DRAFT ENVIRONMENTAL IMPACT ASSESSMENT, ENVIRONMENTAL MANAGEMENT PLAN, WASTE MANAGEMENT LICENSE AND WATER USE LICENSE FOR IRON ORE AND MANGENESE MINING RIGHT APPLICATION WITHIN THE MAGISTERIAL DISTRICT OF CAPRICORN IN LIMPOPO PROVINCE

AUGUST 2021

DMR REF.: LP 30/5/1/2/2/ 10197 MR

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Document History and Distribution List

Document	Date	Institution
Draft EIR and EMPr	15 August 2021	Public Review
Final EIR and EMPr	17 August 2021	Submission to the CA

Name	Institution
Telly Mashau	Department of Mineral Resources (Limpopo)
Divhani Mulaudzi	MA Coal Pty Ltd
	National Department of Agriculture, Forestry and Fisheries
	Department of Water and Sanitation (National)
	Department of Environmental Affairs (Provincial)- LEDET
	Provincial Heritage Resources Agency (PHR)- Limpopo
	Polokwane Local municipality

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List of Abbreviations

%	: Percent
°C	: Degrees Celsius
<	: Less than
>	: Greater than
BID	: Background Information Document
CARA	: Conservation of Agricultural Resources Act
cm	: Centimeter
CR	: Critically Rare
CSI	: Corporate Social Investment
CSR	: Corporate Social Responsibility
dB	: decibel
dBA	: Decibels (Weighted)
DEA	: Department of Environmental Affairs
DM	: District Municipality
DMR	: Department of Mineral Resources
DMS	: Dense Medium Separation
DWS	: Department of Water and Sanitation
EAP	: Environmental Assessment Practitioner
ECA	: Environment Conservation Act

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EIA	: Environmental Impact Assessment
EIS	: Ecological Importance and Sensitivity analysis
EMP	: Environmental Management Plan/Programme
EN	: Endangered
ESR	: Environmental Scoping Report
Fax	: Facsimile
Ha	: Hectare
HIA	: Heritage Impact Assessment
I&APs	: Interested and Affected Parties
IDP	: Integrated Development Plan
IRR	: Issues and Response Register
IWUL	: Integrated Water Use License
IWULA	: Integrated Water Use License Application
IWWMP	: Integrated Water and Waste Management Plan
LED	: Local Economic Development
LM	: Local Municipality
LOM	: Life of Mine
m	: Metres
m^2	: Square Meters
m^3	: Cubic Metres
masl	: Metres Above Sea Level

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MPRDA	: Mineral and Petroleum Resources Development Act
NEMA	: National Environmental Management Act
NEM:BA	: National Environmental Management: Biodiversity Act
NEM: WA	: National Environmental Management: Waste Act
NT	: Near Threatened
NWA	: National Water Act (Act No. 36 of 1998)
PCD	: Pollution Control Dam
PES	: Present Ecological State
PPP	: Public Participation Process
ROM	: Run of Mine
S&EIR	: Scoping and Environmental Impact Report
SAHRA	: South African Heritage Resource Agency
SANBI	: South African National Biodiversity Institute
SANRAL	: South African National Roads Agency Limited
SANS 10103	: South African National Standard 10103
SAWS	: South African Weather Service
SDF	: Strategic Development Framework
SLP	: Social and Labour Plan
sms	: Short Message Services
SWMP	: Storm-water Management Plan
t	: Ton

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WMA : Water Management Area

WULA : Water Use License Application

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Definitions of Terms

Affected Environment: The affected environment refers to those parts of the socio-economic and biophysical environment impacted on by the development.

Consultation: A two-way communications process between the applicant and the community or interested and affected party wherein the former is seeking, listening to, and considering the latter's response, which allows openness in the decision-making process.

Community: A group of historically disadvantaged persons with interests or rights in a particular area of land on which the members have or exercise communal rights in terms of an agreement, custom or law: Provided that, where as a consequence of the provisions of the Act negotiations or consultations with the community are required, the community shall include the members of the community or part of the community, directly affected by prospecting or mining, on land occupied by such members or part of the community.

Environment: The surroundings within which humans exist and that are made up of (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the economic, cultural, historical, and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.

Environmental Impact Assessment: A planning and management tool for sustainable development, aimed at providing decision-makers with information on the likely consequences of their actions.

Environmental Impact: The positive or negative effects on human well-being and/or on the environment.

Interested and affected parties: Individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. These may include local communities, investors, business associations, trade unions, customers, consumers and environmental interest groups, Host Communities, Landowners (Traditional and Title Deed owners), Land Claimants, Lawful land occupier.

Mitigate: The implementation of practical measures to reduce adverse impacts.

Public Participation Process: A process in which potential interested and affected parties are given an opportunity to comment on or raise issues relevant to the proposed development.

Proponent: Any individual, government department, authority, industry or association proposing an activity (e.g. project, programme or policy).

Scoping: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment process. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

Study Area: The area that will be covered by the EIA process within which possible study corridors will be investigated.

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Stakeholders:	A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (I&APs).
Iron Ore:	a rock or mineral from which iron can be profitably extracted.
Manganese:	It is a hard brittle silvery metal, often found in minerals in combination with iron. Manganese is a transition metal with a multifaceted array of industrial alloy uses, particularly in stainless steels.

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EXECUTIVE SUMMARY

Introduction

Envirostep Pty Ltd was appointed by MA Coal (Pty) Ltd, as an independent Environmental Assessment Practitioner (EAP) to conduct an Environmental Impact Assessment, Environmental Management Plan and associated specialist studies for the Mining Right application for Iron and Manganese on portion 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 of the farm Mokotopong 1200 LS within the Magisterial District of Capricorn in Limpopo Province.

MA Coal (Pty) Ltd (MA Coal) holds the Prospecting Right that was granted in terms of section 16 of the Mineral and Petroleum Resources Development Act 28 of 2002 as amended by Act 49 of 2008 ("MPRDA"). MA Coal herewith apply for a Mining right for Iron Ore and Manganese in terms of the Section 23 (a), (b) and (c) read together with regulation 11(1) (g) of the MPRDA (ACT 28 of 2002).

Contact Person and Correspondence Address

This scoping report set out the proposed scope of the Environmental Impact assessment (EIA) that will be conducted. This document therefore will discuss a range of aspects to mention the details of the appointed Environmental Assessment Practitioner (EAP), her qualifications and a summary of her experience.

Description of the Property.

The proposed project is located on the Farm Makotopong 1200LS within the Magisterial District of Capricorn, Limpopo Province. The proposed project is located approximately 32 km northeast of Polokwane along the National Road (N1) and 72km south of Louis Trichardt. A locality map of the proposed project area is included as Figure 1 the immediate adjacent land owners to the proposed project are summarised and tabulated.

Description of the Scope of the Proposed Overall Activity.

The proposed activity might trigger the following listing activities, GNR 983 (Activity 13), GNR 983 (Activity 14), GNR 983 (Activity 24 (ii)), GNR 984 (Activity 9), GNR 984 (Activity 15), GNR 984 (Activity 17), GNR 984 (Activity 21), GNR 985 Activity 10 (f), GNR 985 (Activity 12 (a))GNR 178 Category B (Activity 10), GNR 178 Category B (Activity 11).

Description of the Scope of the Proposed Overall Activity.

The proposed activity might trigger the following listing activities;

NEMA, EIA Regulation, 2014

GNR 983- Listing Notice 1: Activity 13, Activity 14, Activity 24 (ii)

GNR 984- Listing Notice 2: Activity 9, Activity 15, Activity 17, Activity 21.

GNR 985- Listing Notice 3: Activity 10 (f), Activity 12 (a)

Waste Management License

GNR 178 Category B: Activity 10 and Activity 11

The proposed activities that MA Coal is intending to undertake will include the excavation of an open cast mine. Datamine software was chosen to design the pit for the mine, to ensure that all waste within the ultimate pit can be accommodated throughout the life of Mine (LOM), a Waste Dump Design was completed. Apron Feeders will be utilised, as they deliver material at a uniform rate, which allows an optimal feeding to downstream equipment. Crushers will be used to reduce large rocks into smaller rocks, gravel, or rock dust. Conveyors will be used to transport material such as the ore and the overburden. It is assumed the water supply for the plant area will be obtained from the Municipal and other nearby water sources. The power supply will be supplied by Eskom. Gravel Surface roads will be constructed. For the purpose of administration, general buildings will be built. The Surface Mine Layout is presented in Appendix A of this report.

Need and Desirability of the Proposed Activities.

This Chapter focuses on the positive impacts that this proposed project will contribute to the communities and the country. Amongst other benefits, employment opportunities will be created, growth in the Gross Domestic Product (GDP), poverty alleviation and the minerals to be mined have a significate economic benefits to the industry.

Description of the process followed to reach the proposed preferred site.

The preferred activity is the mining of Iron Ore and Manganese and it will be extracted through open cast mining method. The selected site layout is represented in **Error! Reference source not found.**, the selection was based on the position and of the mineral reserves to be exploited, land ownership, geo-hydrological impacts and the ease and available transport modes and routes. The ore will be mined from an open pit using excavators, bulldozers, trucks, bowl scraper and shovel. A tripper conveyor is proposed for the stacking method. The proposed technologies were based on their long-term success in terms of mining history, therefore no alternatives are indicated.

The operation aspects of the proposed mining involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads, diesel and wash bays. No feasible alternative operational aspect methods currently exist. The No-go option might be considered if the mining right application is rejected however, the applicant will loss the opportunity to utilise the reserves and the agricultural activity will continue.

PURPOSE OF THIS REPORT

The overarching objectives of this EIA/EMPr Report are to:

- Identify and assess potential environmental and social impacts associated with the proposed waste management activities associated with the MA Coal Project; and
- Recommend mitigation and management measures to ensure that the development is undertaken in such a way as to enhance positive impacts and minimise negative impacts.

This report also describes the status quo of the biophysical and socio-economic environment of the Project area through specialist studies undertaken. Furthermore, an EMPr has been developed to mitigate and manage environmental and social impacts associated with each

project activity. The EIA/EMPr Report will be submitted to the public for their input and comments for a period of thirty (30) days on the 15th of August 2021 to the 15th of September 2021. The EIA/EMPr Report will be updated based on inputs from the public consultation period.

PUBLIC PARTICIPATION PROCESS

A Public Participation Process (PPP) has been designed not only to comply with the regulatory requirements set out in the EIA Regulations (April 2017, as amended), but is also designed to provide Interested and Affected Parties (I&APs) with an opportunity to evaluate all aspects of the proposed Project. The public meeting will be held before the submission of the Final EIR and EMPr with the farm owners and community representatives. Newspapers used for advertising the EIA Phase for the proposed project is Polokwane Review (22 June 2021). All issues and concerns raised during Scoping and EIA Phase are addressed in this report. The aim is to maximise the Project benefits while minimising its adverse effects. The EIAR and EMPr Report will be made available for public review from 15 August 2021 to 15 September 2021.

SUMMARY OF THE POTENTIAL IMPACTS ASSOCIATED WITH THIS MINING RIGHT APPLICATION

Specialist studies conducted for MA Coal Right Application to assess all negative and positive impacts associated with the mining of Iron Ore and Manganese on farms under application.

- Air Quality Impact Assessment
- Heritage Impact Assessment
- Biodiversity Impact Assessment
- Noise Impact Assessment
- Social Impact Assessment
- Geohydrological study

RECOMMENDATIONS

This section will be completed upon availability of all specialist studies.

OVERALL RECOMMENDATIONS

The predominant impacts on the biophysical environment during the Construction Phase are associated with construction of the pollution control dams and overburden stockpiles. Such activities could lead to soil erosion and contamination, loss of biodiversity and habitats.

The biodiversity within the project area was determined to be low. The project area was dominated by agricultural/ and grazing fields. Certain parts of the project area were altered and were comprised of stands of alien plants and monospecific grassland. Wetland areas were identified within the project area. The proposed mine layout plan indicates that the wetland areas will not be directly affected by the mining activities.

The operation of the stockpiles and PCD could be a source of potential groundwater contamination should seepage occur, with the extent of the contamination plume limited to 2km. The rehabilitated and backfilled mined voids are a source of potential Acid Mine Drainage (AMD) generation. The contamination of mine affected water may impact on groundwater resources and surface water, should decant occur.

The presence and operation of MA Coal mine is likely to have numerous negative socio-economic impacts of minor to moderate significance, largely associated with population influx. Such impacts include increased pressure on local resources and services, community conflict, and an increase in social pathologies. In addition, land acquisition of farms will be necessary for the commencement of the Project.

Positive socio-economic impacts are associated with the Project and include the limited direct, as well as indirect, employment opportunities during the Construction and Operational Phases of the Project and the downstream economic impacts associated with MA Coal Mine. The implementation of the mine's Social and Labour Plan will benefit the community as Local Economic Development initiatives will be undertaken.

CONCLUSIONS AND RECOMMENDATIONS

Mitigation and management measures have been recommended to prevent, avoid and reduce the significance of the potential impacts of the Project. Conversely, enhancement measures will be implemented to increase the significance of the potential positive impacts at MA Coal Mine. Should the mitigation and management measures be correctly implemented, the potential impacts will reduce in their significance impacts.

The proposed activities requiring Environmental Authorisation are critical for the mining activities and the prevention of pollution of the environment, as well as to ensure the efficient and successful operation of the Project. With the implementation of the recommended mitigation measures to manage potential impacts, it is recommended that the proposed Project be granted an Environmental Authorisation.

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT 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 : **MA Coal (Pty) Ltd**

Tel No : **+27 11 234 7152**

Fax No : **+27 86 567 3080**

Postal Address : **P.O Box 97194, Petervale, Sandton, 2151**

Physical Address : **01 Fort Street, Illovo, Melrose, South Africa 2196**

File Reference Number Samrad : **LP 30/5/1/1/2/ 10197 MR**

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting 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.

1 OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
(d) determine the—-
    (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

    (ii) degree to which these impacts—

        (aa) can be reversed;

        (bb) may cause irreplaceable loss of resources, and

        (cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
(g) identify suitable measures to manage, avoid or mitigate identified impacts; and
(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSSSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

2 CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 *Details of*

2.1.1 Details of the EAP

Name of The Practitioner : Thabelo T. Nelwamondo

Tel No. : 081 760 7362

Fax No. : 086 604 5465

e-mail address : tmatshisevhe@gmail.com

2.1.2 Expertise of the EAP.

Thabelo T. Matshisevhe has an Honours degree in Environmental Management from the University of Venda. She is a Senior Environmental Consultant at Envirostep Pty Ltd and a member of South African Council for Natural Scientific Professions (SACNASP). She has more than 7 years working experience in the field of Construction, Waste Management, Environmental Management and Environmental Management Systems (EMS) Implementation and Auditing. She has worked on several municipality and state-owned companies' projects among them included the following:

a. Upgrade of Makwarela stadium for Thulamela Local Municipality in Limpopo Province
b. Waste Management license and Basic Assessment Process for St. Lucia waste disposal site in KwaZulu- Natal Province.
c. Prospecting right application for Diamond and Manganese for Mivami Agri Mining Pty Ltd in Northwest Province.
d. Mining Right Application for Iron Ore for Muhlava Mining Pty Ltd in Thabazimbi, Limpopo Province.
e. Mining Right Application for magnetite for SASOL in Heidelberg, Gauteng Province.
f. Basic Assessment Process for the expansion of a consolidation loop in Phalaborwa for Transnet Capital Projects, Limpopo Province.
g. Basic Assessment Process for the expansion of a Railway line at Pyramid South for Transnet Capital Projects, Gauteng Province.
h. Mining Right Application for Coal for Woestalleen Mining Pty Ltd in Mpumalanga Province.

Proof of Qualification and CV of the EAP on Appendix B

2.1.3 Summary of the EAP's past experience.

She has worked on several municipality projects among them included the following:

a. Upgrade of Makwarela stadium for Thulamela Local Municipality in Limpopo Province
b. Waste Management license and Basic Assessment Process for St. Lucia waste disposal site in KwaZulu- Natal Province.
c. Prospecting right application for Diamond and Manganese for Mivami Agri Mining Pty Ltd in Northwest Province.
d. Mining Right Application for Iron Ore for Muhlava Mining Pty Ltd in Thabazimbi, Limpopo Province.
e. Mining Right Application for magnetite for SASOL in Heidelberg, Gauteng Province.
f. Basic Assessment Process for the expansion of a consolidation loop in Phalaborwa for Transnet Capital Projects, Limpopo Province.
g. Basic Assessment Process for the expansion of a Railway line at Pyramid South for Transnet Capital Projects, Gauteng Province.
h. Mining Right Application for Coal for Woestalleen Mining Pty Ltd in Mpumalanga Province.

Apart from doing municipality projects, Thabelo has also managed many Environmental Impact Assessment Projects and Environmental Monitoring for construction projects in South Africa.

2.2 Description of the property.

Table 1: Description of the property

Farm Name:	Mokotopong 1200 LS
Application area (Ha)	2 987 hectares
Magisterial district:	Capricorn
Distance and direction from nearest town	32 km North-East of Polokwane
21 digit Surveyor General Code for each farm portion	Makotopong 1200LS Ptn 0: T0LS00000000120000000 Makotopong 1200LS Ptn 1: T0LS00000000120000001 Makotopong 1200LS Ptn 2: T0LS00000000120000002 Makotopong 1200LS Ptn 3: T0LS00000000120000003 Makotopong 1200LS Ptn 4: T0LS00000000120000004 Makotopong 1200LS Ptn 5: T0LS00000000120000005 Makotopong 1200LS Ptn 6: T0LS00000000120000006 Makotopong 1200LS Ptn 7: T0LS00000000120000007 Makotopong 1200LS Ptn 8: T0LS00000000120000008 Makotopong 1200LS Ptn 9: T0LS00000000120000009 Makotopong 1200LS Ptn 10: T0LS00000000120000010

	Makotopong 1200LS Ptn 11: T0LS00000000120000011 Makotopong 1200LS Ptn 12: T0LS00000000120000012 Makotopong 1200LS Ptn 13: T0LS00000000120000013 Makotopong 1200LS Ptn 14: T0LS00000000120000014

Land tenure and use of immediately adjacent land

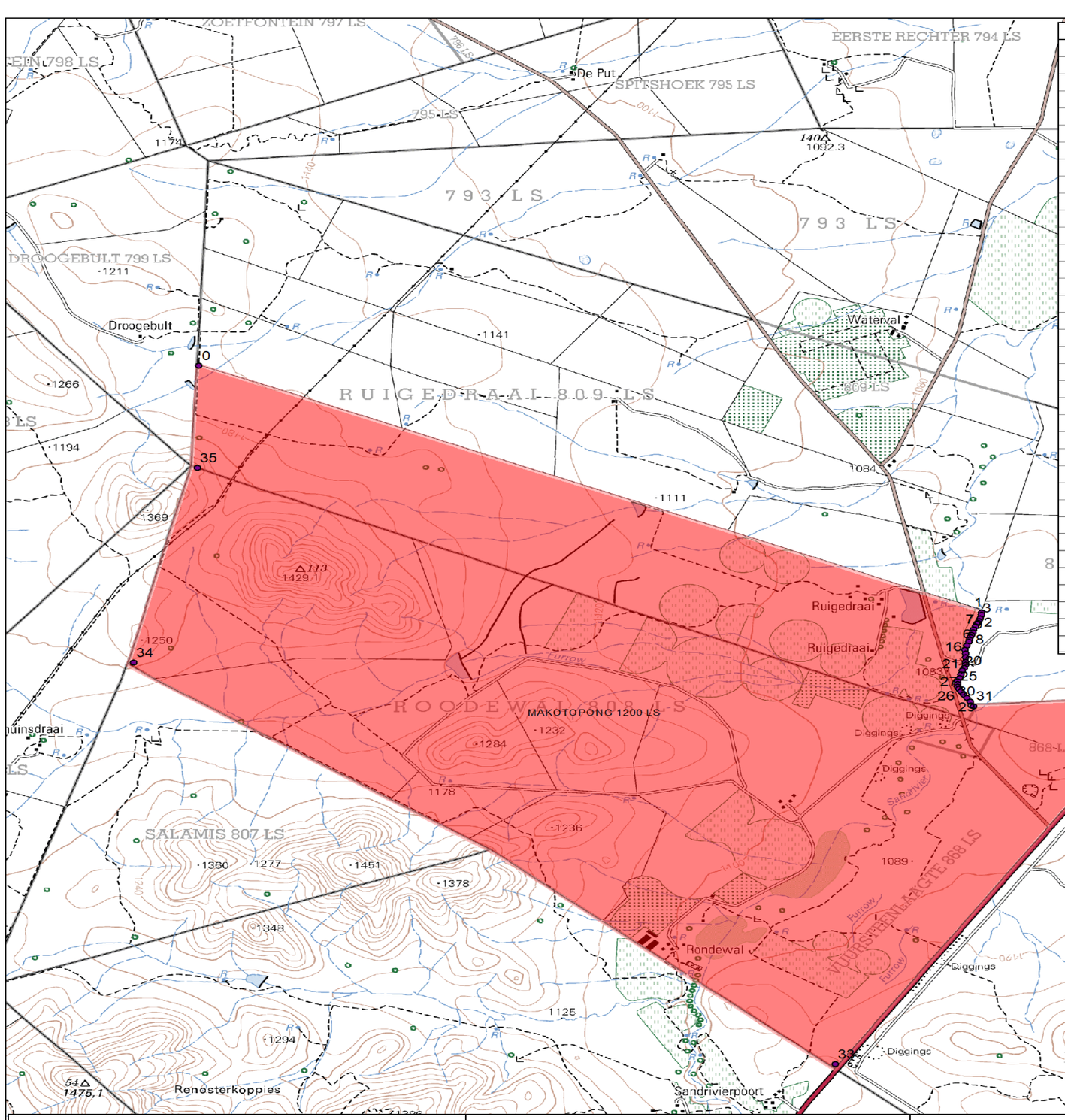
The owners of the farm portions immediately adjacent to the MA Coal site are listed in the Table 2 below. The adjacent land is mostly used for agricultural activities.

Table 2: Adjacent land owners of the site

Farm name	Full names of owner	Title Deed Number	Contact details and address
Roodewal 808 LS	Arrow Creek Investment 4 Pty Ltd	T93117/2008	Dr. Olive Shisana 060 976 6005 oshisana@gmail.com
Ruigedraai 809 LS	Arrow Creek Investment 4 Pty Ltd		Dr. Olive Shisana 060 976 6005 oshisana@gmail.com

2.3 Locality map

The locality of the proposed MA Coal mining area is presented in Figure 1 below. The map shows the the farm portions on which the proposed activity will take place as well as the adjacent farm portions that may be affected by mining activities.



FID	Id	Latitude	Longitude	Latitude_2	Longitude
0	0	23° 35' 57,613" S	29° 33' 26,431" E	-23,599336903019	29,55734201207
1	0	23° 37' 24,357" S	29° 37' 6,729" E	-23,6234325319853	29,61853584287
2	0	23° 37' 25,274" S	29° 37' 6,746" E	-23,6236872994126	29,61854052794
3	0	23° 37' 26,421" S	29° 37' 6,415" E	-23,62400589418	29,61844862560
4	0	23° 37' 27,524" S	29° 37' 6,040" E	-23,6243122353024	29,61834446962
5	0	23° 37' 28,450" S	29° 37' 5,533" E	-23,6245695618452	29,61820355270
6	0	23° 37' 29,355" S	29° 37' 5,025" E	-23,6248207615656	29,61806263579
7	0	23° 37' 30,413" S	29° 37' 4,628" E	-23,6251148490431	29,61795235298
8	0	23° 37' 31,384" S	29° 37' 4,298" E	-23,6253844292309	29,61786045065
9	0	23° 37' 32,288" S	29° 37' 3,989" E	-23,6256356289513	29,61777467513
10	0	23° 37' 33,038" S	29° 37' 3,658" E	-23,6258439409145	29,61768277280
11	0	23° 37' 34,009" S	29° 37' 3,504" E	-23,6261135211022	29,61763988504
12	0	23° 37' 34,803" S	29° 37' 3,151" E	-23,6263340867104	29,61754185588
13	0	23° 37' 36,038" S	29° 37' 2,643" E	-23,6266771887675	29,61740093896
14	0	23° 37' 37,604" S	29° 37' 2,136" E	-23,6271121931613	29,61726002205
15	0	23° 37' 38,883" S	29° 37' 2,246" E	-23,6274675488634	29,61729065616
16	0	23° 37' 40,162" S	29° 37' 2,335" E	-23,6278229045654	29,61731516345
17	0	23° 37' 41,839" S	29° 37' 2,379" E	-23,6282885430715	29,61732741709
18	0	23° 37' 42,743" S	29° 37' 2,379" E	-23,6285397427919	29,61732741709
19	0	23° 37' 43,868" S	29° 37' 1,849" E	-23,6288522107367	29,61718037336
20	0	23° 37' 44,905" S	29° 37' 1,276" E	-23,6291401713918	29,61702107597
21	0	23° 37' 46,140" S	29° 37' 0,901" E	-23,6294832734489	29,61691691999
22	0	23° 37' 47,419" S	29° 37' 0,526" E	-23,6298386291509	29,61681276401
23	0	23° 37' 48,522" S	29° 37' 0,063" E	-23,6301449702734	29,61668410074
24	0	23° 37' 49,536" S	29° 36' 59,975" E	-23,630426804106	29,61665959345
25	0	23° 37' 50,397" S	29° 37' 0,019" E	-23,6306657501815	29,61667184709
26	0	23° 37' 51,257" S	29° 37' 0,504" E	-23,630904696257	29,61680663719
27	0	23° 37' 52,205" S	29° 37' 1,011" E	-23,6311681496223	29,61694755410
28	0	23° 37' 53,242" S	29° 37' 1,673" E	-23,6314561102773	29,61713135878
29	0	23° 37' 54,433" S	29° 37' 2,577" E	-23,6317869586896	29,61738255850
30	0	23° 37' 55,668" S	29° 37' 3,614" E	-23,6321300607467	29,61767051915
31	0	23° 37' 57,367" S	29° 37' 4,562" E	-23,6326018260752	29,61793397252
32	0	23° 37' 54,179" S	29° 37' 57,328" E	-23,6317163946309	29,63259100548
33	0	23° 40' 3,275" S	29° 36' 25,518" E	-23,6675763868844	29,60708835767
34	0	23° 37' 42,133" S	29° 33' 7,956" E	-23,6283702225711	29,55221000448
35	0	23° 36' 33,504" S	29° 33' 25,899" E	-23,6093066747858	29,55719427438

Legend

- Coordinates
- Proposed Mining Ar

Applicant: MA Coal (Pty) Ltd	Signature: Date:	REGULATION 2.2 MAP: PROPOSED MINING RIGHT APPLICATION AREA ON THE FARM MAKOTOPONG 1200. REGISTRATION DIVISION LS, NEAR POLOKWANE, LIMPOPO PROVINCE.

3 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

3.1 Listed and specified activities

Table 3: Listed and specified activities.

APPLICABLE LISTING NOTICE	NAME OF ACTIVITY	LISTED ACTIVITY *(Mark with an X where applicable or affected.)*
GNR 983 Activity 24 (ii)	**Planned road** "The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	X
GNR 983 Activity 13	**Storage** **"**The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014".	X
GNR 983 Activity 14	**Hazardous Storage** "The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres".	
GNR 984	**Powerline**	X

APPLICABLE LISTING NOTICE	NAME OF ACTIVITY	LISTED ACTIVITY *(Mark with an X where applicable or affected.)*
Activity 9	"The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex".	
GNR 984 Activity 15	**Excavations** "The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- The undertaking of a linear activity; or Maintenance purpose undertaken in accordance with a maintenance".	X
GNR 984 Activity 17	**Processing plant** **"**Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) including- Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource; or…"	X

APPLICABLE LISTING NOTICE	NAME OF ACTIVITY	LISTED ACTIVITY *(Mark with an X where applicable or affected.)*
GNR 984 Activity 21	**Processing plant** "Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies**."**	X
GNR 985 Activity 10 (f)	**Storage** "The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres".	X
GNR 985 Activity 12 (a)	**Excavations** **"**The clearance of an area of 300 square metres or more indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan".	X

APPLICABLE LISTING NOTICE	NAME OF ACTIVITY	LISTED ACTIVITY *(Mark with an X where applicable or affected.)*
LISTED ACTIVITIES IN TERMS OF THE WASTE ACT		
GNR 178 Category B Activity 10	**Processing plant** "Construction of facilities and associated structures and infrastructure (the construction of a facility for a waste management activity listed in Category B of this Schedule not in isolation waste management)".	X
GNR 178 Category B Activity 11	**Stockpiles** "Residue stockpiles or residue deposits (the establishment or reclamation of a residue stockpile or residue deposit resulting from activity which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)".	X

3.2 Description of the activities to be undertaken

This section describes the proposed project. The information sourced from the Mining Works Programme (MWP) submitted as part of the Mining Right Application.

3.2.1 Activities to be undertaken by MA Coal (Pty) Ltd

The proposed Makotopong Project locates within a portion of the Rhenosterkoppies Greenstone Belt (RGB), with rocks belonging to the Pietersburg Group of the Murchison Sequence (refer to Figure 2). Low-to-medium grade metamorphism is seen within the volcano-sedimentary greenstone belts within the northern Kaapvaal Craton, formed during the collision between the Kaapvaal and Zimbabwean Cratons some 2.7 billion years ago. The ore is characterised by alternating sequences of banded ironstone (BIS) interlayered with various units of biotite schist, garnet-mica schist, quartzitic schist, amphibolite, quartzites and sulphide-rich breccias. This lithological sequence was deposited in an ancient marine environment under reducing atmospheric conditions, thereby precipitating iron oxide minerals within the BIS units. The sequence has undergone isoclinal folding resulting in steeply dipping (30-45°) units at the surface which have been sporadically truncated and/or intruded by dolerite dykes and sills of younger ages.

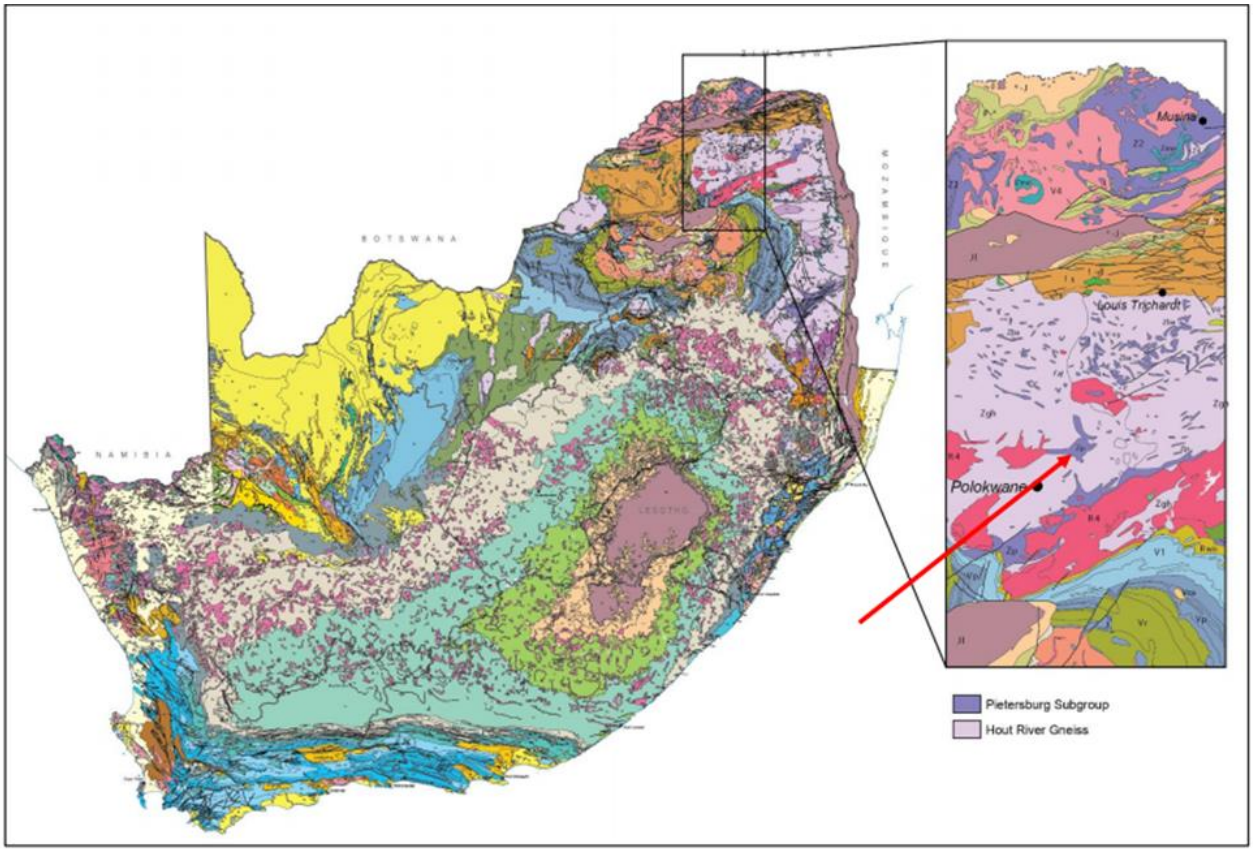


Figure 2: Geological Map of South Africa indicating the proposed Project Setting (Council for Geoscience)

Geological mapping was undertaken on the Makotopong Farm by Minrom geologists during 2019. The drilling programme undertaken included twelve boreholes which were lithologically logged and sampled and eight test pits were also dug ranging up to 1.8m in depth. All boreholes were drilled at inclinations designed to intercept the reefs perpendicularly, with inclinations ranging between 50° and 70°.

Mineralisation within the project area is divided into northern and southern portions (**Error! Reference source not found.**), corresponding with topographic highs. The northern ore body is further divided into five main reefs with an additional two reefs which are seen to pinch out. The southern ore body comprises three main reef horizons, with an additional two which pinch out. The ore body is approximately 46 m thick and ranges depths of up to 100m below the surface.

Figure 3: Interpreted faulting across the Farm Makotopong

3.2.2 Mining Operations

This section provides details of the mining activities and supporting infrastructure which will be constructed as part of the proposed Makotopong Project.

3.2.2.1 Mining Method

The resource will be mined by conventional truck-and-shovel open pit mining with bench heights of 10m. Mining will commence on the southern ore body. Due to the ore body outcropping, ore will be accessed immediately. Ramp up of ore production will be done during the first two years, with steady-state production of 1,200ktpa reached within year three (**Figure 4**). The estimated life-of-mine (LoM) is 22 years. **Figure 5** provides the proposed site layout.

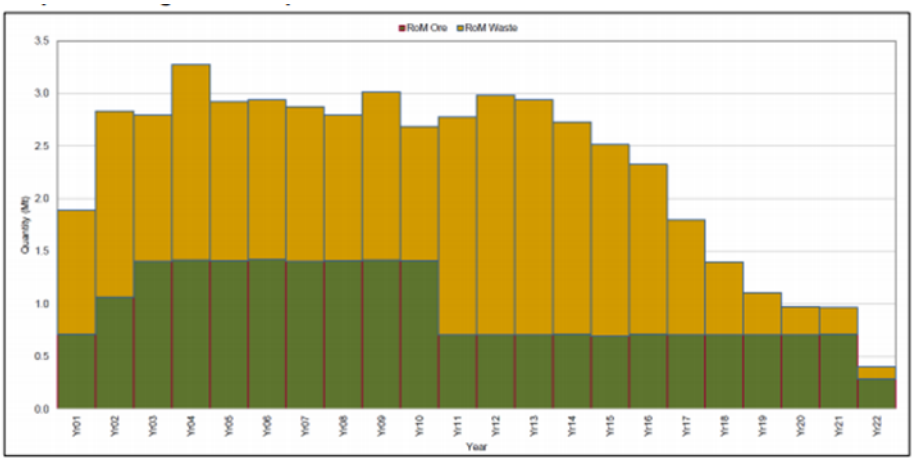


Figure 4: Mining schedule per annum

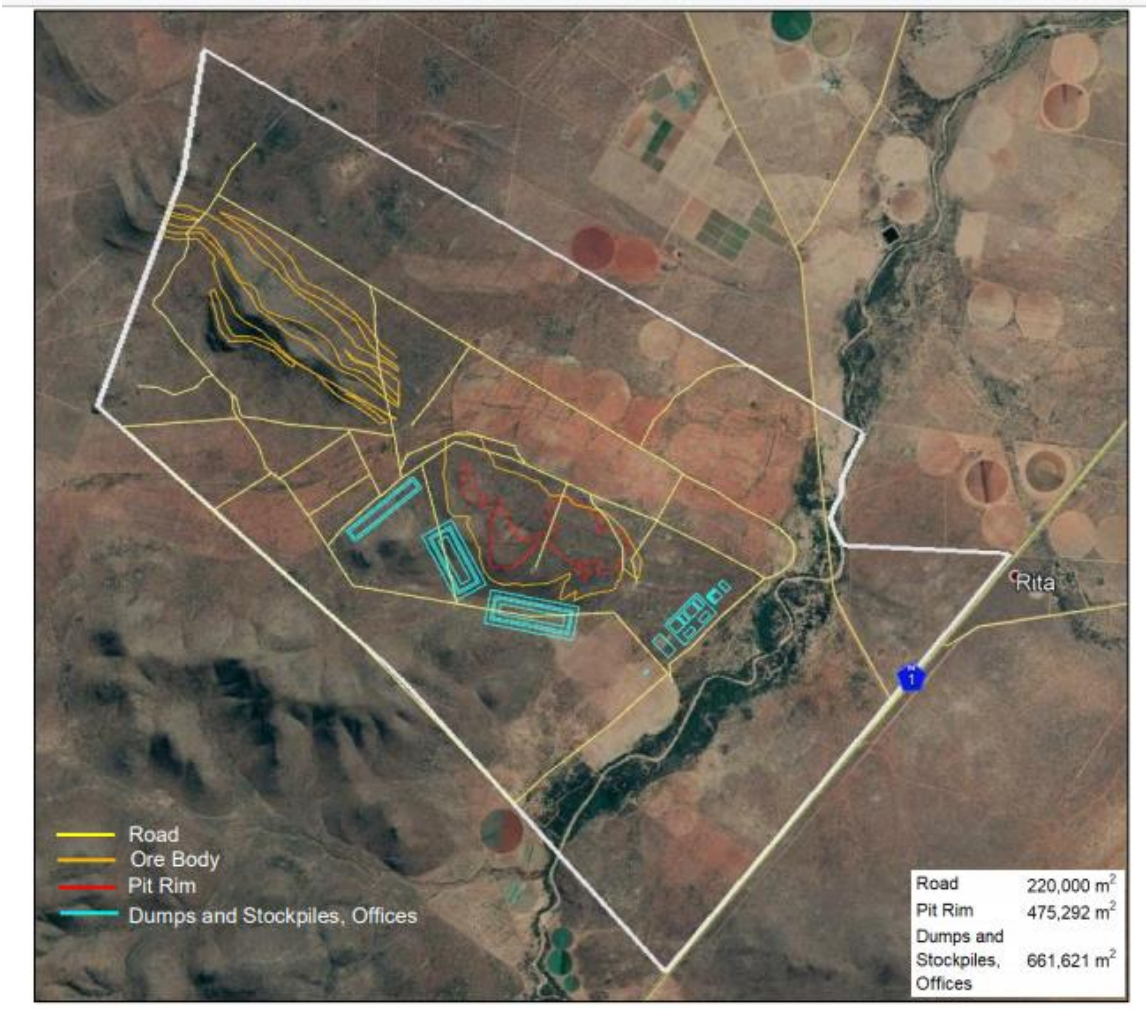


Figure 5: Proposed Makotopong Project layout

Mining of the pit will begin on the outcrop, and as such ore will be accessed immediately. In the second year of mining excavating of additional outcrop will begin while extending the pit. By year eight all excavations will be contiguous, forming a single pit. By year fourteen the total surface footprint will be accessed (**Figure 6**) and thus from year fifteen to twenty-two the pit only increases in depth.

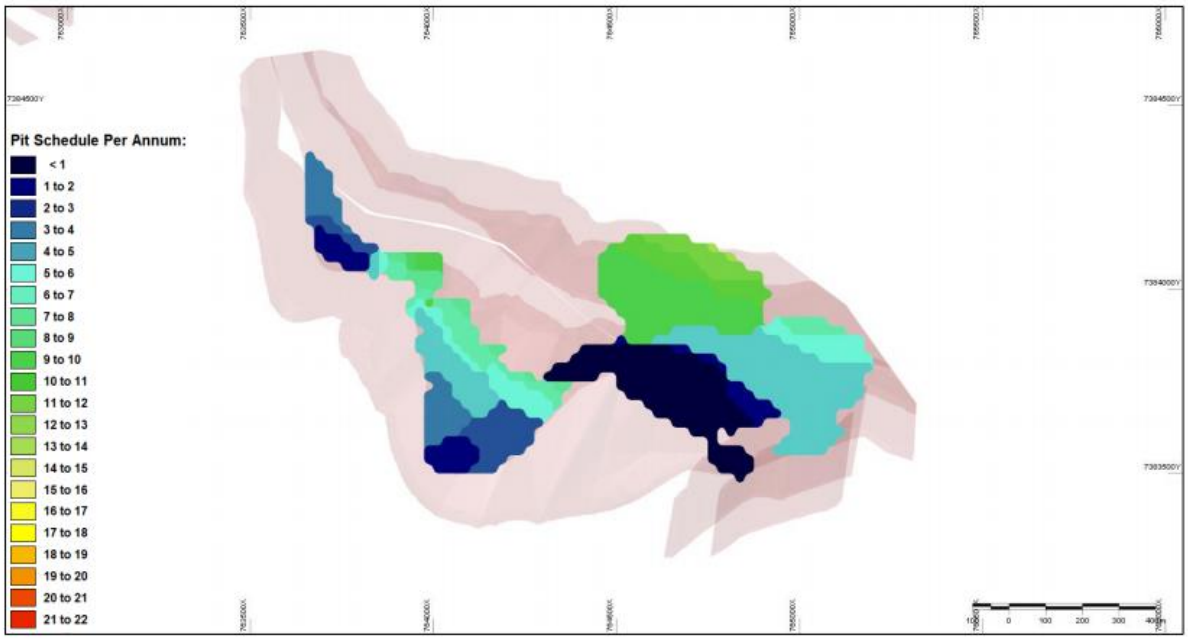


Figure 6: Mining schedule – Year 1 to 14

Approximately 680kt of ore will be mined in the first year and 1,000kt in the second year. Steady-state production of 1,200ktpa will be achieved in the third year of mining. Production will approximately halve from year 11 to year 21 to approximately 670ktpa of ore (**Error! Reference source not found.**). Year 22 is currently the final year of production at 270kt of ore for the year.

The current mine plan targets the southern ore body and produces a 22-year mine plan, leaving the northern ore body as further mining potential.

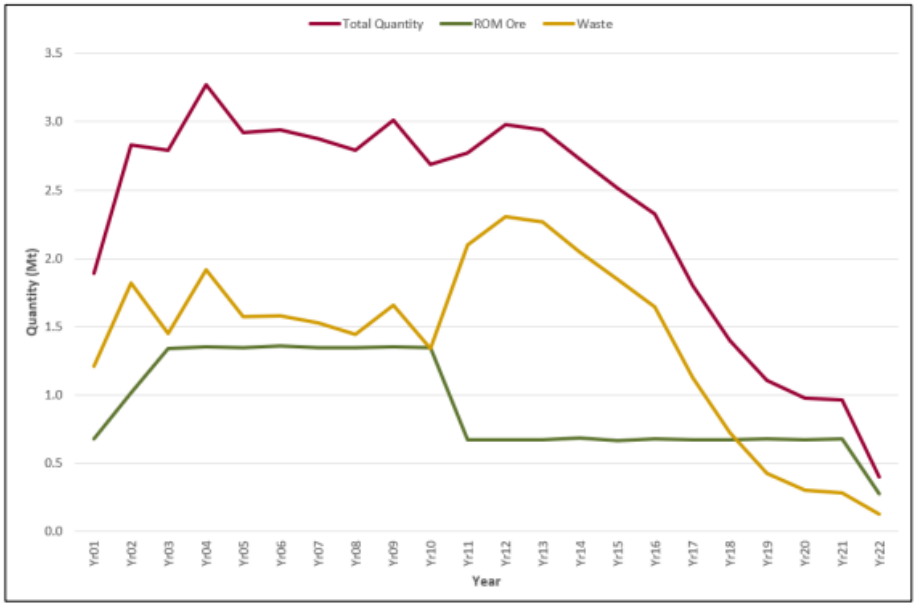


Figure 7: Production profile for the proposed Makotopong Project

3.2.2.2 Infrastructure Requirements

Summary of likely infrastructure requirements include:

- Run of Mine (ROM) stockpile;
- Clearings areas for stockpiles;
- Waste dump, ROM pad and product stockpiles;
- Construction of a crush and screen plant;
- Construction of a filling station/refuelling facility;
- Construct explosive magazine;
- Workshop;
- Offices and ablution; and
- Change house facility.

Based on the requirement for a 2 mtpa ROM feed and a simple lumpy DSO product without beneficiation, it is assumed that a typical iron ore ROM feed size distribution and a simulated a three-stage crushing, and screening circuit is viable as defined in the attached block flow.

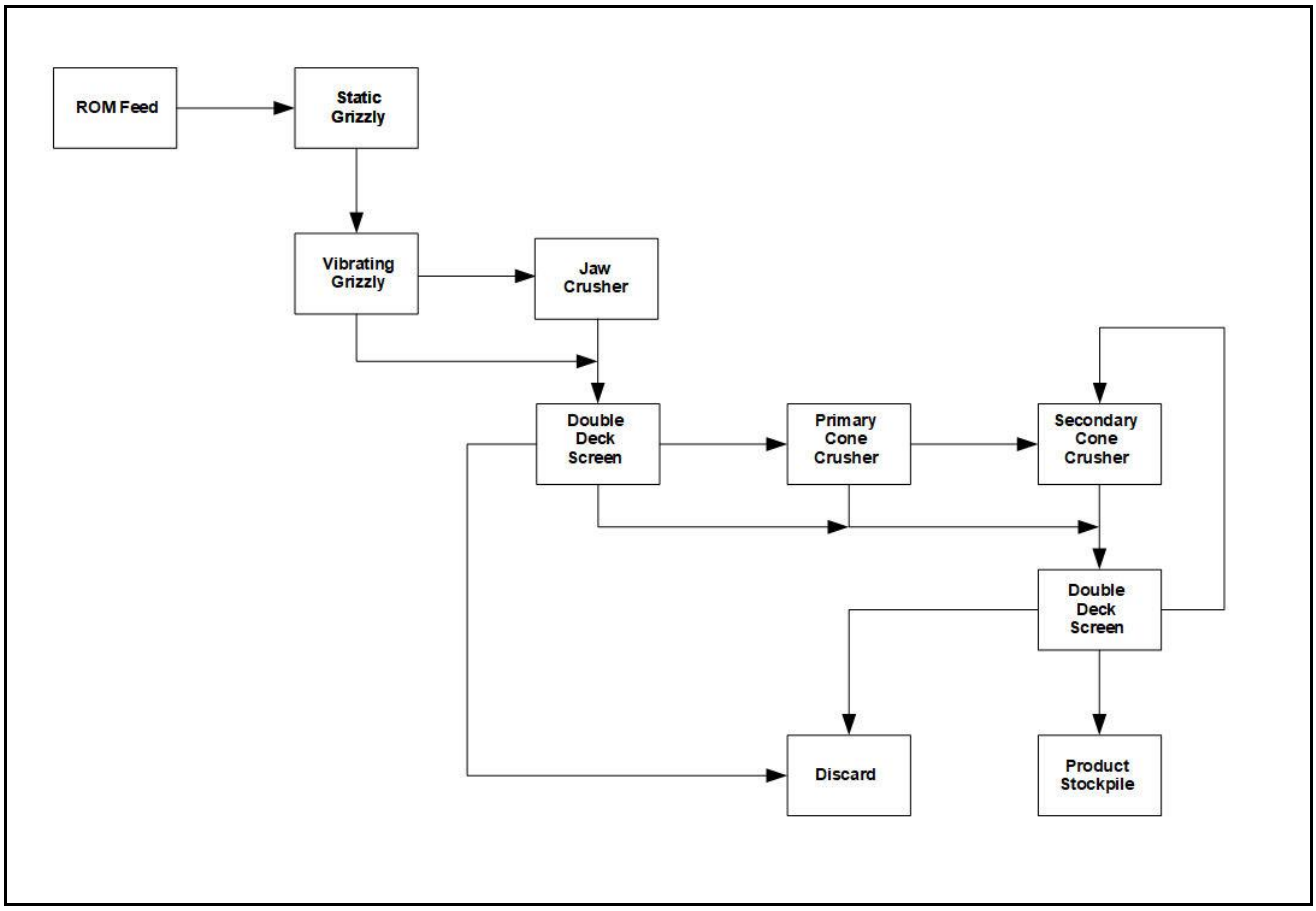


Figure 8: Ore processing flowchart

The ROM feed of 517tph includes about 40.6tph of -6 mm material and after three stages of crushing a further 59.6tph of -6 mm material is generated. The lumpy product of -32mm and +6mm amounts to an estimated 416.8 tph or 80.6% of ROM feed. The flow chart presented in Figure 8 above will be confirmed through additional crushing test work.

a. Apron Feeder

Apron feeders are very rugged in design and are commonly used in iron ore applications. They are used to extract ore from bins at a predetermined rate and can handle impact loadings as is prevalent from intermittent truckloads being deposited into the receiving bin at the primary tip. The length of the apron feeder will be determined from the layout while the width and power factors will be calculated from the required capacity and speed.

b. Crushers

Gyratory crushers are very commonly used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. A single jaw crusher is the preferred option in a lower production requirement.

A single jaw crusher (Metso C140) with a capacity of 750mm, top size, was selected as the primary crusher. A static grizzly is placed at the primary tip to remove oversize material, with a vibrating grizzly placed before the crusher to screen off the fines before it enters the crusher. Secondary and tertiary crushing is required to reduce the size of the material to less than 32mm. Cone crushers are commonly used for this application, but it will have to be confirmed whether the technology is suitable for this ore through further test work. Toothed roll crushers and mineral sizers are ideal to minimise fines but can only handle soft to medium hard type ores. Cone crushers were selected for the secondary open circuit and closed-circuit tertiary crushing applications. The tertiary crusher has a high capacity requirement due to the re-circulating load.

c. Conveyors

The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations.

d. Stockpile stacking and reclaiming

Various methods exist for stacking and extracting material from the stockpile, each with its' own advantages and disadvantages. In the effort to reduce the capital, a tripper conveyor is proposed for the stacking method. The mechanical components cost is essentially equivalent as for a conventional conveyor. Additional steel and civil work are required to extend the conveyor over the stockpile.

Bottom extraction was selected as the reclaim method of the stockpile. A tunnel underneath the stockpile houses a travelling rotary plough feeder and a conveyor. The capital required for this method is less than a conventional bucket or drum re-claimer, but more civil work is required due the construction of the tunnel. Due to the size of the operation, a small stacker/ re-claimer might be a viable alternative solution and should be investigated further.

e. Water supply

It is assumed that sufficient make-up water will be supplied to the perimeter of the plant area, either from municipal supply or other nearby water sources. Holding and settling dams are required to contain the water for water distribution.

f. Power Supply

It is assumed that sufficient power will be supplied at the perimeter of the plant area. The onsite power distribution will be done from the incoming substation through step-down transformers and via electrical reticulation to the various plant MCC's. Provision is included for a backup generator.

g. Access and Plant Roads

Secure access and fencing were included for the plant area, with access control via a single gate with guard houses and booms. 8m wide with 4m wide lanes were provided dual purpose roads and working areas within the main plant area. These will be as gravel surfaced roads. The final layer (wearing course) will comprise a suitable gravel material for plant type roads.

h. General Buildings

General buildings will be built for the plant and general administration sections. All visitors and employees of the mine will need to report to the security clearance area in the administration complex on arrival at the mine. Public buses and cars have access to the bus terminus and visitor parking areas respectively. All other access will be controlled by the security guard station with access control booms.

There will be a training section and clinic adjacent to the security offices for induction and training purposes, including emergency medical response. Once personnel or visitors have passed through security, they have immediate access to the plant change house facility or canteen. Personnel on lunch break or returning from their shift again have access to the canteen or change house facility before passing back through the security gates and returning home.

The plant and administrative offices are located across the road from the change house and canteen, with the possibility of direct road access via one of the gate-controlled access points with authorised plant vehicles. The road passes in front of the plant offices (with dedicated parking adjacent to the office building), continues first to the plant services area, and then to the various plant operational areas.

The plant services area contains the plant stores, capital spares yard/ laydown area and plant workshop (mechanical and electrical). All brick buildings are single-storey semi face brick buildings, with inverted box rib (“IBR”) galvanized roof sheeting. Internal walls are plastered and painted. All floors are tiled or covered with raised computer flooring.

3.3 Policy and Legislative Context

Table 4: Policy and Legislative Context (*Please note, the applicable legislations and guidelines are not only limited to the ones mentioned below*.)

Applicable Legislation And Guidelines Used To Compile The Report	**How Does This Development Comply With And Respond To The Policy And Legislative Context**
Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002) (MPRDA) and Regulations, as amended	MA Coal has applied to the DMR for a mining right in terms of the MPRDA.
National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended	An integrated NEMA and NEM: WA application has been submitted to the DMR.
Environmental Impact Assessment Regulations, 2014 (EIA Regulations 2014) and Environmental Impact Assessment Regulations Listing notices 1, 2 and 3 published in terms of NEMA in Government Notices 982, 983, 984 and 985 of 4 December 2014 (as amended by Government Notices 324, 325, 326 and 327 of 7 April 2017)	
National Environmental Management: Waste Act, 2008 (No 59 of 2008) (NEM: WA)	
List of Waste Management Activities published in terms of NEM: WA in Government Notice 921 of 29 November 2013 (as amended)	
Waste Classification and Management Regulations published in terms of NEM: WA in Government Notice 634 of 2013	These regulations have informed project planning and will be taken into account in the assessment and management of waste for the project.
Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation, published in terms of NEM: WA in Government Notice 632 of 2015	
National Norms and Standards for the Storage of Waste, published in terms of NEM: WA in Government Notice 926 of 2013	
National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, published in terms of NEM: WA in Government Notice 1093 of 2017	
National Waste Information Regulations published in terms of NEM: WA in Government Notice 625 of 2012	
National Norms and Standards for the Assessment of Waste for Landfill Disposal, published in terms of the NEM: WA in Government Notice 635 of August 2013	
National Norms and Standards for the Remediation of Contaminated Land and Soil Quality in the Republic of South Africa, published in terms of the NEM: WA in Government Notice 331 of May 2014	

Applicable Legislation And Guidelines Used To Compile The Report	How Does This Development Comply With And Respond To The Policy And Legislative Context
Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, published in terms of NEMA in Government Notice 1147 of 2015 (as amended)	These regulations will inform the financial provisioning for the project which will be incorporated into the EIA/EMP.
Guideline on the Need and Desirability, Department of Environmental Affairs, 2017	This guideline has been taken into account as part of project planning.
Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, 2017	This guideline has informed the public participation process for the project.
National Guideline on minimum information requirements for preparing Environmental Impact Assessments for mining activities that require an environmental authorisation, published in terms of NEMA in Government Notice 86 of 2018	This guideline has been taken into account as part of project planning.
National Water Act, 1998 (No. 36 of 1998) (NWA)	A water use license would be required for the project. This would be applied towards the end of the EIA process. Regulation 704 has informed project planning and will be taken into account in the assessment and management of impacts.
Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources published in terms of NWA in Government Notice 704 of 1999	
Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals published in terms of NWA in Government Notice 267 of March 2017	
Regulations Requiring that the Taking of Water for Irrigation Purposes be Measured, Recorded and Reported published in terms of NWA in Government Notice 131 of 17 February 2017.	
Several General Authorisations have been published in terms of Section 39 of the NWA (various dates)	
Regulations regarding the Safety of Dams, published in terms of NWA in Government Notice 139 of 24 February 2012	
Purification of Waste Water or Effluent, published in terms of the Water Act, 1956 in Government Notice 991 of 18 May 1984	
Regulations for the erection, enlargement, operation and registration of Water Care Works, published in terms of the Water Act, 1956 in Government notice 2834 of 7 February 1986	
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA)	These regulations have informed project planning and will be taken into account in the assessment and management of emissions from the project.
List of Activities which Result in Atmospheric Emissions, published in terms of NEM: AQA in Government Notice 893 of 2013 (as amended)	
National Ambient Air Quality Standards (NAAQS), published in terms of NEM: AQA in Government Notice 1210 of 2009	

Applicable Legislation And Guidelines Used To Compile The Report	How Does This Development Comply With And Respond To The Policy And Legislative Context
National Dust Control Regulations, published in terms of NEM: AQA in Government Notice 827 of 2013	
National Atmospheric Emission Reporting Regulations, published in terms of NEM: AQA in Government Notice 283 of 2015	
National Greenhouse Gas Emission Reporting Regulations, published in terms of NEM: AQA in Government Notice of July 2017	Establishes a single national reporting system for the transparent reporting of greenhouse gas emissions and pollution prevention plans. This would be required in the operational phase.
National Pollution Prevention Plans Regulations, published in terms of NEM: AQA in Government Notice of July 2017	
Hazardous Substances Act, 1973 (Act No. 15 of 1973) (HAS)	This Act will inform the planning, assessment and management of hazardous substances from the project.
National Forest Act, 1998 (Act No. 84 of 1998) (NFA)	Permit(s) will be required if any protected species are cut, removed and/or translocated from the project footprints.
National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003) (NEM: PAA)	The proposed project footprint does not overlap with any existing protected areas or any areas identified for protected area expansion.
National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004) (NEM: BA)	The Act, regulation and guideline have informed project planning and will be taken into account in the assessment and mitigation of impacts. Depending on residual impacts after mitigation within critical biodiversity areas or highly sensitive biodiversity features, biodiversity offsets may need to be specified.
Alien Invasive Species Regulations, published in terms of NEM: BA in Government Notice 598 of 2014	
Alien and Invasive Species List, Government Notice 864 of 2016	
Mining and Biodiversity Guideline (2013)	
Draft National Biodiversity Offset Policy, 2017	
National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)	These Acts have informed project planning and will be taken into account in the assessment and management of impacts.
Conservation of Agricultural Resources Act, 1993 (Act No. 43 of 1993) (CARA) and the Conservation of Agricultural Resources Act Regulations, Government Notice 1048 of 1984	

Applicable Legislation And Guidelines Used To Compile The Report	How Does This Development Comply With And Respond To The Policy And Legislative Context
National Heritage Resource Act, 1999 (No. 25 of 1999) (NHRA)	
Spatial Planning and Land Use Management Act, 2013 (No. 16 of 2013) (SPLUMA)	The Act, development plans, development frameworks and by-laws have informed project planning and the need and desirability of the project and will be taken into account in the assessment and mitigation of impacts.
National Development Plan 2030	

4 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

The mining project forms part of a larger scheme for the alleviation of poverty within the local municipality, which will not only improve the living standards for several previously disadvantaged communities, but also potentially allow for the future development of this area.

A primary market for iron ore is the manufacturing of steel, where iron is used in the making and strengthening of steel for use in construction and urban development, and cast-iron products, which accounts for 98% of iron usage. Currently, the world's iron market is dominated by China and India, with China producing almost half of the world's steel and growth is driven by industrial development.

Iron ore is traded based on iron content and the amount of impurities and as such processing of the ROM material is required to reach an average grade of 62% Fe. Iron ore is typically divided into size ranges, fines (particles < 4.75 mm, sometimes < 6.3 mm), pellets (particle size 9.55 to 16 mm) and lump (particles > 4.76 mm or between 6.3-30 mm) and pricing may vary based on the form and the Fe content of the ore.

The magnetite concentrates which could be obtained from the low-grade itabirite at Makotopong could be utilised for steelmaking in several different processes. The material could be sintered in a mixture with coarser-grained hematite ore. Its use as a powder will be restricted due to the small particle size affecting the permeability of the sinter bed. Pelletisation, however, will increase the permeability and hence the optimal smelting. An optimum magnetite content in the sinter mix would

have to be ascertained. An advantage of the magnetite concentrates is the very low alkali and phosphorus contents compared to hematite. Sinters containing magnetite concentrate in the mix have similar physical and metallurgical properties compared to sinters produced from hematite only.

Alternative markets for Makotopong concentrate would include:

- Production of acid and self-fluxing pellets for utilisation in blast furnace and direct reduction processes;
- Utilisation in the “AusIron” process (direct processing of ferrous concentrate feed material);
- Coal-to-Liquids (CTL) magnetite catalyst in Sasol’s CTL programme;
- Coal washing process via heavy media bath and heavy media cyclone methods for separating coal;
- Hot briquetted iron (HBI) could be made from the sponge iron produced from a direct reduction kiln, or by the Fastmet process.

The Mines intention and commitment is to make use of the local labour force from the communities in and around the Lephalale area in line with the objectives of the Mineral and Petroleum Resources Development Act (MPRDA) and local job creation. It is envisaged that only highly skilled labour will be sought from other areas within South Africa, only if they are not available in the surrounding areas.

The economic use of the products that will be mined are discussed below:

Iron Ore

Iron is primarily used to make steel which is used in the manufacturing of automobiles, locomotives, ships, beams used in buildings, furniture, paper clips, tools, reinforcing rods for concrete, bicycles etc, therefore the need of Iron mining remains high and can only be fulfilled through mining of ore.

Manganese

Manganese is mostly used in the iron and steel industry and serves as an important metal mineral in the national economy. It is used to produce a variety of important alloys and to deoxidize steel and desulfurize. It is used in dry cell batteries, in forming many alloys and in chemical, glass and electrical industries.

5 MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE.

5.1 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.

The intension of identifying alternatives in the MA Coal proposed project is to provide a basis for choice among other options available. It should be noted that the examination of these alternatives will allow for the incorporation of more practical, feasible, relevant, reasonable, technologically and the least environmentally impacting options available, and reducing or avoiding potentially significant negative impacts at the same time meeting the need and purpose of the proposed projects.

As per the Department of Environmental Affairs (DEA) Criteria for Determining Alternatives in EIA Guideline (2004), the types or categories of alternatives, including:

5.1.1 Property or Locality

The properties on which the proposed project is located is dependent on the location of the target mineral resource(s). It follows that no alternatives could be considered for the mining project (i.e. the proposed mining right application area).

5.1.2 Type of Activity

The location of the open-pit mining areas was informed by the presence of economically mineable resources to which MA Coal would have access. The layouts of the open pit operations have been designed to optimise the extraction of mineral resources. Underground mining is not considered a feasible option as the ore reserves are relatively shallow.

5.1.3 Design or Layout

The mine design and associated infrastructure layout as described in Section 4.3 has taken into consideration all possibilities and aims to create a safe operational environment in which mining activities can take place while minimizing negative impacts on nearby receptors.

Layout and orientation alternatives will be reconsidered during the Impact Assessment phased based on inputs from I&APs and findings of specialist studies completed.

5.1.4 Technology & Operational Aspects

Open-pit mining may involve two forms of extraction methods namely truck-and-shovel or dragline. Truck-and-shovel is the preferred extraction method and is commonly used in the extraction of various minerals and provides employment opportunities as this approach is relatively labour intensive.

A truck-and-shovel approach will also allow the mine to implement blast designs that can be tailored to a particular ore body, pit design and handling system.

5.1.5 The option of not implementing the activity.

The assessment of this option requires a comparison between the options of proceeding with the proposed project with that of not proceeding with the proposed project. Proceeding with the proposed project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the proposed project leaves the status quo of no additional negative social or environmental impacts than what is currently experienced. This will be detailed further in the EIA report.

5.1.6 Statement Motivating the Preferred Site

The preferred site layout is depicted in Figure 6. The overall mine and infrastructure layouts have taken into account the environmental sensitivity of the site, and infrastructure has been placed to avoid or minimise environmental impacts as far as possible. The final mine plan and infrastructure layout plan will be adjusted according to the outcome of the various specialist studies.

6 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED.

This section provides details of the public participation process followed to date and focuses on:

6.1 Introduction to the approach followed;

6.2 Identification of Interested and Affected Parties (I&APs);

6.3 Background to the public participation process; and

6.4 Public participation process undertaken for this environmental authorization.

6.1 *Approach*

The Public Participation Process (PPP) is a vital component of EIA, and it is a regulatory requirement for an environmental authorisation process. It is conducted in terms of Regulations 39 to 44 of the Environmental Impact Assessment (EIA) Regulations GN R.982 (December 2014). PPP is intended to ensure a joint effort of the Interested and affected parties, the stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently. The Scoping Phase enables the I&AP to raise issues of concern and suggestions for enhanced benefits to ensure that their issues have been considered; and assists in identifying reasonable alternatives; allows for comment on the plan of the specialist studies to be undertaken during the impact assessment phase and most importantly allows for the I&APs to contribute relevant local information and traditional knowledge to the environmental assessment.

The public participation process followed for this environmental authorisation is an integrated and comprehensive process with the purpose to provide I&APs with sufficient and accessible information in an objective manner to assist them to:

During the EIA phase:

a) Raise comments and make recommendations to be considered during the impact assessment phase**;**
b) Provide comments on project alternatives and the proposed process of assessment;
c) Verify that their issues were recorded and understood; and

6.1.1 Contribute local knowledge to the process.

During the impact assessment phase

a) Verify that their comments have been considered in the Scoping and EIA & EMP; and
b) Comment on the findings of the specialist studies and the EIA.

During the decision-making phase

a) Advise I&APs of the outcome of the environmental authorization (i.e. DMR decision), and the appeals process and procedure.

6.2 Compilation of Interested and Affected Database

The compilation of a database for I&APs started during the Scoping process and is currently ongoing. Attached as Appendix C1. People are responding to the Site Notices placed on and offsite requesting to be registered in the database. Regarding state organs, a search was done on the internet for contact details and contact people to include on the database. Deeds search was done to identify the landowners adjacent to and in the immediate surroundings of the area. Proof of landownership has been attached to this report.

6.3 Notification of Interested and Affected Parties of the Project

Consultation meetings with the farm owners and the affected communities will be held on different dates and venues to advise them of the intention of MA Coal intentions to mine on the prospecting right area.

6.4 Consultation Meetings with Interested and Affected Parties

Public participation meetings are currently ongoing with the affected villages. During the meetings Background Information Documents (BIDs) are distributed to all the meeting attendees and a

presentation on the Mining Right Application process is presented by Envirostep. The BID and the Consultation Register is attached as Appendix C2 and C5 respectively.

6.5 *Newspaper Advertisements*

A newspaper advertisement was placed in the Polokwane Review in English. The Newspaper Advert is attached as Appendix C3.

Details of the press advert included:

a. Project name and description
b. Details of the client and the Environmental Practitioner
c. Project locations
d. Dead line for Comments
e. A copy or proof of published advert is attached as Appendix C3.

6.6 *Site Notices*

Laminated A3 site notices in English and Setswana were erected with the assistance of the communities in all key position on the around the proposed area. Copies of the site notices and photographs of the places where site notices were placed/ displayed will be attached in the Appendix C4.

6.7 Public Review of EIR/EMP Report

Draft EMP/ EIR report will be distributed to all registered I&APs and also state organs for review and comments from the 15th of August 2021 to 15th of September 2021.

6.8 *Description of the tasks that will be undertaken during the environmental impact assessment process*

The Manganese and Iron Ore mining and related infrastructure project will include several activities which require a Scoping and EIA/EMP.

The EIA/EMP process followed for the proposed mining development is tailored to cater for both the National Environmental Management Act (NEMA) (Act 107 of 1998) as amended; National Environmental Waste Act (NEM:WA) (Act 59 of 2008) as amended; Mineral and Petroleum

Resources Development Act (MPRDA) (Act 28 of 2002) and EIA Regulations 2014. The authorisation process will include the following:

Scoping Phase:

a. Stakeholder identification and notification process
b. State and Non-state Authority Consultation
c. Registration of issues raised by Interested and Affected Parties (Database registration)
d. Impacts identification and assessment
e. Specialist study identification
f. Compiling the Scoping report (Draft and Final)
g. Distribution of reports to stakeholders for review and informative purposes
h. Submissions of Reports to competent authorities for approval.

Impact Assessment Phase:

a. Completion of specialist
b. Environmental Impact Assessment
c. Environmental Management Plan.
d. EIA Report development
e. Distribution of Reports to stakeholders for review
f. Submission of Final reports to Competent Departments for decision making purposes.

Lead Authority's decision

As soon as the DMR has taken a decision on the proposed project, Envirostep will immediately notify I&APs of this decision and also, they will be given the opportunity to appeal. The registered I&AP will be provided with a letter summarising the competent authority's decision and where ever they disagree to the decision of the authority, they can lodge an appeal. Moreover, the Authorities decision will be published through Polokwane Review newspaper advertisement.

6.9 Summary of Issues Raised by I&APS

All comments and responses received during the announcement, scoping public review period and EIA consultation process have been captured in the Appendix C6.

The main categories of comments raised during the Scoping Phase and EIA Phase including the consultation meeting with the farmowners and Mokotopong community had reference to the following:

a. The appointment of specialists, in particular, the ventilation specialist (Air Quality),
b. What measures are in place to deal with the impacts of the mine, more especially air pollution and blasting when the mine is in operation,
c. The issue that the Social and Local Plan (SLP) should be done separately,
d. Employment opportunities associated with the proposed mining project

Conclusions of the PPP

The Public Participation exercise has provided adequate information to enable an understanding of what the MA Coal Mining Right Application entails and to address the concerns and comments received during the process. Comments raised before, during and after the public meeting are captured in Table 5 below.

6.10 *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					
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties					

Municipal councillor					
Municipality					
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent					

Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

7 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE DEVELOPMENT FOOTPRINT ALTERNATIVES.

7.1 *Baseline Environment*

7.1.1 Type of environment affected by the proposed activity.

The information below is primarily extracted from publically available documents, resources and databases and should be updated to include site-specific aspects once specialist investigations have been completed. Source documents include:

- Molemole Local Municipality Integrated Environmental Management Plan & Framework from 2008;
- Molemole Local Municipality Integrated Development Plan for 2019/2020; and
- Capricorn District Bioregional Plan from 2018.

7.1.1 Regional Geology

A large area of the Capricorn District Municipality area is covered by metamorphic rock. Metamorphic alteration of rocks is brought about by excessive heat and pressure, and by chemical changes resulting from the action of hot gases or liquids passing through the rock.

As such, metamorphism tends to be associated with igneous activity, since the intrusion of magma into the crust results in considerable changes in the surrounding environment. The magma exerts pressure upon the adjacent rock, it heats it and volatile substances escaping from the magma permeate the surrounding material. It is apparent that in many instances all three processes may operate together, and they may affect rocks over a large area.

Gneiss covers a big part of the Molemole Local Municipality area. It stretches from the north-west of Bandelierkop to the western side of Polokwane. The specific gneiss occurring in the study area covers a vast region from Pietersburg in the south to the Soutpansberg Mountain in the north and is known as the Houtrivier Gneiss. These rocks are essentially granitic in composition and are typically medium to coarse-grained. Coarse-grained pegmatite veins are developed in places. The variation in mineralogical composition, textures and structures within the gneiss, causes the Houtriver Gneiss to vary from a solid, homogeneous granitic rock to a coarse-grained, highly weathered rock in places.

The proposed Makotopong Project locates within a portion of the Rhenosterkoppies Greenstone Belt (RGB), with rocks belonging to the Pietersburg Group of the Murchison Sequence. Low-to-medium grade metamorphism is seen within the volcano-sedimentary greenstone belts within the northern Kaapvaal Craton, formed during the collision between the Kaapvaal and Zimbabwean Cratons some 2.7 billion years ago.

7.1.2 Topography and Landscape

The Capricorn District is characterised by level to undulating plains. Steep slopes and ridges are localised.

The Molemole Local Municipality predominately lies within the Transvaal Plateau Basin (Pietersburg Plan) physiographic region. The proposed project is approximately 1300m above sea level.

7.1.3 Land Use

The land cover data for the District shows that the most extensive and widely dispersed land cover is natural. Human settlement is concentrated in the central and southern portions of the District between the Blouberg Mountains and the Olifants River with concentrated areas at Polokwane, Seshego, Matoks, Thabamoopo and Senwabarwana.

The land cover data indicates that 72.5% of the Capricorn District is in a natural state. This high percentage is partially due to the proportion of the District which lies within protected areas and the largely rural nature of the District. Approximately 22% is altered by agriculture, plantations and degraded areas and a further 5.6% are severely or irreversibly modified by towns, settlements and mining.

7.1.4 Climate

The proposed project falls within the Cwb by the Köppen-Geiger system and can be described as warm and temperate. Of the mean annual precipitation, 661mm, the majority falls during the summer months with July being the driest month. The temperatures average 18 degrees Celsius. January is the warmest month of the year with an average temperature of 21.1 degrees Celsius and a maximum of up to 26 degrees Celsius on average. July is the coldest month with temperatures reaching as low as 6.5 degrees Celsius. Winter throughout the area is mild and mostly frost-free.

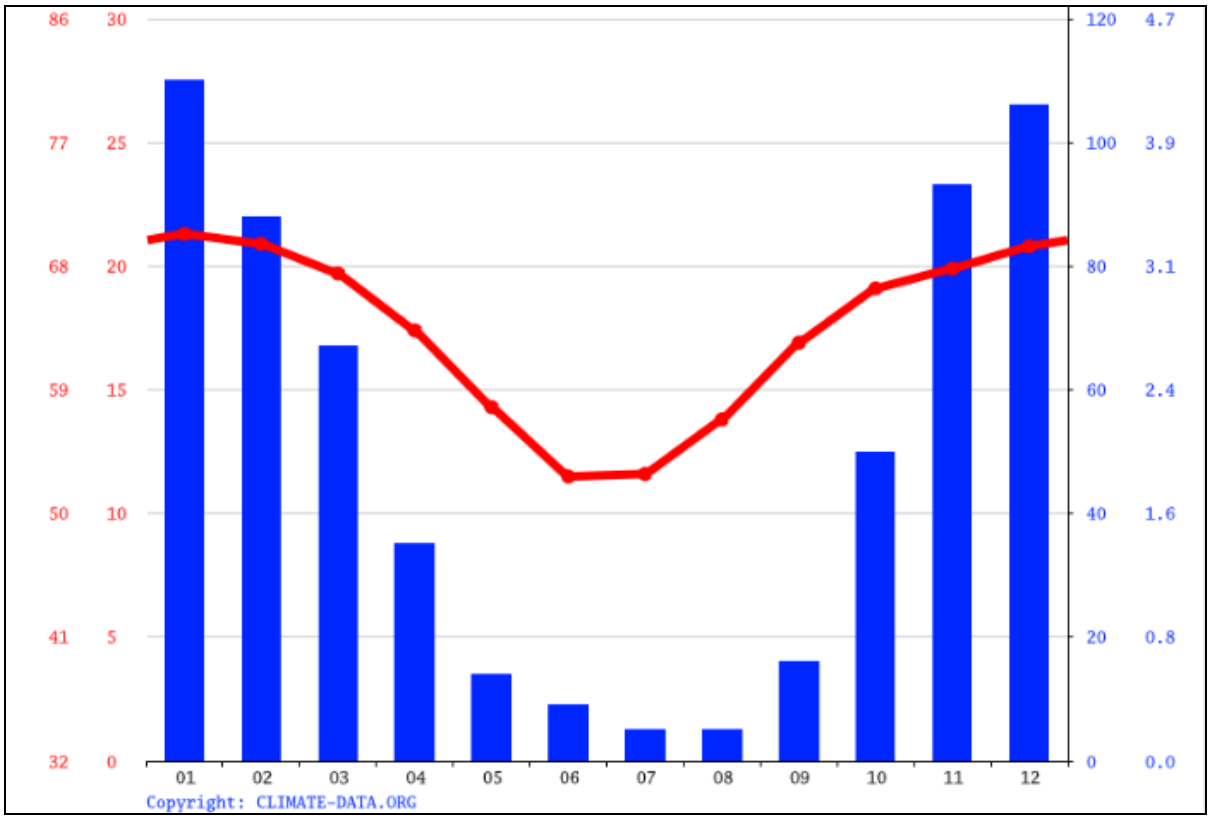


Figure 9: Polokwane Climate Graph by Month

The process by which liquid water is transformed into vapour is tremendously important in that evaporation depletes available water. It is estimated that 91% of the mean annual precipitation with the Molemole Local Municipality is evaporated from free water surfaces and transpired from vegetation. Hence, in an area with limited water resources evaporation is critical in determining the amount of water available to users.

The evaporation pattern is similar to the rainfall pattern. The figures are higher for the eastern part of the local municipality area than the western parts.

7.1.5 Soil, Land Capability and Land Use

Soils occurring in the Molemole Local Municipality have the following general characteristics and occur in the areas as indicated below:

- Plinthic catena: eutrophic; red soils not widespread, upland duplex and margalitic soils rare - NW P/burg, Soetdorings, Turfloop, Mara, Dendron.

- Red-yellow apedal, freely drained soils; red, high base status, > 300 mm deep – South Polokwane & Blouberg, Maleboch & Bewaarkloof & Bandelierkop Complex, Maakepansgat
- Glenrosa and/or Mispah forms, lime rare or absent – North Pietersburg, Moria, Soekmekaar areas.

7.1.6 Biodiversity

7.1.6.1 Flora

According to Low and Rebelo's (1998) vegetation map of South Africa, most of the Molemole Local Municipality is dominated by the Mixed Bushveld vegetation type forming part of the Savanna Biome (typically observed on shallow, relatively coarse-grained, sandy soil overlying granite, quartzite or shale). The vegetation found here varies from dense short bushveld to a more open tree savanna. This vegetation type is found in areas where the rainfall varies between 350 and 650 mm per annum and the altitude comprises low relief plains at an altitude range of 700 to 1000 masl.

The northern & western parts of the municipal area are dominated by Mixed Bushveld (variation 2 of open Sclerocarya Veld) (Acocks, 1975).

Several plant species in the study area have medicinal and food value. The species that are most heavily used include Euclea undulata (purgative), Sclerocarya birrea (diarrhoea, dysentery, fruit) and Peltophorum africanum (colic, stomach disorders and sore eyes).

Tree species that enjoy statutory protection under the Forest Act (No. 84 of 1998) are the Marula (Sclerocarya birrea) and Camel Thorn (Acacia erioloba). According to this Act, these trees cannot be damaged or destroyed. Should such damage be unavoidable due motivation to the Department of Environmental Affairs and Tourism (DEAT)(Limpopo Province) will have to be provided on why damaging these specimens should be submitted – it is necessary to obtain a permit for their destruction.

7.1.6.2 Fauna

Most of the large mammals found in the study area are herbivores – either browsers or grazers. None of the animals are considered dangerous. No large carnivores are found in the area, it is however possible that they can move between the farms and perhaps enter the area. Species that could move through the project area include Leopard and Cheetah.

Many small mammals, such as Mongooses, Porcupine, Chackma Baboon, Vervet Monkeys, etc may be found in the area. Small carnivores such as African Wild Cat, Black-Backed Jackal, Caracal, and Small-spotted Gennet, Brown Hyena, and Leopard also occur.

The extent of disturbance in the areas immediately surrounding rural villages is not conducive to the survival of fauna, particularly mammalian fauna, due to the presence of humans and domestic animals (e.g. dogs).

7.1.6.3 Sensitive Landscapes

In terms of the Department of Environmental Affairs and Tourism (DEAT) guidelines for Integrated Environmental Management (IEM) (DEAT, 1992), the term ‘sensitive landscapes’ is a broad one applying to:

- Nature conservation or ecologically sensitive areas – indigenous plant communities (particularly rare communities or forests), wetlands, rivers, riverbanks, lakes, islands, lagoon, estuaries, reefs, intertidal zones, beaches and habitats of rare animal species;
- Unstable physical environments – such as unstable soils and geotechnical unstable areas;
- Important nature reserves – river systems, groundwater systems, high potential agricultural land;
- Sites of special scientific interest;
- Sites of social significance or interest – including sites of archaeological, historic, cultural, spiritual or religious importance and burial sites;
- Green belts or public open space in municipal areas.

By identifying these sensitive areas, due action can be taken to ensure that environmental sustainability, health and safety are not compromised and that natural and cultural resources (as well as economically viable resources) are not endangered.

Capricorn District has numerous Project Area Management Plans. Protected Area Management Plans are the overarching management planning documents compiled for protected areas. All

protected areas s are required to have management plans in place as per the requirements of the Protected Areas Act. The objective of a management plan is to ensure the protection, conservation and management of the protected areas concerned in a manner that is consistent with the objectives of the Protected Areas Act and for the purpose for which it was declared.

The nearest protected area to the proposed Matokopong Project is the Blesbokfontein Private Nature Reserve (**Figure 10**).

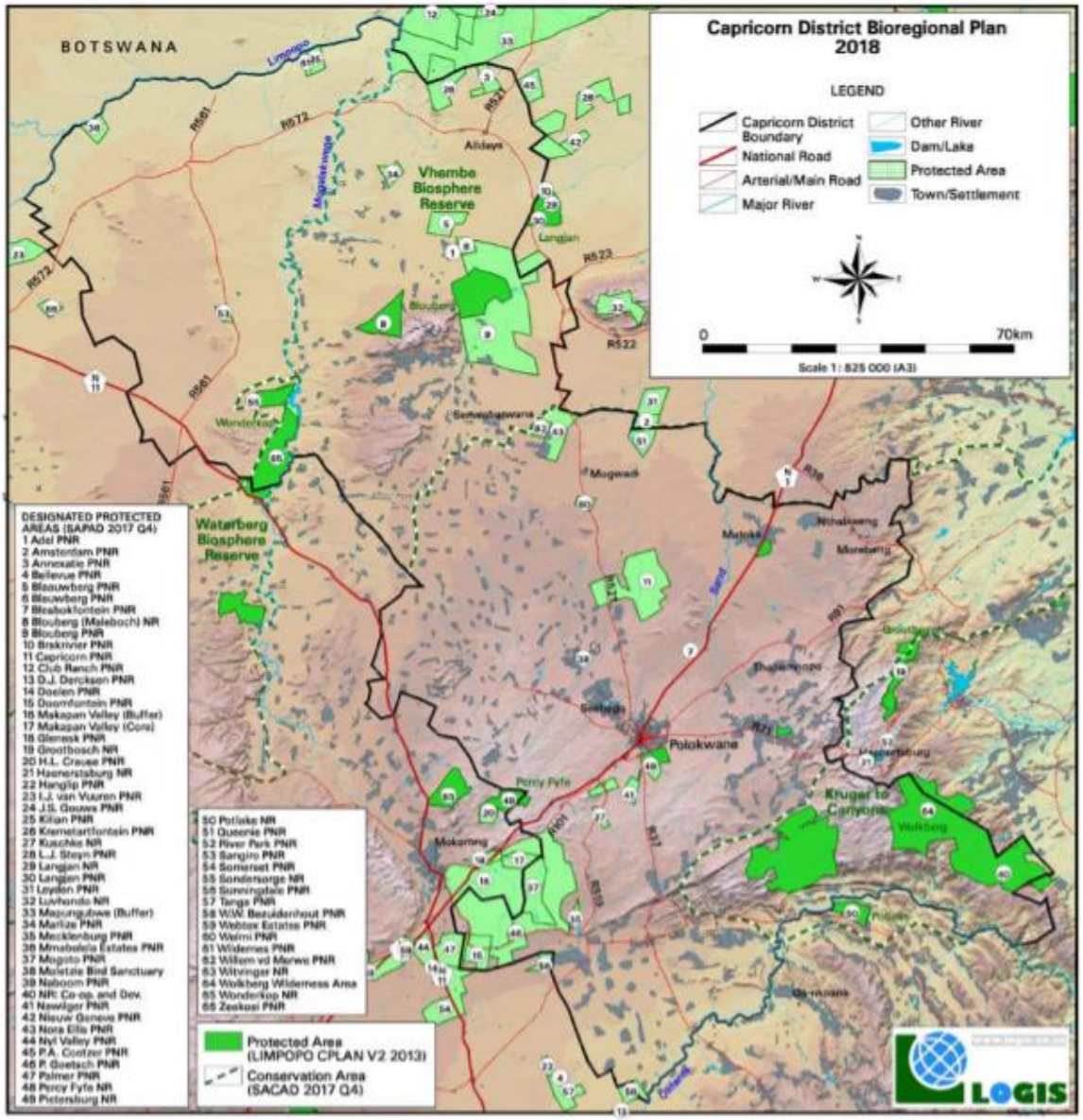


Figure 10: Protected areas and conservation areas for Capricorn District Municipality.

7.1.7 Water Resources

The Capricorn District's southern and northern borders are defined by watercourses, namely the Limpopo River in the north and the Olifants River in the south. The proposed project is located in the Limpopo Water Management Area.

The central part of the Molemole Local Municipality area falls within the Sand River catchment, which occupies a total area of 15 639 km^2. The headwaters of the Sand River catchment are in the hills south of Pietersburg, and extends north, through the Soutpansberg to the confluence of the Sand River with the Limpopo River. The Sand River's flow is non-perennial and intermittent during the wet season. The Sand River is dry for up to 9 months per year, with the visible surface flow for approximately 3 months per year.

The Sand River is fed by several tributaries, the two largest being the Hout River and the Brak River, both of which enter the Sand River from the west. From the east, the Sand River is fed by some smaller tributaries, the most important of which are the Diep, Dwars and Dorp rivers.

The Sand River has been identified as having low conservation status, but high conservation importance (DWAF, Vol. 4.3, 1992). The Sand River and its tributaries have deep alluvial deposits overlying zones of deeply weathered rock which form extensive aquifers. Contrary to expectations, flow in the upper reaches of the catchment is higher than downstream possibly due to the high storage potential of the deep alluvial aquifers in the channels. (DWAF, Vol. 5.2, 1992).

The western part of the Molemole Local Municipality area falls within the Hout River catchment and the extreme eastern parts falls within the Klein- & Middle Letaba River catchments.

In the central & western parts of the municipal area there is relatively little surface water due to several factors, viz:

- Low annual precipitation
- High evaporation
- High infiltration rates and corresponding low runoff.

As such, much of the channel flow is sub-surface. This sub-surface flow has been identified as the driving force in the hydrological system in the catchment (DWAF, vol. 4.3, 1992).

Values have been calculated by DWAF for both "naturalised" and denaturalised" flow in the region. "Naturalised" flow refers to virgin flow in an unimpacted situation. "Denaturalised" flow refers to the

flows expected once the area has been unimpacted by development. Naturalised flow peaks occur in the January/February period. Dams in the catchment have been identified as being highly inefficient, (DWAF, Vol. 3.5, 1992)

Significant surface erosion was noted in the central parts of the study area (i.e. Matoks/ Batlokwa).

In terms of groundwater resources, the shallow perched water aquifer is commonly developed within the upper 2,0m of the weathered zone. The aquifer, comprising transported and residual soils as well as weathered bedrock, is unconfined and transient, usually existing only during the rainy season. It may also be sustained or maintained by an artificial source of recharge.

Groundwater is retained within the fractures and joints of the rock. Collectively, these water-bearing fractures combine to form the fractured rock aquifer.

The depth of the fractured rock aquifer is variable and dependent on the degree of fracture frequency, transmissivity and continuity. Generally, the regional water table will also approximate the shape of the surface topography. Although naturally occurring joints/fractures typically tend to close with depth.

Groundwater is the main source of water in the catchment, with 88% of total water use being from groundwater, 10% imported and 2% from locally developed surface water source. (DWAF, Vol. 5.3, 1992).

The Pietersburg/Seshego region has high groundwater potential, with the alluvial aquifer displaying a storage capacity of up to 20% of its total volume. The alluvial aquifers in the region have high transmissivities. The estimated recharge for A711 is 3.5% of MAR, and for A712, 3% of MAR. The extent of the aquifer, in conjunction with the three factors above, make the groundwater a good source of water for the area.

The groundwater quality displays seasonal variations, with excellent quality during reasonable flow periods, with decreasing quality evident in the dry season.

The groundwater resource within the study area has been impacted due to both historical anthropogenic activities, as well as more recent developments. The following factors have influenced groundwater:

- Overexploitation for irrigation (historically) and increasingly for domestic purposes has had two effects. The water table has dropped by an average of 2 m per year since 1981 up to

1992. This was also influenced by the severe drought experienced in the 1980s. In addition, the excessive abstraction of groundwater has resulted in the deterioration of the quality of the groundwater.

- Water quality has decreased due to contamination from domestic, sewage and industrial sources. Currently, both the Perskebult nor Blood River settlements (NW of Seshego) have waterborne sewage and the groundwater indicates severe contamination levels. Only 15% of the population in the catchment have access to waterborne sewage. The two current treatment works at Seshego and Pietersburg discharge 3.3x106 m3/yr and 4.6 x 106 m3/yr respectively into the Blood and Sand Rivers.

The subsurface of the earth is conventionally divided vertically into two zones: a zone of aeration– characterised by the presence of a mixture of water and air (also known as the unsaturated zone) – and a zone of saturation, which only contains water (also known as the saturated zone) (Botha, 1996). It is custom to refer to water in the unsaturated zone as soil water and water in the saturated zone as groundwater. The movement of soil water is referred to as unsaturated flow, while groundwater movement is referred to as saturated flow.

Although groundwater motion is a continuous process, the ability of the earth's geological formations to store water varies considerably from one geological formation to the next. For example, highly permeable formations are often bounded from below and/or above by less permeable formations. These confined layers are sometimes very thick and impermeable, while others may be thin and permeable. The flow of groundwater in geological formations is therefore often further subdivided into a confined, semi-confined and unconfined flow. Physically, there is not a difference between semi-confined and confined flow (Botha, 1996) and therefore, no distinction will be made between these types of flow. It is custom to refer to the aquifers characterised by these types of flow as confined or unconfined aquifers.

It is well known that groundwater can only flow along the interstices formed by the voids in the geological formation that contains the water. The size of these interstices varies considerably and range from huge solution caverns (in dolomites and limestones) to subcapillary openings in clays (Bear, 1979). The interstices of practical importance in groundwater flow are usually one of three types (Botha, 1996).

a. Porous interstices – these are interstices with dimensions so small that their boundaries restrict the flow of water in all three spatial directions. They are commonly found in consolidated and unconsolidated sands and weathered igneous and metamorphic rocks.

b. Fractures – caused by stresses, to which the earth's mantle was subjected in the past, are found in igneous, metamorphic and sedimentary rocks. The sizes of these fractures can vary from huge fissures, extending over hundreds of kilometres, to microscopic fractures. Flow in fracture therefore often resembles flow in porous interstices.
c. Solution caverns – caused by the dissolution of the surrounding geological formation, are mainly found in more soluble rocks, such as limestone and dolomite. These caverns usually have diameters ranging from micrometres to a hundred and more metres.

It follows from the preceding discussion that the sizes and distribution of interstices play an important role in the ability of a geological formation to transmit groundwater. This property allows one to divide subsurface flow into three basic types: channel flow (in solution caverns and fissures), fracture flow (in the fractures), and porous flow (in sedimentary and weathered rocks).

The National Freshwater Ecosystem Priority Areas (NFEPA) (Nel *et. al*., 2011) identifies rivers, wetlands and estuaries in South Africa that are most important for sustaining the integrity and continued functioning of our freshwater ecosystems. The following is relevant for the Capricorn District:

- The Limpopo River which forms the northern boundary of the Capricorn District is classified as a Class A river.
- The Mogalakwena River which is located in the centre of the northern portion of the Capricorn District is classified as both a Class C and Class B river.
- The Sand River in the eastern section and along portions of the eastern boundary of the Capricorn District is also a Class C river.
- The Olifants River which forms the southern boundary of the Capricorn Districts is classified as Class D River.

River Freshwater Ecosystem Priority Areas (FEPAs) achieve biodiversity targets for river ecosystems and fish species and are identified in rivers that are currently in a good ecological condition (A or B PES). River ecosystem types where less than 20% of their total length is in A or B ecological conditions are identified as Phase 2 FEPAs, as well as, moderately modified rivers (C). Phase 2 FEPA's are found in the south near Polokwane. Upstream Management Areas are areas where human activities need to be managed to prevent the degradation of downstream river FEPAs and fish support areas. These areas occur mainly in the centre of the District. Mining and agricultural activities are those sectors that impact most on freshwater features in the Capricorn District as well as urban and rural settlement. Changes in water quality (e.g. acid mine drainage, wastewater from

treatment plants, fertilizer and pesticide runoff) and changes in water flow regimes within urban areas (e.g. catchment hardening and increased stormwater flows) are the most significant impacts.

7.1.8 Socio-economic

7.1.8.1 Capricorn District Municipality

Capricorn is one of the 5 districts in Limpopo province, South Africa. The district is named after the Tropic of Capricorn which runs through it. The Capricorn District Municipality is situated at the core of economic development in the Limpopo Province and includes the capital of the province, the City of Polokwane. One national and various major provincial roads pass through the district municipal area, that is, the N1 - National Road from Gauteng to Zimbabwe and the rest of Africa, the P33/1 (R37) from Polokwane to Burgersfort/Lydenburg, the P94/1 (R521) from Polokwane to Alldays and Botswana and the P17/1 (R71) from Polokwane to Tzaneen and Phalaborwa (IDP, 2020).

Capricorn has 4 (four) local municipalities, namely Blouberg, Molemole, Polokwane and Lepelle-Nkumpi. The district is made up of 113 wards, 586 villages and 28 Traditional Authorities. Capricorn is home to 1 330 436 people (IDP, 2020).

The fact that the District is still predominantly rural, results in challenges with waste management. Pollution is widespread e.g. littering and illegal dumping; sewerage treatment facilities, habitat destruction through uncontrolled urban expansion; overexploited groundwater resources, etc. Although 95+% of households have access to the electricity grid, a large number of households (more than 50 000) still rely on firewood for cooking and heating due to electricity cost. The sewage treatment facilities need to be refurbished and upgraded, to meet the demand and minimum level of service. 9 (nine) of the 12 (twelve) wastewater treatment plants in the district are not licensed and eleven do not have operational plans. An effluent analysis is not done effectively and in Lebowakgomo Zones B and F, effluent is discharged into an artificial wetland.3 Roads construction, maintenance and the management of stormwater were identified as one of the main priority areas. Although there is a relatively well-developed road network of surfaced roads in the urban areas, it is necessary to focus resources on the gradual expansion of this network into the rural areas to improve mobility and the public transport system. The maintenance of the existing infrastructure is a cause for great concern and many existing roads may not be sustainable (IDP, 2020).

In Capricorn District Municipality the economic sectors that recorded the largest number of employees in 2018 were the community services sector with a total of 91 100 employed people or 25.8% of total employment in the district municipality. The trade sector with a total of 88 200 (24.9%) employs the second-highest number of people relative to the rest of the sectors. The electricity

sector with 2 330 (0.7%) is the sector that employs the least number of people in Capricorn District Municipality, followed by the mining sector with 4 770 (1.3%) people employed (IDP, 2020).

The Gross Domestic Product (GDP), an important indicator of economic performance, is used to compare economies and economic states. The Capricorn District Municipality contributes 2.09% to the GDP of South Africa. With a GDP of R102 billion in 2018 (up from R43.2 billion in 2008), the Capricorn District Municipality contributed 28.50% to the Limpopo Province GDP of R358 billion in 2018 (IDP, 2020).

7.1.8.2 Molemole Local Municipality

Molemole Local Municipality (MLM) is located in the Capricorn District Municipality in the Limpopo Province with a population of approximately 132 321 people and covers an area of 3347km² (IDP, 2019). The Black African population in 2011 accounted for about 98.36% of the Molemole Municipal population, followed by the White population at 1.12%. The Coloured and Indian population together accounted for only 0.25% of the total municipal population (IDP, 2019).

MLM is predominantly rural and comprises 37 settlements which are located in a fragmented pattern throughout the area. The spatial pattern displays certain characteristics namely:

- The central area of the Municipal area is sparsely populated with no major settlements.
- The eastern area is characterised by two major settlement areas namely the Botlokwa area, which is located along the N1 between Polokwane and Makahdo, and the Morebeng area which is located along the R36, between the N1 and Tzaneen.
- The western area is characterised by the urban settlement areas of Mogwadi along the R521 between Polokwane and Alldays.

The Town Mogwadi (formerly known as Dendron) is the administrative and economic capital of the Municipality. Mphakane was classified as Municipal Growth Point. The Municipal IDP from 2019 identified other nodal points such as Mohodi and Ramokgopa.

The proportion of people in youth and school-going age categories (0-19 years) high similar to Limpopo and Capricorn District Municipality. In terms of gender composition, the female gender in MLM is relatively dominant (54%) than the male gender (46%) and is believed to be the result of the migration of the male population to other provinces in search of job opportunities. This puts pressure on the MLM to create job opportunities to counter the exodus of the economically active population to other areas (IDP, 2019).

The economically active population in MLM increased significantly from 9.7% in 2001 to 26.3% in 2007 and 57.3% in 2011. Job creation and poverty alleviation remain important challenges to be addressed as the unemployment rate increased from 32.4% (8 561) in 2007 to 42.7% (11 344) in 2011 (IDP, 2019).

Due to the MLM dispersed settlements structure, most settlements are accessible only by gravel roads, which are generally in urgent need of maintenance. This situation has, and will continue to contribute towards the isolation of the areas; which in turn hampers the economic growth of the region, undermines the region's potential as a tourist destination, contributes to security problems, and negatively affects access to education and health facilities.

8 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE.

8.1 *Infrastructure*

8.1.1 Powerlines and Pipelines

Eskom has got an existing powerline that traverses the site on the eastern portion of the proposed pit area. Portions of the farm under applications have an existing water boreholes

8.1.2 Access Road

A site access road is required to link the site to the national road system. The nearest national road is the N1 which is just adjacent to the site. The current gravel road on site requires upgrading.

There is an existing powerline, boreholes, gravel roads, and rails that traverse the site as illustrated in **Error! Reference source not found.** site below.

8.2 *Environmental and current land use map.*

The proposed mining site is mostly an agricultural area and is characterized by farming and agricultural activities, generally the land use is open veld and wilderness as illustrated in Picture 1.

Picture 1: Property used for grazing

The properties have also been used for subsistence crop farming as illustrated in **Error! Reference source not found.**

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 potential impacts are discussed according to each Phase of the proposed Project: The Construction, Operational, Decommissioning and Post-Closure Phases/ Rehabilitation Phase. The Project and listed activities as per NEMA, EIA Regulation are summarised in Table 3. Project activities have been summarised in detail in Table 6 below.

This section also rates the significance of the potential impacts pre-mitigation and post- mitigation. The impacts below are a result of both the environment in which the activity takes place, as well activity itself. The impacts associated with the Project include the NEMA, EIA Regulations Listed Activities, as well as the mining activities to take place at MA Coal mine. The methodology utilised to assess the significance and extent of the potential impacts is described in Table 7.

Table 6: Summary of Project Activities

Activity No.	Activity
Construction Phase	
1	Construction of surface infrastructure.
2	The construction of stockpiles.
Operational Phase	
3	Dirty water management.
4	PCD operation.
5	Stockpile operation and maintenance.
6	Concurrent replacement.
Decommissioning Phase	
7	Demolition of infrastructure.
8	Final rehabilitation.

Post-closure Phase	
9	Monitoring and Rehabilitation.

10 METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS;

The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk

Table 7: Methodology to determine the extent of the impact

PARAMETERS	DESCRIPTIONS
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: • Onsite – Within specific site boundary (weight value – 1) • Local – Within municipal boundary (weight value – 2) • Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: a. Short term – 1 Year or less (weight value – 1) b. Medium term – 1- 5 Years (weight value –2) c. Long term – Longer than 5 Years (weight value – 3

PARAMETERS	DESCRIPTIONS
Intensity and reversibility	The severity of an impact on the receiving environment: a. Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1) b. Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) c. High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Impact Significance/Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). Extent + Duration + Intensity = High/Medium/Low Impact
Probability	The likelihood of an impact occurring: a. Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) b. Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) c. Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk Refer to table below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. High/Medium/Low Impact X Probability = High/Medium/Low

PARAMETERS	DESCRIPTIONS
	Environmental Risk

Table 8: Risk Assessment Matrix

	Risk Assessment Matrix			
	Low Impact (1 -5)	Medium (6-8)	High Impact (9)	
Probability	Definite/Very Likely (3)	9 - 15 L-M	18-24 M-H	27 H
	Possible (2)	6-10 L-M	12-16 M	18 M-H
	Unlikely (1)	3-5 L	6-8 L	9 L
ENVIRONMENTAL RISK	**Guidelines for Control Strategies**			
(H)-High	Proactively reduced risk level, short term response			
(M-H) -Medium High	Proactively reduce risk level, short term response			
(M)-Medium	Management strategies to reduce risk level, short to medium term response			
(L-M) Low -Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping			
(L) Low	Operational Control			

10.1 *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.*

Table 9: Positive and Negative impact of the proposed activity

Alternative		**Advantages**	**Disadvantages**
Activity alternatives (mining method alternatives)	Prefered Alternative (Opencast mining methods)	The shallow nature of Iron Oreand Manganese deposit can easily be mined by means of opencast mining. Economically and socially empowerment of the local communities	Opencast mining methods may result in direct and indirect impacts on several aspects of the environment including: Soil (compaction), flora (clearance and dust), fauna (habitat destruction, noise), air quality (dust, vehicle emissions), noise (animal life and surrounding communities), and surface- and groundwater (spillages, inadequate separation of clean and dirty water, potential leaching of water)
	Alternative 1 (Underground mining method)	In comparison to the preferred alternative, if underground mining would have been feasible there could be less surface-related environmental impacts that would have resulted from mining.	Underground mining has greater safety risk to the miners as compared to the open cast mining method. Owing to the shallow nature of the proposed minerals it is not feasible to undertake underground mining.
No-go versus Open cast mining	Open cast Mining	Mining activity was prefered on the proposed site based on the availability of Mangaanese and Iron–Ore reserves within the area. The open cast mining is prefered such that the shallow nature of the mineral	**Visual impacts** The development of the mine will have a visual impact on the proposed area due to the dust generation and construction activies resulting to the mining activities.

Alternative		Advantages	Disadvantages
		deposit can easily be mined by means of opencast mining. If the mining right is granted local communities will be positively impacted through employment opportunities that will arise and the proposed area's economy will grow through trading activities associated with mining activities like transport, increase in health facility as well as an increase turnover in hospitality and tourism sectors. Most importantly the proposed mining project will create skills development and community building opportunities to the local community therefore eradicating poverty in such a case stimulating Local Economic Development. Not only that, the business opportunities will be encouraged through infrastructural development as roads will be constructed,	**Dust** The excavation activities and the use of the access dusty roads will result in the emission of dust into the surrounding atmosphere. This will not only impact on the surrounding communities but also the plants surrounding the area as the dust is deposited on the leaves. This interferes with the photosynthesis process of the plants. Furthermore, animals that feed on the plants will be impacted upon as this will affect their forage. **Noise** Noise pollution will be generated from the mining activities, namely through the movement of trucks and vehicles, machinery operations, trenching activities. Depending on the size, noise levels of the trucks and excavators may cause the noise to be localised in the specific site. **Soil contamination** Soil pollution due to the leakages of oil and other industrial liquids from the trucks and machineries. This is a potential

Alternative		Advantages	Disadvantages
		this will assist in increasing the demand of goods and services in the affected area/s in a long term. The project will contribute directly and indirectly to the Country's GDP. Moreover, the development will encourage income generation in the area as well as the development of BEE opportunities during construction, operation and eventual closure and rehabilitation	risk of soil contamination, which will change the soil chemistry and soil nutrients of the affected soil. Ultimately this could also potentially affect the vegetation growth in the contaminated areas. **Impact on heritage resources** The mining activity could result in danger of negatively impacting on unidentified heritage resources during site assessment however, the possibility of the impact is very minimal as education and training on heritage resources will be given to mine employees. **Fauna disruption** Due to the impacts of noise, dust, movement and operation of trucks and vehicles, the potential loitering of the employees and the trenching itself will disrupt the surrounding animals. This disruption can further lead to injury or death in cases where animals fall into the trenches.

Alternative		Advantages	Disadvantages
			Stripping (Removal of vegetation) While all means will be applied to minimise disturbance, removal of vegetation cannot be avoided altogether. Deforestation will occur to clear the land for the opencast mining, this will leave the ground bare and prone to erosion. **Soil erosion** Erosion of the soil will occur through runoff and wind. **Habitat destruction** The habitat that support the animal within the project site will be disturbed and destructed by the movement and operations during the mining activities. This could possibly cause the relocation of some of the animals, and result in habitat fragmentation. **Waste generation** Debris (slimes), waste rock, litter and other solid waste will be generated and deposited in and around the site. This

Alternative		Advantages	Disadvantages
			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. **Surface and ground water impacts** The hazardous chemical spills may lead to surface water containation and ground water due to the leakages.
	No-go Alternative	The implementation of the no-go option would result in the continuation of the current land uses (farming). Therefore, no additional impacts on the bio-physical environment will occur, besides those that are currently occurring, and / or which may potentially occur if the areas are not managed appropriately.	It is also very important to note that the implementation of the no-go option may not necessarily prevent the mining of these resources on the property, as other companies may apply to mine the resources, unless the DMR sterilizes the reserves.
Prefered Layout (No Layout	The Layout plan presented in **Figure 5**	The site was selected based on the geographic position of the potentially underling required Manganese and Iron	No disadvantanges have been identified presently

Alternative		Advantages	Disadvantages
Alternative was identified)		reserves, ease of operations and mining activities on site as well as minimal disturbance to the community near the sit.e	
Technology Prefered (No techology Alternative was identified).	Excavators, apron feeders, bulldozers, trucks, bowl scraper, crushers, conveyors and shovels	The technologies have a long-term success in terms of mining history. According to Mclanahan (2018), due to their long service life with low-maintenance applications, apron feeders are a popular feeder choice	No disdvantanges have been identified presently
Operation Prefered (No Operation Alternative was identified)	The operation includes the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations,	The mine and its related activies will generate employment opportunies.	Relocation and loss of cattle grazing area for the herders at the Cattle post, overcrowding of the area in search of greener pastures.

Alternative		Advantages	Disadvantages
	access roads diesel and wash bays		

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

Table 10: Mitigation measures

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; Topsoil should be stored separately to be used in rehabilitation and landscaping, Transformation of natural areas should exclude any areas designated as having high or very high sensitivities; Prevent all effluent from the mining activities from entering the wetland habitat Management of the topsoil stockpile to preserve the seedbed; Fence development footprint area prior to commencement construction;

Activity	Potential Impact	Mitigation
		No off-road driving into natural vegetation 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 ways and conveyancing systems wherever possible; b. Implement a soil utilization plan; Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction; 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;

Activity	Potential Impact	Mitigation
		Maintain flow connectivity in any valley bottom wetlands during the construction phase by temporarily diverting streams around the construction area; 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; Dressing off of tip faces, unused roads and disturbed areas; Minimizing unnecessary disturbance of non-operational areas; 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	a. Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness;

Activity	Potential Impact	Mitigation
	the noise levels at the nearest sensitive receptors would be objectionable;	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; f. Clean upslope runoff will be diverted around construction areas.

Activity	Potential Impact	Mitigation
		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; 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;

Activity	Potential Impact	Mitigation
		b. Identify and support community development programs that address challenges raised by population influx and spontaneous settlement; c. Support local government capacity for integrated development planning.
Operational Phase		
Blasting, loading, hauling, stockpiling, backfilling and tailings storage and vehicle operations	Release of fugitive emissions in the form of N_2O, CH4 and CO_2 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; 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; Mining will take place according to design mine

Activity	Potential Impact	Mitigation
		stability safety factors; Mining will not take place in the weathered overlying strata; Identify boreholes (undertake hydrocencus) within mining area and plug deep boreholes to prevent inflow into the pit; b. Monitor groundwater levels and yields of external borehole users.
Excavation of an open cast mine	The formation of Acid Mine Drainage in groundwater resources.	a. Optimise storage of mine water to minimize exposure to oxygen; b. Develop a groundwater monitoring program to assess the groundwater quality; 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	Contamination of soil	a. Spill leak detection plan should be

Activity	Potential Impact	Mitigation
machineries and stockpiling.		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; 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; Minimizing unnecessary disturbance of non-operational areas; c. Use of chemical additives to control dust to be employed if necessary.

Activity	Potential Impact	Mitigation
Blasting and vibrations	General increase in Blasting and vibrations	a. 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; 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.	a. 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;

Activity	Potential Impact	Mitigation
		Support local government capacity for integrated development planning.
Employment	Benefits resulting from employment and income opportunities created by the mine	a. Positive impact that need to be enhanced.
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; e. Contour and stabilize slopes to be free-draining; f. 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

Activity	Potential Impact	Mitigation
		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 disturbed areas; c. Minimising unnecessary disturbance of non-operational areas; 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;

Activity	Potential Impact	Mitigation
		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; 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.

11 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

The pit site for the proposed open-cast mining operations was selected based on availability of Vanadium, Titanium and Iron- Ore reserves to be mined. Minerals can only be mined where there are identified and verified, therefore it was not practical to select any other sites. The No-Go option is the only other alternative identified during the Scoping phase. If the proposed operation were not to proceed, the land may or may not be utilized for agricultural, or grazing activities in the future. It is worth noting that as much as the no go option may result in the protection of the environment in situ; the consequences of not proceeding with the proposed operation will include the forfeiture of a mining opportunity and therefore the loss of support towards the Molemole municipality. It would further suggest that no new employment opportunities would be created as well as any resultant community upliftment and development programs would likely take place in the surrounding communities.

If an alternative resource cannot be identified this will limit the development of the proposed mine. The site is therefore regarded as the preferred site and alternative sites are not considered.

11.1 *Statement Motivating the Preferred Site.*

The location of the proposed mining activity was influenced by the following factors;

a. Availability of the Manganese and Iron Ore;
b. Land ownership;
c. Geo-hydrological impacts; and
d. Available transport modes and routes.

The proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

12 FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE

12.1 Assessment of each identified potentially significant impact and risk

Table 11: Potential 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	Wetland&	Construction Phase	Minor negative	Monitor and prevent	Negligible

	and siltation of water courses	Aquatic Ecology			through: Aquatic monitoring programme; Storm water management plan	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	Negligible Negative

					Dust monitoring programme.	
	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

13 SUMMARY OF SPECIALIST REPORTS.

Table 12: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
Air Quality Impact Assessment	
Heritage Impact Assessment	• The identified cemetery should be fenced off and a 50 metre buffer is observed to insure the graves are not destroyed by the development. • Relatives of the deceased should be given access if they wish to visit the burials. • There is a very high possibility that more graves and archaeological material may be found during the cultivation phase. This is due to the dense vegetation cover in the project area and the fact that some of the families that lived in that farm before are no longer living there. There could be more graves that the survey could not find. • In the event that any human remains are discovered. It should also be pointed out that the NHR-Act requires that operations exposing archaeological and historical residues, including modern graves, should cease immediately pending an evaluation by the heritage authorities. • It is very likely that sub-surface remains of archaeological artefacts and sites could still be encountered during the construction activities associated

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	with the project. Such sites would offer no surface indication of their presence due to heavy plant cover in other areas. In the event of discovery such archaeological artefacts or sites during site preparation and mining phase, the Provincial Heritage Resources Authority or SAHRA will be informed immediately and a Phase 2(two) Heritage Impact assessment should be initiated. • It is recommended that a limited Phase 2 Specialist Study be conducted prior to the commencement of development in this area (if the developer wishes to use sections where heritage resources were identified). The study should be aimed at the following : o The Lutherin Native Mission house is in a dilapidated state and it is recommended that it be carefully documented before destruction. o The other two historical buildings (Old Ruigedraai homestead and Roodewal farmstead) carry low cultural heritage significance but would also need to be documented before destruction. o The Ages (2012) report noted the existence of a number of MSA debris flakes on the farm Makotopong 1200LS, scattered in low concentrations. The same report also noted the existence of two settlement areas with occupation phases possibly dating to the

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	early parts of the Later Iron Age (mid-second millennium AD) was located along the southern border of Makotopong. The sites are characterized by the presence of deep ash deposits, granary stand structures, diagnostic potsherds and faunal remains. Though the occurrences are of low significance, a detailed background of the sites should be established by means of a desktop study and social consultation and participation, if the sites were to be impacted on by the proposed mining project. This process should minimally include the recording of the larger MSA cultural context by means of a more comprehensive area survey, surface sampling and consequent analysis of the stone artefacts by a suitably qualified Stone Age and Iron Age archaeologist. The specialist should obtain the necessary permits from the relevant heritage resources authority (SAHRA).
Avifaunal Impact Assessment	While job creation is highly needed for the country, it important that it does not negatively impact on ecological resources (aquatic, flora, fauna & avifauna). Conservation of these resources should be highly prioritized to avoid biodiversity loss. Impacts such as collisions, electrocutions, avifaunal displacement, and loss of habitats especially nesting site are expected during developments of this magnitude. Bird mortalities caused by transmission infrastructures have been

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	documented worldwide and applicable methods to prevent such mortalities have been developed. Some of the listed mitigation measures will also protect other collision prone species, which include non-threatened large terrestrial and waterbird species. The following recommendations are applicable for the proposed mining and associated infrastructures: For vegetation clearance, the contractor should be guided by the Flora/Vegetation Assessment Report. Avifaunal Specialist should be present during site establishment and electrification, should any bird or nest require rescue. A “Bird Friendly” structure, with a bird perch (as per standard Eskom guidelines) should a new powerline be constructed. All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents (Hunting, 2002). Installation of artificial bird space perches and nesting platforms, at a safe distance from energised components (Goudie, 2006; Prinsen et al., 2012). Bird Flight Diverters should be placed from tower/pylon to tower/pylon instead of 60% placement along the collision risk areas. The relevant sections of power line requiring this mitigation should be confirmed by an avifaunal walk down once the exact route and tower positions are confirmed just prior to construction. Shaw (2013) found that collision still occurred near the towers/pylons. As a result, they recommended a 100% marking of a powerline on high collision risk sections. Overall, the avifaunal impacts associated with this proposed project are considered

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	Low-Medium with the exception of habitat loss resulting from proposed pits and stockpiling. This would in turn affect nesting sites and foraging grounds.
Ecological faunal Impact Assessment	The faunal assessment showed that the area has a very low level of diversity and none of the recorded faunal species are classified as Red Data Species. There are several habitats within the proposed site that have been exposed to high levels of disturbance resulting from mixed farming, vegetation clearance, and farm dwellings. There are also areas that still have intact vegetation, such areas are associated with koppies and riparian habitats. As a result, the ecological integrity of the site is in fair condition, and it can maintain the ecological processes. The impacts associated with the proposed mining activities are likely to be Medium-Low after implementation of mitigation measures.
Ecological vegetation Impact Assessment	Although there are several habitats within the proposed site that have been exposed to some degree of disturbance resulting from mixed farming, vegetation clearance, and farm dwellings. There are also areas that still have intact vegetation, such areas are associated with koppies. As a result, the ecological integrity of the site is in fair condition, and it can maintain the ecological processes. The following are recommended: • Tree permits should be obtained before disturbing any protected trees. • All temporary stockpile areas including litter and dumped material and

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	rubble must be removed on completion of site establishment. • No painting or marking of vegetation shall be allowed. Marking shall be done by steel stakes with tags, if required. • Avoid translocating topsoil stockpiles from one place to another or importing topsoil from other sources that may contain alien plant propagules. • All construction plant and vehicles should be maintained and be in good condition. • Only necessary damage must be caused: for example, unnecessary driving around in the site should not take place. The impacts associated with the proposed mining activities are likely to be Medium-Low after implementation of mitigation measures.
Noise Impact Assessment	The noise intrusion levels from the proposed MRA will have to be monitored during the construction, operational and rehabilitation phases to ensure that the recommended noise levels along the boundaries of the proposed MRA will not be exceeded. The threshold value of 7.0dBA will not be exceeded during the day and/or night- time periods. There will be a shift in the prevailing ambient noise level in the immediate vicinity of the proposed mining activities but at a distance

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	exceeding 500m from the mining activities the noise levels will be minimal and in line with the Noise Control Regulations. The wind noise (when blowing) will create the predominant ambient noise level in the vicinity of the noise receptors which will mask the noise from mining activities. People who may work or visit the mining activities will experience an increase in the prevailing ambient noise level in the vicinity of the mine. The noise increase at the residential properties will be insignificant should all the mitigatory measures be in place. The large variations in the meteorological conditions and the geographical relations between the mining activities and the noise sensitive receptors allow for the decrease in the noise as it propagates from the mining activities. . The potential noise impact from the proposed mining activities will be low with all the mitigatory measures in place and authorisation for the MRA may be granted from an environmental noise point of view.
Social Impact Assessment	Overall the proposed mining activities of this nature has both negative and positive social impact to the local community. However, social impacts will either be low, medium, or high and also it will vary between phases of the proposed mining project at farm Makotopong 1200 LS. The negative socio economic impacts will largely have a long and lasting impact on the local communities as compared to positive ones. The following recommendations have been made based on the

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	findings of the social impact assessment provided by the current SIA report: • Before the mining is allowed to go ahead, there must be confirmation that the proposed mining will operate on a long term basis and that the mineral deposit in the area are available at large scale. • Where possible, procurement of construction materials, goods, and products should be encouraged from local suppliers, as well as engagement with local authorities and business organizations. • To maximize and ensure more opportunities for the local SMMEs and other service providers, a database must be created and priority must be given to the local service providers but prevent nepotism/corruption and abuse of power by those in authority. • Ensure that the proposed development provides skills development and training initiatives implemented effectively more for local labour force. • To maximize and ensure more opportunities for the local labour force, a local employment policy must be adopted. • All semi-skilled labour forced to be sourced locally, either at local or district level. • Women should be given preference during recruitment and employment

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	whenever possible but prevent nepotism/corruption and abuse of power by those in authority. • Create a training and employment plan then develop a workforce that will stay on the job for a longer period of time. • To enhance the benefits resulting from the project to local communities that will also be most significantly impacted / affected by it, suppliers and contractors who are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria must be utilized as far as possible. • The appointment of a Community Liaison Officer (CLO) will enable the organization to locate and recruit local labour. • Work with Molemole Local Municipality and community leaders to establish and implement a recruitment protocol. Provide clear instructions on how to apply for a job i.e., the requirement and ensure that this is clearly known by everyone. • In cases where the graveyard is not moved (although the best thing here will be to relocate the graves in the area), the descendants should have access to the graveyard. • Otherwise, it is recommended that there must be relocation of the graves which are currently in the proposed area of development even if they won't

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	be directly affected by the mining activities i.e., out of areas to be dug out but for as long as they are inside the area demarcated for mining. • It is important to investigate and implement road upgrading measures jointly with local authorities (e.g., repairing and rehabilitating the N1 road on a regular interval). • Also, the portion of the N1 national road to be affected need to be prepared to and therefore increase its capacity for Heavy Moving Vehicles. • Ensure that for the changes in the landscape setting, implement the appropriate mitigation measures as recommended by the Visual Impact Assessment (if such specialist study was undertaken). • A grievance/complaint register that is available, maintained, and implemented effectively between neighbours and mine management. • Take all steps to reduce noise, air quality, traffic, and visual influences and ensure that all mitigation techniques as recommended by specialist studies are followed. • In an event where current land owners are displayed in the proposed area, there must be arrangements of compensation of their livelihood and land. • Before construction phase, livelihood restoration plans and relocation action plans might be put in place.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	• Compensation to current livestock farmers, a purchase of land where their livestock can be moved to can be done to ensure security of their livelihood.
Surface water Investigations	In conclusion, the proposed mine infrastructure development can take place provided mitigation measures in line with this write-up are adhered to. In addition, the SWMP and EMPr must all be implemented during the different life cycles of the proposed project. Based on the WR2012 study, the project area falls within the quaternary catchment A71C. The total catchment area of A71C is 1331 Km2, with a net MAR of 7.80 million cubic meters (mcm) and a (MAP) of 418 millimetre (mm). The proposed project area is situated in a region generally characterized by a steeply topography with hilly landforms, as depicted on the topography map. The following recommendations have been made: • Surface water quality monitoring is to be conducted monthly during the construction and operational phases of the project. • A GN 704 audit is to be conducted bi-annually to assist with compliance to the separation of clean and dirty water infrastructure. • The construction phase of the project must take place during the dry months so as to minimise pollutant runoff; and

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	• An independent ECO is to be appointed during construction. The mine's internal Environmental officers must be conversant with best practices in line with rehabilitation during decommissioning and an audit is to be conducted during and after rehabilitation. • Where mining infrastructure, such as haul roads, are required across natural watercourses, new storm water infrastructure, such as pipes and culverts could replace the hydraulic function currently offered by the natural water courses. This infrastructure should be designed for both hydraulic performance and environmental functionality. A thorough assessment of the suitability of the new stormwater infrastructure must be made at preliminary design stage. • With all the mitigation and management measures in place, this project will not pose any threat into the natural surface water resources and should therefore go ahead.
Geohydrological Impact Assessment	**Monitoring:** Conduct water monitoring and implement remedial actions as required and effective rehabilitation to as close to pre-mining conditions as practically possible. It is recommended that the monitoring network be implemented at the proposed mining right project area. The monitoring must be overseen by a qualified Hydrogeologist to monitor pollution in the upper weathered

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	aquifer as well as the lower fractured aquifer. A monitoring network should be dynamic. This means that the network should be extended over time to accommodate the migration of contaminants through the aquifer as well as the expansion of infrastructure and/or addition of possible pollution sources. An audit on the monitoring network should be conducted annually The applicant is advised to follow the monitoring plan as outlined in chapter 8 of this report. **Modelling**: The numerical model should be recalibrated as soon as more hydrogeological data such as monitoring holes are made available. This would enhance model predictions and certainty. **Water contamination:** Prevention of pollution of surface water resources and impacts on other surface water users by training of workers to prevent pollution, equipment and vehicle maintenance, fast and effective clean-up of spills, effective waste management, manage clean and dirty water in accordance Flow of water The disturbance of streams and surface drainage patterns and reduction in flow to downstream must be mitigated through careful design of ephemeral stream diversion that minimizes impacts on the downstream environment, limit activities and infrastructure within wetland and watercourses and their floodlines and implementation of storm water management plan to divert clean water. **Clean**

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
	water trenches should be constructed surrounding the mining right to prevent clean water from entering the mining area, regarded as a dirty water catchment. **Dirty water trenches** must be constructed as well to direct water from the mine to the pollution control dam, thereby preventing any contaminant water from leaving the mine area. **Water Use License (DWS):** According to section 21(S21) of the National Water Act 36 of 1998, if a proposed project triggers any of the listed S21 activities, a water use license must be applied for. For this project, there will be activities which includes abstraction of water from groundwater, mining activities within 500m from the water courses, dust suppression, dewatering and ROM stockpiles. It is therefore recommended that a water use license be applied for.

Attach copies of Specialist Reports as **APPENDIX D**

14 ENVIRONMENTAL IMPACT STATEMENT

14.1 Summary of the key findings of the environmental impact assessment;

Table 13: Aspects to be assessed

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

Environmental Aspect	Potential Impact	Activities
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); b. 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; c. Spillages from sanitary conveniences, fuel deposits or storage facilities;
Ground Water	Impact on the availability of groundwater	a. 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

Environmental Aspect	Potential Impact	Activities
	Noise above ambient noise levels in the surrounding settlements and farm holdings	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.
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;

Environmental Aspect	Potential Impact	Activities
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

14.2 *Final Site Map*

Attached to Appendix A.

14.3 *Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;*

The predominant impacts on the biophysical environment during the Construction Phase are associated with the construction of the PCDs and overburden stockpiles. Such activities could lead to soil erosion and contamination, loss of biodiversity and habitats, as well as the contamination and sedimentation of wetlands on site. The potential impacts on soils are significant due to the high agricultural potential and erosion potential of the soils within the Project area. Potential contamination from hydrocarbon spillages, erosion due to vegetation clearance, exposure of soil surfaces and stockpiling and degradation due to compaction, could all lead to the overall loss of soil resources. The loss of soil resources impacts on the sustainability of the soil and the land capability, which will limit the final land use of the site following rehabilitation, as well as require costly remediation practices. The removal of vegetation and presence of disturbed areas will be a likely contributor for the establishment of alien invasive vegetation.

The construction and development of the coal mining by proponent within the Highveld grassland biome will result in the permanent removal of vegetation (grass and forbs species) composing this biome. Although the farms were highly invaded by alien trees and shrubs, the site has shown potential habitat that could support various individuals of the protected Species of Conservation Concern (annual species that may have not been detected during the study).

Despite of the non-occurrence of the CI species in the farms and extremely low chances of finding a red listed data species it is a necessity to continuously check such species within the farm during construction and development. A field guide encompassing pictures has been appended in the report, with the information sourced from South African National Biodiversity Institute (SANBI).

The farm areas also pose threat to the nearby sheep, goat and cattle species as it hosts high diversity of alien invasive plants species. However, based on the vegetation composition within the both farms, construction and development would pose low impact. Nevertheless, mitigation and management measures of the alien invasive species should be implemented to minimise spread and infesting nearby farms and elsewhere.

The presence of dumping and old mining activities within the farm areas have already decreased the abundance as well as diversity of the faunal assemblage. Therefore, the impact that would be caused by the development was of significantly low or moderate prior and after implementation of mitigation and management measure suggested.

According to the faunal diversity and assemblage's data collected, there was no Red Data Listed (RDL) species identified within the both farms. It was assumed that, due to the disturbance activities associated with this site and lack of suitable breeding sites, it is unlikely that RDL species would still have existing diversity. Moreover, it has been concluded that, RDL species would most likely be avifaunal species utilizing the site. Terrestrial birds are not necessarily restricted to common habitat unit, unlike aquatic adapted species that may be confined/ localized. Although there was a pond of water, it is unlikely to attract high diversity of birds and other conservation important species as it is contaminated with previous mining tailings. Therefore, the likelihood of the proposed coal mining development would result in low or moderate significant impact on breeding habitants of SCC species.

The proposed Project is a mining right application for Coal. The impacts listed in this report are because of the open-pit mining operations, underground operations and associated infrastructure and activities on the farms under application. Mitigation and management measures have been recommended to prevent, avoid and reduce the significance of the potential impacts of the Project. Conversely, enhancement measures will be implemented to increase the significance of the potential positive impacts on all farms under application. Should the mitigation and management measure be correctly implemented, the potential impacts will reduce in their significance. The proposed activities requiring Environmental Authorisation are critical for the mining activities and the prevention of pollution of the environment, as well as to ensure the efficient and successful operation of the Project. With the implementation of the recommended mitigation measures to manage potential impacts, it is recommended that the proposed PCDs and overburden stockpiles be issued a Waste Management License.

15 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR;

The EMP seeks to achieve a required end state and describes how activities that have, or could, an adverse on the environment will be mitigated, controlled and monitored.

The EMP will address the environmental; impacts during construction, operational, Decommissioning and post -closure phases of the project. Due regard must be given to environmental protection. These recommendations are aimed at ensuring that the contractors maintain adequate control over the project to:

a. Minimize the extent of an impact during the life of the PCDs and overburden stockpiles;
b. Ensure appropriate restoration of areas affected by the PCDs and overburden stockpiles; and
c. Prevent long term environmental degradation.

15.1 *Final proposed alternatives.*

The layout was informed by previous environmental and technical studies, as well as due to the location of mineral resource, the area is rich with magnetite mineral. The initial will consider the placement of infrastructure in a manner that will avoid and minimise potential environmental impact. Where impacts cannot be avoided, mitigation and management measures will be provided.

Refer to Appendix A for the final layout, as well as the description of the preferred layout.

15.2 Aspects for inclusion as conditions of Authorisation.

Not applicable

15.3 *Description of any assumptions, uncertainties and gaps in knowledge.*

It is Envirostep Pty Ltd opinion that no knowledge gaps or uncertainties exist regarding the investigations undertaken by specialist studies as part of the MA Coal Pty Ltd mining right application.

15.4 *Reasoned opinion as to whether the proposed activity should or should not be authorised*

15.4.1 Reasons why the activity should be authorized or not.

a. The desktop studies have proven that the site is located on a magnetite rich mineral zone, and there were prospecting activities taking place at these zones and by that these mining right application must be authorised.
b. It has also been noted that mining sector is the pillar of South African economy and provides employment opportunities for many.
c. The option of not approving the activities will result in a significant loss to valuable information regarding the status of the ore bodies present on these properties.

15.4.2 Conditions that must be included in the authorisation

15.4.2.1 Specific conditions to be included into the compilation and approval of EMPr

No specific conditions are required in addition to the requirements stipulated in the EMPr.

15.4.2.1.1 Rehabilitation requirements

A Rehabilitation Plan is an important planning tool designed to assist in preventing, minimising or mitigating adverse long-term environmental and social impacts caused by the proposed Project, as well as to create a self-sustaining ecosystem and to ensure the optimal management of rehabilitation issues that may arise. The overall rehabilitation objectives for the MA Coal Project are as follows:

a. Maintain and minimise impacts to the ecosystem within the Project area;
b. Establishment of a suitable post-mining land capability, vegetation and biodiversity;
c. Implement progressive rehabilitation measures where possible;
d. Prevent soil, surface water and groundwater contamination;
e. Comply with the relevant local and national regulatory requirements; and
f. Maintain and monitor the rehabilitated areas.

15.4.3 Period for which the Environmental Authorisation is required.

The Environmental Authorisation will be required for a period of 30 years.

15.4.4 Undertaking

All mitigation measures as described in this EIAR was included in the EMPr. We hereby confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the EIAR and the EMPr.

15.5 *Financial Provision*

The amount required to manage and rehabilitate the environment in respect of rehabilitation is **R 10380099.**

15.5.1 Explain how the aforesaid amount was derived.

As part of the requirements of the MPRDA, Envirostep calculated the environmental closure liability for MA Coal Pty Ltd according to the DMR guidelines. The financial provision will be made available to the DMR in the form of a guarantee from a financial institution to ensure that adequate rehabilitation will be undertaken following the Mining Right for MA Coal Pty Ltd. The financial provision was calculated as **R 10380099.**

The environmental closure liability for MA Coal Pty Ltd was calculated according to the DMR's "Guideline Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine". The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are utilised.

During this assessment, the 2018 Master Rates, as published by the DMR, were increased by an average inflation rate of 5.6% (Statistics SA, 2013). An average rate of inflation of 5.9% (Statistics SA, 201411) was added to the 2019 Master Rates to reflect 2019 costs.

The DMR Guideline Document classifies a mine according to a number of factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

a. The mineral mined;
b. The risk class of the mine;

c. Environmental sensitivity of the mining area;

d. Type of mining operation; and

e. Geographic location.

Table 14 provides a summary of the estimate calculated for each component for the proposed MA Coal Pty Ltd Project.

CALCULATION OF THE QUANTUM

Applicant: **MA Coal Pty Ltd** **Ref No.:** **LP 30/5/1/1/2/ 10197 MR**
Evaluators: **Envirostep Pty Ltd** **Date:** **15/08/2021**

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	1,5	14,05	1	1	21,075
2 (A)	Demolition of steel buildings and structures	m2	3	195,76	1	1	587,28
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	2,5	35,03	1	1	87,575
4 (A)	Demolition and rehabilitation of electrified railway lines	m	2	340,01	1	1	680,02
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	1,5	185,46	1	1	278,19
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,5	205242,16	1	1	102621,08
7	Sealing of shafts adits and inclines	m3	30	105,09	1	1	3152,7
8 (A)	Rehabilitation of overburden and spoils	ha	50	136828,1	1	1	6841405
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	1,5	170416,93	1	1	255625,395
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,5	494971,55	1	1	247485,775
9	Rehabilitation of subsided areas	ha	0,1	114572,93	1	1	11457,293
10	General surface rehabilitation	ha	0	108390,94	1	1	0
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		7463401,383

1	Preliminary and General	895608,166	**weighting factor 2** 1	895608,166
2	Contingencies	746340,1383		746340,1383
			Subtotal 2	9105349,69
			VAT (14%)	1274748,96
			Grand Total	**10380099**

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

Envirostep Pty Ltd confirms that the amount determined in Section 15.5 can be provided for from the operating expenditure of MA Coal Project.

16 DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY.

16.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

This submission to the DMR for the amendment of them MA Coal Mining Right is being undertaken in terms of Section 22 of the MPRDA. As a result, no Scoping Report was compiled in terms of the requirements of the MPRDA. A Scoping Report was compiled in terms of NEMA for Listed Activities and was submitted to the DMR as a commenting authority. The Plan of Study and methodology used in this EIA Report, however, did not deviate from the Scoping Report sent to the Department of Mineral Resources.

16.2 *Motivation for the deviation.*

No deviations were undertaken from the scoping report

17 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

The potential socio-economic impacts expected to arise because of the project have been investigated and assessed in detail. These include identification and quantification of impacts to the

socio-economic environment, based on the baseline conditions prior to the project being implemented.

Mining activities can cause considerable disruption to local cultures, especially when the operations occur, as is increasingly the case, in areas occupied by indigenous people who have had little contact with the outside world.

Much of the environmental damage caused by mining affects local communities, most significantly in terms of their livelihoods and health. Environmental health problems may become evident not just close to the mine, but some distance away.

At these MA Coal Mining right application, the greatest socio-economic impact is the likely displacement of farm owners or agricultural land being disturb and these could have impact on food production of the area around.

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

The sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all mining and construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

a. If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.

The senior site Manager must then make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area before informing ISS.
The mine manager will then contact a professional archaeologist for an assessment of the finds who will in turn inform SAHRA/PHRA.

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

Not applicable

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

18 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

18.1 *Details of the EAP*

The details of the EAP have been provided in Section 1, Item 1.1 in Part A of this report.

18.2 *Description of the Aspects of the Activity*

The details of the aspects of the activity are covered on PART A, Section 3, and item 3.1.2.

18.3 *Composite Map*

Attached as an Appendix A.

18.4 *Description of Impact management objectives including management statements*

18.4.1 Determination of closure objectives.

The closure objectives have been formulated for MA Coal mine. The closure objectives for MA Coal Pty Ltd Mining Right Application 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 closure objectives are to:

a. Eliminate any safety risk associated with drill holes and sumps though adequate drill hole capping and backfilling;
b. Remove and/ or rehabilitate all pollution and pollution sources such as waste materials and spills;
c. To establish rehabilitated area which is not subject to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources; and
d. Restore disturbed area and re- vegetate these areas with grass species naturally occurring in the area to res tore the ecological function of such areas as far as is practicable.

18.4.2 The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

An Environmental Response Plan is a process to respond rapidly and effectively to and manage emergency situations that may arise on farm portions under this Mining Right Application. The Environmental Response Plan has the following objectives:

a. To categorize emergency situations through hazard identification and to define procedures for responses to the situations;
b. To assign responsibilities for responding to emergency situations;
c. To implement an effective system to receive, record and communicate reports of environmental incidents and emergencies; and
d. To ensure that all environmental incidents or emergencies are investigated, and the necessary procedures are in place to implement corrective and preventative actions to prevent a recurrence of the incident.

The MA Coal mine emergency preparedness and response code of practice must be compiled in accordance with the following:

a. ISO 9001:2000;
b. ISO 14001;Occupational Health and Safety (OHSAS) 18001;
c. The Mine Health and Safety Act, 1996 (Act No. 29 of 1996); and
d. The Mineral Act, 1991 (Act No. 50 of 1991).

In the event of an emergency, the Emergency Response Plan/Procedure will be consulted, and the required actions implemented. To facilitate the effective implementation of the procedures, copies of the Emergency Response Plan will be placed in accessible and visible locations around the farms which are under applications. Figure 11 provides a general overview of the emergency response procedures.

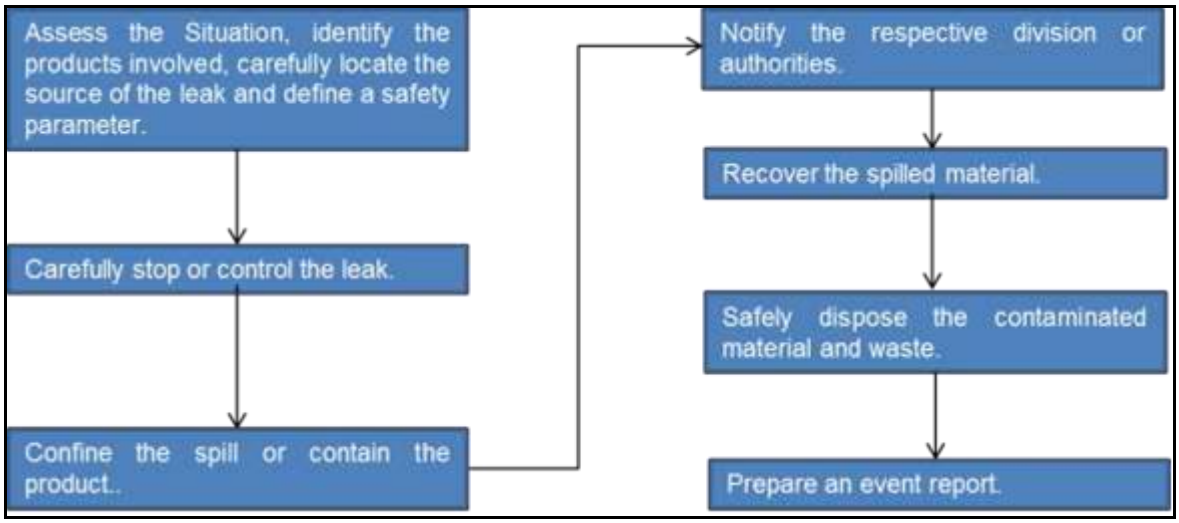


Figure 11: Emergency Response Procedure Overview

a. Communication

A list of emergency contact numbers will be displayed at various locations around MA Coal mine. If the emergency has the potential to affect surrounding communities, the communities will be alerted via alarm signals or contacted in person.

b. Training and Emergency

The efficiency of the emergency response plan must be tested by running training programmes and frequent emergency simulations. This will aid to prepare employees to respond in case of emergencies.

13.4.1. Potential risk of Acid Mine Drainage.

This section needs the lab results for Surface and Groundwater investigations and Geochemistry lab reports for farm portions under applications, respectively for the Mining Right Application for Manganese and Iron Ore.

18.4.3 Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

AMD is the process where mining and ore processing methods expose sulphates and metals in the source material to water and oxygen, producing low pH waters often associated with heavy metal contamination. By performing geochemical analysis on the source material, it is possible to

estimate the acid generating and neutralising potential of the source rocks as a basis for an impact assessment.

18.4.4 Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

MA Coal Pty Ltd will design a clean and dirty water management system consisting of a series of canals, pipelines, berms and PCDs for each overburden stockpile.

Dirty water from the open pit will be pumped to the respective PCDs; the overburden stockpile located to the north of Pit BD will have PCDs located to the east and west of the stockpile, with a PCD located to the northeast of the topsoil stockpile and a PCD located to the southwest of the overburden stockpile to the west of Pit BD.

The PCDs will temporarily store water from the pit dewatering activities, as well as surface water run-off from the respective stockpiles to ensure no contaminated water is discharged or reports to the surrounding environment and catchment. The water will then be pumped to the existing PCD located within the boundary of Mokotopong farm. Water from the PCD is recycled and used in the beneficiation process at PCPP. No dirty water is discharged from site.

The separation of clean and dirty water is essential in avoid the generation of acid mine water.

18.4.5 Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

The measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage includes:

a. Groundwater monitoring of the water quality and levels must take place quarterly to identify impacts;
b. Quarterly water monitoring will assist the mine to identify water quality and level trends over time. Seasonal variations will be identified, as well as potential impacts to the groundwater environment. Should potential impacts be identified, management measures will be put in place based on the type of potential contaminant or level change;
c. A Storm Water Management Plan will be implemented to separate clean and dirty water to minimise the volume of dirty water produced, thereby reducing the probability of contamination of groundwater from infiltration of dirty surface water;

d. Monitoring and maintenance of the dirty water diversion channels and berms must be undertaken to ensure that they are not silted up to allow for free drainage;
e. The conceptual and numerical models must be refined and annually for the first four years and thereafter every five years based on groundwater monitoring results. This will help to quantify impacts to water quantity and quality;
f. All contaminant, storm water, waste and hazardous waste storage facilities and other contaminated water storage areas (PCDs) must be lined to pro-actively prevent infiltration of contaminated seepage water;
g. The backfilled material must be compacted where possible and the pre-mining drainage pattern must be emulated;
h. 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;
i. The backfill material must be placed in such a manner to reduce the potential leaching impacts on the underlying aquifers. Material with a high neutralising 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 neutralising capacity. The top layer needs to ensure free draining of the rain water from the rehabilitated areas;
j. Should contamination plumes exist near sensitive receptors, intercept boreholes or trenches must be installed to collect the contaminated water before disposal in PCD; and
k. The rehabilitated areas must be flooded as soon as possible to reduce the amount of time the potential acid producing material is exposed to oxygen. This will reduce the potential AMD risk and volumes.

18.4.6 Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

It is expected that approximately ≤ 5000 cubic metres of water will be required per day during the Operational Phase of the MA Coal mine.

18.4.7 Has a water use licence has been applied for?

No, Water use Licence has not been lodged with DWS.

18.5 Impacts to be mitigated in their respective phases

Table 15: Measures to rehabilitate the environment affected by the undertaking of any listed activity

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	a. Ensure that the areas of disturbance are minimised and restricted to the required footprint areas; and b. Ensure that dust suppressants are applied to exposed surfaces.	a. Dust Management Plan; and b. Dust Monitoring Programme in accordance with NEM: AQA.	Daily
	Topography and Visual Environment	Construction Phase	Local	a. Limit the footprint areas of the of the surface infrastructure, where possible, especially the width of the haul roads; b. Ensure that access and haul roads are contoured to limit	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
				erosion from surface runoff, preventing further alteration to the topography; c. Establish vegetation, where possible, to aid in screening infrastructure; d. Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape; e. Pylons and metals structures should be galvanised or painted with a neutral matt finish; and f. Limit construction activities at night and down lighting must be used to minimise light pollution.		
	Soils	Construction Phase	Local	a. Ensure soils are stripped and stockpiled prior to the excavation of infrastructure foundations; and	a. Soil Rehabilitation Plan;	Weekly during construction and operational phase

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				b. Implement Storm Water Management designs to prevent erosion	b. Storm Water Management Plan in accordance with MPRDA Regulation 56 (1) to (8); and Soil pollution and erosion control.	
	Fauna and Flora	Construction Phase	Local	a. Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation; b. Ensure a Storm Water Management Plan is implemented; and c. Alien invasive vegetation to be identified and removed	a. Conservation Management Plan; and b. Alien Invasive Management Plan in accordance with NEM:BA	Weekly

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				throughout the LoM.	and ECA.	
	Wetland and Aquatic Ecology	Construction Phase	Local	a. Ensure the statutory buffers are implemented from the wetlands systems and watercourses, unless otherwise stated in the IWUL; b. Ensure a Storm Water Management Plan is implemented; and c. Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	a. Storm Water Management Plan; and Aquatic Monitoring Programme in accordance with NWA.	a. On-going and Biannually during Life of Mine.
	Surface Water	Construction Phase	Local	a. Ensure that the topsoil stockpiles are vegetated to prevent soil erosion; b. Implement Storm Water	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
				Management designs to prevent erosion and divert dirty water to the appropriate storage dams (PCDs); and c. 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	a. Ensure construction activities are only undertaken during daylight hours; b. Construction related machines and vehicles should be serviced on a regular basis to ensure	Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	a. Daily and according to Maintenance Plan during Construction Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				noise suppression mechanisms are effective (e.g. installed exhaust mufflers); and c. Ensure equipment and machinery is switched off when not in use.		
	Heritage	Construction Phase Operational Phase	Local	a. Consultation with the bona fide Next of Kin must be undertaken in accordance with the NHRA Regulations and any other applicable legislation; and b. 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.	Entitlement Framework in Accordance with NHRA.	Prior to Construction Phase
Construction of stockpiles	Soils	Construction	Local	a. Minimise topsoil stockpile heights as far as possible;	a. Soil Rehabilitation	a. On-going and Annually

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		Phase Operational Phase		b. 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; c. Ensure soils are stripped and stockpiled prior to the excavation of infrastructure foundations; d. Ensure stockpiles are maintained in a fertile and erosion free state by sampling and analyzing for macro nutrients and pH on an annual basis; e. Traffic and access to the stockpiles will be restricted; f. Ensure that the topsoil stockpiles are vegetated to prevent soil	Plan; b. Storm Water Management Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and erosion control.	during Construction Phase and Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				erosion and to reinstitute the ecological processes within the soil; and g. Implement Storm Water Management designs to prevent erosion.		
	Fauna and Flora	Construction Phase	Limited	a. Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation; b. Ensure a Storm Water Management Plan is implemented; and c. Alien invasive vegetation to be identified and removed throughout the Life of Mine.	a. Conservation Management Plan; and b. Alien Invasive Management Plan in accordance with NEM:BA and ECA.	a. On-going during Life of Mine.
	Wetland and Aquatic Ecology	Construction Phase	Local	a. Ensure the statutory buffers are implemented from the wetlands systems and watercourses,	Storm Water Management Plan;	a. On-going and Biannually during Life of

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

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				operation and maintenance of water management facilities must be in accordance with GN R 704 capacity requirements.		
	Groundwater	Construction Phase Operational Phase	Local	a. 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; b. Implement a Surface Water Management Plan to minimise the volume of dirty water produced, as well as the effectiveness of the containment	a. Groundwater Monitoring Programme; b. Storm Water Management Plan; and • Numerical and conceptual model in accordance with NWA.	a. 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
				of dirty water, thereby reducing the probability of contamination of groundwater from infiltration of dirty surface water; c. Refine and update the conceptual and numerical models annually for the first four years and thereafter every five years based on groundwater monitoring results. This will help to better quantify impacts to water quantity and quality; and d. 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.		

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
Operational Phase						
Dirty Water Management System	Wetlands and Aquatic Ecology	Operational Phase	Provincial	a. Ensure a Storm Water Management Plan is implemented; b. 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; c. 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 d. Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and	a. Storm Water Management Plan; b. Dust Management Plan; c. Dust Monitoring Programme; and d. Aquatic Monitoring Programme in accordance with NWA.	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
				implement corrective actions, should it be required.		
	Surface Water	Operational Phase	Municipal	a. Diversion berms and pipelines used for dewatering activities need to be sized based on the dewatering rates and volumes; b. 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; c. Monitor the dirty water management facilities monthly to identify potential leaks and implement management measures to rectify potential	a. Storm Water Management Plan b. Surface Water Monitoring Programme in accordance with NWA.	a. On-going and Monthly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				issues; and d. Monitor surface water resources up and downstream of the Project area to identify potential contamination.		
	Groundwater	Operational Phase	Limited	a. 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; b. Ensure that pipelines and diversion channels and berms are monitored for potential leaks and structure failures; c. Potential leaks and spills must be contained and cleaned up immediately, as well as the leakage location repaired;	a. Storm Water Management Plan b. Groundwater Monitoring Programme in accordance with NWA.	a. Monthly and Quarterly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				d. Ensure that a Storm Water Management Plan is in place to separate clean and dirty water; and e. 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	a. Ensure a Storm Water Management Plan is implemented; b. 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;	a. Storm Water Management Plan b. Dust Management Plan; c. Dust Monitoring	a. 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
				c. 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 d. Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	Programme; and Aquatic Monitoring Programme in accordance with NWA.	
	Surface Water	Operational Phase	Municipal	a. 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	a. Storm Water Management Plan b. Surface Water Monitoring Programme in	On-going and Monthly during Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				to contain a 1:50 year, 24-hour storm event; and b. Monitor the dirty water management facilities monthly to identify potential leaks and implement management measures to rectify potential issues.	accordance with NWA.	
	Groundwater	Operational Phase	Limited	a. The operation and maintenance of the PCD must be in accordance with the NWA Regulations set out in GN R704; b. The PCD must be monitored for potential leaks and structure failures; c. Potential leaks and spills must be contained and cleaned up immediately, as well as the leakage location repaired;	a. Groundwater Monitoring Programme in accordance with NWA.	a. Monthly and Quarterly during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				d. Monitor PCDs' water quality on a quarterly basis to understand water quality and potential impacts on the groundwater should seepage occur; and e. 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	a. Monitor the establishment of vegetation	a. Dust Management Plan; and b. Dust Monitoring Programme in accordance with NEM: AQA.	a. Monthly during Operational Phase
	Topography	Operational	Local	a. Ensure topsoil stockpiles are	a. Mine Plan	a. On-going

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
	and Visual Environment	Phase		contoured and have a steepness of less than 18° to prevent slope failure and erosion and aid in vegetation establishment; b. Limit and reduce the stockpile heights as far as possible; c. Ensure that the topsoil stockpiles are vegetated; and d. Establish and maintain vegetation screens.	Development	during Operational Phase.
	Soils	Operational Phase	Local	a. Ensure stockpiles are maintained in a fertile and erosion free state by sampling and analyzing for macro nutrients and pH on an annual basis; b. Ensure topsoil stockpiles are vegetated to prevent erosion; c. Ensure access to the stockpiles is restricted to prevent	a. Storm Water Management Plan; and b. Soil Rehabilitation Plan in accordance with MPRDA Regulation 56	Annually and on-going during Construction Phase and Operational Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				unauthorized use and borrowing of topsoil; d. Ensure topsoil stockpiles are clearly demarcated; and e. Implement Storm Water Management designs to prevent erosion.	(1) to (8); c. Soil pollution and erosion control	
	Wetlands and Aquatic Ecology	Life of Mine	Local	a. Ensure a Storm Water Management Plan is implemented; and b. Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.	a. Storm Water Management Plan b. Aquatic Monitoring Programme in accordance with NWA.	a. On-going and Biannually during Life of Mine.
	Surface Water	Operational Phase	Local	a. Ensure a Storm Water Management Plan is implemented; and	a. Storm Water Management Plan	On-going and Monthly during Operational

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				b. Monitor surface water resources up and downstream of the Project area to identify potential contamination.	b. Surface Water Monitoring Programme in accordance with NWA.	Phase.
	Groundwater	Operational Phase	Limited	a. Buffer acid generating overburden material with acid neutralising material, where possible; b. Divert water run-off from the stockpiles to the PCD to prevent water ingress; and c. Groundwater monitoring of the water and levels must take place quarterly to identify potential impacts and seepage.	a. Groundwater Monitoring Programme in accordance with NWA.	On-going and Monthly during operational phase
Concurrent Rehabilitation	Air Quality	Operational Phase & Decommission	Municipal	a. Ensure the rehabilitated areas are vegetated to prevent erosion and surface exposure to winds;	a. Dust Management Plan;	As required and Monthly during Operational Phase

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
		ing Phase		and b. Monitor the establishment of vegetation.	b. Dust Monitoring Programme in accordance with NEM: AQA	and Decommissioning Phase.
	Topography and Visual Environment	Operational Phase Decommissioning Phase	Local	a. The open-pit must be backfilled; and b. 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	a. All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; b. Spillage control kits will be readily available on site to contain the mobilization of contaminants and clean up spills; c. All vehicles and machinery to be	a. Emergency Response Plan b. Vehicle Maintenance Plan in accordance with MPRDA Regulation 56 (1) to (8);	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				serviced in a hard park area or at an off-site location; and d. Vehicles with leaks must have drip trays in place.	c. Soil pollution and erosion control and Hazardous Substances Act 1973	
		Operational Phase Decommissioning Phase		a. Ensure that the topography of rehabilitated areas takes the pre-mining landscape into consideration and that the topography is free draining; b. Ensure that the soil layers are backfilled in reverse order of the stripping and the subsoil must underlie the topsoil; c. Ensure that the yellow and red soils are placed in upland landscape positions and wetland soils placed in the lower	a. Soil Rehabilitation Plan; b. 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
				landscape positions; d. 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 e. 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,		

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				if required.		
	Surface Water	Operational Phase Decommissioning Phase	Limited	a. Rehabilitation activities must be monitored to ensure that the pre-mining drainage pattern is emulated, and that vegetation establishment is successful; b. The backfilled areas should be vegetated as soon as possible to prevent dust and siltation of the water bodies; c. Monitor surface water resources up and downstream of the Project area to identify potential contamination; and d. Where rehabilitation (grass seeding of topsoil cover) is not effective, the associated soil erosion must be mitigated by installing silt traps in affected	a. Rehabilitation Plan in accordance with NEMA.	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
				areas.		
	Groundwater	Operational Phase Decommissioning Phase	Local	a. Ensure that the backfilled material is compacted where possible and the pre- mining drainage pattern is emulated; b. 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; and c. The backfill material must be placed in such a manner to reduce the potential leaching impacts on the underlying	a. Rehabilitation Plan; and b. Groundwater Monitoring Programme in accordance with NWA.	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
				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. d. The top layer needs to ensure free draining of the rain water from the rehabilitated areas.		
	Fauna and Flora	Operational Phase Decommissioning Phase	Very limited	a. Vegetate disturbed and rehabilitated areas with indigenous vegetation; b. Alien invasive vegetation to be identified and removed throughout the LoM; and c. Establish and implement an Alien Invasive Management Programme.	a. Rehabilitation Plan; and b. 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
	Noise	Construction Phase Operational Phase	Project Area	a. 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 b. Ensure equipment and machinery is switched off when not in use.	a. 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	a. The area of disturbance must be restricted to the required footprint size; b. Demolition activities should be undertaken judiciously during windy periods (winds greater than 5.4 m per second); and c. The area of disturbance must be minimized to limit the area	a. Dust Management Plan; b. 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
				exposed to wind erosion.		
	Topography and Visual Environment	Decommissioning Phase	Limited	a. Demolish all unnecessary infrastructure; b. Ensure that all demolished infrastructure is removed from site's surface; and c. Ensure that rehabilitated areas are rehabilitated and vegetated.	a. Rehabilitation Plan; and b. Closure Plan in accordance with ECA.	As required during Decommissioning Phase and Post-Closure.
	Soils	Decommissioning Phase	Very limited	a. Ensure that demolished infrastructure is removed off-site and disposed of by a reputable contractor; b. All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; c. Spillage control kits will be readily available on site to contain the mobilization of	a. Emergency Response b. Vehicle Maintenance Plan in accordance with MPRDA Regulation 56 (1) to (8); Soil pollution and erosion control;	As required during Life of Mine.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				contaminants and clean up spills; d. All vehicles and machinery to be serviced in a hard park area or at an off-site location; and e. Vehicles with leaks must have drip trays in place.	Hazardous Substances Act 1973	
	Fauna and Flora	Decommissioning Phase Post-Closure	Limited	a. Restrict vehicles and machinery to existing roads and designated areas to prevent vegetation destruction; and b. Alien invasive vegetation to be identified and removed throughout the LoM and c. Establish and implement an Alien Invasive Management Programme.	a. Conservation Management Plan b. 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	a. Restrict vehicles and machinery to existing roads and designated areas to prevent vegetation	a. Storm Water Management Plan	On-going and Biannually during: LoM.

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

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				transport and disposal of wastes and demolished material off-site; b. All potential hydrocarbon spillages and leaks to be cleaned up immediately and the soils remediated; c. Spillage control kits will be readily available on site to contain the mobilization of contaminants and clean up spills; and d. Vehicles with leaks must have drip trays in place.	Response Plan c. Vehicle Maintenance Plan in accordance with NWA.	
	Noise	Decommissioning Phase	Project Area	a. Ensure demolition activities only take place during daylight hours; b. Demolition related machines and vehicles should be serviced on a regular basis to ensure noise suppression mechanisms are	a. Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				effective (e.g. installed exhaust mufflers); and c. Ensure equipment and machinery is switched off when not in use.		
Final Rehabilitation	Air Quality	Operational Phase Decommissioning Phase	Local	a. Replacement of overburden and topsoil should be undertaken judiciously during windy days (winds speed greater than 5.4 m per second); b. Ensure the rehabilitated areas are vegetated to prevent erosion and surface exposure to winds; and c. Monitor the establishment of vegetation.	a. Rehabilitation Plan in accordance with NEM: AQA	On-going and Monthly during: Operational Phase, Decommissioning Phase and Post-Closure.
	Topography and Visual Environment	Decommissioning Phase	Local	a. The open-pit must be backfilled as much as possible; b. The rehabilitated area must be	a. Rehabilitation Plan; and b. Closure	As required during Decommissioning Phase and Post-

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

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				explosives must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); and e. Vehicles with leaks must have drip trays in place.	Substances Act 1973.	
	Soils	Decommissioning Phase Post Closure	Very limited	a. Ensure that the topography of rehabilitated areas takes the pre-mining landscape into consideration and that the topography is free draining; b. Ensure that the soil layers are backfilled in reverse order of the stripping and the subsoil must underlie the topsoil; c. Ensure that the yellow and red soils are placed in upland landscape positions and wetland soils placed in the lower	a. Soil Rehabilitation Plan; b. 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
				landscape positions; d. 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; e. 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		

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				f. Monitor vegetation establishment.		
	Fauna and Flora	Operational Phase Decommissioning Phase	Local	a. Vegetate disturbed and rehabilitated area with indigenous vegetation; b. Monitor vegetation establishment and implement erosion control measures, if required; c. Alien invasive vegetation to be identified and removed throughout the LoM; and d. Establish and implement an Alien Invasive Management Programme.	a. Rehabilitation Plan; and b. Alien Invasive Management Plan in accordance with NEM:BA and ECA.	As required and On-going during Operational Phase, Decommissioning Phase and Post-Closure.
	Surface Water	Operational Phase Decommissioning Phase	Local	a. Rehabilitation activities must be monitored to ensure that the pre-mining drainage pattern is emulated, and that vegetation establishment is successful;	a. Rehabilitation Plan in accordance with NEMA.	Monthly during Operational Phase, Decommissioning

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

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				b. 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; c. 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 d. The backfill material must be placed in such a manner to	Programme in accordance with NWA.	Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				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.		
	Noise	Operational Phase Decommissioning Phase	Project Area	a. 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 b. Ensure equipment and	a. Regular Vehicle Inspections in accordance with NEM: AQA and ECA.	Daily and according to Maintenance Plan during Decommissioning Phase.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				machinery is switched off when not in use.		
Post Closure Phase						
Impacts on the Post-Mining Landscape	Air Quality	Post-Closure Phase	Local	a. Ensure vegetation is established across all disturbed and rehabilitated areas; and b. Monitor vegetation establishment.	a. Post Closure Monitoring and Maintenance Plan in accordance with NEM: AQA.	Monthly during Post-Closure.
	Topography and Visual Environment	Post-Closure Phase	Local	a. Should water pool on the surface, the drainage lines must be rehabilitated further and shaped to ensure a free-draining topography; and b. Monitor vegetation establishment and potential soil erosion. Should it be required, vegetation establishment and erosion	Post rehabilitation monitoring plan in accordance with NEMA.	Monthly during Post-Closure.

Activity	Aspect Affected	Phase	Size & scale of distribution	Mitigation Measure	Compliance with Standards	Time Period for Implementation
				control measures must be implemented.		
	Soils	Post-Closure Phase	Very Limited	a. Ensure that the topography of rehabilitated areas is free draining; b. Model post-mining landforms to establish post-mining landscape stability; c. Implement erosion prevention techniques, if required; d. Establish clear medium and long-term targets for the post-mining land capability and land use and e. Monitor vegetation establishment.	a. Post-rehabilitation monitoring plan in accordance with MPRDA Regulation 56 (1) to (8) and soil pollution and erosion control.	Annually during Post-Closure.
	Fauna and flora	Post-Closure Phase	Municipal	a. Monitor vegetation establishment and implement erosion control measures, if required;	a. Rehabilitation Plan; and b. Alien	Monthly and as required during Post-Closure.

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

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

18.6 *Impact Management Outcomes*

Table 16: Objectives and Outcomes of the EMP

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
All activities throughout the Life of Mine.	Dust generation	a. A minimum of eight (8) dust buckets should be installed, for each direction; b. Dust fallout levels must be monitored; c. It is recommended that PM10 fallout be monitored.	a. Environmental Manager; b. Environmental Control Officer; c. 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	a. Inspection of	a. Environmental	Inspection of stripping	Inspection of stripping

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	recourses and land capability	stripping depths and separation of topsoil and subsoil during stockpiling; b. Inspection of stockpiles to manage and prevent erosion; c. Inspection of rehabilitated areas to ensure that the surface is free-draining; d. Random inspections of soil thickness	Manager; b. Environmental Control Officer; c. Soil Specialist.	depths must be on-going 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 selected for to test for soil thickness. The land must be shaped	depths must be on-going 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

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
		on rehabilitated areas; e. Fertility and acidic analysis and amelioration procedures prior to vegetation establishment.		and sampled, and remediation techniques implemented, if necessary, prior to vegetation establishment.	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	a. Floral and faunal SSC must be rescued and relocated, should they occur within the disturbed	a. Environmental Manager; b. 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 previous years' results to keep track of the	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 previous

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
		areas; b. Faunal and Floral SSC in the Project area, but not within the directly disturbed mine areas, should be monitored, particularly the Grass Owl, Serval, Hedgehog and Giant Bullfrog populations; c. Alien invasive vegetation must be controlled on a		populations of the faunal and floral species. Monthly monitoring for alien invasive vegetation must take place and managed according to the NEM: BA requirements.	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.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
		monthly basis.			
	Potential contamination and sedimentation of wetlands and aquatic ecosystems.	The following must be tested for: a. *In situ* water quality must be analyzed; b. Sediment and water column metal analysis; c. Toxicity testing; d. Habitat integrity; and e. Aquatic macro-invertebrates.	a. Environmental Manager; b. Environmental Control Officer	The Aquatic Ecology Monitoring Programme must be implemented from the onset of 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.	The Aquatic Ecology Monitoring Programme must be implemented from the onset of 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

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
					potential impacts.
	Contamination to surface water resources	a. The following constituents must be tested for: b. Sodium, calcium, sulphate, chloride and potassium c. Manganese, magnesium and fluoride; d. Nitrate and ammonium; and e. pH, electrical conductivity and TDS.	a. Environmental Manager; b. Environmental Control Officer	Surface water monitoring must take place from 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 to a quarterly basis. All sampling results must	Surface water monitoring must take place from 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

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

18.7 *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;

Activity	Potential Impact	Mitigation
		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 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

Activity	Potential Impact	Mitigation
		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-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	a. Regular planned mobile plant maintenance, with special attention paid to the

Activity	Potential Impact	Mitigation
	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;	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

Activity	Potential Impact	Mitigation
		be available; 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;

Activity	Potential Impact	Mitigation
		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 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

Activity	Potential Impact	Mitigation
		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; g. Mining will take place according to design mine stability safety factors; h. Mining will not take place in the weathered overlying strata; i. Identify boreholes (undertake hydrocencus) within mining area and plug deep boreholes to prevent inflow into the pit; b. Monitor groundwater levels and yields of external borehole users.
Excavation of an open cast mine	The formation of Acid Mine Drainage in groundwater resources.	a. Optimise storage of mine water to minimize exposure to oxygen; b. Develop a groundwater monitoring program

Activity	Potential Impact	Mitigation
		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;

Activity	Potential Impact	Mitigation
		c. Minimizing unnecessary disturbance of non-operational areas; d. Use of chemical additives to control dust to be employed if necessary.
Blasting and vibrations	General increase in Blasting and vibrations	a. 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.	a. 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	a. Develop an employment and recruitment

Activity	Potential Impact	Mitigation
	on social services	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	a. Positive impact that need to be enhanced.
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; j. Contour and stabilize slopes to be free-draining; k. 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,

Activity	Potential Impact	Mitigation
		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 disturbed areas; c. Minimising unnecessary disturbance of non-operational areas; d. Use of chemical additives to control dust to

Activity	Potential Impact	Mitigation
		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.

19 FINANCIAL PROVISION

19.1 Determination of the amount of Financial Provision.

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

The closure objectives have been formulated for MA Coal Pty Ltd. The closure objectives for MA Coal project are as follows:

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

19.1.2 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 will be 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 in due time.

19.1.3 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.

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

The rehabilitation plan will be compiled in support of the primary closure objective which is the remediation of the impact land to a post-mining land use capable of supporting grazing activities.

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:

19.1.4.1 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 establish rapidly. 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.

19.1.4.2 Rehabilitation of plant area:

a. The compacted areas shall be ripped, and the topsoil returned over the area.
b. Coarse natural material used for the construction of ramps shall be removed and dumped into the excavations.
c. Stockpiles shall be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.
d. On completion of operations, all structures or objects shall be dealt with in accordance with Section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

    - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
    - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora if natural vegetation does not re-establish within 6 months of the closure of the site.

Photographs of the mining area and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300 mm and graded to an even

surface condition and the previously stored topsoil will be returned to its original depth over the area.

Prior to replacing the topsoil, the overburden material that was removed from these areas will be replaced in the same order as it originally occurred.

The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix if natural vegetation does not re-establish within 6 months after closure of the site.

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 seed mix to his or her specification.

19.1.4.3 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 44 of 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; Regulations 15 & 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.

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

The environmental closure liability for MA Coal Pty Ltd was calculated according to the DMR's "Guideline Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine".

The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are utilised.

The 2005 DMR Master Rates were updated and published by the DMR in 2012 however, due to inflation, these are no longer accurate. During this assessment, the 2019 Master Rates, as published by the DMR, were increased by an average inflation rate of 5.7% (Statistics SA, 2013). An average rate of inflation of 5.9% (Statistics SA, 2014) was added to the 2018 Master Rates to reflect 2019 costs.

The DMR Guideline Document classifies a mine according to many factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

a. The mineral mined;
b. The risk class of the mine;
c. Environmental sensitivity of the mining area;
d. Type of mining operation; and
e. Geographic location.

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

Commodity	Manganese and Iron Ore
Sealable mineral by-product	None

Risk ranking

Primary risk ranking	C (Low risk)
Revised risk ranking	N/A

Environmental sensitivity of the mine area

Environmental sensitivity of the mine area	Low

Level of information

Level of information available	Limited

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

The applicant MA Coal Pty Ltd confirms that the financial provision will be provided for as determined in Part A, Section 15.5, Page 108 of this report.

20 MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING

20.1 Monitoring of Impact Management Actions

20.1.1 Air Quality

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.

20.1.2 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 MA Coal Project come under scrutiny from regulatory agencies. Calibration of the monitoring instruments should be conducted yearly

20.1.3 Soil Management

20.1.3.1 Soil management during the construction phase

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 Aero Wind 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.

20.1.3.2 Soil management during the operational phase

Soil management should be an on-going strategy through the operational phase as soil disturbing activities will continue in areas where operation of the mine continues, and new areas are developed through operation activities.

It is recommended that concurrent rehabilitation techniques be followed to prevent topsoil from being stockpiled too long and losing its inherent fertility, but opportunities may be limited by the layout of the operation. Disturbed sites must be rehabilitated as soon as they have reached the end of their life. During operations, soil will continue to be removed from newly developed areas and stockpiled for later use. Topsoil stripping and stockpiling should follow the guidelines as stipulated under the construction phase above.

As new stockpiles are created, they should be re-vegetated immediately to prevent erosion and resulting soil losses from these stockpiles. It is recommended that vegetation removed during land clearance be composted during the operational phase and that this compost be used as a soil ameliorant for soil rehabilitation purposes.

All above soil management measures explained under the Construction Phase should be maintained for similar activities during the Operational Phase. In addition to this, the following Soil Management Measures are recommended:

i. The vegetative (grass) cover on the soil stockpiles (berms) must be continually monitored in order to maintain a high basal cover. Such maintenance will limit soil erosion by both the mediums of water (runoff) and wind (dust).
ii. Drains and intercept drains must be maintained so that they continue to redirect clean water away from the operating areas, and to convey any potentially polluted water to pollution control dams.
iii. Routine monitoring will be required in and around the sites.

a. **Management of potential soil contamination during the operational phase**

The following management measures will either prevent or significantly reduce the impact of soil chemical pollution on site during the operation phase:

i. Stockpiles are managed so they do not become contaminated and then need additional handling or disposal;
ii. A low process or storage inventory must be held to reduce the potential volume of material that could be accidentally released or spilled;
iii. Processing areas should be contained, and systems designed to effectively manage and dispose of contained storm water, effluent and solids;
iv. Storage tanks of fuels, oils or other chemicals stored are above ground, preferably with inspectable bottoms, or with bases designed to minimise corrosion. Above-ground (rather than in-ground) piping systems should be provided. Containment bunds should be sealed to prevent spills contaminating the soil and groundwater;
v. Equipment, and vehicle maintenance and washdown areas, are contained and appropriate means provided for treating and disposing of liquids and solids;
vi. Air pollution control systems avoid release of fines to the ground (such as dust from dust collectors or slurry from scrubbing systems);
vii. Solids and slurries are disposed of in a manner consistent with the nature of the material and avoids contamination; and
viii. Effluent and processing drainage systems avoid leakage to ground.

20.1.3.3 Soil management during the decommissioning phase

At decommissioning any excavated areas will be backfilled and covered with a layer of topsoil. Some re-grading and re-contouring will be carried out. Soil management in the decommissioning phase will include the following:

a. Prevention of soil contamination

During the decommissioning phase, chemical soil pollution should be minimised as follows:

- Losses of fuel and lubricants from the oil sumps of vehicles and equipment should be contained using a drip tray with plastic sheeting and filled with absorbent material;

i. Using biodegradable hydraulic fluids, using lined sumps for collection of hydraulic fluids and recovering contaminated soils and treating them off-site;
ii. Avoiding waste disposal at the site wherever possible, by segregating, trucking out, and recycling waste;
iii. Containing potentially contaminating fluids and other wastes; and
iv. Cleaning up areas of spillage of potentially contaminating liquids and solids.

Soil management during the closure phase

During the closure phase activities include the maintenance and aftercare of final rehabilitated land. In this regard, frequent visual observations should be undertaken to confirm if vegetation has re-established and if any erosion gullies have developed. In the event that vegetation has not re-established, and erosion gullies have developed, remedial action should be taken.

20.1.4 Fauna and Flora

20.1.4.1 Recommendations for Ensuring Application of Mitigation Measures

It is vital that mitigation measures are applied as recommended (based on practicality and cost effectiveness). This can be achieved with a series of plans assuring the process to be followed for monitoring and application of mitigation measures. Plans recommended for the proposed MA Coal mining development are as follows:

a. An alien invasive management plan;
b. A comprehensive assessment of all plant SSC within the footprint of the development and corresponding permit applications for removal of these species (removal includes both transplantation and destruction of these species);
c. A search and rescue plan for both plant and animal SSC to be applied before construction (plants) and during construction (animals);
d. A rehabilitation plan detailing the methods used for the rehabilitation of areas cleared for construction but not required for operation of the development; and
e. An offset plan should be developed should the proponent wish to demonstrate a net gain of biodiversity for the proposed MA Coal Mining Project.

f. It is further recommended that all such plans be included in an overall Biodiversity Action Plan or BAP (optional) as is usually required for IFC projects to meet international best practice. Such a plan will allow for centralization of biodiversity-related mitigation actions with associated responsibility assignations and monitoring.

20.1.4.2 Monitoring Requirements

The main aims of compliance monitoring by the authorities are to:

a. Evaluate the adherence by the contractors and developer to the conditions attached to the letter of authorisation;
b. To check compliance with the Environmental Management Plan (EMP) and any other legal requirements referred to in the letter of authorisation;
c. To assess the contractor's and applicant's effectiveness in implementing the conditions of authorisation and the EMP; and
d. To recommend how and where improvements could be made to ensure compliance, enhance environmental performance and promote sustainability of the development.
e. The fauna and flora monitoring program should be initiated pre-construction and continue through construction thereafter conducted annually during the growing season as close to the same time of year as possible. If the monitoring results indicate the additional presence of red data species, or threatened species, this may require the need to undergo monitoring for that particular species more frequently, especially during the breeding season and birthing season for that species.
f. Monitoring will include sites in the undisturbed vegetation which will act as control plots, plots within the disturbed infrastructure areas which will have baseline data and then be monitored during the rehabilitation phase. These same plots will be monitored with each survey to ensure collected data is comparable and trends are identified. Where rehabilitation has been conducted, additional plots will be included to monitor the effectiveness of the re-vegetation.
g. Aspects that will be monitored in the annual surveys will include, species richness, vegetation composition i.e. proportion grasses, forbs and woody species, canopy height, cover percentage, presence of Red Data or protected species, and presence of alien invasive species.

20.1.5 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 Aero wind 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.

20.1.6 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 no 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.

20.1.7 Groundwater

Groundwater monitoring does not currently take place at Rosseauspoort farm. The groundwater monitoring locations have been selected from the identified hydro census and newly drilled boreholes locations within the site. 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.

20.2 *Monitoring and reporting frequency*

Table 18: Monitoring and Management of Environmental ImpactsTable 18 discusses the monitoring and reporting frequency.

20.3 *Responsible persons*

Table 18 sets out roles and responsibilities with respecting to the monitoring programme.

20.4 *Time period for implementing impact management actions*

Table 18 Table 17 captures the time period for implementing impact management actions.

20.5 *Mechanism for monitoring compliance.*

Table 18 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.

Table 18: Monitoring and Management of Environmental Impacts

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All activities throughout the Life of Mine.	Dust generation	a. A minimum of eight (8) dust buckets should be installed, for each direction; b. Dust fallout levels must be monitored; c. It is recommended that PM10 fallout be monitored.	a. 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.
	Loss of soil recourses and land capability	a. Inspection of stripping depths and separation of topsoil and subsoil during stockpiling; b. Inspection of stockpiles to manage and prevent erosion; c. Inspection of rehabilitated	a. Environmental Manager; Environmental Control Officer Soil Specialist.	Inspection of stripping depths must be on-going during site clearance activities and stockpiling to ensure that soils are stored separately. Stockpiles

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		areas to ensure that the surface is free-draining; d. Random inspections of soil thickness on rehabilitated areas; e. Fertility and acidic analysis and amelioration procedures prior to vegetation establishment.		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 must be kept planning for rehabilitation. The rehabilitation activities must be monitored, and random samples selected for to test for soil thickness. The land must be shaped and sampled, and remediation techniques

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
				implemented, if necessary, prior to vegetation establishment.
	Loss of biodiversity	a. Floral and faunal SSC must be rescued and relocated, should they occur within the disturbed areas; b. Faunal and Floral SSC in the Project area, but not within the directly disturbed mine areas, should be monitored, particularly the Grass Owl, Serval, Hedgehog and Giant Bullfrog populations; c. Alien invasive vegetation must be controlled on a monthly	a. 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 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

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		basis.		according to the NEM: BA requirements.
	Potential contamination and sedimentation of wetlands and aquatic ecosystems.	The following must be tested for: a. *In situ* water quality must be analyzed; b. Sediment and water column metal analysis; c. Toxicity testing; d. Habitat integrity; and e. Aquatic macro-invertebrates.	a. Environmental Manager; Environmental Control Officer	The Aquatic Ecology Monitoring Programme must be implemented from the onset of 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

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
				potential impacts.
	Contamination to surface water resources	The following constituents must be tested for: a. Aluminium and iron; b. Sodium, calcium, sulphate, chloride and potassium c. Manganese, magnesium and fluoride; d. Nitrate and ammonium; and e. pH, electrical conductivity and TDS.	a. Environmental Manager; b. Environmental Control Officer	Surface water monitoring must take place from 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 to

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
				a quarterly basis. All sampling results must be recorded to track potential quality changes or deterioration.

20.6 *Indicate the frequency of the submission of the performance assessment report.*

The performance assessment report will be submitted on an annual basis.

21 ENVIRONMENTAL AWARENESS PLAN

21.1 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 Plan was developed for MA Coal Pty Ltd and will be implemented for MA Coal Mine. The Environmental Awareness Plan describes the way the mine intends to inform its employees of any environmental risks that may result from their work and the way the risk must be dealt with to avoid pollution or degradation to the environment.

Environmental conditions are included in all operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity to prevent accidental spillages by implementing good housekeeping practices.

The following principles will apply to the Environmental Awareness Plan (Safety, health and Environmental (SHE) Training) for MA Coal Pty Ltd.

a. All personnel will, as a minimum, undergo general SHE induction and awareness training;
b. An Environmental Control Officer (ECO) will be appointed;
c. The ECO will identify the SHE is training requirements for all MA Coal mine personnel and contractors. The training requirements will be recorded in a training needs matrix indicating training that must be undertaken by the identified personnel and contractors. The training matrix will be administered by the ECO; and
d. Development of a training programme.

21.1.1 General Awareness Training

The ECO will be responsible for the development, or the facilitation of the development, of the required general SHE induction and awareness training. A general environmental awareness training module will be developed and integrated into the MA Coal mine induction programme. The general awareness training must include the following:

a. A review of the Environmental Policy;
b. A description of the EMPr and the importance of compliance to the EMPr requirements;
c. A review of the significant environmental aspects;
d. General responsibilities of personnel regarding the EMPr requirements; and
e. A review of the emergency and corrective action processes.

The ECO, or an appointee, must conduct the general awareness training. The training presenter will keep a record of the details of all personnel and contractors that attend the general awareness training and the attendance register will indicate the names of the attendants, their organizations, the date and the type of training received.

21.1.2 Specific Environmental Training

Specific environmental training will be in line with the requirements identified in the training matrix. Personnel whose work tasks may impact on the environment will be made aware of the requirements of appropriate procedures and work instructions. The ECO will communicate the training requirements to the responsible supervisors to ensure that personnel and contractors are trained accordingly.

21.1.3 Training Evaluation and Re-Training

The effectiveness of the environmental training will be reflected by the degree of conformance to the EMPr requirements, the results of internal audits and the general environmental performance achieved at MA Coal mine. Incidents and non-conformances raised against the EMPr will be assessed by the ECO to determine if the cause was due to a lack of awareness or training. Should it be evident that re-training is required; the ECO will inform the responsible supervisors and Heads of Departments of the need to take the appropriate actions. General Awareness Training will be repeated to all personnel every two years.

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

An Emergency Response Plan is detailed in Part B of this report and is the approach used by MA Coal Pty Ltd to response to risks that may pollute or degrade the environment during the operational phase.

It should be noted that the Emergency Response Plan is in additional to the EMPr presented in Part B.

21.3 *Specific information required by the Competent Authority*

The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by National Environmental Management Act, 1998, Act 107 of 1998), as amended, (NEMA) which provides in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision will be reviewed annually.

22 UNDERTAKING

The EAP herewith confirms

a. the correctness of the information provided in the reports ☐
the inclusion of comments and inputs from stakeholders and I&APs; ☐
the inclusion of inputs and recommendations from the specialist reports where relevant; ☐ and
the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☐

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APPENDIX A: MAPS

APPENDIX B: DETAILS OF EAP

APPENDIX C: PUBLIC PARTICIPATION REPORT

APPENDIX D: SPECIALIST STUDIES