(b) Summary of the EAP's past experience.

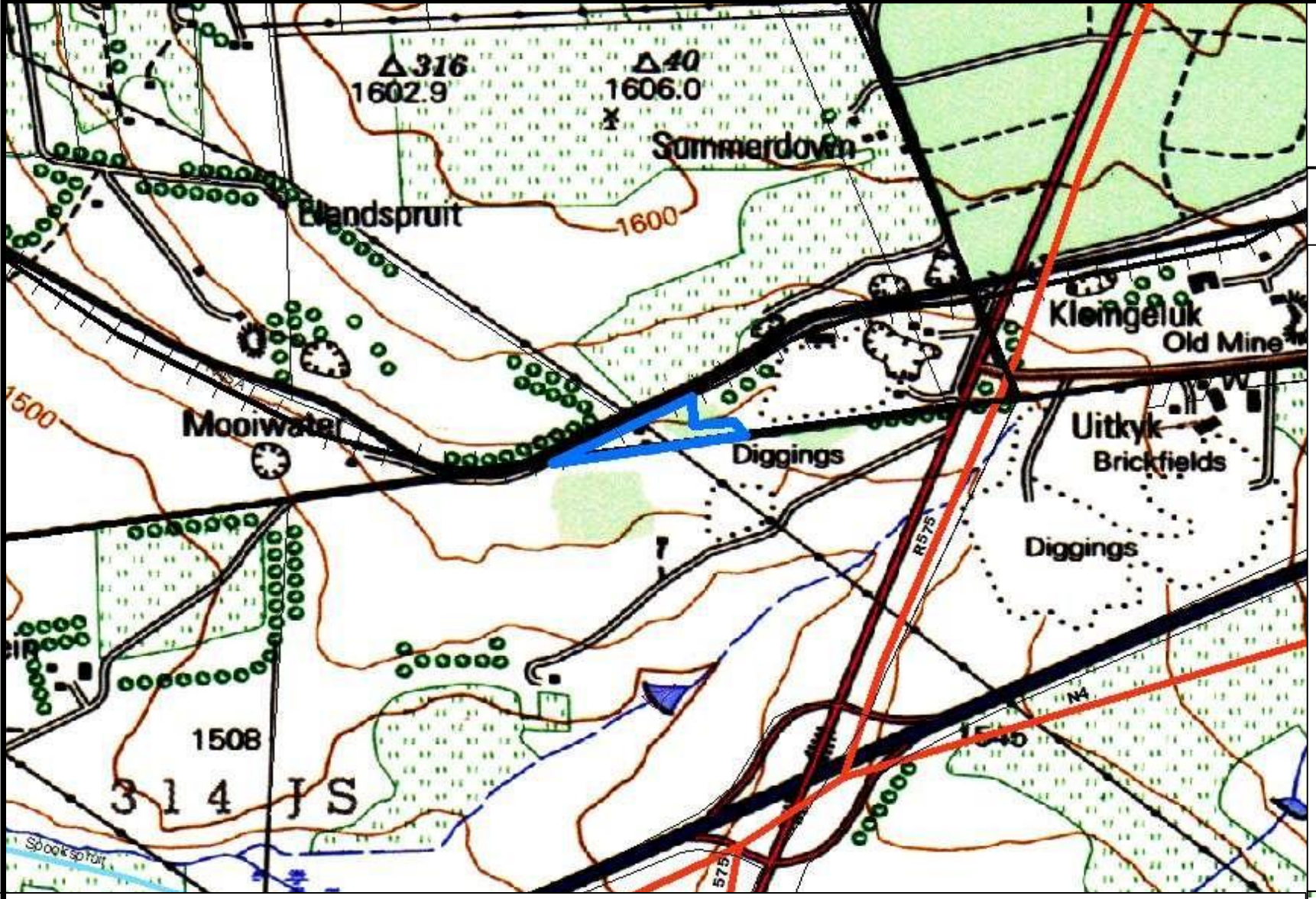
This report was prepared by Thabelo Teressa Nelwamodo (Pr. Sci. Nat), a certified Environmental Assessment Practitioner with over 7 years working experience in the field of Environmental Sciences. She holds an Honours degree in Environmental Management and specialises in EIA (Environmental Impact Assessment) and related projects. She has been involved in a variety of different types of EIAs, construction project, mineral tenure and water related projects in South Africa. Thabelo Matshisevhe has also been involved in public participation programmes on a number of projects.

2. Location of the overall Activity.

Table 1: Location of the overall Activity

Farm Name:	Elanspruit 291 JS portion 19 Rietfontein 314 JS
Application area (Ha)	5 Ha
Magisterial district:	Middlebirg
Distance and direction from nearest town	10 km from Middleburg
21 digit Surveyor General Code for each farm portion	T0JS00000000029100019 T0JS00000000031400017

2.1. Locality map



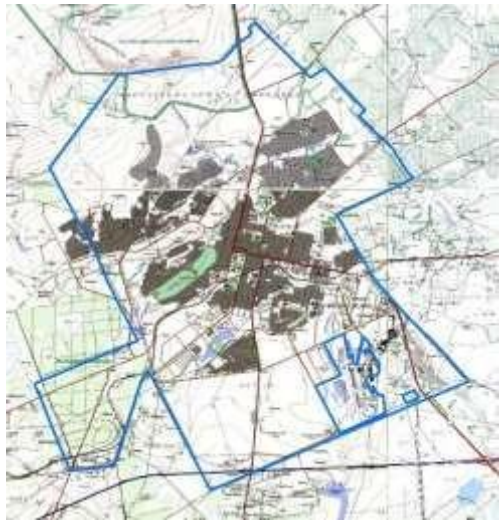
CONTRARIANS CAPITAL (PTY) LTD

REG NO: 2014/256289/07

APPLICANT: .....

DATE: .....

MINING BOUNDARY CO-ORDINATES		
	DATUM	WGS 84
	LATITUDE	LONGITUDE
A	-25.834009	29.395212
B	-25.831886	29.399468
C	-25.832826	29.399554
D	-25.832695	29.400809
E	-25.833136	29.401178



PLAN PREPARED IN ACCORDANCE TO REGULATION 2 (2) OF THE MPRDA, 2002 (ACT NO 28 OF 2002)

Description of the land under application for MINING PERMIT:

The figure: A - E representing 5 hectares of land in extent being:

Portion 19 of ELANDSPRUIT 291 JS & Portion 17 of RIETFONTEIN 314 JS

Middelburg District Municipality, Mpumalanga

N

W E

S

Mining Area

Farm Portions

Roads

Rail

Perennial Water

Perennial Rivers

Figure 1: Locality map for portion 19 of Elandspruit 291 JS and portion 17 of Rietfontein 314 JS

3. Description of the scope of the proposed overall activity.

Contrarians (Pty) Ltd proposes to mine Coal on portion 19 of the farm Elandspruit 291 JS and portion 17 of farm Rietfontein 314 JS within the magisterial district of Middelburg. The proposed project entails excavation, blasting, stockpiling, loading, hauling, processing and transportation. Please refer to Table 2 for the equipment that would be utilised for the proposed project

3.1. Mining Method Statement to be used for proposed Project

In terms of NEMA regulations and requirements by the DMR, BAR and EMPr template, Contrarians (Pty) Ltd must describe the methods and technology to be utilised for the proposed project. In view of the above, a method statement for each phase of the proposed project has been provided below. This identifies all actions, activities or processes associated with the proposed mining operation.

3.1.1. Specific activities to be undertaken

The specific activities that will be undertaken during the life of the project will include:

- Excavation of Coal and stockpiling of this in front of the opencast mining, with bulldozers and front-end loaders;
- Blasting of the hard silica deposit, excavating and stockpiling,
- Loading, hauling, processing and transport of mined materials to the mine market.
- The overburden will be stockpiled separately from the topsoil and the waste rock, if any;
- Continuously backfilling the opencast void with waste rock, overburden and topsoil, in that order, followed by fertilisation and re-vegetation with locally indigenous species of grass, shrubs and trees;
- Decommissioning and removing all equipment, removing infrastructure, backfilling the opencast quarry, making the ex-operating area safe, shaping them to be free draining and rehabilitating them to a condition fit for grazing or game farming.

Table 2: Equipment's to be used or needed

Equipment and/or Technology to be used	Excavator Bulldozer and Tipper truck Water cart 4x4 Bakkies Generator

Materials required	Diesel Grease Hydraulic Oil Picks and shovels
Storage Facility	Diesel, Grease and Oil
Spillage control	Dip trays
Sanitation Facility	Chemical toilets
Waste Management	Waste skip and Bins
Water	Water will be transported to site
Safety	Safety Boards

3.2. Proposed Mining permit project urface infrastructure description

3.2.1. Access Roads

There are various main and minor roads passing over the proposed project area. Some of these roads will be used to access the proposed mining project area. Existing provincial roads to be used include the R575. Authorities will be informed of the road to be used where required and land owners of private farms will also be requested permission to use their roads. The accumulative traffic impact mainly due to mine trucks rom the mines within the area has been taken into consideration.

All mining equipment such as excavators and bull dozers will be kept on site as long as they are still usable. Additional double cab bakkies will be used during the lifespan of the mine as a daily in mine vehicles. Local employees will be hired to avoid traffic network of many vehicles on site. During the life span of the mine, water carts will be used to spray water on the gravel mine roads to supress dust. No roads will be constructed, only existing roads and existing farm tracks will be used.

3.2.2. Power Line Infrastructure

No power line infrastructure will be affected and no electricity from the National Grid will be required for the proposed mining project. Only diesel-powered vehicles and generators machinery will be used for the proposed project. The proposed site area is close to a railway line which did not pass through the site but is on the northen part of the site under application.

3.2.3. Water Infrastructure

Based on the amount of water required and the use of such water during the operation of this mining activities which is estimated to 1090 cubic meters per annum, there is no planned water infrastructure for the proposed project. Water will be requested from the neighbouring mines where available or purchased from other commercial suppliers (i.e the local Municipality). Water delivered to the project area (mining site) will be trucked with a water cart. This water will be used for the purpose of supplying service water, potable water and fire protection water. Service water will be required for the operation of machinery and dust suppression. Potable water supply will be required for domestic water use within the mining sites. Fire water will be required for firefighting purposes. A water tank will be used for the storage of water at the proposed project area. Water Use License is required for proposed mining activities in terms of Section 22 of the Water Act (Act 36 of 1998).

3.2.4. Workshops and Buildings

There are building structures on site. This project will install mobile offices within the mine area as. Access will be requested from the farm owner to demolish or use the exisiting building structures on site. 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.

3.2.5. Waste Management

a. Waste Identification and Management

<u>Hazardous Waste</u>

- Hazardous waste to be generated includes, hydrocarbon wastes (oil and liquid fuel wastes);
- Oil waste and liquid fuels waste include used oils bottles and containers from mine machinery and vehicles;
- Mineral residue will be stored within the site and will form part of rehabilitation materials;
- Hydrocarbon waste will be collected in 210 litre drums for storage. The drums will be placed on protected ground. 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. Waste disposal certificates will be kept.
- Chemical toilets will be used for the management of sewage waste generated on site

General Waste

- General waste to be generated from the proposed project area include domestic waste such as food (left-overs), polystyrene, paper, and discarded personal protective equipment (PPE).
- This waste will be collected in marked 210l bins and disposal of at a registered landfill site closer to the proposed site.
- A disposal certificate will be kept as proof of proper disposal.

4. LISTED AND SPECIFIED ACTIVITIES

Table 3: Listed and specified activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
Mining permit activities within the proposed project area for the mining of Coal which will includes excavation, stockpiling, loading, hauling, processing and transport, discard dumps and supporting infrastructure.	5 Ha (proposed mining permit area)	**ACTIVITY 21 OF THE 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 — (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.	GNR 327, Activity 21 and Activity 27.

		ACTIVITY 27 OF THE 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- (i) the undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	

5. Policy and Legislative Context

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
National Environmental Management Act , 1998	This Basic Assessment Report & EMP	An application for Environmental Authorisation was submitted to the DMR Mpumalanga. The application was accepted by the DMR on the 28th of May 2021 (MP 5/1/1//2/12632 MP). The Department of Mineral Rsources requested the submission of the BAR and EMP within the period of 90 days of the acceptance letter.
National Water Act , 1998		An application for Water Use License will be lodged with the DWS.
Mineral and Petroleum Resources Development Act, 2002	Application for Mining in terms of Section 16	A Mining permit application has been submitted to the Department of Mineral Resources by the Applicant. The application was accepted by the Department of Mineral Resources on the 28th of June 2021, (MP 5/1/1//2/ 12632 MP).
Strategic Development Framework (SDF)	Alternatives	In terms with the SDF of the Middleburg Local municipality, various strategies and associated policies should be adopted to ensure effective spatial Development.

5.1. 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-mentioned, 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.

This document was accordingly prepared, submitted and considered within the constitutional framework set by, inter alia, section 24 and 33 of the Constitution.

5.2. The promotion of access to information act (Act no. 2 of 2000)

Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or wellbeing or, for that matter, any other Constitutional right) has been infringed. The purpose of the Promotion of Access to Information Act ("PAIA") is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith. In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature.

This is captured under Chapter 4 of part 2 and 3 of PAIA. This document is accordingly prepared, submitted for public review and comments in terms of PAIA.

5.3. The Mineral and Petroleum Resources Development Act (Act No. 49 of 2008)

The MPRDA was passed in order to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, and to provide for matters connected therewith. The Preamble to the MPRDA inter alia affirms the State's obligation to:

- protect the environment for the benefit of present and future generations;
- ensure ecologically sustainable development of mineral and petroleum resources, and;
- promote economic and social development.

The aforesaid MPRDA preamble affirms the general right to an environment provided for in section 24 of The Constitution of the Republic of South Africa, Act 108 of 1996 (then Constitution). The national environmental management principles provided for in section 2 of the National Environmental Management Act (NEMA), Act No.107 of 1998 apply to all mining and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including, inter alia, the Department of Mineral Resources (DMR), previously known as the Department of Minerals and Energy (DME), which may significantly affect the environment. Any mining or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of mining and mining projects in order to ensure that exploitation of mineral resources serves present and future generations.

The project is in relation to mining activities, and for that instant the Mineral and Petroleum Resource Development Act applied herewith and necessary licensing application has been taken into consideration.

5.4. National Environmental Management Act (Act No. 107 of 1998)

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 8th 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 rehabilitate the effect of 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 GN983, GN984 and GN985. 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

The listed activities triggered by the proposed mining permit activities are activity 21 and activity 27 of the Listed Notice 1 of the GNR983 as amended and these activities are been assessed in the EIA process being undertaken (i.e. Basic Assessment). This DBAR and EMPr will be circulated to all identified and registered IAPs including the competent and commenting authority in support of the application for environmental authorisation.

5.5. National Environmental Management Air Quality Act (Act No. 39 of 2004)

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 mining permit activities will not trigger any of the activities listed under the above-mentioned Regulations as Contrarians (Pty) Ltd will ensure that emissions from their activities complies with the standards as set in the above-mentioned regulations. Dust Control Regulations describe the measures for control and monitoring of dust, including penalties. These regulations will be applicable during the mining phase.

5.6. The National Heritage Resources Act (Act No. 25 of 1999)

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 this act, certain listed activities require authorisation from provincial agencies:

a. the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
b. the construction of a bridge or similar structure exceeding 50 m in length;
c. any development or other activity which will change the character of a site—

    i. exceeding 5 000 m2 in extent; or
    ii. involving three or more existing erven or subdivisions thereof; or
    iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

d. the re-zoning of a site exceeding 10 000 m^2 in extent; or
e. any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The applicant must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Stand-alone HIAs are not required where an EIA is

carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.

Further assessment of the proposed area will be done prior to mining activities commencement to determine if there are any sites that require protection. Any sites identified will be marked and no mining will be undertaken in close proximity of such a site. A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed mining activities.

5.7. National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEM: BA)

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.

In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.

In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.

The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary

statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011).

The Basic Assessment Report and Environmental Management Programme has been complied to ensure that all applicable requirements prescribed in the NEM: BA are complied with.

5.8. Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)

The Department of Mineral Resources (DMR) 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 and waste management licences in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA), respectively, 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 accepted by the Department of Mineral Resources on the 28th May 2021 as the competent authority.

5.9. National Water Act (Act No. 36 of 1998) (NWA)

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). Furthermore, 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.

No Water Use Licence Application has been submitted yet to the Department of Water and Sanitation for their consideration. However, measures are been undertaken to ensure that requirements in terms of the NWA and the GN 704 are complied with where necessary.

5.10. 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.

As no waste disposal site is to be associated with the proposed project, no permit is required in this regard. Waste handling, storage and disposal during operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr.

5.11. The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

The aim of the National Environmental Management: Protected Areas Act (No 57 of 2003) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural seascapes. The purpose of a Protected Environment is amongst others to protect a specific ecosystem outside a special nature reserve world heritage site or nature reserve and also to ensure the use of the natural resources in the area is sustainable.

5.12. The Conservation of Agricultural Resources Act (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (No 43 of 1983) requires the maintenance of riparian vegetation and provides a list of invasive alien vegetation that must be controlled or eradicated. Control of invasive vegetation has been discussed in the Environmental Management Plan (EMPr).

5.13. The Occupational Health and Safety Act (Act No. 9 of 1997)

The Occupational Health and Safety Act, 1993 (No.85 of 1993) provides for the health and safety of people at work as well as the health and safety of persons using plant and machinery. The applicant, Contrarians (Pty) Ltd, will be required to meet the requirements of the OHS Act during the construction and operational phases of the proposed project.

5.14. The Mine Health and Safety Act (Act No. 29 of 1996)

The Mine Health and Safety Act, Act 29 of 1996 provide for protection of the health and safety of employees and other persons at mines and, for that purpose –

- to promote a culture of health and safety;
- to provide for the enforcement of health and safety measures;
- to provide for appropriate systems of employee, employer and State participation in health and safety matters;
- to establish representative tripartite institutions to review legislation,
- promote health and enhance properly targeted research;
- to provide for effective monitoring systems and inspections, investigations and inquiries to improve health and safety;
- to promote training and human resources development;
- to regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety;
- to entrench the right to refuse to work in dangerous conditions; and to give effect to the public international law obligations of the Republic relating to mining health and safety; and to provide for matters connected therewith.

Contrarians (Pty) Ltd, will be required to meet the requirements of the MHS Act during the operational phases of the proposed project.

6. Need and desirability of the proposed activities.

In terms of the EIA Regulations the need and desirability of any development must be considered by the relevant Competent Authority when reviewing the application. The need and desirability must be included in the reports to be submitted during the Environmental Authorisation application processes. This section of the DBAR and EMPr indicates the need and desirability for the proposed mining permit project.

Coal is South Africa's dominant energy source. 77% of South Africa's energy needs are provided by coal, according to the Department of Energy. Eskom produces 95% of electricity used in South Africa, and its coal-fired stations produce about 90% of electricity produced by the utility. Coal also serves many industrial uses, among the most significant are steel production, which uses metallurgical/ coking coal, and cement manufacture.

With South Africa's economy built on gold and diamond mining, the sector is an important foreign exchange earner, with gold accounting for more than one-third of exports. Given its history and mineral wealth, it is no surprise that the country's mining companies are key players in the global industry. The coal mining industry is an important employer. The mining industry as a whole employed a total of 535 457 individuals at the end of June 2012. The coal mining industry was the third largest employer, employing 91 605 individuals (17% of the total mining workforce). The PGM industry ranked first (206 764 or 38%), followed by gold (144 084 or 27%). There will be direct and indirect employment due to this project.

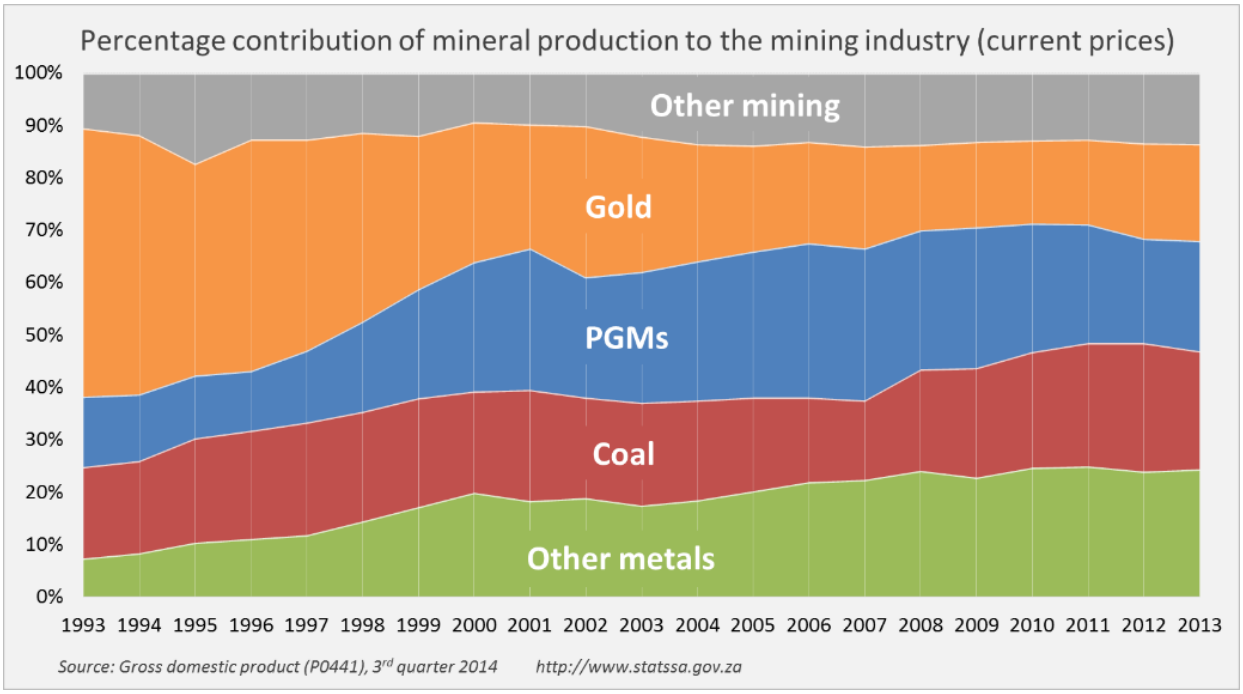


Figure 2: Source: Gross domestic product (P0441), 3RD quarter 2014

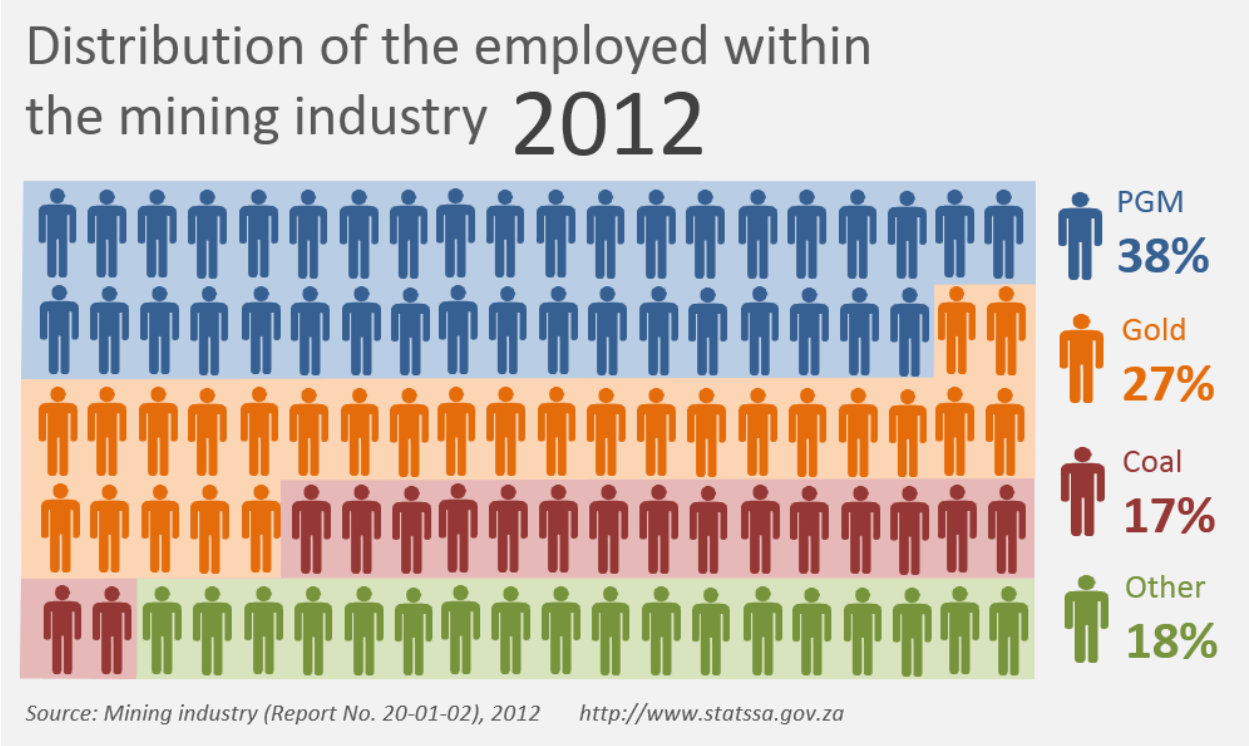


Figure 3: Source: Mining industry (Report No. 20-01-02), 2012

The mining operation will help Steve Tshwete Local Municipality's achieve the 2021/2022 IDP which plans to meet the key challenges facing the area including housing and road infrastructure. Steve Tshwete Local Municipality furthermore plans to ensure equitable access to social infrastructure and to promote Local Economic Development by way of an evenly distributed range of Multi-Purpose Community Centres to be established throughout the District. The coal mine can thus help meet demands of the Local Municipality in terms of service delivery and promoting development of the area by the provision of sand for cement to be used in construction.

The broader socio-economic benefits of the project include employment, skills development, local economic development through the availability and affordability of the coal, and increased business development for the area generally. While the project is small in operation, the providing of high-quality Coal to be used for generating electricity, which will aid to the supply of Coal to Eskom.

The applicant (Contrarians Pty Ltd) further commits to ensure their contribution to environmental education and to their employees during the project lifespan. The employees will be made aware of work that may be harmful to their health and the environment and of any work posing danger. This is undertaken in terms of the Mine Health and Safety Act, 1999 (Act 25 of 1999) and their regulations, which gives the employees the right to refuse work that is dangerous. The

applicant will respect decisions of employees regarding the above and is committed to the protection of employees against any dangerous working environment.

6.1. Motivation for the overall preferred site, activities and technology alternative.

Mining is the most important economic sector in the country as a whole, and the area proposed for the project lies within the shales and sandstones of the Rose Hill Formation and the thin, distinct Keefer Formation underlie the flanks of the mountains. These Formations comprise alternating layers of chromatite, pyroxenite, norite and anorthosite (SACS, 1980). The outcrop of the Winterveld Norite-Anorthosite Formation, which hosts the platiniferrous UG-2 chromatite layer and Merensky Reef is orientated north/south.

The project site is located in the Steve Tshwete Local Municipality and according to the municipality's draft integrated development plan 2016/17-2020/21, it was identified that Steve Tshwete Municipality has significant mining of Coal, but unemployment is still significantly above the provincial average. The project will result in several benefits both at the local and national levels. The local economy will also be boosted by the creation of job opportunities. The proposed mining method for Coal will be mainly excavation (opencast) allows easy access of mining machinery and mobile offices installations to the site using existing roads and does not require extensive machinery or any development for new structures based on the project scale. The applied area is located in a close proximity to other mines, and this will assist the operation of mine in terms of not expanding in the already existing infrastructures such as roads, waste management facilities, water facility etc and this alone would minimise the impact the proposed project would have.

6.1.1. Preferred site

The proposed mining area is targeted as, historically several Coal occurences are known in the area with a coal mine (Rietfontein mine) within 15km from the site area. The site therefore regarded as preferred site and alternative site is not considered.

6.1.2. Technological and Site Activity Alternatives

The most economical method (strip and horizon mining method) of coal extraction from coal seams depending on the depth and quality of coal will be used. The technology to be used cannot be replaced by any other methods thus these are the preferred activities

Due to the nature of the proposed mining activities future land use alternatives will not be compromised. In terms of the technologies proposed, these have been chosen based on the

long term success of the company in terms of their mining history. The mining activities proposed in the Mining Works Programme is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted mining techniques .

7. Full description of the process followed to reach the proposed preferred alternatives within the site.

7.1. Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect 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.

7.1.1. The property on which or location where it is proposed to undertake the activity;

The location alternative considered for the proposed project includes the mining site and access routes. The location alternatives were selected based on a number of criteria, which include the environmental considerations (how sensitive is the area in terms of soils, wetlands, groundwater etc.) and the dependency of the project to the required infrastructure.

7.1.2. The type of activity to be undertaken;

The most economical method (strip and horizon mining method) of coal extraction from coal seams depending on the depth and quality of coal will be used. The technology to be used cannot be replaced by any other methods thus these are the preferred activities

7.1.3. The design or layout of the activity;

The proposal layout for the coal mining activity will be as per the attached infrastructure sketch plan. There will be one entrance via existing access gravel road from the R575 road and mine/gravel roads. There will also be two (2) sections of dumps and coal stockpiling, immediately from the mine pit. There will be mobile site office and a portable chemical toilets

within the mobile offices, which will be utilised by the employees. The site has been minimised to impact the smallest possible area

7.1.4. The technology to be used in the activity;

The only practical means of coal mining is per a front-end loader and excavator method, and/or by means of the drilling, blasting, loading and hauling system. Accordingly, no other input alternatives were considered. It has been determined that the only best technological way of undertaking the proposed activities would be to use front-end loader and excavator.

As mentioned above, that the front-end loader and excavator will be utilised and this equipment's uses energy such as petrol and diesel, therefore the best way will be to use current available energy on the operation of the proposed project. In terms of running the offices on a daily basis for mining operation, generators will be utilised. In view of the above, no input material alternatives were considered for this project.

7.1.5. The operational aspects of the activity;

The mining area must be clearly demarcated (Working Areas and No-go Areas), by means of pegs/markers at all corners of the site and along its boundaries (where practical). Permanent pegs/markers must be firmly erected and maintained in their correct position throughout the life of the operation.

Working areas

- The Site shall be divided into working areas and 'no-go' areas and shall be marked on appropriate plans for reference.
- Working areas are those areas required by the mining permit to erect their site works.

No-go Areas

- No-go' areas are generally those large areas outside the designated working areas, and may include, but not be limited to:
- Existing services and infrastructure (e.g. overhead power line towers and bridge pylons)
- Watercourses
- Any heritage sites that receives the protection (Provincial Heritage Resources Authority Mpumalanga).
- Natural or special features as defined in the Environmental Specification.

7.1.6. The option of not implementing the activity.

The 'no-go' alternative is the option of not undertaking mining permit activities on the project site. The no-go option assumes the site remains in its current state. The no go alternative would result in no impacts on the social and biophysical environment.

The Project Manager and Safety Officers shall ensure that all "no go" areas are demarcated and that no unauthorised entry, litter, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated "no go" areas. Once mining activities within an area has been completed and the area has been rehabilitated and re-vegetated, it shall be considered a "no go" area.

7.2. Details of the Public Participation Process Followed

7.2.1. Identification of Interested and Affected Parties

Settlements were identified through the use of the 1:50 000 topographical map, aerial imagery Title deed searches and through consultation. No communities are situated on the said properties. All the affected properties belong to private farmers and some portions are state owned land.

Other I&APs identified, include Organs of State, who have jurisdiction over, or might have an interest in the proposed protecting activities, adjacent and other landowners, non-governmental organisations and other organisations and/ private persons.
Adjacent and non-adjacent landowners were identified through the review of property databases and deed searches, natural person (s) contact databases, and expanded through queries and recommendations made by identified stakeholders and general internet based searches.

a. *Methodology of Notification:*
    - Cadastral search and Deeds searches to identify farm portions
    - Adverts and Site Notices to notify stakeholder
    - Distribution of BIDs with comments sheet requesting the recommendation of any other stakeholders
    - Site Visit to consult with stakeholder
    - Community or Communities Identified and whether these parties are the landowner.

b. Land Claims

The request for a Land Claim Letter was e-mailed to from the Liimpopo Department of Rural Development and Land Reform (Sonto Shongwe and Molimisi Mathedimosa) on the 16th of June 2021. The department has not responded to the landclaim enquiry to this date.

c. Traditional Authorities

No Traditional Authority was identified.

d. Municipalities

The project is located within the Magisterial District of Middleburg, under the jurisdiction of the Steve Tshwete Local Municipality, located with in Nkangala District Municipality. Both municipalities were informed in person, BID and Site Notices were hand delivered.

e. Landowners and Notification Methodology

The Landowners involved are all private farmers and only only the woner of portion 17 of farm Rietfontein 314 JS JS responded. The farm owner of portion 19 of farm Elandspruit 291 JS was not found (contact details). Envirostep obtained the details for each landowner from the Title Deed search done. BIDs were also sent where applicable. In addition a Site Visit to the study area was done on the 22nd of June 2021. In addition meetings with stakeholders were not held due to Covid-19 lockdown restrictions. The following method was applied in informing relevant stakeholders.

f. Adverts were place in the:

- Middleburg observer on the 25th of June 2021

- BID and Registration Sheet with a Locality map was sent to all interested and affected parties via e-mai l on the 22nd of June 2021.
- A site visit was conducted on 22nd May 2021.
- All Government department where informed of the said application in person and via e-mail.
- A3 Site Notices were placed at the site boundary, Steve Tshwete Local Municipality, Emalahleni local municipality, Steve Tshwete local library and Nkangala district municipality on 05th July 2021.
- BIDs were printed and made available within the study area (Uitkyk community), local libraries and local municipalities.

- A draft copy of this BAR and EMP will be provided to all I&APs registered on the project database for a period of 30 days to allow I&APs the opportunity to comment on the findings of the EMP. The draft report will be made available to I&APs on the 05th of July 2021.
- Unfortunately due to Covid-19 lockdow restrictions, meetings were not held, only telephones calls and emails notifications about the project were done.

g. Issues and Response Register

All comments received by Stakeholders are included in the table below.

7.2.2. Summary of issues raised by I&Aps

Table 5: Summary of issues raised by I&APs

Interested and Affected Parties **List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES					
Landowner/s	**X**				
Sons of God ministries	x				
Lucas Cornelus de Clercq	x	23/06/2021	Portion 17 of Rietfontein 314 js which I am the owner, according to your map does not form part of the marked area. I am downstream across your southern boarder in the same catchment area. Are you aware of the gas pipe lines to the south and north of this area?	Yes, the gas line belongs to Afrox and they will be contacted to see if we encroaching on their lines or if we need to create buffers.	
Municipality	**X**	23/06/2021	STM & NDM (They both requested a BAR and EMP for comments)		
Organs of state (Responsible for					

infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
DARDLEA Tshimangadzo Tshikwatala	x	23/06/2021			
Communities	x	23/06/2021			
Uitkyk					
Dept. Land Affairs					
Molimisi Mathedimosa Sonto Shongwe	X	16/16/2021			
Traditional Leaders					
No Traditional Leaders within the site area					

7.3. Concluding Remarks on Stakeholder Consultation

Only a gas pipeline across the proposed area for Afrox has been raised by the farm owner. The consultation commenced two weeks after the acceptance of the application and therefore the findings in this section should be considered preliminary and will be updated once the final report is available. The consultation report have not been submitted to the DMR (Competent Authority).

8. The Environmental attributes associated with the alternatives.

8.1. Baseline Environment

8.1.1. Type of environment affected by the proposed activity.

The biophysical environment is described with specific reference to geology and soils, vegetation and landscape features, climate and general biodiversity.

8.1.2. Description of the current land uses.

Based on the available information from previous studies conducted in the same area, it is assumed that the land portions included in the mining permit application is currently not utilized for anything. This was confirmed during a site investigation and stakeholder investigation process conducted on the 22nd of June 2021.

8.2. Description of specific environmental features and infrastructure on the site.

8.2.1. Geology and soils

According to Mucina and Rutherford (2006) the site is underline with quartzite ridges of the Witwatersrand Supergroup, the Pretoria Group and the Selons River Formation of the Rooiberg, which the last two mentioned forms part of the Transvaal Supergroup. It supports soils of various quality namely shallow Glenrosa and Mispah which forms especially on rocky

ridges. Land capability is the combination of soil suitability and climate factors. The site and surrounds has a land capability classification, on the 8-category scale, of Class 3 –arable, moderate to severe limitations regarding crop production, with good grazing pastures.

8.2.2. Vegetation and landscapes feautures

In terms of vegetation type the site falls within the Rand Highveld Grassland vegetation type (Mucina and Rutherford, 2006). Rand Highveld Grassland type, is described by Mucina and Rutherford (2006) as 'Vulnerable'. Rand Highveld Grassland vegetation covers areas of Gauteng, North-West, Mpumalanga and Free State Provinces. This vegetation occurs mainly in areas between rocky ridges from Pretoria to Witbank, extending onto ridges in the Stoffberg and Roossenekal regions as well as west of Krugersdorp centred in the vicinity of Derby and Potchefstroom, and extending southwards and north-eastwards.

Parts of the sites are located in the Mesic Highveld Grassland. According to the South African National Biodiversity Institute (SANBI) Grassland Ecosystem Guidelines (2013) General characteristics of this group are that they:

- Are located in the eastern, higher rainfall parts of the Highveld, covering much of Gauteng, the Eastern Free State, much of Mpumalanga and extending slightly into neighbouring parts of the Eastern Cape, and Lesotho.
- Comprise 17 national vegetation types.
- Are made up of highly productive sourveld grasslands characterised by long-lived grasses that favour re-sprouting and other plants that show a tendency to store carbohydrates in specialised underground storage organs; plants withstand above-ground disturbance by being long-lived with only occasional replacement from seed.
- Are adapted to a climate characterised by high summer rainfall (700 – 1 200 mm mean annual precipitation), combined with warm summer temperatures and cool to cold winters with a moderate to high incidence of frost.
- Occur at mid-altitudes (1 300 – 1 800 m) in varied landscapes that include extensive flat or undulating plains broken by low hills and tafelbergs, rocky outcrops, steep boulder-strewn slopes and deep river valleys.
- Occur on soils that are generally deep, fertile and free-draining but can have impervious layers of hardpan or 'ouklip' (impervious soil layers, often infused with minerals such as calcium carbonate or iron oxide). The diversity of soil types is influenced by the underlying geology which includes base layers of sedimentary rock (shales, mudstones and sandstones), cut through by dykes and ridges of dolerite, quartzite and gabbro. A high proportion of vegetation types in Mesic Highveld Grassland are considered to be

threatened and this ecosystem group is generally poorly protected. Many key economic activities take place in this grassland ecosystem – mining, grazing, cultivation, plantation forestry and urban settlement. Mesic Highveld grasslands are key water production landscapes – many wetlands and pans and five major river systems have their origin in these grasslands – refer to Figure 4 below

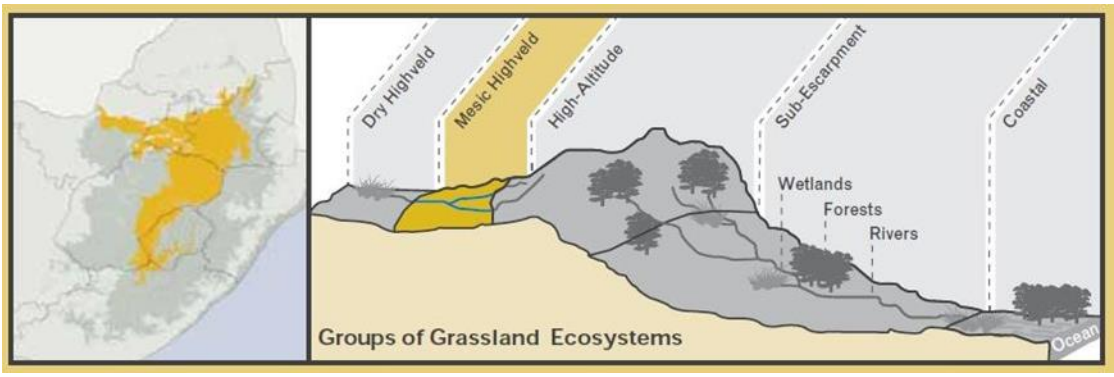


Figure 4: Groups of Grassland Ecosystems

Vulnerabilities or pressure in Mesic Highveld Grassland due to urban sprawl:

Mesic Highveld grasslands happen to be home to some of the major urban and economic centres of the country, such as Johannesburg in Gauteng. The trend of rapid urbanisation, and its associated growth in demand for infrastructure, can cause increasing habitat loss and fragmentation of landscapes if it is not carefully planned. In many instances, the growth is associated with extensive informal peri-urban sprawl and undesirable ribbon development along main roads.

Hydrological characteristics:

Mesic Highveld grasslands are located in high rainfall regions and are vitally important for water production. The characteristically dense vegetation cover traps surface water, slowing runoff and allowing more time for water to drain vertically through the porous soil profile; this water is then stored as sub-surface water by the impermeable rock layers that lie beneath the subsoil. This sub-surface water drains slowly as clean water into the many wetland systems that occur throughout this ecosystem (as a result of its flattish topography), replenishing streams and rivers almost year-round. The supply of good quality water from these ecosystems is important for domestic, agricultural, industrial and commercial water users both in South Africa and neighbouring countries.

The National Classification System for Wetlands (Ollis et al. 2013) recognises the following main categories of wetland, based on how they function:

- Seeps: (sometimes called 'sponges'): these are generally seasonal, small and widely scattered wetlands formed at valley heads or on hill-slopes, largely by the discharge of sub-surface water.
- Valley-bottom Wetlands: these occur in valley bottoms and are usually wetter for longer periods than seeps. They may be channelled (with at least one or more clearly defined stream channels, but lacking floodplain features), or un-channelled (with no clearly defined stream channel).
- Floodplain Wetlands: gently sloped, with floodplain features and a distinct stream channel.
- Depressions and 'Flats': areas that accumulate surface water (e.g. 'pans'), either in depressions, or extensive areas characterised by level, gently undulating or uniformly sloping land.

8.2.3. Climate

The area is characterised by a strongly seasonal summer-rainfall, warm-temperate region, with very dry winters. The Mean Annual Precipitation (MAP) ranges from about 570-730 mm, slightly lower in the western regions. The average known daily temperature difference varies from a minimum of 13,5°C in January to a maximum of 20,6°C in August. The average annual winter temperature can be taken as 15,5°C and the average summer temperature as 27,2°C.

8.2.4. Biodiversity

According to the Provincial Data Base, the Mpumalanga Biodiversity Conservation Plan (MBCP), the sites Biodiversity Conservation Status and Ecological Corridors are classified as, 'Least concern'. These areas have biodiversity value in the form of natural vegetation cover. Although they are not currently required in order to meet biodiversity targets, they do contribute significantly to functioning ecosystems, including ecological connectivity. A greater variety of development choices exists in these areas. However, they are still subject to National EIA legislation. Per the MBCP the land use suitability per biodiversity category, urban and business developments are permitted. Furthermore, the area is classified as a highly significant

catchment in terms of importance for aquatic biodiversity and water production. Wetlands vary, from seasonally waterlogged grasslands; from seep zones to vleis and floodplains. The countries most important and extensive wetlands occur in Highveld grasslands and are probably the most threatened ecosystems and yet are most important to human livelihoods – refer to Figure 5 for the Mpumalanga Biodiversity Conservation Plan Map.

Figure 5: Land use suitability per biodiversity category

7.10.14. Socio-economic

The socio-economic analysis is specifically aimed at spatial related matters, i.e. employment, income and economic profile. This analysis is based on a municipal level to give a broader overview of the Municipality. Povertyand Inequality In the last ten years the municipality has

made huge investments in infrastructure and housing development as a result of that, poverty and inequality has been decreasing steadily. However the current rate of unemployment and poverty are key factors contributing to high inequality levels.

Table 6: Poverty in Steve Tshwete 2001, 2011 and 2016

Indicators	2001	2011	2015
Pverty rate	31.6%	25.9%	21%
Number of people in poverty	48 865	59 929	53 567
Poverty gap (R million)	R54	R110	R575

Source: Statistics South Africa Census 2001, 2011, 2016

The share of population in Steve Tshwete below the poverty line (of StatsSA) declined/improved to 21.0% (53 567) in 2015 with the lower-bound poverty line of R575 per capita per month. In 2015, Steve Tshwete's share of population below the lower-bound poverty line was the 2nd lowest (favourable) among the municipal areas. According to the 2016 Community Survey of StatSA, the poverty headcount of Steve Tshwete deteriorated from 4.3% in 2011 to 5.1% in 2016 which then made the municipality to be 4th lowest in the Province however the poverty intensity decreased slightly from 42.0% to 41.7% in the same period.

Employment

Steve Tshwete economy is one of the biggest economic areas and it is therefore expected that a significant number of employment opportunities are being provided in the area. Mining, trade and manufacturing are the major leading employment drivers in Steve Tshwete LM. The unemployment rate of Steve Tshwete decreased slightly from 19.7% in 2011 to 16.4% in 2015 and was the lowest among all the municipal areas of Mpumalanga. Unemployment rate for females 21.8% and that of males 12.9%.Youth unemployment rate according to the 2011 Census figures 27.1% - challenge with especially very high youth unemployment rate of females. The largest employing industries in Steve Tshwete are trade (including industries such as tourism), community/government services and mining. High labour intensity in industries such as agriculture, trade and construction.

Cultural and heritage aspects

Special attention was given to the identification of possible cultural or heritage resources on site. The initial site investigation concluded that there are no obvious heritage resources located on the site earmarked for development. However, a Heritage Impact Assessment will be conducted to ensure that there would be no impact on cultural or historical features as a result of the proposed activity. From a heritage point of view the following condition will apply:

- To address any subsurface cultural or heritage resources it needs to be clearly stated in the construction environmental management plan, submitted with the EIA report, that SAHRA will be informed immediately should any artefacts be exposed during construction. Training of contractors on heritage issues will also form part of the contractor's brief.

8.3. Environmental and current land use map.

Attached to Appendix A

9. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

The following table illustrates the potential impacts associated with each activity.

Table 5: Potential impacts associated with each activity.

Activity	Potential impact	Aspects affected	Phase	Significance	Mitigation type	Significance
Contraction of Infrastructure	Fugitive Dust generation	Air Quality	Contraction Phase	Minor Negative	Monitor and manage through: Mine plan	Minor Negative
	Topography and visual alteration	Topography and visual environment	Minor negative	Minor Negative	Avoid and minimise through: Mine plan	Minor Negative
	Degradation to soil resources	Soils	Construction phase and Operational phase	Moderate negative	Prevent through: Soil rehabilitation plan and storm water management plan	Negligible Negative
	Influx of alien invasive vegetation	Flora and fauna	Construction phase	Minor negative	Prevent through: Storm water Management plan and alien invasive management	Minor negative
	Noise generation	Noise	LoM	Negligible Negative	Manage and prevent through: Regular vehicle inspections	Moderate Positive
	Sedimentation and siltation of water courses	Wetland& Aquatic Ecology	Construction Phase	Minor negative	Monitor and prevent through: Aquatic monitoring programme; Storm water management plan	Negligible Negative
		Surface water				

PCD	Contamination of water resources	Wetland and Aquatic ecology	Operational phase	Minor negative	Monitor and manage through: Storm water management plan and Aquatic monitoring programme	Minor negative
		Surface water			Manage and prevent through: storm water management plan	Negligible Negative
		Ground water			Monitor and manage through: Storm water management plan; Ground water monitoring programme and emergency response plan	
Demolition of infrastructure	Fugitive dust generation	Air Quality	Decommission phase	Minor Negative	Monitor & manage through: Dust management plan and Dust monitoring programme.	Negligible Negative
	Alteration of topography and visual environment	Topography &visual environment			Remedy through: rehabilitation plan and closure plan	N/A

	Hydro-Carbons and waste material contamination	Soils		Moderate Negative	Mana through: Emergency response plan	Minor negative
	Alien invasive vegetation establishment	Flora and Fauna		Negligible Negative	Manage through: Alien Invasive and Management programme	Negligible Negative
	Noise generation	Noise			Prevent and manage through: Vehicle maintenance plan	
	Sedimentation and contamination of water resources	Wetlands and aquatic ecology		Minor negative	Monitor remedy through: Emergency response plan and Aquatic monitoring programme	Minor negative
		Surface water			Remedy through: emergency response plan	Negligible negative

10. Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

10.1. Criteria of assigning significance to potential impacts

The evaluation of impacts is conducted in terms of the criteria detailed in Table 7 to Table 11. The various environmental impacts and benefits of this project are discussed in terms of impact status, extent, duration, probability, and intensity. Impact significance is regarded as the sum of the impact extent, duration, probability and intensity and a numerical rating system has been applied to evaluate impact significance; therefore an impact magnitude and significance rating is applied to rate each identified impact in terms of its overall magnitude and significance (Table 11).

In order to adequately assess and evaluate the impacts and benefits associated with the project it was necessary to develop a methodology that would scientifically achieve this and to reduce the subjectivity involved in making such evaluations. To enable informed decision- making it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impact or benefit on the surrounding natural and social environment.

10.2. Impact Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

Table 7: Status of Impact

Rating	Description	Quantitative Rating
Positive	A benefit to the receiving environment	P
Neutral	No cost or benefit to the receiving environment	-

Rating	Description	Quantitative Rating
Negetive	A cost to the receiving environment	N

10.3. Impact Extent

The extent of an impact is considered as to whether impacts are either limited in extent of if it affects a wide area or group of people. Impact extent can be site specific (within the boundaries of the development area), local, regional or national and/or international.

Table 7: *Extent of impact*

Rating	Description	Quantitative Rating
Low	Site specific: occurs within the site boundry	1
Medium	Local: Extends beyond the site boundry; Affects the immediate surrounding environment (i.e. up to 5km from the project site boundry)	2
High	Regional: Extends far beyond the site boundry; widespread effect (i.e. 5km and more from the project site boundry)	3
Very High	National: Extends far beyond the site boundry; widespread effects.	4

10.4. Impact Duration

The duration of the impact refers to the time scale of the impact or benefit.

Table 8*:* Duration of Impact

Rating	**Description**	**Quantitative Rating**
Low	Short term: Quickly reversible; less than the project lifespan; 0-5 years.	1
Medium	Medium term: Reversible over time; Approximate lifespan of the project; 5-17 years.	2
High	Long term: Permanent; Extends beyond the decommissioning phase; >17 years	3

10.5. Impact Probability

The probability of the impact describes the likelihood of the impact actually occurring.

Table 9: Probability of impact

Rating	Description	Quantitative Rating
Improbable	Possibility of the impact materialising is negligible; Chance of occurrence <10%.	1
Probable	Possibility that the impact will materialise is likely; Chance of occur rence 10 – 49.9%.	2
Highly Probable	It is expected that the impact will occur; Chance of occurrence 50– 90%.	3
Def ini te	Impact will occur regardless of any prevention measures; Chance of occurrence >90%.	4
Definite and Cumulat ive	Impact will occur regardless of any prevention measures; Chance of occurrence >90% and is likely to result in cumulative impacts	5

10.6. Impact Intensity

The intensity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project.

Table 10: Intensity of Impact

Rating	Description	Quantitative Rating
Maximum Benefit	Where natural, cultural and/or social functions or processes are positively affected resulting in the maximum possible and permanent benefit.	+5
Significant Benefit	Where natural, cultural and/ or social functions or processes are altered to the extent that it will result in temporary but significant benefit.	+4
Beneficial	Where the affected environment is altered but natural, cultural and/ or social functions or processes continue, albeit in a modified, beneficial way.	+3
Minor Benefit	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are only marginal ly benef i ted.	+2
Negligible Benefit	Where the impact af fects the envi ronment in such a way that natural, cul tural and/ or social funct ions or processes are negligibly benefited.	+1
Neut ral	Where the impact af fects the envi ronment in such a way that natural, cul tural and/ or social funct ions or processes are not affected.	0
Negl igible	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are negligibly affected.	-1
Minor	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are only marginally affected.	-2
Average	Where the affected environment is altered but natural, cultural and/ or social functions or processes continue, albeit in a modified way.	-3
Severe	Where natural, cultural and/ or social functions or processes are altered to the extent that it will temporarily	-4

Rating	Description	Quantitative Rating
	cease.	
Very Severe	Where natural, cultural and/ or social functions or processes are altered to the extent that it will permanently cease.	-5

10.7. Impact Significance

The impact magnitude and significance rating is utilised to rate each identified impact in terms of its overal l magnitude and significance.

Table 11: Impact Magnitude and Significance Rating

Impact	Rating	Description	Quantitative Rating
7	High	Of the highest positive order possible within the bounds of impacts that could occur.	+12- 16
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. Other means of achieving this benefit are approximately equal in time, cost and effort.	+6- 11
	Low	Impacts is of a low order and therefore likely to have a limited effect. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.	+1- 5
No Impact	No Impact	Zero impact	0
Negat ive	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural, and economic activities of communities can continue	-1- 5

Impact	Rating	Description	Quantitative Rating
		unchanged.	
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly possible. Social cultural and economic activities of communities are changed but can be cont inued (albeit in a different form). Modification of the project design or alternative action may be required.	-6- 11
	High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt.	-12- 16

11. The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

11.1. Potential impacts on communities, individuals or competing land uses in close proximity

The following impacts are regarded as community impacts:

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;

- Noise due to the undertaking of the site fly-overs;
- Poor access control resulting in impacts on cattle movement, breeding and grazing practices;
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
- Visual Impact

Mining will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the mining activities.

11.1.1. Water quality and availability

There is no river identified close by.

11.1.2. Influx of persons resulting in increased crime rates

The potential impacts of an increase in crime rates associated with an influx of unemployed persons travelling to mine sites seeking employment may occur.

11.1.3. Visual Impact

The general characteristics of the site and that of the surrounding area are regarded to be that of “wilderness” and mining activities may result in localised visual impacts.

11.2. The possible mitigation measures that could be applied and the level of risk.

The section below provides a summary of the key management measures associated with the impacts identified in the previous section. The detailed rating and management plan is presented in Section 10, page 53.

11.2.1. Measures to manage the potential impact on heritage resources

No Heritage Impact Assessment study has been conducted. No graveyards were identified during the site visit.

11.2.2. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity

a. *Pollution Prevention*

- Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. These mitigation and management measures are discussed in the following section.

b. *Noise due to the under taking of the site fly-overs and mining activities;*

- Directly affected, adjacent landowners and game farms in proximity to the site will be informed of the planned dates of the airborne geophysics survey and a grievance mechanism will be made available. Mitigation alternatives are limited to timing of the flyovers which may affect aspects such as hunting activities on game farms.
- Farms owners must be consulted and informed of any low fly overs which may affect people or any animals being held in restricted holding pens, with a view to prevent possible injury or damage as a result of animals being start led by the noise.
- Site activities will be conducted during day time hours 07h00– 17h30 to avoid night time noise disturbances and night time collisions with fauna.

c. *Poor access control resulting in impacts on cattle movement, breeding and grazing practices;*

- Access control procedures must be agreed on with farm owners and all staff trained on these procedures.

d. *Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime;*

- Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
- The landowner (all private and state land owners) will be notified of unauthorised persons encountered on site.
- If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.

e. *Visual Impact*

- Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered in order to conserve water resources.
- The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
- A waste management system will be implemented and sufficient waste bins will be provided for on- site. A fine system will be implemented to further prohibit littering and poor housekeeping practices.

Mining will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the mining activities.

11.2.3. Measures to manage the potential impact on Water quality and availability

a. Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion will be mitigated and managed as follows;

- Existing tracks and roads must be used as far as is practicable to minimize the potential for soil erosion. In instances where access to drill sites are to be established, and if required, raised blade clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential .
- Soil disturbances are to be limited as far as is practicable to minimize the potential for soil erosion.
- When establishing the drill pad, topsoil including the remaining vegetation, will be stripped and stockpiled up- slope of the pad. The stock pile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad. Stockpiled topsoil will be used during rehabilitation efforts.
- Where practicable topsoil will be stripped to a depth of 10cm. Topsoil will be stockpiles to a max imum height of 1.5 m with a side slope of not more than 1:3.
- Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes.

- To reduce the potential for water pollution during the drilling activities, a sump will be constructed with a sufficient capacity to receive drill fluids and allow for evaporation.
- The sump will be constructed to divert storm water away and/ or around the sump to avoid clean stormwater inflow.
- Oils and lubricant will be stored with in secondary containment structures.
- Where practicable, vehicle maintenance will be undertaken off- site.
- In the event that vehicle maintenance is undertaken on- site (i.e. such as break down maintenance), drip trays and/ or UPVC sheets will be used to prevent spills and leaks onto the soil.
- A waste management system will be implemented and sufficient waste bins will be provided for onsite. A fine system will be implemented to further prohibitlittering and poor housekeeping practices.
- Waste separation will be undertaken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).
- Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.
- Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.
- Drill holes must be temporarily plugged immediately after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate the risk posed to fauna by open drill holes.
- Drill holes must be permanently capped as soon as is practicable.

11.2.4. Motivation where no alternative sites were considered.

Based on the existing Coal mines in the area, there is possibility to encounter further minerals (Coal) on the properties subject to this Mining Permit Application was identified.

The applicant therefore applied for mining permit on the properties as discussed in this report to extract Coal on a small scale. No alternatives are available that will have an impact on a different setting than the environment discussion provided below.

The site is therefore regarded as the preferred site and alternative sites are not considered.

11.2.5. Statement motivating the alternative development location within the overall site.

As it is clear from the information provided, each of the phases is dependent on the results of the preceding phase. The location and extent of extraction and hauling has determined based on information derived from the geophysics surveys.

12. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

In order to identify the potential impacts associated with the proposed mining activities the following steps were undertaken:

The stakeholder consultation process was undertaken in a manner to be interactive, providing landowners and identified stakeholders with the opportunity to provide input in to the project. This is a key focus, as the local residences have capabilities of providing site specific information, which may not be available in desktop research material. Stakeholders are requested (as part of the BID) to provide their views on the project and any potential concerns which they may have. All comments and concerns will be captured and formulated into the impact assessment.

A detailed desktop investigation was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations various resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of**:**

- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database LUDS system;
- Geographic Information System base maps;
- Department of Water Affairs information documents such as the (ISP and Groundwater Vulnerability Reports);
- Municipal Integrated Development Plan;
- Municipal Strategic Development Framework; etc.

A site visit was undertaken on 22nd of June 2021. This site visit was utilized to ensure that the information gathered as part of the desktop investigation reflects the current status of the land.

The rating of the identified impacts was undertaken in a quantitative manner as provided from Impact Ratings. The ratings are undertaken in a manner to calculate the significance of each of the impacts. The EAP also assesses the outcomes of the calculation to determine whether the outcome reflects the perceived and actual views. The identification of management measures are done based on the significance of the impacts and measures that have been considered appropriate and successful, specifically as Best Practical and Economical Options.

12.1. Assessment of each identified potentially significant impact and risk

Table 12: Identified potentially significant impacts and risk

Activity	Potential impact	Aspects affected	Phase	Significance	Mitigation type	Significance
Contraction of Infrastructure	Fugitive Dust generation	Air Quality	Contraction Phase	Minor Negative	Monitor and manage through: Mine plan	Minor Negative
	Topography and visual alteration	Topography and visual environment	Minor negative	Minor Negative	Avoid and minimise through: Mine plan	Minor Negative
	Degradation to soil resources	Soils	Construction phase and Operational phase	Moderate negative	Prevent through: Soil rehabilitation plan and storm water management plan	Negligible Negative
	Influx of alien invasive vegetation	Flora and fauna	Construction phase	Minor negative	Prevent through: Storm water Management plan and alien invasive management	Minor negative
	Noise generation	Noise	LoM	Negligible Negative	Manage and prevent through: Regular vehicle inspections	Moderate Positive
	Sedimentation and siltation of water courses	Wetland& Aquatic Ecology	Construction Phase	Minor negative	Monitor and prevent through: Aquatic monitoring programme;	Negligible Negative

		Surface water			Storm water management plan	
PCD	Contamination of water resources	Wetland and Aquatic ecology	Operational phase	Minor negative	Monitor and manage through: Storm water management plan and Aquatic monitoring programme	Minor negative
		Surface water			Manage and prevent through: storm water management plan	Negligible Negative
		Ground water			Monitor and manage through: Storm water management plan; Ground water monitoring programme and emergency response plan	
Demolition of infrastructure	Fugitive dust generation	Air Quality	Decommission phase	Minor Negative	Monitor & manage through: Dust management plan and Dust monitoring programme.	Negligible Negative
	Alteration of topography and visual	Topography &visual environment			Remedy through: rehabilitation plan and closure plan	N/A

	environment					
	Hydro-Carbons and waste material contamination	Soils		Moderate Negative	Mana through: Emergency response plan	Minor negative
	Alien invasive vegetation establishment	Flora and Fauna		Negligible Negative	Manage through: Alien Invasive and Management programme	Negligible Negative
	Noise generation	Noise			Prevent and manage through: Vehicle maintenance plan	
	Sedimentation and contamination of water resources	Wetlands and aquatic ecology		Minor negative	Monitor remedy through: Emergency response plan and Aquatic monitoring programme	Minor negative
		Surface water			Remedy through: emergency response plan	Negligible negative

12.2. Summary of specialist reports.

Table 13: Summary of Specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
No studies has been conducted for this application.	N/A	N/A	N/A

13. ENVIRONMENTAL IMPACT STATEMENT

13.1. Summary of the key findings of the environmental impact assessment;

Table 14: Aspects to be assessed

Environmental Aspect	Potential Impact	Activities
Soil	Soil compaction	a) Open pit development; a) Trenches and foundations for surface infrastructure development;
	Soil erosion	a) Removal of vegetation; b) Topsoil stripping; Stockpiles; Road development;
	Soil pollution	a) Oil and fuel spills from vehicles; b) Waste generation; c) Leakage from waste storage facilities;
	Sterilization of topsoil layer	a) Stripping of topsoil during construction will remove this fertile layer;

Environmental Aspect	Potential Impact	Activities
Fauna	Loss of faunal habitat and ecological structure	a) Placement of infrastructure within sensitive faunal habitat areas; b) Site clearing and the removal of faunal habitat; c) Inadequate design of infrastructure; d) Construction of infrastructure; e) Construction of access and haul roads; f) Fire;
	Loss of faunal diversity and community integrity	a) Use of subject property; b) Construction related; disturbance; c) Removal of faunal habitat and migratory corridors; d) Collision of construction; vehicles with faunal species; e) Vehicles accessing site; f) Poaching;
Surface Water and Wetland	Reduction in resources	a) Use of Potable water;
	Reduction in surface water quantity	a) River diversions; b) Opencast and construction activities at tributaries;
	Deterioration in water quality	a) V River diversions (bridges & Opencast sections); Spilled construction materials such as cement, paint, fuel and oil;
	Water/ deterioration of surface water quality	a) Chemical contaminants; b) Vehicle wash bays and workshop;

Environmental Aspect	Potential Impact	Activities
		c) Spillages from sanitary conveniences, fuel deposits or storage facilities;
Ground Water	Impact on the availability of groundwater	d) Developmet of the blasting opencast mining
	Impact on the quality of groundwater	
Air Quality	Reduction in air quality	a) The dust and vehicle emissions generated by the mining activities;
Noise	Day and night time noise impact	a) Preparation of the boxcut area b) Waste Rock Dump area (close to noise sensitive area); c) Bulldozer clearing vegetation and topsoil; d) Excavator loading topsoil/softs on LHD trucks for removal to stockpiles; e) Drilling activities; f) LHD trucks idling or offloading; g) Pouring of concrete for foundations at plant; and h) Diesel generator.
	Noise above ambient noise levels in the surrounding settlements and farm holdings	
Blasting and Vibration	Excess may cause damage to the nearby structures	a) Rock excavation
Visual	Alter the overall landscape character and sense of place of the region	a) Preparing and planning of the site; b) Construction of mining infrastructure; c) Siting of mining infrastructure; d) Construction of mining infrastructure such - offices and plant areas;

Environmental Aspect	Potential Impact	Activities
		e) Removal of vegetation; and f) Loss of topsoil and creation of topsoil stockpiles.
	Dust generated during the construction phase may cause negative visual impacts	a) Preparing and planning of site; b) Construction of infrastructure; c) Removal of vegetation cover; and d) Dust generation due to movement of vehicles
	The mining facilities may impact negatively on receptors (residents and motorists) situated in or utilising the identified receptor sites	a) Preparing and planning of the site; b) Construction of mining infrastructure; c) Siting of mining infrastructure; d) Construction of mining infrastructure such as offices and plant areas; e) Removal of vegetation;
Cultural and Heritage Aspects	Destruction of heritage or cultural aspects	a) Construction of mining infrastructure;
Socio-economic aspects	Economic Opportunities, Infrastructure Development and Employment	a) Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the project area.
Sioil and land capability	Loss of current land capability	a) Change of land use from natural vegetation and agriculture (livestock grazing and commercial) to industrial.
Traffic	Incease in traffic congestion	a) Mine workers traveling to and from the mine

13.2. Final Site Map

Attach to **Appendix A.**

13.3. Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

- Increased ambient noise levels resulting from geophysic surveys site fly-overs and increased traffic movement during all mining phases as well as drilling activities.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts result from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Increased vehicle activity with in the area resulting in the possible destruction and disturbance of fauna and flora.
- Poor access control to farms which may impact on other practices within the vicinity of the study area.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by blasting/ extraction activities.

Mining will be undertaken by specialist sub-contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the mining activities.

13.4. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the mining activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan mining activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social & environmental Impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Noise impacts can be managed through consultation and through the restriction of operating hours;
- The pollution of soil and water resources can be effectively managed through containment;
- Ecological impact can be managed through the implementation of pollution prevention measures, minimizing land clearing, restricting working hours (faunal disturbance) and rehabilitation.
- Concerns regarding access control to farms can be managed through the development and ensuring compliance to an appropriate access control procedure.
- Risks associated with crime can be mitigated through avoiding recruitment activities on site, as well as monitoring and reporting.
- Visual impact can be minimized through giving consideration to drill site infrastructure placement and materials used.

13.5. Aspects for inclusion as conditions of Authorisation.

The following conditions should be included into the Authorisation:

- A map detailing the drilling locations should be submitted to the relevant landowners and the DWS and DMR prior to the commencement of these activities;
- No activities may be undertaken in the pans;
- No activities, with the exception of the soil sampling, may take place within 32m from any river.

13.6. Description of any assumptions, uncertainties and gaps in knowledge.

The following assumptions, uncertainties and gaps are applicable to this project:

- Due to significant time constraints allowed for the assessment of the impacts, and at the time of compiling the draft Basic Assessment Report and EMP:
  - The Stakeholder Consultation is not yet complete.
  - Landowners were not consulted with, in person.
  - Details from the DWS regarding Water Use Licensing requirements is not yet available.
  - Details regarding the presence and status of land claims are not available.

- No detailed site layout is available due to then nature of the mining activities. The study is therefore undertaken as a holistic assessment of the overall site.
- Site investigation by EAP was undertaken on the 22nd of June 2021. No public meeting was held due to Covid-19 Lockdown restrictions.

14. Reasoned opinion as to whether the proposed activity should or should not be authorised

14.1. Reasons why the activity should be authorized or not.

According to the impact assessment undertaken for the proposed project, the key impacts of the project are on soils, natural vegetation and land owners/occupiers. The project will also have positive impacts due to the employment to be created although for a short term (maximum of 2 years).

The public are provided an opportunity to review the DBAR and EMPr and provide their input/comments and concerns. All comments that will be received during Public Participation Process will be included in the Final BAR and EMPr. Their 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

14.2. Conditions that must be included in the authorisation

The following conditions must be included in the authorisations:

- A map detailing the drilling locations should be submitted to the relevant landowners and the DWS and DMR prior to the commencement of these activities;
- No activities may be under taken in the pans ;
- No activities, with the exception of the soil sampling, may take place with in 32m from any river.

14.3. Period for which the Environmental Authorisation is required.

The Mining permit has been applied for a period of 2 (two) years.

15. Undertaking

The signed undertaking is presented at the end of the current document.

16. Financial Provision

According to Appendix 3 of the EIA Regulations, 2014 as amended, where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts must be provide in the BAR and EMPr. In order to avoid duplication, the financial provision for the proposed project has only been provided under the relevant section of the EMPr.

16.1. Explain how the aforesaid amount was derived.

Most important to note is that the prescribed method for estimating a closure costs, as provided for by the DMR in the form of the Guideline Document for the Evaluation of Financial Provisions, only acts as a guideline, and therefore indicates the minimum requirements for assessing and reporting on a closure cost estimate.

16.1.1. Method of Assessment

As mentioned before, Envirstep Pty Ltd made use of the Guideline Document for the Evaluation of Financial Provisions made by the Mining Industry. The following table presents the step-by-step details on how the financial provision has been derived. For the purposes of determining the quantum for closures, it is assumed that the infrastructure will have no salvage value.

Table 14: Method of assessment of financial provision.

Step	Description	DMR Applicable Table	Outcomes
1	Determine primary mineral and saleable mineral by-products	Table B.12	**Low Risk**
2	Determine Risk Class	Table B.12	**Primary Risk Class: C** (Small

Step	Description	DMR Applicable Table	Outcomes
			operation, no waste, no processing). Risk Class C is considered a low risk with a low probability of occurrence of the impact with a negligible consequence.
3	Determine the Area Sensitivity	Table B.4	**Medium to High Sensitivity**.
4.1	Determine the level of informat ion	N/A	Limited information is available which is based on desktop investigations and consultation with stakeholders.
4.2	Determine the closure components	Table B.5	
4.3	Determine the unit rates for closure components	Table B.6	
4.4	Determine and apply the weighting factors	Table B.7 Table B.8	Weighting factor 1 (Nature of the terrain): 1 (generally flat terrain) Weighting factor 2 (Peri-urban, less than 150km from a developed urban area): 1.05(Rural/Urban).
4.5	Identify areas of disturbance	N/A	No areas of disturbance are considered in this assessment. The area in which t he prospect ing act ivi t ies are planned is considered to be undisturbed.
4.6	Identify closure costs from specialist studies	Table B.9	Due to the fact that the operation in question is only a mining operation, no residual impacts should take place. During the Life of Mining and ongoing rehabilitation, the self-succession results should be assessed and monitored. If self–succession does not take place satisfactorily the client may be subjected to additional specialist investigations (ecological and

Step	Description	DMR Applicable Table	Outcomes
			pedology) to determine seeding and re-vegetation requirements.
4.7	Calculate Closure Costs	Table B.10	See the following section.

16.1.2. Quantity Estimation

For the purposes of this assessment, Envirostep Pty Ltd can confirm that the method adopted to obtain and compile the schedule of quantities is sound, correct, and provides detail that is required by the DMR. The information will allow for continued monitoring and updating of quantities and provides the ideal platform to manage and monitor the actual on-site rehabilitation measures and costs incurred.

16.1.3. Determination of Rates

The method of determining the applicable rehabilitation rates is based on practical experience and information by third party contractors.

The following table summarises the unit rates for closure components as specified in the DMR Guideline Document and indicates which rates were used by Evirostep Pty Ltd in this assessment.

CALCULATION OF THE QUANTUM

Applicant: **Contrarians Pty Ltd** **Ref No.:** **MP 30/5/1/2/2/ 12632MP**
Evaluators: **Envirstep Pty Ltd** **Date:** **05/07/2021**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0,01	14,05	1	1	0,1405
2 (A)	Demolition of steel buildings and structures	m2	0	195,76	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	0,001	35,03	1	1	0,03503
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0,1	340,01	1	1	34,001
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0,05	185,46	1	1	9,273
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,15	205242,16	1	1	30786,324
7	Sealing of shafts adits and inclines	m3	0,5	105,09	1	1	52,545
8 (A)	Rehabilitation of overburden and spoils	ha	0,5	136828,1	1	1	68414,05
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,012	170416,93	1	1	2045,00316
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,12	494971,55	1	1	59396,586
9	Rehabilitation of subsided areas	ha	0,001	114572,93	1	1	114,57293
10	General surface rehabilitation	ha	1,05	108390,94	1	1	113810,487
11	River diversions	ha	0	108390,94	1	1	0
12	Fencing	m	0	123,64	1	1	0
13	Water management	ha	0	41213,28	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	14424,65	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		274663,0176

1	Preliminary and General	32959,56211	**weighting factor 2** 1	32959,56211
2	Contingencies	27466,30176		27466,30176
			Subtotal 2	335088,88

VAT (14%)	46912,44
Grand Total	**382001**

16.1.4. Financial Provision

The financial provision required by the holder of the mining right must be provided for by one or more of the following methods in order to achieve the total quantum of rehabilitation and remediation of environmental impacts and damage as well as final closure:

- Approved dedicated trust fund;
- Financial guarantee from a South African registered bank or any other approved financial institution;
- Cash deposit to be deposited at the office of the Regional Manager; or
- Any other manner determined by the Minister.

The client is required to annually assess the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure), as well as the end of life liability.

As per Government Legislature, the client is required to ensure full financial cover for the current liability at any point in the life of the operation. Pecuniary provision must be made for the short fall between the existing trust fund balance and the premature closure or current environmental rehabilitation liability if applicable.

16.1.5. Confirm that this amount can be provided for from operating expenditure.

It should be noted that the current expenditure provided for in the Financial and Technical ability does not included the calculated Financial Provision as included into this Basic Assessment, as these values were not available at the time of the submission.

17. Specific information required by the Competent Authority

17.1. Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the:-

17.1.1. Impact on the socio-economic conditions of any directly affected person.

No specific report was generated for the purposes of the socio -economic conditions. All findings are presented hereafter:

a. *Potential impacts on communities, individuals or competing land uses in close proximity*

The following impacts are regarded as community impacts:

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
- Noise due to the undertaking of the site fly -overs;
- Poor access control resulting in impacts on people movement
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
- Visual Impact

Mining will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the mining activities.

b. *Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity*

- Pollution Prevention
  - ❖ Mitigation and management measures must be implemented to prevent envi ronmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. These mitigation and management measures are discussed in the following section.
- Noise due to the undertaking of the site fly- overs and mining activities;

- ❖ Site activities will be conducted during day time hours 07h00 –17h30 to avoid night time noise disturbances and night time collisions with fauna.

- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime;
  - ❖ Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
  - ❖ The landowner (all private and state land owners) will be notified of unauthorised persons encountered on site.
  - ❖ If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.
- Visual Impact
  - ❖ Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be cons idered in order to conserve water resources.
  - ❖ The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
  - ❖ A waste management system will be implemented and sufficient waste bins will be provided for on-site. A fine system will be implemented to further prohibit littering and poor housekeeping pract ices.

Mining will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the mining activities.

17.1.2. Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

No graves were seen on site during the site visi, and should they be discovered during the extraction of Coal, operations should stop and an Archaeologist shoud be consulted.

18. Other matters required in terms of sections 24(4)(a) and (b) of the Act.

None.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Environmental Management Programme.

1.1. Details of the EAP

The requirement for the provision of the details and expertise of the EAP are included in PART A, section 1 (a).

1.2. Description of the Aspects of the Activity

The requirement to describe the aspects of the activity that are covered by the draft envi ronmental management programme is already included in PART A, section 3.

1.3. Composite Map

Please refer to Appendix A for the Composite Map.

1.4. Description of Impact management objectives including management statements

1.4.1. Determination of closure objectives.

The following are the closure objectives, general principles and objectives guiding closure of the Mining permit area closure planning:

- Rehabilitation of areas disturbed as a consequence of mining permit to a land capability that will support and sustain a predetermined post-closure land uses;
- 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.

1.4.2. Volumes and rate of water use required for the operation.

This information will be made available once the WULA commence.

1.4.3. Has a water use licence has been applied for?

Not yet.

1.5. Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

Table 15: Impacts to be mitigated in their respective phases.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
Construction Phase						
Construction of Infrastructure	Air Quality	Construction Phase	Local	Ensure that the areas of disturbance are minimised and restricted to the required footprint areas; and Ensure that dust suppressants are applied to exposed surfaces.	Dust Management Plan; and Dust Monitoring Programme in accordance with NEM: AQA.	Daily
	Topography and Visual Environment	Construction Phase	Local	Limit the footprint areas of the of the surface infrastructure, where possible, especially the width of the haul roads; Ensure that access and haul roads are contoured to limit erosion from surface runoff, preventing further alteration to the topography; Establish vegetation, where possible, to aid in screening infrastructure;	Mine Plan Development	On-going during Construction and Operational Phase

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape; Pylons and metals structures should be galvanised or painted with a neutral matt finish; and Limit construction activities at night and down lighting must be used to minimise light pollution.		
	Soils	Construction Phase	Local	Ensure soils are stripped and stockpiled prior to the excavation of infrastructure foundations; and Implement Storm Water Management designs to prevent erosion	Soil Rehabilitation Plan; Storm Water Management Plan in accordance with MPRDA Regulation 56 (1) to (8); and Soil pollution and erosion control.	Weekly during construction and operational phase
	Fauna and Flora	Construction Phase	Local	Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation;	Conservation Management Plan; and Alien Invasive	Weekly

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Ensure a Storm Water Management Plan is implemented; and Alien invasive vegetation to be identified and removed throughout the LoM.	Management Plan in accordance with NEM: BA and ECA.	
	Wetland and Aquatic Ecology	Construction Phase	Local	Ensure the statutory buffers are implemented from the wetlands systems and watercourses, unless otherwise stated in the IWUL; Ensure a Storm Water Management Plan is implemented; and Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Storm Water Management Plan; and Aquatic Monitoring Programme in accordance with NWA.	On-going and Biannually during Life of Mine.
	Surface Water	Construction Phase	Local	Ensure that the topsoil stockpiles are vegetated to prevent soil erosion; Implement Storm Water Management designs to prevent erosion and divert dirty water to the appropriate storage dams (PCDs);	Storm Water Management Plan in accordance with NWA.	On-going during Construction Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				and The design, construction, operation and maintenance of water management facilities must be in accordance with GN R 704 capacity requirements. The PCDs must have a freeboard of 0.8 m and must be able to contain a 1: 50-year, 24-hour extreme rainfall event.		
	Noise	Life of Mine	Project Area	Ensure construction activities are only undertaken during daylight hours; Construction related machines and vehicles should be serviced on a regular basis to ensure noise suppression mechanisms are effective (e.g. installed exhaust mufflers); and Ensure equipment and machinery is switched off when not in use.	Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Construction Phase.
	Heritage	Construction	Local	Consultation with the bona fide Next of Kin must be undertaken in	Entitlement Framework in	Prior to Construction

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		Phase Operational Phase		accordance with the MPHRA Regulations and any other applicable legislation; and Develop an entitlement framework for the Next of Kin in which the health and safety risks are identified and remedial preventative measures are agreed upon.	Accordance with MPHRA.	Phase
Construction of stockpiles	Soils	Construction Phase Operational Phase	Local	Minimise topsoil stockpile heights as far as possible; Ensure soils are stripped in accordance with the Rehabilitation Soil Management Plan. It is recommended that the topsoil (upper 0.3 m) and subsoil (0.7 m to 0.9 m in thickness) of the soil profile should be stripped and stockpiled separately; Ensure soils are stripped and stockpiled prior to the excavation of infrastructure foundations; Ensure stockpiles are maintained in	Soil Rehabilitation Plan; Storm Water Management Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and erosion control.	On-going and Annually during Construction Phase and Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				a fertile and erosion free state by sampling and analyzing for macro nutrients and pH on an annual basis; Traffic and access to the stockpiles will be restricted; Ensure that the topsoil stockpiles are vegetated to prevent soil erosion and to reinstitute the ecological processes within the soil; and Implement Storm Water Management designs to prevent erosion.		
	Fauna and flora	Construction Phase	Limited	Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation; Ensure a Storm Water Management Plan is implemented; and Alien invasive vegetation to be identified and removed throughout the Life of Mine.	Conservation Management Plan; and Alien Invasive Management Plan in accordance with NEM: BA and ECA.	On-going during Life of Mine.
	Wetland and	Construction	Local	Ensure the statutory buffers are	Storm Water	On-going and

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
	Aquatic Ecology	Phase		implemented from the wetlands systems and watercourses, unless otherwise stated in the IWUL; Ensure a Storm Water Management Plan is implemented; and Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Management Plan; and Aquatic Monitoring Programme in accordance with NWA.	Biannually during Life of Mine.
	Surface Water	Construction Phase	Local	Ensure that the topsoil stockpiles are vegetated to prevent soil erosion; Implement Storm Water Management designs to prevent erosion and divert dirty water to the appropriate storage dams (PCDs); and The design, construction, operation and maintenance of water management facilities must be in accordance with GN R 704 capacity requirements.	Storm Water Management Plan in accordance with NWA-GN R. 704;	b) On-going during Construction Phase

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
	Groundwater	Construction Phase Operational Phase	Local	A groundwater monitoring system must be implemented and test the water on a quarterly basis for changes in water quality and water levels. Should impacts be identified, management measures must be implemented based on the contaminant or water level change; Implement a Surface Water Management Plan to minimise the volume of dirty water produced, as well as the effectiveness of the containment of dirty water, thereby reducing the probability of contamination of groundwater from infiltration of dirty surface water; Refine and update the conceptual and numerical models annually for the first four years and thereafter every five years based on	Groundwater Monitoring Programme; Storm Water Management Plan; and • Numerical and conceptual model in accordance with NWA.	On-going, Quarterly and Annually during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				groundwater monitoring results. This will help to better quantify impacts to water quantity and quality; and All contaminant, waste and hazardous waste storage facilities and other contaminated water storage areas (PCD) must be lined to pro-actively prevent infiltration of contaminated seepage water.		
Operational Phase						
Dirty Water Management System	Wetlands and Aquatic Ecology	Operational Phase	Provincial	Ensure a Storm Water Management Plan is implemented; Dirty water from the open-pit must be diverted by channels and berms and separated from clean water. The dirty water must be stored in the PCD; The operation and maintenance of the PCD must be in accordance with	Storm Water Management Plan; Dust Management Plan; Dust Monitoring Programme; and Aquatic	On-going, Daily and Biannually during Life of Mine

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				the NWA Regulations set out in GN R704 and must have a minimum freeboard of 0.8 m and be able to contain a 1:50 year, 24-hour storm event; and Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Monitoring Programme in accordance with NWA.	
	Surface Water	Operational Phase	Municipal	Diversion berms and pipelines used for dewatering activities need to be sized based on the dewatering rates and volumes; The operation and maintenance of the PCD must be in accordance with the NWA Regulations set out in GN R704 and must have a minimum freeboard of 0.8 m and be able to contain a 1:50 year, 24-hour storm	Storm Water Management Plan Surface Water Monitoring Programme in accordance with NWA.	On-going and Monthly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				event; Monitor the dirty water management facilities monthly to identify potential leaks and implement management measures to rectify potential issues; and Monitor surface water resources up and downstream of the Project area to identify potential contamination.		
	Groundwater	Operational Phase	Limited	Ensure that monitoring and maintenance of the dirty water diversion channels and berms are undertaken to ensure that they are not silted up to allow for free drainage; Ensure that pipelines and diversion channels and berms are monitored for potential leaks and structure failures;	Storm Water Management Plan Groundwater Monitoring Programme in accordance with NWA.	Monthly and Quarterly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Potential leaks and spills must be contained and cleaned up immediately, as well as the leakage location repaired; Ensure that a Storm Water Management Plan is in place to separate clean and dirty water; and Groundwater monitoring of the water quality and levels must take place quarterly especially for the water supply boreholes to ensure a sustainable resource and identify impacts on local users.		
Pollution Control Dam	Wetlands and Aquatic Ecology	Operational Phase	Provincial	Ensure a Storm Water Management Plan is implemented; Dirty water from the open-pit must be diverted by channels and berms and separated from clean water. The dirty water must be stored in the	Storm Water Management Plan Dust Management Plan; Dust	On-going, Daily and Biannually during Life of Mine

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				PCD; The operation and maintenance of the PCD must be in accordance with the NWA Regulations set out in GN R704 and must have a minimum freeboard of 0.8 m and be able to contain a 1:50 year, 24-hour storm event; and Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Monitoring Programme; and Aquatic Monitoring Programme in accordance with NWA.	
	Surface Water	Operational Phase	Municipal	The operation and maintenance of the PCD must be in accordance with the NWA Regulations set out in GN R704 and must have a minimum freeboard of 0.8 m and be able to contain a 1:50 year, 24-hour storm event; and	Storm Water Management Plan Surface Water Monitoring Programme in accordance with NWA.	On-going and Monthly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Monitor the dirty water management facilities monthly to identify potential leaks and implement management measures to rectify potential issues.		
	Groundwater	Operational Phase	Limited	The operation and maintenance of the PCD must be in accordance with the NWA Regulations set out in GN R704; The PCD must be monitored for potential leaks and structure failures; Potential leaks and spills must be contained and cleaned up immediately, as well as the leakage location repaired; Monitor PCDs' water quality on a quarterly basis to understand water quality and potential impacts on the groundwater should seepage occur; and	Groundwater Monitoring Programme in accordance with NWA.	Monthly and Quarterly during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Groundwater monitoring of the water quality and levels must take place quarterly to identify potential impacts and leaks or seepage.		
Stockpiles	Air Quality	Operational Phase	Municipal	Monitor the establishment of vegetation	Dust Management Plan; and Dust Monitoring Programme in accordance with NEM: AQA.	Monthly during Operational Phase
	Topography and Visual Environment	Operational Phase	Local	Ensure topsoil stockpiles are contoured and have a steepness of less than 18° to prevent slope failure and erosion and aid in vegetation establishment; Limit and reduce the stockpile heights as far as possible; Ensure that the topsoil stockpiles are vegetated; and	Mine Plan Development	On-going during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Establish and maintain vegetation screens.		
	Soils	Operational Phase	Local	Ensure stockpiles are maintained in a fertile and erosion free state by sampling and analyzing for macro nutrients and pH on an annual basis; Ensure topsoil stockpiles are vegetated to prevent erosion; Ensure access to the stockpiles is restricted to prevent unauthorized use and borrowing of topsoil; Ensure topsoil stockpiles are clearly demarcated; and Implement Storm Water Management designs to prevent erosion.	Storm Water Management Plan; and Soil Rehabilitation Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and erosion control	Annually and on-going during Construction Phase and Operational Phase.
	Wetlands	Life of Mine	Local	Ensure a Storm Water Management Plan is implemented; and	Storm Water Management Plan	On-going and Biannually during

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
	and Aquatic Ecology			Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Aquatic Monitoring Programme in accordance with NWA.	Life of Mine.
	Surface Water	Operational Phase	Local	Ensure a Storm Water Management Plan is implemented; and Monitor surface water resources up and downstream of the Project area to identify potential contamination.	Storm Water Management Plan; Surface Water Monitoring Programme in accordance with NWA.	On-going and Monthly during Operational Phase.
	Groundwater	Operational Phase	Limited	Buffer acid generating overburden material with acid neutralising material, where possible; Divert water run-off from the stockpiles to the PCD to prevent water ingress; and Groundwater monitoring of the water	Groundwater Monitoring Programme in accordance with NWA.	On-going and Monthly during operational phase

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				and levels must take place quarterly to identify potential impacts and seepage.		
Concurrent Rehabilitation	Air Quality	Operational Phase Decommissioning Phase	Municipal	Ensure the rehabilitated areas are vegetated to prevent erosion and surface exposure to winds; and Monitor the establishment of vegetation.	Dust Management Plan; Dust Monitoring Programme in accordance with NEM: AQA	As required and Monthly during Operational Phase and Decommissioning Phase.
	Topography and Visual Environment	Operational Phase Decommissioning Phase	Local	The open-pit must be backfilled; and Topsoil must be backfilled over the open-pit area and the area vegetated.	Rehabilitation Plan in accordance with ECA.	As required during Operation Phase and Decommissioning Phase.
	Soils	Life of Mine	Very limited	All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; Spillage control kits will be readily available on site to contain the mobilization of contaminants and	Emergency Response Plan Vehicle Maintenance Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				clean up spills; All vehicles and machinery to be serviced in a hard park area or at an off-site location; and Vehicles with leaks must have drip trays in place.	erosion control and Hazardous Substances Act 1973	
		Operational Phase Decommissioning Phase		Ensure that the topography of rehabilitated areas takes the pre-mining landscape into consideration and that the topography is free draining; Ensure that the soil layers are backfilled in reverse order of the stripping and the subsoil must underlie the topsoil; Ensure that the yellow and red soils are placed in upland landscape positions and wetland soils placed in	Soil Rehabilitation Plan; Soil monitoring in accordance with MPRDA Regulation 56 (1) to (8); soil pollution and erosion control.	On-going and Prior to vegetation establishment during Operational Phase; Decommissioning Phase and Post-Closure Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				the lower landscape positions; It is recommended that the soil cover should be at least 0.8 m in depth, consisting of 0.5 m of subsoil and 0.3 m of topsoil on top of the reconstructed profile to mimic the pre-mining land capability. However, the soil cover must be at least 0.3 m depth in order to sustain the identified end land use of grazing; and Investigate soil quality prior to establishment of vegetation on rehabilitated areas through representative sampling and laboratory analysis. Soil fertility and acidity must be corrected prior to vegetation establishment, if required.		
	Surface Water	Operational	Limited	Rehabilitation activities must be monitored to ensure that the pre-	Rehabilitation Plan in	Monthly during Operational

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		Phase Decommissioning Phase		mining drainage pattern is emulated, and that vegetation establishment is successful; The backfilled areas should be vegetated as soon as possible to prevent dust and siltation of the water bodies; Monitor surface water resources up and downstream of the Project area to identify potential contamination; and Where rehabilitation (grass seeding of topsoil cover) is not effective, the associated soil erosion must be mitigated by installing silt traps in affected areas.	accordance with NEMA.	Phase, Decommissioning Phase and Post-Closure.
	Groundwater	Operational Phase Decommissioning Phase	Local	Ensure that the backfilled material is compacted where possible and the pre- mining drainage pattern is emulated; Groundwater monitoring of the water quality and levels must take place	Rehabilitation Plan; and Groundwater Monitoring Programme in accordance with	As required and Quarterly during Operational Phase and Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				quarterly to identify potential impacts and leaks or seepage. The monitoring programme will assist with the identification of potential AMD occurring. All contaminated water must be contained in the PCD; and The backfill material must be placed in such a manner to reduce the potential leaching impacts on the underlying aquifers. Material with a high neutralizing effect needs to be placed at the bottom followed by waste rock and coal slurry higher up. The top layers can again be material with a high neutralizing capacity. The top layer needs to ensure free draining of the rain water from the rehabilitated areas.	NWA.	
	Fauna and Flora	Operational	Very limited	Vegetate disturbed and rehabilitated areas with indigenous vegetation;	Rehabilitation Plan; and	As required and On-going during

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		Phase Decommissioning Phase		Alien invasive vegetation to be identified and removed throughout the LoM; and Establish and implement an Alien Invasive Management Programme.	Alien Invasive Management Plan in accordance with NEM:BA; and ECA.	Operational Phase, Decommissioning Phase and Post-Closure.
	Noise	Construction Phase Operational Phase	Project Area	Rehabilitation related machines and vehicles should be serviced on a regular basis to ensure noise suppression mechanisms are effective (e.g. installed exhaust mufflers); and Ensure equipment and machinery is switched off when not in use.	Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Operational Phase.
Decommission Phase						
Demolition of Infrastructure	Air Quality	Decommissioning Phase	Local	The area of disturbance must be restricted to the required footprint size; Demolition activities should be undertaken judiciously during windy periods (winds greater than 5.4 m per second); and	Dust Management Plan; Dust Monitoring Programme in accordance with NEM: AQA.	On-going during Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				The area of disturbance must be minimized to limit the area exposed to wind erosion.		
	Topography and Visual Environment	Decommissioning Phase	Limited	Demolish all unnecessary infrastructure; Ensure that all demolished infrastructure is removed from site's surface; and Ensure that rehabilitated areas are rehabilitated and vegetated.	Rehabilitation Plan; and Closure Plan in accordance with ECA.	As required during Decommissioning Phase and Post-Closure.
	Soils	Decommissioning Phase	Very limited	Ensure that demolished infrastructure is removed off-site and disposed of by a reputable contractor; All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; Spillage control kits will be readily available on site to contain the mobilization of contaminants and clean up spills;	Emergency Response Vehicle Maintenance Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and erosion control; Hazardous Substances Act 1973	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				All vehicles and machinery to be serviced in a hard park area or at an off-site location; and Vehicles with leaks must have drip trays in place.		
	Fauna and Flora	Decommissioning Phase Post-Closure	Limited	Restrict vehicles and machinery to existing roads and designated areas to prevent vegetation destruction; and Alien invasive vegetation to be identified and removed throughout the LoM and Establish and implement an Alien Invasive Management Programme.	Conservation Management Plan Alien Invasive Management Plan in accordance with NEM:BA and ECA.	On-going during Decommissioning Phase and LoM.
	Wetlands and Aquatic Ecology	Decommissioning Phase	Provincial	Restrict vehicles and machinery to existing roads and designated areas to prevent vegetation destruction; All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; Spillage control kits will be readily	Storm Water Management Plan Aquatic Monitoring Programme in accordance with NWA.	On-going and Biannually during: LoM.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				available on site to contain the mobilization of contaminants and clean up spills; All vehicles and machinery to be serviced in a hard park area or at an off-site location; and Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.		
	Surface Water	Decommissioning Phase	Local	Reputable and accredited contractors will be used for the transport and disposal of wastes and demolished material off-site; All potential hydrocarbon spillages and leaks to be cleaned up immediately and the soils remediated; Spillage control kits will be readily available on site to contain the mobilization of contaminants and	IWWMP; Emergency Response Plan Vehicle Maintenance Plan in accordance with NWA.	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				clean up spills; and Vehicles with leaks must have drip trays in place.		
	Noise	Decommissioning Phase	Project Area	Ensure demolition activities only take place during daylight hours; Demolition related machines and vehicles should be serviced on a regular basis to ensure noise suppression mechanisms are effective (e.g. installed exhaust mufflers); and Ensure equipment and machinery is switched off when not in use.	Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Decommissioning Phase.
Final Rehabilitation	Air Quality	Operational Phase Decommissioning Phase	Local	Replacement of overburden and topsoil should be undertaken judiciously during windy days (winds speed greater than 5.4 m per second); Ensure the rehabilitated areas are vegetated to prevent erosion and surface exposure to winds; and Monitor the establishment of	Rehabilitation Plan in accordance with NEM: AQA	On-going and Monthly during: Operational Phase, Decommissioning Phase and Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				vegetation.		
	Topography and Visual Environment	Decommissioning Phase	Local	The open-pit must be backfilled as much as possible; The rehabilitated area must be contoured and profiled to create a free- draining topography emulating the pre-mining topography; and Topsoil must be backfilled over the rehabilitated area and vegetated.	Rehabilitation Plan; and Closure Plan in accordance with NEMA.	As required during Decommissioning Phase and Post-Closure.
	Soils	Decommissioning Phase	Very limited	All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; Spillage control kits will be readily available on site to contain the mobilization of contaminants and clean up spills; All vehicles and machinery to be serviced in a hard park area or at an off-site location; Storage of hydrocarbons and explosives must be managed	Emergency Response Vehicle Maintenance Plan in accordance with MPRDA Regulation 56 (1) to (8), Soil pollution and erosion control, and Hazardous Substances Act 1973.	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); and Vehicles with leaks must have drip trays in place.		
	Soils	Decommissioning Phase Post Closure	Very limited	Ensure that the topography of rehabilitated areas takes the pre-mining landscape into consideration and that the topography is free draining; Ensure that the soil layers are backfilled in reverse order of the stripping and the subsoil must underlie the topsoil; Ensure that the yellow and red soils are placed in upland landscape positions and wetland soils placed in the lower landscape positions; It is recommended that the soil cover should be at least 0.8 m in depth, consisting of 0.5 m of subsoil and 0.3 m of topsoil on top of the	Soil Rehabilitation Plan; Soil monitoring in accordance with MPRDA Regulation 56 (1) to (8), Soil pollution and erosion control.	On-going and prior to vegetation establishment during Operational Phase, Decommissioning Phase and Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				reconstructed profile to mimic the pre-mining land capability. However, the soil cover must be at least 0.3 m depth in order to sustain the identified end land use of grazing; Investigate soil quality prior to establishment of vegetation on rehabilitated areas through representative sampling and laboratory analysis. Soil fertility and acidity must be corrected prior to vegetation establishment, if required; and Monitor vegetation establishment.		
	Fauna and Flora	Operational Phase Decommissioning Phase	Local	Vegetate disturbed and rehabilitated area with indigenous vegetation; Monitor vegetation establishment and implement erosion control measures, if required; Alien invasive vegetation to be identified and removed throughout the LoM; and	Rehabilitation Plan; and Alien Invasive Management Plan in accordance with NEM:BA and ECA.	As required and On-going during Operational Phase, Decommissioning Phase and Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				Establish and implement an Alien Invasive Management Programme.		
	Surface Water	Operational Phase Decommissioning Phase	Local	Rehabilitation activities must be monitored to ensure that the pre-mining drainage pattern is emulated, and that vegetation establishment is successful; The backfilled areas should be vegetated as soon as possible to prevent dust and siltation of the water bodies; Monitor surface water resources up and downstream of the Project area to identify potential contamination and residual impacts; and Where rehabilitation (grass seeding of topsoil cover) is not effective, the associated soil erosion must be mitigated by installing silt traps in affected areas.	Rehabilitation Plan in accordance with NEMA.	Monthly during Operational Phase, Decommissioning Phase and ○ Post-Closure.
	Groundwater	Operational	Municipal	Ensure that the backfilled material is compacted where possible and the	Rehabilitation Plan; and	Quarterly and as required during

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		Phase Decommissioning Phase		pre- mining drainage pattern is emulated; Groundwater monitoring of the water quality and levels must take place quarterly to identify potential impacts and leaks or seepage. The monitoring programme will assist with the identification of potential AMD occurring. All contaminated water must be contained in the PCD; The rehabilitated voids must be flooded as soon as possible to create anaerobic conditions to reduce the amount of time the potential acid producing material is exposed to oxygen. This will reduce the potential AMD risk and volumes; and The backfill material must be placed in such a manner to reduce the	○ Groundwater Monitoring Programme in accordance with NWA.	Operational Phase and Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				potential leaching impacts on the underlying aquifers. Material with a high neutralizing effect needs to be placed at the bottom followed by waste rock and coal slurry higher up. The top layers can again be material with a high neutralizing capacity. The top layer needs to ensure free draining of the rain water from the rehabilitated areas.		
	Noise	Operational Phase Decommissioning Phase	Project Area	Rehabilitation related machines and vehicles should be serviced on a regular basis to ensure noise suppression mechanisms are effective (e.g. installed exhaust mufflers); and Ensure equipment and machinery is switched off when not in use.	Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Decommissioning Phase.
Post Closure Phase						
Impacts on the Post-Mining	Air Quality	Post-Closure Phase	Local	Ensure vegetation is established across all disturbed and rehabilitated areas; and	Post Closure Monitoring and Maintenance Plan	Monthly during Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
Landscape				Monitor vegetation establishment.	in accordance with NEM: AQA.	
	Topography and Visual Environment	Post-Closure Phase	Local	Should water pool on the surface, the drainage lines must be rehabilitated further and shaped to ensure a free-draining topography; and Monitor vegetation establishment and potential soil erosion. Should it be required, vegetation establishment and erosion control measures must be implemented.	Post rehabilitation monitoring plan in accordance with NEMA.	Monthly during Post-Closure.
	Soils	Post-Closure Phase	Very Limited	Ensure that the topography of rehabilitated areas is free draining; Model post-mining landforms to establish post-mining landscape stability; Implement erosion prevention techniques, if required; Establish clear medium and long-	Post-rehabilitation monitoring plan in accordance with MPRDA Regulation 56 (1) to (8) and soil pollution and erosion control.	Annually during Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				term targets for the post-mining land capability and land use; and Monitor vegetation establishment.		
	Fauna and flora	Post-Closure Phase	Municipal	Monitor vegetation establishment and implement erosion control measures, if required; Alien invasive vegetation to be identified and removed throughout the LoM; and Establish and implement an Alien Invasive Management Programme.	Rehabilitation Plan; and Alien Invasive Management Plan in accordance with NEM:BA and ECA.	Monthly and as required during Post-Closure.
	Wetlands and Aquatic Ecology	Post-Closure Phase	Municipal	Ensure a Storm Water Management Plan is implemented and direct all decant to a PCD; and Implement an Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Storm Water Management Plan Aquatic Monitoring Programme in accordance with NWA.	On-going and Biannually during Post-Closure.
	Groundwater	Post-Closure Phase	Municipal	Groundwater monitoring of the water levels and quality must be implemented, as well as the	Post-Closure Monitoring and Maintenance Plan;	Quarterly during Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				decant point once decanting commences. Passive or active treatment options must be implemented where the water is an unacceptable quality for release into the environment.	and Rehabilitation Plan in accordance with NWA.	
	Surface water	Post-Closure Phase	Provincial	Water quality monitoring must continue post-closure to allow for the early detection of potential decant and to enable mitigation measures to be implemented. Passive or active treatment options must be implemented where the water is an unacceptable quality for release into the environment.	Surface Water Monitoring Programme; and Rehabilitation Plan in accordance with NWA.	Quarterly during Post-Closure.
		Post-Closure Phase	Municipal	Rehabilitation activities must be monitored to ensure that the surface profile is free draining; and Where rehabilitation (grass seeding of topsoil cover) is not effective, the associated soil erosion must be mitigated by installing silt traps in	Rehabilitation Plan in accordance with NWA.	Quarterly during Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				affected areas.		

1.6. Impact Management Outcomes

Measures to rehabilitate the environment affected by the undertaking of any listed activity is presented in the following table.

Table 16: Impact Management Outcomes

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
All activities throughout the Life of Mine.	Dust generation	A minimum of eight (8) dust buckets should be installed, for each direction; Dust fallout levels must be monitored; It is recommended that PM10 fallout be monitored.	Environmental Manager; Environmental Control Officer; Air Quality Specialist	Dust buckets must be monitored every month, with a report compiled every quarter. Should the reports indicate that the NEM: AQA NDCR are exceeded, additional mitigation measures must be implemented.	Dust buckets must be monitored every month, with a report compiled every quarter. Should the reports indicate that the NEM: AQA NDCR are exceeded, additional mitigation measures must be implemented.
	Loss of soil recourses and land capability	Inspection of stripping depths and separation of topsoil and subsoil during	Environmental Manager; Environmental Control Officer;	Inspection of stripping depths must be on-going	Inspection of stripping depths must be on-going

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
		stockpiling; Inspection of stockpiles to manage and prevent erosion; Inspection of rehabilitated areas to ensure that the surface is free-draining; Random inspections of soil thickness on rehabilitated areas; Fertility and acidic analysis and amelioration procedures prior to vegetation establishment.	Soil Specialist.	during site clearance activities and stockpiling to ensure that soils are stored separately. Stockpiles should be monitored monthly to manage potential soil erosion. The testing and analysis for macro nutrients and pH must be sampled on an annual basis and results kept planning for rehabilitation. The rehabilitation activities must be monitored, and random samples	during site clearance activities and stockpiling to ensure that soils are stored separately. Stockpiles should be monitored monthly to manage potential soil erosion. The testing and analysis for macro nutrients and pH must be sampled on an annual basis and results kept planning for rehabilitation. The rehabilitation

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
				selected for to test for soil thickness. The land must be shaped and sampled, and remediation techniques implemented, if necessary, prior to vegetation establishment.	activities must be monitored, and random samples selected for to test for soil thickness. The land must be shaped and sampled, and remediation techniques implemented, if necessary, prior to vegetation establishment.
	Loss of biodiversity	Floral and faunal SSC must be rescued and relocated, should they occur within the disturbed areas; Faunal and Floral SSC in the Project area, but not within the directly disturbed mine areas, should be monitored,	Environmental Manager; Environmental Control Officer	Monitoring must take place at least in two years and especially during the wet season. Results of the monitoring must be recorded and compared to	Monitoring must take place at least in two years and especially during the wet season. Results of the monitoring must be recorded

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
		particularly the Grass Owl, Serval, Hedgehog and Giant Bullfrog populations; Alien invasive vegetation must be controlled on a monthly basis.		previous years' results to keep track of the populations of the faunal and floral species. Monthly monitoring for alien invasive vegetation must take place and managed according to the NEM: BA requirements.	and compared to previous years' results to keep track of the populations of the faunal and floral species. Monthly monitoring for alien invasive vegetation must take place and managed according to the NEM: BA requirements.
	Potential contamination and sedimentation of wetlands and aquatic	The following must be tested for: *In situ* water quality must be analyzed; Sediment and water column metal analysis;	Environmental Manager; Environmental Control Officer	The Aquatic Ecology Monitoring Programme must be implemented from the onset of the Construction	The Aquatic Ecology Monitoring Programme must be implemented from the onset of

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	ecosystems.	Toxicity testing; Habitat integrity; and Aquatic macro-invertebrates.		Phase and continue throughout the LoM. The monitoring must take place biannually, once during high flow and once during low flow. A report must be compiled annually and take cognisance of previous years' monitoring results to track and identify potential impacts.	the Construction Phase and continue throughout the LoM. The monitoring must take place biannually, once during high flow and once during low flow. A report must be compiled annually and take cognisance of previous years' monitoring results to track and identify potential impacts.
	Contamination to surface water	The following constituents must be tested for: Sodium, calcium, sulphate,	Environmental Manager; Environmental Control Officer	Surface water monitoring must take place from the	Surface water monitoring must take place from

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	resources	chloride and potassium Manganese, magnesium and fluoride; Nitrate and ammonium; and pH, electrical conductivity and TDS.		onset of the Construction Phase, throughout the LoM and for a period of 3 years following closure. Sampling must be undertaken monthly during the Construction Phase, as well as during the initial stages of the Operational Phase. Should the water sampling indicate that there are no impacts to the surface water quality, sampling can be reduced to a quarterly basis. All sampling results must be recorded to	the onset of the Construction Phase, throughout the LoM and for a period of 3 years following closure. Sampling must be undertaken monthly during the Construction Phase, as well as during the initial stages of the Operational Phase. Should the water sampling indicate that there are no impacts to the surface water quality, sampling can be reduced

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
				track potential quality changes or deterioration.	to a quarterly basis. All sampling results must be recorded to track potential quality changes or deterioration.

1.7. Impact Management Actions

Table 17: Impact Management Actions

Activity	Potential Impact	Mitigation
Construction Phase		
Site clearance for road construction, powerlines, water pipelines, Construction of infrastructure and the plant	Loss of vegetation and subsequent loss of habitat for fauna. The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining. Noise generated by the mining and mining related activities may frighten animals which may lead to injuries, deaths as well as the animals migrating away from the site.	a. Removal of vegetation should be restricted to the relevant infrastructure footprints only; b. Topsoil should be stored separately to be used in rehabilitation and landscaping, c. Transformation of natural areas should exclude any areas designated as having high or very high sensitivities; d. Prevent all effluent from the mining activities from entering the wetland habitat e. Management of the topsoil stockpile to preserve the seedbed; f. Fence development footprint area prior to commencement construction; g. No off-road driving into natural vegetation h. Implement alien invasive species eradication program.
Site clearance for road construction, powerlines, plant, ttrenches and foundations for surface infrastructure development, Topsoil stripping and Stockpiling	Loss of soil resource and land use	a. Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes, access and haulage

Activity	Potential Impact	Mitigation
		ways and conveyancing systems wherever possible; b. Implement a soil utilization plan; c. Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction; and d. Topsoil to be stripped and stockpiled separately.
Site clearance	Increased risk of erosion	a. Minimise the construction footprint within any wetland areas. Clearly demarcate the required construction servitude and maintain all activities within the demarcated area; b. Maintain flow connectivity in any valley bottom wetlands during the construction phase by temporarily diverting streams around the construction area; c. Install erosion prevention measures prior to the onset of construction activities;
Stripping, dumping activities and vehicular movements on dust roads	Increase in ambient dust levels	a. Regular watering of the site roads; b. Dressing off of tip faces, unused roads and disturbed areas; c. Minimising unnecessary disturbance of non-

Activity	Potential Impact	Mitigation
		operational areas; d. Use of chemical additives to control dust to be employed if necessary.
Trenching activities, Equipment use and vehicular activity	Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest sensitive receptors would be objectionable;	a. Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b. Regular planned vehicle services.
Vehicles maintenance, fuel storage, servicing areas and construction equipment storage	Pollution of surface water resource including wetlands due to hydrocarbon spillages	a. Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays; b. Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil; c. Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills if they should occur; d. Hazardous material will be placed in bunded areas; e. Spill kits to clean up hydrocarbon spills will be available;

Activity	Potential Impact	Mitigation
		f. Clean upslope runoff will be diverted around construction areas. g. Prevent all effluent from the mining activities from entering the wetland habitat.
Site Clearance and Excavation of an open cast mine	Potential impact on heritage Resources	a. Conduct heritage impact assessment to identify heritage sites within the project area; b. If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken; c. Education and training on heritage resources will be given to mine employees
Vehicular movements	Increase in traffic volumes on existing traffic network	a. Traffic signage at site access point; b. Undertake traffic impact study; c. Traffic signage at site access points; d. Upgrade gravel roads to tarred roads.
Employment	Spontaneous settlement and increased pressure on social services	a. Develop a clear and concise employment and recruitment policy that prioritizes local recruitment; b. Identify and support community development programs that address challenges raised by population influx and spontaneous settlement; c. Support local government capacity for

Activity	Potential Impact	Mitigation
		integrated development planning.
Operational Phase		
Blasting, loading, hauling, stockpiling, backfilling and tailings storage and vehicle operations	Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	a. Efficiency will be applied to reduce wastage and unnecessary fuel consumption; b. Carbon offsets will be considered if required; c. Concurrent best practice rehabilitation and vegetation monitoring will be applied to allow for the restoration of some the carbon sink functionality within the mining right area.
Excavation for an open cast mine	Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield	a. Detailed geological mapping to identify geological features; b. Mining will take place according to design mine stability safety factors; c. Mining will not take place in the weathered overlying strata; d. Identify boreholes (undertake hydrocencus) within mining area and plug deep boreholes to prevent inflow into the pit; e. Monitor groundwater levels and yields of external borehole users.
Excavation of an open cast mine	The formation of Acid Mine Drainage in	a. Optimise storage of mine water to minimize

Activity	Potential Impact	Mitigation
	groundwater resources.	exposure to oxygen; b. Develop a groundwater monitoring program to assess the groundwater quality; c. Should Acid Mine Drainage (AMD) be identified within the groundwater resources, the polluted water will be remediated accordingly.
Equipment, vehicle operations, leakages of oil and other industrial liquids from the trucks and machineries and stockpiling.	Contamination of soil	a. Spill leak detection plan should be implemented.
Vehicles maintenance, Fuel storage, servicing areas and construction, spilled construction materials such as cement, paint, fuel and oil.	Surface water and wetland resources due to hydrocarbon spills and carbonaceous material.	a. Implement storm water management plan; b. Divert clean storm water around construction areas; c. Surface water management structures be constructed first as to ensure that runoff and dirty water spills are contained;
Loading, stockpiling, backfilling and Co-Disposal Facility storage.	Dust generated during the mining may cause a negative visual impact and altered visibility	a. Regular watering of the site roads; b. Dressing off tip faces, unused roads and disturbed areas; c. Minimizing unnecessary disturbance of non-operational areas; d. Use of chemical additives to control dust to be

Activity	Potential Impact	Mitigation
		employed if necessary.
Blasting and vibrations	General increase in Blasting and vibrations	Blasting and other noise generating activities should be conducted during the day when surrounding noise levels is high.
Vehicular operation, hauling and transportation of material	General increase in ambient noise levels	a. Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b. Regular planned vehicle services.
Waste disposal	Waste generation including Debris (slimes), waste rock, litter and other solid waste will be generated and deposited in and around the site. This could potentially attract nuisance and affect the natural scenery of the site.	The slimes and waste rock will be used to backfill the trenches. This will be undertaken in a concurrent rehabilitation manner.
Employment	Spontaneous settlement and Increase pressure on social services	a. Develop an employment and recruitment policy that prioritises local recruitment; b. Identify and support community development programmes; c. Support local government capacity for integrated development planning.
Employment	Benefits resulting from employment and income opportunities created by the mine	Positive impact that need to be enhanced.

Activity	Potential Impact	Mitigation
Decommissioning Phase		
Backfilling of the open cast mine	Compaction of soil and contamination of soil resources	a. Reinstatement of stored soils onto areas of disturbance where infrastructure has been demolished; b. Contour and stabilize slopes to be free-draining; c. Cultivation of growing medium, the planting of required vegetative cover and irrigation if required.
Backfilling of the open cast mine	Pollution of surface water resources	a. The storm water management infrastructure, including the PCD, will be decommissioned last to ensure adequate storm water management during the rehabilitation phase; b. Erosion protection measures will be implemented at steep areas; c. Spill kits will available and hydrocarbon spills will be cleaned up immediately; d. All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.
Backfilling of the open cast mine	Increase in dust fallout	a. Regular watering of the site roads; b. Dressing off tip faces, unused roads and

Activity	Potential Impact	Mitigation
		disturbed areas; c. Minimising unnecessary disturbance of non-operational areas; d. Use of chemical additives to control dust to be employed if necessary.
Hauling, Equipment and vehicular operations	General increase in ambient noise levels	a. Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b. Regular planned vehicle services.
Loss of employment	Loss of employment and enterprise development opportunities	a. Develop and implement Labour and Human Resources Plan (LHRP) that address the impacts associated with retrenchment, job losses and reduced demand for local goods and services; b. Develop a closure plan which will aim to reinforce the objectives of the SLP by reducing the reliance on LCM for employment by promoting skills transfer to ensure alternative livelihoods portable skills.

2. Financial Provision

2.1. Determination of the amount of Financial Provision.

2.1.1. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation under Regulation 22 (2) (d) as described in 2.4 herein.

The closure objectives have been formulated for Contrarianss Mining Permit application. The closure objectives for Contrarians mine are as follows:

a. Identify post-closure uses of land occupied by mine infrastructure in consultation with the surrounding land owners. Should a suitable use for any mine infrastructure not be found, it will be demolished and removed;
b. Rehabilitate all disturbed land to a condition that is suitable for its post-closure uses;
c. Rehabilitate all disturbed land to a condition that facilitates compliance with applicable environmental quality objectives, such as air and water quality objectives as an example;
d. Reduce the visual impact of the mine components through rehabilitation of all disturbed land and residue deposits;
e. Rehabilitate all disturbed land and residue deposits to a condition where post-closure management is minimised;
f. Develop a retrenchment programme in a timely manner;
g. Keep authorities informed of the progress of the activities during the Decommissioning Phase;
h. Submit monitoring results to the relevant authorities; and
i. Maintain the required pollution control facilities and the condition of the rehabilitated land following closure.

The decommissioning phase will entail the rehabilitation of the mining site. Upon cessation of the mining activities, the area will be fully rehabilitated. The perimeter walls of the opencast pit will either be sloped at 1:3 to the pit floor to prevent soil erosion or be stepped by creating benches of not more than 3 meters high. The applicant will comply with the minimum closure objectives as prescribed by DMR and detailed below.

Rehabilitation of the excavated area:

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

Final rehabilitation:

a. Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and weed / alien clearing.
b. All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44of the MPRDA).
c. Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
d. Weed/ Alien clearing will be done in a sporadic manner during the life of the mining activities.
e. Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983- Act 43; Regulations15 & 16 (as amended in March 2001) need to be eradicated from the site.
f. Final rehabilitation shall be completed within a period specified by the Regional Manager.

2.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

As part of the public participation process, the closure objectives and rehabilitation plan was presented and discussed in general with landowners and I&APs. All Interested and Affected Parties including the farm owners were told that a Rehabilitation Plan will be done for this project which will also be circulated for public review.

2.1.3. Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The site closure objective is to rehabilitate the site so it is as close to its natural state before any operations took place. Rehabilitation of the excavated area will continue as excavations progress and will consist of landscaping and reshaping the slope. Topsoil will be placed over the excavated area, as well as the access route to provide a source of seed and a seed bed to encourage the re-growth of plant species.

Upon closure of the mine all infrastructure will be removed. The compacted areas will be ripped and levelled upon which the topsoil will be replaced. The sides of the pit will be sloped to ensure safety and prevent erosion. No permanent structures will remain upon closure of the site. The Independent ECO shall do a final site visit after rehabilitation was completed to ensure compliance with environmental standards.

a. Re- vegetation

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10-20k g/ha (application rate to be confirmed based on input from a suitably qualified specialist). The fertilizer should be added to the soil in as low release granular form.

A suitably qualified ecologist will be appointed to determine the appropriate veld grass mix for hand seeding. Re- vegetation efforts will be monitored every second month for a period of six months after initial seeding. An effective vegetat ion cover of 45% must be achieved. Re- seeding will be under taken if this cover has not been achieved after six months.

2.1.4. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The decommissioning phase will entail the rehabilitation of the mining site. Upon cessation of the mining activities, the area will be fully rehabilitated. The perimeter walls of the opencast pit will be sloped at 1:3 to the pit floor to prevent soil erosion or stepped by creating benches of not more than 3 meters. The rehabilitation of the coal pit will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

2.1.5. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The financial provision for the environmental rehabilitation and closure of any mine/ mining and its associated operations forms an integral part of the MPRDA. Sections 4 1(1), 41(2), 41(3) and 45 of the MPRDA deals with the financial provision for rehabilitation and closure. During 2012 the DMR made updated rates available for the calculation of the closure costs, where contractor's costs are not available these are used in assessments.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMR in January 2005, in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of mining sites. With the determination of the quantum for closure it must be assumed that the infras tructure has no salvage value (clean closure).The closure cost estimate (clean closure) was determined in accordance with the DMR guidelines and is based, where possible, on actual costs provided by a third party contractor.

2.1.6. Confirm that the financial provision will be provided as determined.

It should be noted that the current expenditure provided for in the Mining Works Programme does not included the calculated Financial Provision as included into this Basic Assessment, as these values were not available at the time of the submision- into the Mining Work Programme prior the decision by the DMR should this decision be positive.

3. Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

a. Monitoring of Impact Management Actions
b. Monitoring and reporting frequency
c. Responsible persons
d. Time period for implementing impact management actions
e. Mechanism for monitoring compliance

3.1. Monitoring of Impact Management Actions

3.1.1. Air Quality

(a) Dust Monitoring Programme

Dust deposition rates must be monitored monthly throughout the Life of Mine to establish a historical repository of data needed to understand and address fugitive and airborne dust emissions. Should sources of fugitive dust be effectively managed, there is likely to be an overall reduction in respiratory diseases that are a result of air pollution, a reduced risk of damage to property, improved visibility and fewer disturbances to existing floral and faunal habitats.

(b) Monitoring Programme

It is recommended that monitoring sites be established for the Project to collect data for future assessment of the ambient air quality. This proactive approach will be beneficial and of use should the Klipbank colliery come under scrutiny from regulatory agencies. Calibration of the monitoring instruments should be conducted yearly.

1.1.1. Soil Management

Considering the importance of and formation timeframes associated with soil properties, it is evident that managing soil stockpiles adequately must have a high priority for Contrarians Project. The topsoil and subsoil must be stored separately, and the topsoil stockpile must be limited in height to prevent compaction.

Progressive monitoring of the stripping, stockpiling, shaping of rehabilitated areas and the replacement of topsoil will ensure the successful post-mining land and soil

rehabilitation. Monitoring should take place on at least a quarterly basis and should involve the following:

- Inspection of stripping depths and the separation of topsoil and subsoil;
- Inspection of the stockpiles to manage degradation, erosion and pollution;
- Inspection of the rehabilitated areas to ensure that the pre-mining drainage lines are emulated;
- Random inspections of soil thickness on rehabilitated areas; and
- Fertility and acidic analysis and amelioration procedures, if required, on soil prior to vegetation establishment.

1.1.2. Fauna and Flora

The objective of the monitoring programme is to conserve as much of the natural and indigenous vegetation species as possible, and conserve habitats for SSC.

The on-site effects that the open-pit will have on the flora of the area, such as possible ecosystem destruction, can be quantified with continuous monitoring of natural areas on the Project site, including wetlands, grasslands and ridges. The monitoring program must focus on the faunal and floral SSC, specifically the Grass Owl, Serval, Hedgehog and Giant Bullfrog populations. The other SSC within the Project area must also be monitored, although these species are transient in nature.

An alien invasive vegetation management plan must be implemented, and alien invasive vegetation must be identified and eradicated or controlled. The large infestations mapped within the Project area and encountered within other vegetation types, as well as potential establishment inn disturbed areas, pose a threat to indigenous species.

Seasonal monitoring of the effects of the study area on flora and fauna must be conducted; this can be accomplished through information sharing with local land owners and surveys conducted on the surrounding farms. The predominant management measure to be employed will be to set aside biodiversity corridor areas for SSC.

A monitoring program needs to evaluate the management actions on each of these components. The method of monitoring is the Braun Blanquet method, which is a specialised method designed specifically for vegetation survey and monitoring purposes. The requirements for the monitoring programme include:

- Monitoring must take place annually;
- Monitoring must be completed by qualified specialists;
- Adaptive management must applied;

- Monitoring during the wet season is essential; and
- Findings must be compared to previous years.

The following management and monitoring plans are recommended as part of the Project:

- Biodiversity Land Management Plan;
- Fauna and Flora Monitoring plan;
- Fauna and flora SSC Monitoring; and
- Alien Invasive Management Plan.

3.1.2. Wetlands and Aquatic Ecology

An Aquatic Ecology Monitoring Programme must be implemented from the outset of the Construction Phase and continue throughout the LoM and following closure. The potential for decant is of particular importance following closure of Contrarians proposed mine. The aquatic ecology monitoring must be undertaken biannually, once during the wet season or high flow and once during the dry season or low flow. The following parameters must be tested:

- In situ water quality constituents;
- Sediment and water column metal analysis;
- Toxicity testing;
- Habitat integrity; and
- Aquatic macro invertebrates.

The wetlands will be monitored through an integration of fauna and flora, aquatic and surface water monitoring programmes.

3.1.3. Surface Water

A surface water monitoring plan is crucial for the early detection of surface water quality impacts and will be used to determine when mitigation measures have failed, or whether additional management and mitigation measures are required. Surface water monitoring must be implemented throughout the Life of Mine, as well as for three years following closure.

The sampling must take place on a monthly basis during the Construction Phase, as well as during the initial stages of the Operational Phase. Should the water sampling indicate that there are not quality impacts as a result of the Project, the sampling frequency may be reduced to quarterly. The predominant constituents to be tested include:

- Aluminium; Hydrocarbons; Sulphate; Iron; Manganese; Calcium; Magnesium; Nitrate; Ammonium; Fluoride; Chloride; pH; Electrical Conductivity; TDS; Sodium; Potassium; and Metals.

3.1.4. Groundwater

The groundwater monitoring locations will be selected from during Geohydrological study when the WULA commence. Water quality and levels should be recorded quarterly for one year prior to the commencement of the Project to establish an accurate baseline water level. Water quality must be analysed to ensure that no groundwater contamination takes place and mitigation measures can be implemented should the water become polluted.

3.2. Monitoring and reporting frequency

Table 49-50 discusses the monitoring and reporting frequency.

3.3. Responsible persons

Table 49-50 sets out roles and responsibilities with respecting to the monitoring programme.

3.4. Time period for implementing impact management actions

Table 16- 17 captures the time period for implementing impact management actions.

3.5. Mechanism for monitoring compliance

Table 16- 17 sets out the method of monitoring the implementation of the impact management actions, the frequency of monitoring the implementation of the impact management actions, an indication of the persons who will be responsible for the implementation of the impact management actions, the time periods within which the impact management actions must be implemented and the mechanism for monitoring compliance with the identified impact management.

1.1. Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Annual performance assessments must be undertaken on the EMP. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMR.

2. Environmental Awareness Plan

2.1. Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

An Environmental Awareness and Risk Assessment Schedule have been developed and is outline in Table below. The purpose of this schedule is to ensure that employees are not only trained but that the principles are continuously re- enforced.

Table 18: Environmental Training and Awareness Schedule

Frequency	Time allocation	Objective
Induction (all staff and workers)	1 hour training on environmental awareness training as part of site induction	2. Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects. 3. Establish a basic knowledge of the environmental legal framework and consequences of non-compliance. 4. Clarify the content and required actions for the implementation of the Environmental Management

Frequency	Time allocation	Objective
		Plan. 5. Confirm the spatial extent of areas regarded as sensitive and clarify restrictions. 6. Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents
Monthly Awareness Talks (all staff and workers)	30 minute awareness talks	Based on actual identified risks and incidents (if occurred) reinforce legal requi rements, appropriate responses and measures for the adaptat ion of mitigation and/or management practices.
Risk Assessments (supervisor and workers involved in task)	Daily task based risk assessment	Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily tool box talks.

2.2. Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

As prescribed in Table 18 above, Task/ Issue Based Risk Assessments must be under taken with all worker involved in the specific task in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures.

2.2.1. Environmental Awareness Training Content – Induction Training:

The following environmental awareness training will be provided to all staff and workers who will be involved in mining activities.

- Description of the approved mining activities and content of the mining right;
- An overview of the applicable legislation and regulations as it relates to environmental, health, safety and community including (but not limited to):

    - ❖ General Environmental Legal Principles and Requirements
    - ❖ Air Quality Management
    - ❖ Water and Wastewater Management
    - ❖ Hazardous Substances
    - ❖ Non-Mining-Related Waste Management
    - ❖ The Appropriate Remediation Strategies & Deteriorated Water Resources
    - ❖ Biodiversity
    - ❖ Weeds and Invader Plants
    - ❖ Rehabilitation
    - ❖ Contractors and Tenants
    - ❖ Energy & Conservation
    - ❖ Heritage Resources
    - ❖ General Health and Safety Matters
    - ❖ Basic Conditions of Employment
    - ❖ Compensation for Occupational Injuries and Diseases
    - ❖ General Mine Health and Safety Matters
    - ❖ Smoking in the Workplace
    - ❖ Noise & Hearing Conservation
    - ❖ Handling, Storage and use of Hazardous Substances
    - ❖ Weapons and Fire arms

- Content and implementation of the approved Environmental Management Plan
    - ❖ Allocated responsibilities and functions
    - ❖ Management and Mitigation Measures
    - ❖ Identification of risks and requirements adaptation

- Sensitive environments and features
    - ❖ Description of environmentally sensitive areas and f eatures
    - ❖ Prohibitions as it relates to activities in or in proximity to such areas.

- Emergency Situations and Remediation
    - ❖ Methodology for the identify areas where accidents and emergency situations may occur, communities and individuals that may be impacted
    - ❖ An overview of the response procedures,

- ❖ Equipment and resources
- ❖ Designate of responsibilities
- ❖ Communication, including communication with potentially Affected Communities
- ❖ Training schedule to ensure effective response.

2.2.2. Development of procedures and checklists

The following procedures will be developed and all staff and workers will be adequately trained on the content and implementation thereof.

2.2.3. Emergency Preparedness and Response

The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness and response measures. The appropriate emergency control centers (fire department, hospitals) will be identified and the contact numbers obtained and made available on site. The procedure must be developed in consultation with all potentially affected landowners.

In the event that risks are identified which may affected adjacent landowners or other persons), the procedure will include the appropriate communication strategy to inform such persons and provide response measures to minimize the impact.

2.2.4. Incident Reporting Procedure

Incident reporting will be undertaken inaccordance with an established incident reporting procedure to (including but not limited to):

- o Provide details of the responsible person including any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident ;or (iii) was in control when the incident occurred;
- o Provide details of the incident (time, date, location);
- o The details of the cause of the incident;
- o Identify the aspects of the environment impacted;
- o The details corrective action taken, and
- o The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

2.2.5. Environmental and Social Audit Checklist

An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the Environmental Management Plan. Non- conformances will be identified and corrective action taken where required.

4. Specific information required by the Competent Authority

No specific information was required by the Competent Authority.

5. Undertaking

The EAP herewith confirms

- **a.** the correctness of the information provided in the reports;
- **b.** the inclusion of comments and inputs from stakeholders and I&APs;
- **c.** the inclusion of inputs and recommendations from the specialist reports where relevant; and
- **d.** that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.

Signature of the environmental assessment practitioner:

Evirostep Pty Ltd

Name of company:

05/07/2021

Date:

-END-

APPENDIX A: MAPS

APPENDIX B: CONSULTATION REPORT

APPENDIX C: DETAILS OF THE EAP