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ENVIRONMENTAL IMPACT REPORT:
APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR COAL MINING RIGHT PROJECT-INGOGO AREA

FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING RIGHT SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (ACT 59 OF 2008) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY AN APPLICATION IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002) (AS AMENDED).

NAME OF APPLICANT: **IDWALA MINING (PTY) LTD**
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DMRE Reference No. KZN 30/5/2/2/10107

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (MPRDA), 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 (EA) can be granted following the evaluation of an Environmental Impact Assessment (EIA and an Environmental Management Programme (EMPr) report in terms of the National Environmental Management Act (NEMA, Act 107 of 1998), 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 (CA) and in terms of section 17 (1) (c) the CA must check whether the application has considered 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 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 (EAP) 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.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT PROCESS

An ideal Environmental Impact Process covers all activities that have significant environmental impact and address all the impacts that are expected to be significant. It involves some comparisons to alternatives including that of not developing the site as well as mitigation measures. The objectives of this process include to:

(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.

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

LISTF ABBREVIATIONS

ADM	Amajuba District Municipality
BPEO	Best Practicable Environmental Option
CA	Competent Authority
CBA	Critical Biodiversity Area
CBD	Central Business District
CHPP	Coal Handling and Preparation Plant
CPR	Competent Person's Report
DEA	Department of Environmental Affairs
DSR	Draft Scoping Report
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
DWS	Department of Water and Sanitation
EMPr	Environmental Management Programme
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
MAMSL	Metres above mean sea level
IDWALA	Witklip Colliery
LDV	Light Delivery Vehicle
MRA	Mining Rights Area
NEMA	National Environmental Management Act (Act 107 of 1998)
NLM	Newcastle Local Municipality
NSBA	National Spatial Biodiversity Assessment
ROM	Run of Mine
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
TIA	Traffic Impact Assessment

GLOSSARY OF TERMS

Alien species	A plant or animal species introduced from elsewhere: neither endemic nor indigenous to the area.
Applicant	Any person who applies for an authorisation to undertake an activity or to cause such activity to be undertaken as contemplated in the NEMA (Act 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2017. In this report Applicant refers to Keaton Mining (Pty) Ltd.
Biodiversity	The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and their ecological complexes.
Borehole	Generic term used for any drilled or hand-dug hole used to abstract or monitor groundwater, irrespective of diameter or construction.
Catchment	The area from which any rainfall will drain into the watercourse or watercourses or part of the water course, through surface flow to a common point or common points.
Contamination	The introduction into the environment of any substance by the action of man.
Ecology	The study of the inter relationships between organisms and their physical environments.
Environment	All physical, chemical, and biological factors and conditions that influence an object and/or organism; the surroundings within which humans exist and are made up of the land, water, atmosphere, plant, and animal life (micro and macro), interrelationship between the factors and the physical or chemical conditions that influence human health and well-being.
Environmental Impact Assessment	An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting, and assessing the potential positive and negative social, economic, and biophysical impacts of any proposed project, plan, programme, or policy which requires authorisation of permission by law, and which may significantly affect the environment. The EIA includes an evaluation of alternatives. As well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and environmental management and monitoring measures.
Environmental Management Plan	A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by responsible parties throughout the duration of the proposed project.
Groundwater Recharge	The inflow of water into a groundwater reservoir from the surface, e.g., infiltration of precipitation and its movement to the water table.
Hydrogeological	The study of distribution and movement of groundwater.

Hydrological	The study of movement, distribution, and quality of surface water.
Public Participation Process	A process of involving the public in order to identify issues and concerns and obtain feedback on options and impacts associated with a proposed project, programme, or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on or raise issues relevant to specific matters.
Study Area	Refers to the entire study area compassing the total area of the land parcels as indicated on the study area map of Idwala/Witklip Colliery.
Sustainable Development	Development that has integrated social, economic, and environmental factors into planning, implementation and decision making, to ensure that it serves present and future generations.
Topography	Indicates whether pollutants will run off or remain on the surface allowing for infiltration to groundwater to occur. • Impact of the vadose zone: The part of the geological profile beneath the earth's surface and above the first principal water-bearing aquifer. The vadose zone can retard the progress of the contaminants.
Water quality	Means the physical, chemical, toxicological, biological (including microbiological) and aesthetic properties of water that determine sustained (1) healthy functioning of aquatic ecosystems and (2) fitness for use (e.g., domestic, recreational, agricultural, and industrial). Water quality is therefore reflected in (a) concentrations or loads of substances (either dissolved or suspended) or micro-organisms, (b) physio-chemical attributes (e.g., temperature) and (c) certain biological responses to those concentrations, loads or physio-chemical attributes.
Water use license	An authorisation from the Department of Water and Sanitation to a designated water user to use water. The authorisation will provide details on the timeframes and conditions for the designated water use.
Water Resource	A water resource includes any watercourse, surface water, estuary, or aquifer. Watercourses include rivers, springs, and natural perennial and non-perennial channels. Wetlands, lakes, dams, or any collection identified as such by the Minister in the Government Gazette.

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SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

The following Table 1 summarises the content of this section, with reference to requirements of the Scope and content of Environmental Impact Assessment reports, according to Appendix 3 of the Amendments to the EIA Regulations of 2014, published as GNR 326 of 07 April 2017.

Table 1: Section Guide According to requirements of the Regulations

Regulation reference	Section details
3. (1) (a) details of- (iii) The EAP who prepared the report; and (iv) The expertise of the EAP, including curriculum vitae;	1.4 Appendix 1
(b) The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including: (i) the 21-digit Surveyor general code of each cadastral land parcel. (ii) where available, the physical address and farm name; and (iii) where the required information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	1.2 Figure 1 Table 2
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken. (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2 Section 12
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development;	Table 5
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 3
(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred [location] development footprint within the approved site as contemplated in the accepted scoping report;	Section 4
(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 5.1 Section 12
(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (i) details of the development footprint alternatives considered;	Section 5
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 6

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 6
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
(v) the impacts and risks identified including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts— (aa) can be reversed. (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 8
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 11
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 16
viii) the possible mitigation measures that could be applied and level of residual risk;	Section 16
(ix) if no alternative development [locations] footprints for the activity were investigated, the motivation for not considering such; and	Section 5
(x) a concluding statement indicating the location of the preferred alternative development [location] footprint within the approved site as contemplated in the accepted scoping report;	Section 12
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred [location] development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including—	Section 11
(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Section 16
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 16
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring. (v) the degree to which the impact and risk can be reversed. (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated;	Section 8
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Section 9

(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred [location] development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 10
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed [impact management objectives, and the] impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Section 9
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 5
(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 16
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 13
(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 16
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Section 16
(s) an undertaking under oath or affirmation by the EAP in relation to [:]— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix 1
(t) where applicable, details of any financial provision[s] for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Appendix 13
(u) an indication of any deviation from the approved scoping report, including the plan of study, including— (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	Section 13
(v) any specific information that may be required by the competent authority; and	
(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	

1. INTRODUCTION AND OVERVIEW

1.1. Scope of Assessment

Dumisani Madi acquired the prospecting right in year 2018 and prospected on the same in year 2019. During the prospecting phase, drilling was done which showed that the reserve is open castable along certain contours and as you move up to the mountain, the reserve is an underground reserve. iDwala Coal Mine owned by Dumisani Madi lodged a mining right over the same area and extended it with the following properties Rem of Ptn 3 (of 2) of Witklip No.98, Ptn 4 (of 2) of Witklip No.98, Ptn 8 (of 2) of Witklip No.98, Ptn 9 (of 2) of Witklip No.98, Ptn 13 (of 1) of Witklip No.98, Ptn 16 (of 1) of Witklip No.98, Ptn 17 (of 1) of Witklip No.98 Ptn 18 (of 12) of Witklip No.98, Rem of Ptn 1 of Gejaag No.99, Rem of Ptn 2 of Gejaag No.99, Ptn 3 (of 1) of Gejaag No.99, Rem of Tigerkloof No.399, Rem of Ptn 1 of Tigerkloof No.399, Ptn 2 (of 1) of Tigerkloof No.399, Ptn 3 (of 1) of Tigerkloof No.399. An application for both a mining right and environmental authorisation (EA) was lodged with the Department of Mineral Resources and Energy in July 2021 (reference number KZN30/5/1/2/2/10107MR). The application for mining right was accepted on 21 September 2021. The proposed mining project is located approximately 34 km North of Newcastle, within the Magisterial District of Amajuba in KwaZulu Natal Province.

BGES Pty Ltd was appointed as an independent Environmental Assessment Practitioner (EAP) to carry out a Scoping and Environmental Impact Assessment (EIA) process to evaluate the potential environmental impacts of the proposed coal mining project. The EIA is being done in terms of the EIA Regulations and with guidance from the Amendments to the Environmental Impact Assessment Regulations of 2017. This study summarises the first phase of a Scoping and EIA process and allows input from various Interested and Affected Parties (I&APs) before a Final Scoping Report can be submitted to the competent authority. Proposed activity being a coal mining activity, the competent authority was identified as the Department of Mineral Resources (DMR), KwaZulu Natal Province.

1.2. Description of Property and Locality

Idwala Coal Mining is located approximately 35 kilometres (km) northeast of Utrecht, 36km south of Wakkerstroom and 30km north of the town Newcastle in the eMadlangeni Local Municipality, Amajuba District Municipality in the KZN Province of South Africa as illustrated in figure 1 below. The mining right area is located within Ingogo area, and the extent of the area applied for covers approximately 4 351 hectares (ha). The location of the mine is largely within Quarter Degree Grid Square 2729BD within the V31B Quaternary Catchment within the Thukela Water Management Area (WMA 7) at the following central GPS location 27°29'28.36"S and 29°56'9.09"E. Idwala is located on a catchment divide between two major river systems, namely the Buffels River and the Slang River that are draining on the west and east sides of the project site respectively and towards the south.

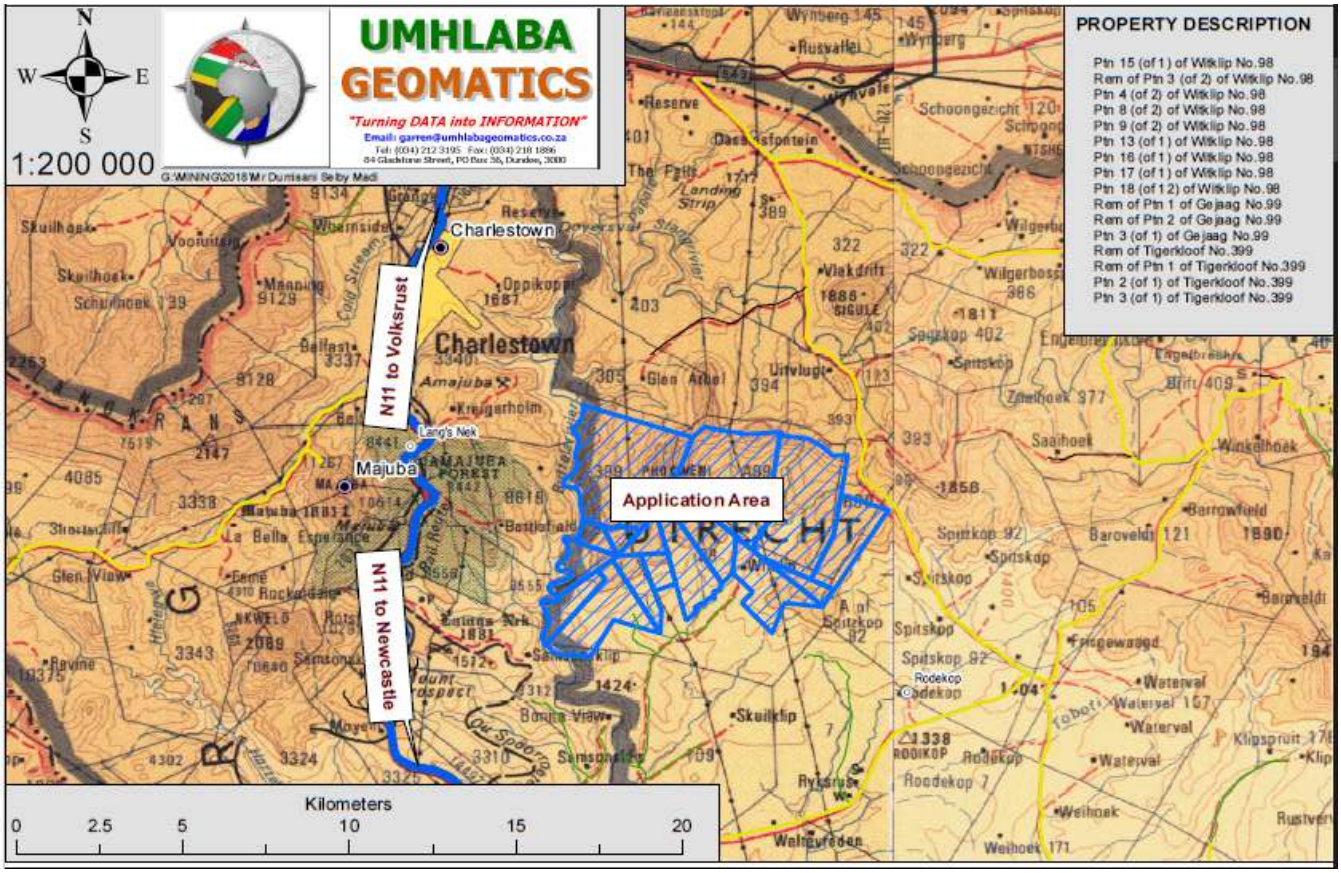


Figure 1: Layout Map for project site

Table 2: Details of Property involved

Farm	Portion	Registered Owner	Contacts	Cadastral Code
Witklip No.98,	3 (of 2)	Lofdal Trust-Trustees		N0HS00000000009800003
Witklip No.98,	4 (of 2)	Inthemba Property Cc		N0HS00000000009800004
Witklip No.98,	8 (of 2)	Nel Family Trust-Trustees		N0HS00000000009800008
Witklip No.98,	9 (of 2)	Magudulela's Estate Services		N0HS00000000009800009
Witklip No.98,	13 (of 1)	Nyandeni Beryldon Thulasizwe		N0HS00000000009800013
Witklip No.98	15(of 1)	Dumisani Madi		N0HS00000000009800015
Witklip No.98,	16 (of 1)	Kaalkop Ibis Trust-Trustees		N0HS00000000009800016
Witklip No.98	17 (of 1)	Lofdal Trist		N0HS00000000009800017
Witklip No.98,	18 (of 12)	De Bruyn Familie Trust		N0HS00000000009800018
Gejaag No.99,	Rem of 1	Zandspruit Trust-Trustees		N0HS00000000009800000
Gejaag No.99,	Rem of 2	Soloprop 1011 Pty Ltd (Po: Thom Christina Geertje)		N0HS00000000009800000
Gejaag No.99,	3 (of 1)	Zandspruit Trust-Trustees		N0HS00000000009800003
Tigerkloof No.399,	Rem	Lofdal Trist		N0HS00000000039900000
Tigerkloof No.399,	2 (of 1)	Lofdal Trist (Po: Botha Wilhelmina)		N0HS00000000039900002
Tigerkloof No.399,	1	Langa Junior		N0HS00000000039900001
Tigerkloof No.399.	3 (Of 1)	Amandla Amadoda Properties		N0HS00000000039900003

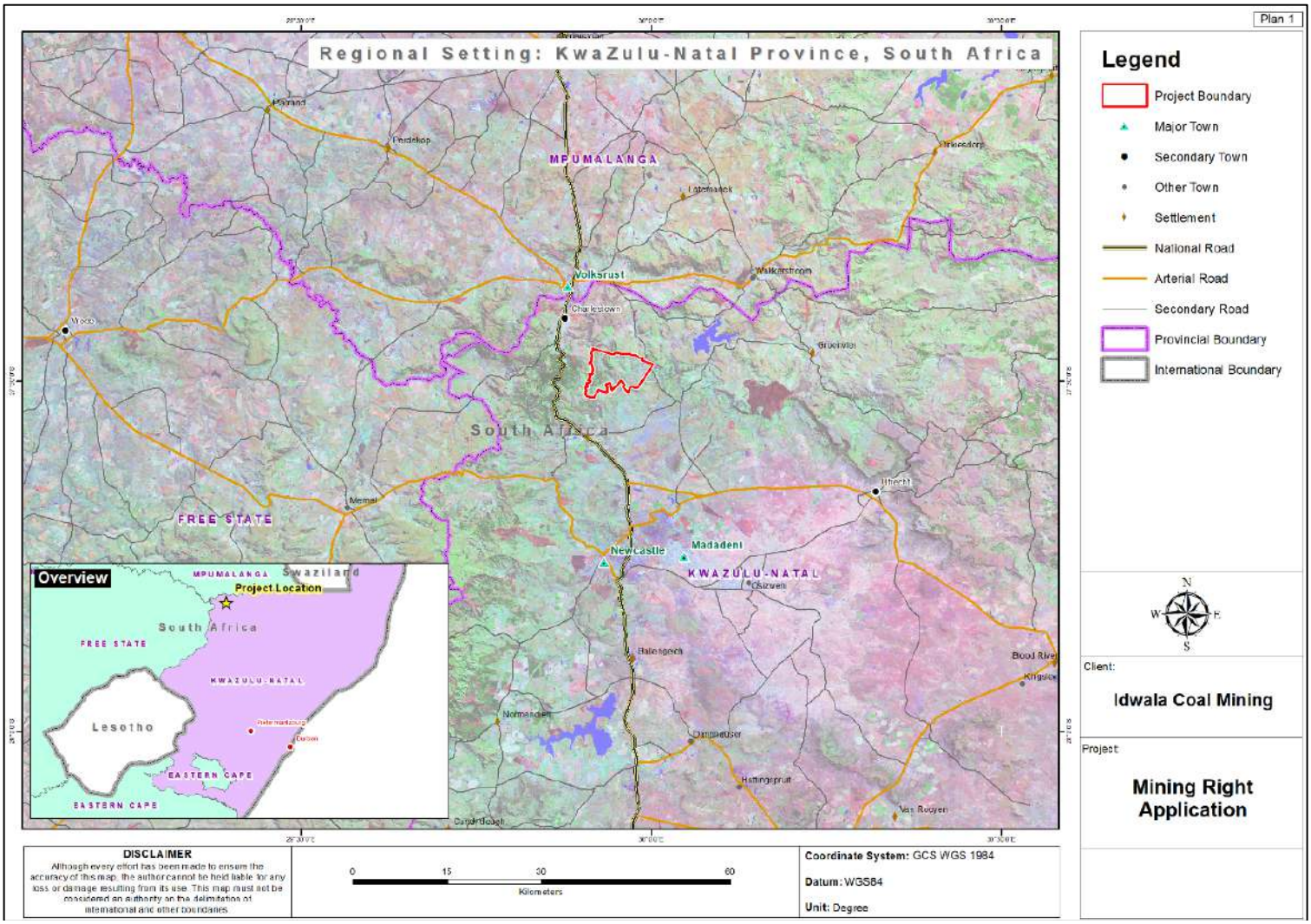


Figure 2: Locality Map

1.3. Applicant Details

The details of the Applicant are summarised in Table 3 below:

Table 3: Applicant Details

Applicant Name	Idwala Coal Mining
Owner Name	Dumisani Madi
Registration Number	2018 / 435703 / 07
Mining right details	**KZN 30/5/2/2/10107MR**
Contact Person	Dumisani Madi- CEO
Email	dumim@siyazama.co.za
Telephone	Cell: 0833091967 / 0313143700
Fax	0313014578
Postal address	No.7 Avonworld; Cowie's Hill;
Physical address	Same as above

1.4. Project Team

Nonkululeko Mbasane	holds a Bachelor of Science Honours Degree in Environmental Management. She has over 12 years' experience within the field of environmental management. She has extensive experience in Environmental Impact Assessments, Environmental audits, Mine Rehabilitation, environmental authorisations, and compliance requirements of all South African environmental legislation. Had exposure in various industries including oil and gas industry, mining, construction, botany & ecology, and education. Successful in delivering projects and contributing to large projects. Has managed budgets of up to R2 million. Passionate about collaborating with others including knowledge sharing and skills transfer. She holds a Bachelor of Science degree in Biological Science obtained in 2006, University of Zululand and BSc Honours in Environmental Monitoring and Modelling obtained in 2009, UNISA.
Nomthandazo Ntuli	Holds a Bachelor of Science Honours Degree in Geology. She is a graduate geologist with over 8 years' experience in mining. She has been involved in desktop studies and exploration of several coal projects in the Kwa-Zulu Natal. She has acquired significant skills in geological mapping, core logging, sampling, and analysis, mine planning, desktop studies, map production, geochemical sampling and geophysical survey (magnetic survey).
Mitrance Nana	Holds a Master's Degree in Botany and `Master's degree in Environmental science Bachelor of Science. She has more than 5 years' experience and has been involved in several multi-commodity projects and EIA projects. Through the years, she has acquired the diverse set of skills including geological mapping, geochemical sampling, map production, desktop studies and modelling. She continuously gains significant skills and experience in exploration and EIA's through working with both internal and external experts.

The qualifications and past experience of the EAP is detailed in Appendix 1.

Table 4: Details of EAP

EAP	BGES Pty Ltd t/a Beyond Green Environmental Services
Name	Nonkululeko Mbasane
Contact Person	Nana Mitrance – Environmental Consultant
Telephone	0721728374 / 012 003 6594
Fax	0866134794
Email address	nana@beyondges.co.za or nonkululeko@beyondges.co.za
Postal address	P O Box 68823, Highveld, 0169
Physical address	c/n Jean Ave & Olievenhoutbosch, Bylsbridge Office Park, Centurion

1.5. Activities to be Undertaken

In broad terms the project includes opencast and underground mining accessed via a box cut established in the side of the mountain, on-site crushing, and screening, washing plant, contractor workshop and office area, as well as water management infrastructure, temporary stockpiling of coal, and transport off-site by truck to customers directly and via a regional railway siding. Various support infrastructure and services will be required for the project.
Surface infrastructure is planned around the mine access box cut next to the existing adit opened during historical mining, on the north of the farm application area. Despite the application having several farm portions, all proposed surface infrastructure will be on Ptn 15 (of 1) of Witklip No.98. Portion of farm Witklip No.98 which is a brownfield area; mining has occurred 50 years ago. To date, a discard coal dump is existing.

Coal will be mined over various portions of the farms namely, Witklip No. 98, Gejaag No. 99 and Tigerkloof No. 399. Previously underground mining took place on the farm Witklip No.98.

The overall planned life of mine (LoM) is approximately 30 years with an additional 3-5 years post-closure monitoring. For the first five (5) years opencast mining method will be utilized. At year six of operation the underground operation will also commence. Coal will be conveyed from the underground sections to temporary ROM stockpiles at the adits.

Stockpiles of materials will be positioned separately, including topsoil stripped on construction and project initiation, subsoil, overburden, ROM, coal product as well as discard from coal washing operations.

Three Pollution Control Dams (PCDs) are proposed to contain wastewater and dirty runoff from site catchments. The collection and conveyance of dirty water will be through gravity, via concrete lined dirty water channels. At closure, all infrastructure will be removed, the mined-out areas backfilled, and the site rehabilitated back to natural environment/cattle farming with controlled grazing.

The proposed activities mining operations are summarised in Table 5 below:

Table 5: Summary of Proposed Activities

Name Of Activity	Aerial Extent Of The Activity	Listed Activity	Applicable Listing Notice
All proposed infrastructure onsite within Witklip farm portion, mining on farm Witklip, Gejaag & Tigerkloof.	MRA boundary Approx. 4000ha	Some	As listed below
Open cast area	264 ha	X	GNR 325 07 April 2017 Activity 17
Topsoil and subsoil stripping and stockpiling as well as clean and dirty catchment separation berms	310ha ha	X	GNR 325 07 April 2017 Activity 15
Overburden stockpiles	10 ha		
Underground shaft mining (tbc)	3000ha	X	GNR 325 07 April 2017 Activity 17
Run of Mine coal stockpiling	6ha	X	GNR 633 24 July 2015
Coal handling and processing plant; including crushing, screening, and washing activities			GNR 325 07 April 2017 Activity 15
Coal product stockpiling, truck loading area and weighbridge Dirty water management infrastructure: dirty water trenches. Pollution Control Dam	310 ha		GNR 327. 07 April 2017. Activity 12
Discard dump: integrated discard and slurry dump stockpile		X	GNR 921 29 November 2013. GNR 633 24 July 2015.
Access and haul roads within mine site	2,5km		

2. DESCRIPTION OF THE PROPOSED ACTIVITY

2.1. Overview

Project will involve opencast and underground mining; production will start at 10 000 tonnes per month for the first year and will increase to 20 000 tonnes per month of opencastable coal from year two (2). On year six (6), when mining of the underground reserve commences, the production will be increased to 60 000 tonnes per month. Coal will be conveyed from the underground sections to temporary ROM stockpiles at the adits.

Stockpiles of materials will be positioned separately, including topsoil stripped on construction and project initiation, subsoil, overburden, ROM, coal product as well as discard from coal washing operations. Three Pollution Control Dams (PCDs) are proposed to contain wastewater and dirty runoff from site catchments. Despite the application having several farm portions, all proposed surface infrastructure will be on Ptn 15 (of 1) of Witklip No.98. Portion of farm Witklip No.98 is a brownfield area; mining has occurred 50 years ago.
The Planning Phase will involve the following activities:

- Acquisition of required authorisations including environmental authorisation (including waste) and water use license. This EIA forms part of this activity, and commencement of mining activities will be determined by the issuing of the required authorisations.
- Detailed designs of the proposed mining operations.
- Negotiations and consultation of the interested and affected parties, regulatory authorities as well as the public will be done during planning. The concerns of various stakeholders will be recorded for decision making.

The Construction Phase is expected to take 6 months to one year. This phase will involve the establishment of the facilities and infrastructure required for the proposed mining activities. The following activities will be done during this stage:

In areas where the stripping ratio is less than 8:1, an opencast mining method will be used. In areas where the stripping ratio is above 8:1 an underground (pillar method) will be used.

The initial opencast will be conducted in the following steps:

- Stripping and stockpiling of the topsoil
- Establishment of offices, diesel bay and workshop area.

- Demarcation of mining area and construction of berms
- Construction of access and haul roads.
- Construction of stockpiling areas.
- Construction of the plant area.
- Marking of first box cut.
- Topsoil stripping
- Drilling and blasting of hard rock overburden.
- Establishment of water management structures.
- Some activities will be completed when the Operation Phase has been initiated.

The Operation Stage will be the peak of production for the proposed mine, where the site if fully operational with coal production as the major activity. This stage will involve the following activities:

- Coal mining at opencast pits and underground shafts.
- Transport of RoM coal from mining areas to the plant area.
- Transport of coal product from plant area to the markets.
- Maintenance of machinery and vehicles at the workshop site.
- The rollover method of mining will then be followed by rehabilitation being done concurrently with mining.
- Dust suppression and maintenance of roads and berms.
- Maintenance of water infrastructure within the mine site.
- Coaling
- The underground reserve will be mined by board and pillar method.

The Decommissioning Phase will involve the removal of site infrastructure and closure of operations. Opened pits will be backfilled according to natural soil layers, with discard deposition where it does not affect the water table. Paved surfaces will be dug up and uncompacted for revegetation. Seeding of compacted areas will be done to reclaim land use option of grazing. Office containers will be taken offsite, together with all machinery which will no longer be in use. Final rehabilitation will take place at the end of the Operational Phase and will end when iDwala obtains a closure certification from the regulatory authorities. The decommissioning of the mine will be done in accordance with an applicable EMPR as part of a

closure EIA to be conducted and in accordance with any other closure plans pertaining to mine infrastructure and facilities. Post mining monitoring of surface and underground watercourses will be done to determine any residual impacts of mining activities. Monitoring of vegetation growth will also be done, to ensure post mining land use option is enabled, determined as grazing.

2.2. Life of Mine

According to the Mining Work Programmes, the estimated Life of the Mine (LoM) is 30 years followed by 3-5 years for decommissioning and closure activities. (Figure 3). Please note that this a draft mine plan. More infill drilling is required to finalize and detail the design of the mine.

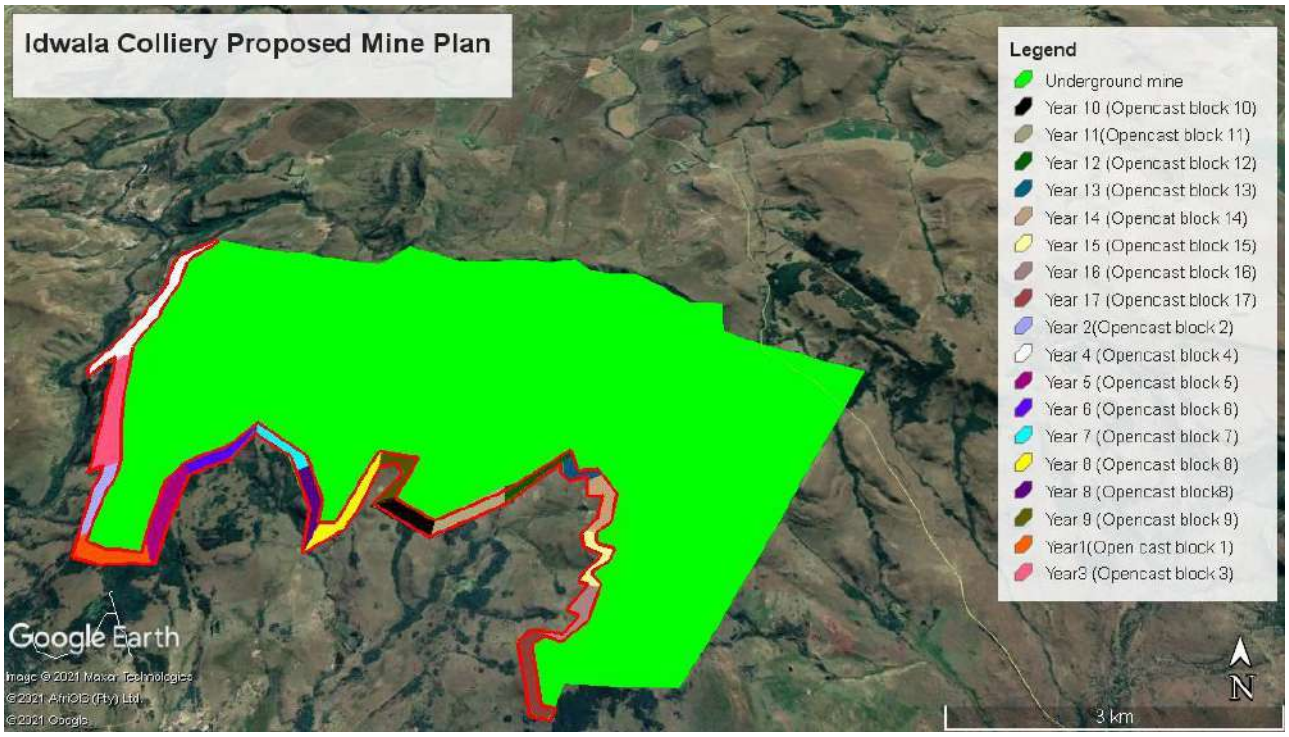


Figure 3: Mine Production Plan (MWP, 2021)

2.3. Mineral Reserves

In the local area, only the Gus and Alfred Seams are of economic interest with all other seams being thin and/or sporadically developed. The Gus Seam, which is the main economic target, is expected to range in thickness between about 0.8m and 1.6m and occur at depths of 80 to over 300 metres below surface. The Alfred Seam is usually about 1.0m in thickness and lies between

5m and 17m above the Gus Seam. The quality of the Alfred seam is usually inferior to the Gus seam and it is considered unlikely to represent a viable mining target at the present time.

During the prospecting phase, drilling was done which showed that the reserve is opencastable along certain contours and as you move up to the mountain, the reserve is an underground reserve. The opencastable belt was then traced to the neighboring farms, hence their inclusion in this application. More infill drilling is required in order to clearly outline the limits of mining. The infill drilling will be carried out over a period of one year, then production will commence.

Production will start at 10 000 tonnes per month for the first year and will increase to 20 000 tonnes per month of opencastable coal from year 2. On year 6, when mining of the underground reserve commences, the production will be increased to 60 000 tonnes per month. The estimated Life of the Mine (LoM) is 30 years, Gross Tonnes Insitu: 72 854 978 and production rate: 720 000 tonnes per annum, (see table 6 below).

Table 6: Resource statement

	Number of Boreholes	Area (m^2)	Average Seam Width (m)	SG	Gross Tonnes Insitu
Opencast block	2	2641597	1.08	1.50	4279387
Underground block	5	28220408	1.62	1.50	68575591
Total	7	30862005	1.35	1.50	72854978

2.4. Mining Methods

Coal reserves will be mined by both opencast and underground mining methods. The following products will be produced per month: Duff: 0mm x 6mm (40%); nuts: 25mm x 50mm (30%) and peas: 10mm x 25mm (30%).

On development of the conceptual mine design, the following surface and sub-surface structures were considered:

- the public road that runs through the MRA.
- the railway line that runs through the southern part of the MRA.
- adjacent residential areas.

In areas where the stripping ratio is less than 8:1, an opencast mining method will be used. In areas where the stripping ratio is above 8:1 an underground (pillar method) will be used.

The initial opencast will be conducted in the following steps:

- Stripping and stockpiling of the topsoil
- Removal and stockpiling of sub-soils
- Drilling and blasting of hard rock overburden.
- Coaling
- The rollover method of mining will then be followed by rehabilitation being done
- concurrently with mining.
- The underground reserve will be mined by board and pillar method.
- All the machines that will be used are diesel driven. An application for a 1000 Kva tension powerline will be made for powering of the washing plant.

2.4.1 Opencast Pits

iDwala intends to carryout opencast mining on the south edge of their mining right area. Mining production will start at 10 000 tonnes per month for the first year and will increase to 20 000 tonnes per month of open-castable coal from year 2. The operation will commence from the edge on the northern portion and progress towards the south direction wherein underground mining will commence from 6th year onward.

2.4.2 Underground shaft

Underground mining is used where the coal seems are deeper than 60m into the earth. The board and pillar method progress along the seam, while pillars and timber are left standing to support the mine roof. Currently the site has one existing shaft, which was used during historical mining. The shaft has caved in and cannot be reused, it may pose safety risk. Underground mining alone would imply inclined shafts underground. Being ideal for lower coal seams, underground mining would reserve all existing terrestrial ecology as well as externally owned and public surface infrastructure.

The underground will be accessed via a box cut adit, which is to be decided once opencast mining is completed. The high walls and sidewalls of the box-cut will be terraced where necessary to limit the possibility of weathering and sloughing. Entries will generally be limited via two or three portals, allowing for conveying and travelling, as well as return airways and

escape routes. Ventilation points will be stablished along the course of the underground shaft to dilute and remove dust and noxious gases and to regulate temperature.

2.5. Mineral Processing

The mine plan includes onsite coal processing. Coal will be hauled on the surface from opencast pits to the processing plant onsite. Coal will be transferred to the plant through a conveyor belt. Mined Run of Mine will also be transferred from the underground to surface by means of a conveyor belt, whereby it will be sent to the plant area for processing. The coal will be crushed, screened, and washed onsite. A Coal Handling and Preparation Plant (CHPP) will be built onsite as a static plant, close to the Run of Mine stockpiling areas. With on-site beneficiation, the quality of raw coal is improved by reducing the extraneous matter that gets extracted along with the mined coal and also the reduction of the associated ash.

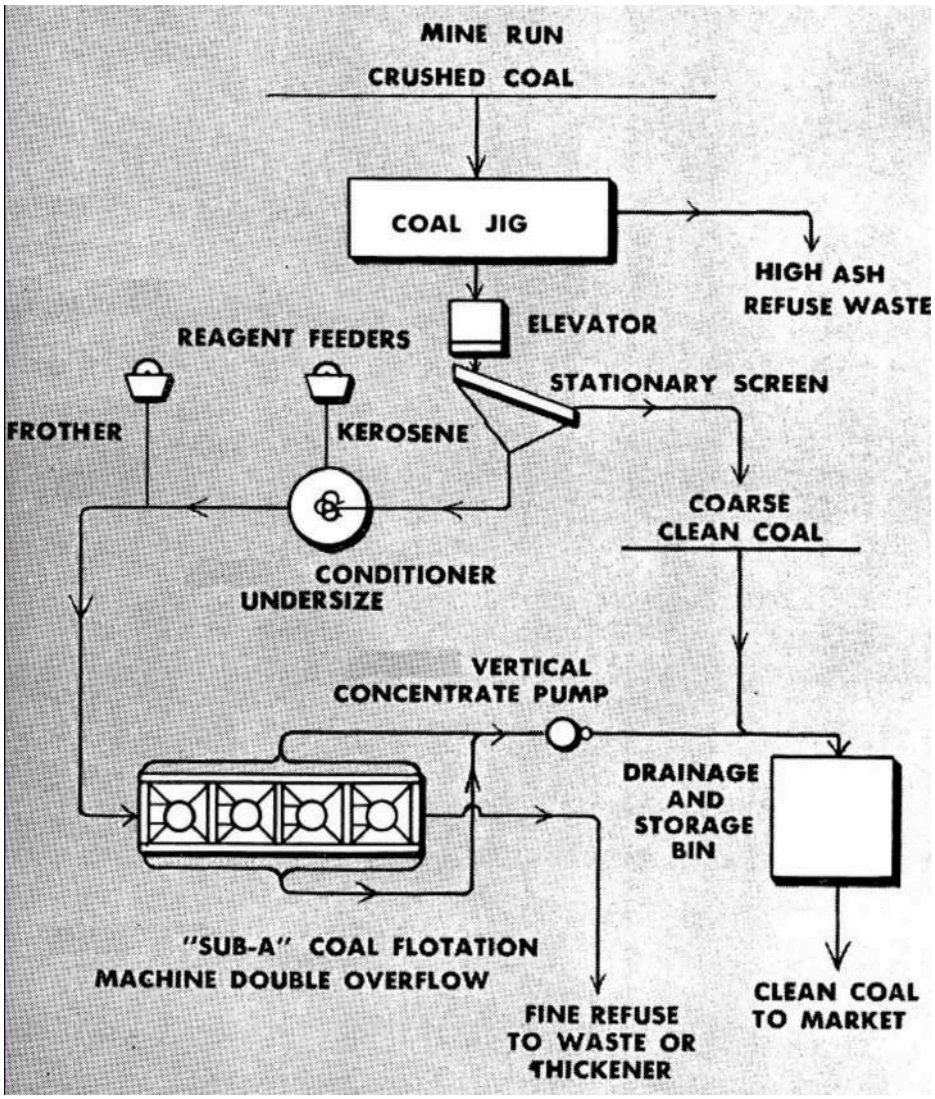


Figure 4: Processing Plant Design (Idwala MWP, 2021)

2.5.1 Crushing

The ROM will be crushed to reduce the size of coal ore body. Crushing will occur as the first stage of coal processing, from the time raw coal is fed into the plant through haulage tipper machines. The plant will have primary and secondary crushers where ROM is crushed to reduce its size.

2.5.2 Screening

Crushed coal will then be conveyed to the primary sizing station. Coal is screened to separate coal orebody to different sizes. The raw coal will be screened at 150mm with the undersize reporting to the secondary sizing station feed conveyor. The screen oversize will be screened at 150mm and report to the secondary sizing station feed conveyor. The -150mm raw coal will be conveyed to the secondary sizing station and screened at 50mm. The 150x50mm raw coal reports to a crusher and will be sized to -50mm. The -50mm is conveyed to the secondary sizing station feed conveyor to ensure a closed loop crushing system

2.5.3 Washing

The CPP feed conveyor will discharge into the raw coal distribution box where the coal will be slurred with water prior to feeding onto a deslime fixed sieve. The spiral plant will be used for the beneficiation of fractions, then a thickener, filtration plant, and water reticulation system for coal washing. Discard will be separated and stockpiled. The production is planned at a rate of 10 000 tonnes per month for the first year and will increase to 20 000 tonnes per month of opencastable coal from year 2. On year 6, when mining of the underground reserve commences, the production will be increased to 60 000 tonnes per month. The product will then be stockpiled targeting both export and domestic thermal markets.

2.6. Stockpiles

Different materials of hards (overburden) and softs (subsoil and topsoil) will be stockpiled separately.

2.6.1 Mine Residue Material

Mine residue from the processing plant will be disposed of onto an integrated discard dump, with a storage capacity of 109 200t/for the life of mine. The discard dump design is underway, and considers the geotechnical investigations of the area, waste classification of similar waste material and with reference to R.634, R.635 and R.636 of NEM: WA. According to a Design

Report PCD undertaken by Zedek Engineering, 2022; iDwala mine residue can be classed as Type 3 waste and therefore requires disposal to a facility with a Class C liner.

The applicant has also applied for authorisation to backfill mined out areas with discard material. Discard material will be deposited back into mining areas at an elevation below the aquifer to prevent the contamination of groundwater resources. Therefore, the water table will be determined before discard backfilling can be done.

2.6.2 Coal Product

Coal product from the plant operations will be directed onto the conveyor which will supply product coal to a 1 000 000t product stockpile. The material will be sampled to determine the quality of the coal. Product coal will be sized and stockpiled in designated areas for pre-qualification prior to being trucked to markets. The product stockpile area will form part of the plant dirty catchment that will be adequately lined according to liner deigns approved by the regulatory authorities.

2.6.3 Run of Mine coal

The raw coal from opencast or underground will be stockpiled on a 60 000t stockpile area. Opencast and underground will be undertaken respectively. The ROM stockpiles will be on lined grounds, prepared according to approved civil engineering designs for the protection of soils and groundwater. An underground ROM stockpile area will also temporarily contain raw coal before it can be conveyed to the surface for processing.

2.6.4 Overburden

The subsoil as well as blasted hard overburden material will be stockpiled separately during the life of mine before they can be utilised for backfilling of mined out areas. Overburden stockpile is proposed for initial box cut. Preceding box cut material will then be used during concurrent backfilling of mined out pit areas.

2.6.5 Topsoils

Topsoil will be stripped at the onset of construction for any affected area, including preparation of the box cut. The nutrient rich topmost layer with vegetation natural seeds will be scooped and stockpiled at the designated topsoil stockpile site. Subsoil will then be stockpiled at a separate stockpiling area. Other management options for stockpiles will be considered for preserving topsoil, avoiding erosion prevention, and avoidance of material mixing.

Considerable heights for visual impacts will also be considered. Mitigation measures for preservation of vegetation seed and soils will be detailed in the EMPr.

2.7. Transport Infrastructure

An access road from the main road, N11 to farmhouse to the mine already exists. No new roads will be constructed, only expansion, scarifying and levelling of the existing road, almost about 2,5km. D93 provides access to the proposed mining area and into various agricultural activities in the area. N11 is under Provincial Government jurisdiction, P279 is under jurisdiction of Provincial government and the access road is under jurisdiction of District Municipality. Road network in the area generally has one lane per direction separated by white broken lane or solid line providing right turning into lower roads classification.

A mine access road will be required for access to mine components, with restricted access control. Haul roads will be required to allow movement between the mine components including the mining pits, underground shaft, plant site, stockpiles and associated workshops and office areas.

A contractor's workshop area will be developed within the mining site to service mine machinery and Light Delivery Vehicles (LDV) of the mine. The workshop will also have support services including wash bay, hazardous substances storage and management as well as a diesel bay for fuelling of mine machinery and LDVs. A site weighbridge is also proposed where trucks will pass before leaving site with the coal product. The weighbridge will also have a tarpaulin management site for closure of coal truck buckets before leaving site for the markets. A conveyor belt is proposed for ferrying raw coal from northern pits to the plant area, as well as from underground mining areas to the surface plant area.

2.8. Administrative Support infrastructure

Mine offices are proposed for administration needs of the mine operations. Movable containers will be considered as an alternative to adopting a farmhouse already existing onsite. Mine entrance security will also be established for restricted access to mine components.

2.9. Water reticulation and Services

An existing farm borehole will be utilized for water. Water accumulating in the pits will be used for dust suppression. Water uses onsite include both domestic and industrial, and both surface and underground sources may affect other surrounding water users. Therefore, the necessary negotiations will be undertaken with the landowners and/or local authorities to obtain water from approved sources, and on receiving Water Use Licence (WUL) from the Department of Water and Sanitation (DWS). A Water Use License Application (WULA) was lodged for listed water uses according to Section 21 of the National Water Act 36 of 1998.

2.9.1 Domestic Water Demand

Potable water is required for the proposed mining operation. The water will be used for drinking purposes and will be sourced from the existing farm boreholes. Onsite personnel and contractor(s) will require water for onsite potable uses, including drinking and sanitary requirements. Water will also be used in the preparation the foundations for the office space and workshop area. Water will also be potentially required on compaction of stockpile areas, roads and dust suppression purposes. Abstraction of underground water through the existing farm borehole is proposed for onsite domestic and industrial uses, for a maximum of 100 000m^3 per annum from existing borehole. The existing borehole is located on farm Witklip owned by the applicant. The necessary process will be followed to acquire water use licence (WUL) from the Department of Water and Sanitation (DWS). Sanitation services will be required for site workers in the form of chemical toilets, which will be serviced at regular intervals by a service. Septic and conservative tanks will be required to store domestic wastewater, with emptying services as and when required. Three septic tank systems are proposed at the administration offices (8 750m^3), security gate 8 750m^3) and workshop area (17 500m^3) where change rooms will be established.

2.9.2 Industrial Water Uses

Water will also be used during the construction stage, for the preparing the foundations for the office space and workshop area. Water will also be potentially required for compaction of stockpile areas, roads, and dust suppression purposes. Clean and dirty stormwater will be managed separately onsite. Berms, trenches and two Pollution Control Dams are proposed at

strategic positions within the mining site for management of wastewater. The location of these facilities is at the low-lying areas to allow for natural gravitation.

The estimate make-up water, of between 5 to 10 tons (7.5 tons used) of water per 1 ton of coal washed. The maximum production rate, 60 000 tons per month, was used to arrive at a conservative water requirement figure. This results in a daily water requirement of approximately 14 845 m^3/day. Based on this, a third the water requirement (4828 m^3/day) has been assumed to be sourced from the Borehole during the initial stage of mining. The stockpile area, plant area ad coal discard dump all share the same area (10.8 ha) and have thus been apportioned 30%, 20% and 50% of the total area, respectively.

Process water will be sourced from the underground workings via a system of tanks, reservoirs, and pollution control dams (PCDs). The water balance and subsequent life cycle analysis indicates a surplus which needs to be evaporated during the LoM (Surface Water Study, 2022).

A PCD will be established to contain dirty runoff from the discard dump, for an annual volume of 2.64 km2. An underground sump will be used for temporary storage of water before it can be pumped for surface use when needed. All dirty water management facilities have been designed to cater for a 1:50 year storm event, as required by GN704 of the National Water Act, Act 36 of 1998 (NWA). Dust suppression on access and haul roads will be done using water from the onsite PCD systems as well as water found underground during mining of opencast and underground areas. Underground removal systems will be established such that mining can safely continue.

2.10. Energy Infrastructure

A 1000 Kva tension powerline will be required to provide power for the proposed operation. During the first few years the mine will mostly be using diesel power as compared to the electricity. Diesel generators will be supplemented by electricity where necessary once all approvals have been received from Eskom. Currently site power is sourced from Eskom through the national grid. The farmers onsite use electricity and a powerline also passes through the mining rights area. Energy will be required for lighting, moving machinery and other electrical energy requirements onsite. Power will be required for the offices, workshop, and weighbridge. Equipment that will require electricity will be:

- Diesel refuelling.
- Crushers.
- Apron Feeders.
- Conveyors.
- Office lighting and computers.
- Workshop equipment.
- Potable water pump station.

These requirements will be met using diesel generators or national grid electricity connections at different project components as necessary.

2.11. Servitudes

An access road from the farmhouse to the mine already exists. Coal will be hauled about 20km to the siding. D93 provides access to the proposed mining area and into various agricultural activities in the area. Road network in the area generally has one lane per direction separated by white broken lane or solid line providing right turning into lower roads classification. N11 is under Provincial Government jurisdiction connects the access roads from the national. P279 connecting D93 with N11 is under jurisdiction of Provincial government and the Access Road is under jurisdiction of District Municipality. D93 is regarded as servitudes existing within the proposed mining area.

2.12. Waste Management

This section describes the type of waste that would be generated and methods to manage those waste. Waste that will be generated during the project can be categorized in different group, solid waste, liquid, hazardous, general waste, medical, mining waste and non-mining waste.

2.12.1 General Waste

General waste that will be generated from the mine includes domestic waste, construction waste. Upon approval of the project, a dedicated, approved {registered) waste contractor will be appointed to manage the non-mining waste generation and safe disposal thereof.

Sewage waste will be discharged into septic tanks and disposed offsite with the services of an external service provider. Timely disposal will be done to avoid overflows.

2.12.2 Hazardous waste

Hazardous and industrial waste such as chemical containers, spent oil, diesel, grease and medical waste will be generated and stored in dedicated containers and collected at regular intervals by a registered sub-contractor and disposed of at a licensed disposal site. The applicant must ensure that a contract is signed prior to commencing with reclamation activities.

The main sources of hazardous waste will be operations around the workshop area as well as the diesel fuelling bay. Mine residue will also form part of hazardous waste. Discard will be stockpiled on a lined discard facility. The mine residue dump will be managed according to GNR632 (2015) of NEM: WA regarding planning and management of residue stockpiles and deposits. As mining progresses, discard will be buried in mined out pits according to authorisation requirements.

2.12.3 Metal Waste

Scrap metals from vehicle and machinery maintenance will constitute metal waste onsite. This group of wastes will be kept in a designated area to be salvaged if necessary. Also, they will be recycled, through selling to scrap metal dealers and realisation of benefits from used metals. Metal waste for disposal will be collected by a reputable and registered contractor for transport to a suitably licensed facility. Waste disposal certificates will be obtained from disposal contractors and waste manifest will be maintained on site.

All waste will be separated and stored as per the relevant Norms and Standards where applicable.

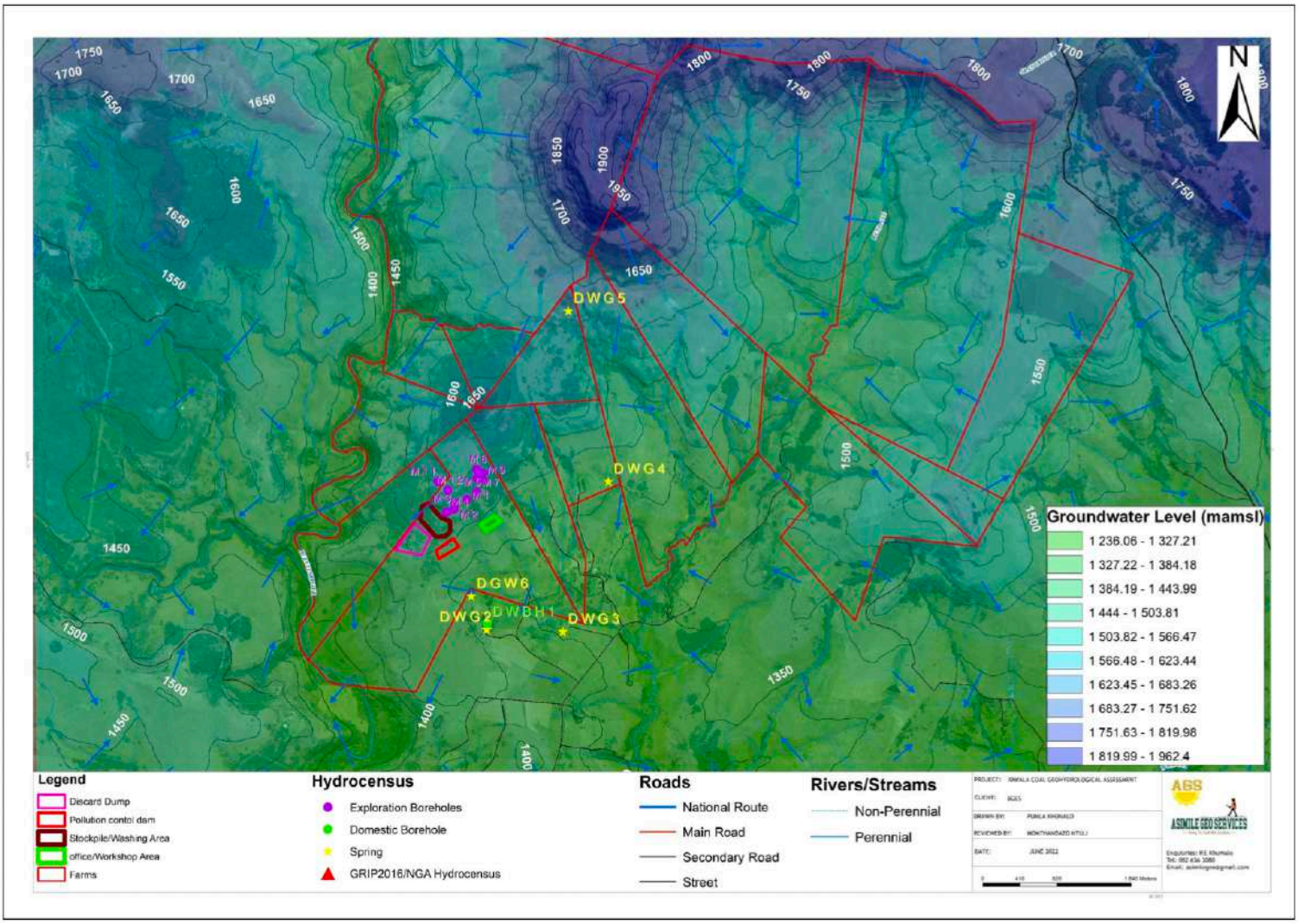


Figure 5: Detailed Surface Infrastructure Layout Map

3. POLICY AND LEGISLATIVE CONTEXT

3.1. Overview

This section describes the relevant legislative requirements for the proposed coal mining project. Being a mining operation involving extraction of coal, washing and screening as well as transportation to the market, various pieces of legislation are relevant. Due to the nature of activity proposed, its background environmental setting, surrounding land uses, various pieces of legislation requirements are triggered. There are several regulatory requirements at local, provincial, and national level with which the proposed project must conform. The NEMA is not the only legislation that is required for the proposed activity.

There are several legislations that will be considered as part of the environmental authorisation process to ensure legal compliance. Some of the key environmental legal requirements include the following:

- The Constitution of South Africa, (Act 108 of 1996).
- Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA).
- Mineral and Petroleum Resources Royalty Act (Act 28 of 2008) (MPRRA).
- National Environmental Management Act (Act 107 of 1998), as amended (NEMA).
- EIA Regulations 2017, as amended and promulgated in terms of NEMA.
- National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM: AQA).
- National Environmental Management: Waste Act (Act 59 of 2008) (NEM: WA).
- National Water Act (Act 36 of 1998) (NWA).
- National Heritage Resources Act 25 of 1999 (NHRA).
- National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA).
- National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEM:PA).
- National Forests Act (Act 30 of 1998) (NFA).
- Hazardous Substances Act (Act 15 of 1973) (HSA).
- Explosives Act (Act 25 of 1956).
- Mine Health and Safety Act (Act 29 of 1996) and amendments (MHSA).
- National Road Traffic Act (Act 93 of 1996) (NRTA).

3.2. Constitution of South Africa, 1996

Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) enshrines the concept of sustainability, specifying rights regarding the environment, water, access to information and just administrative action. The Bill of Rights contained in the Constitution of the Republic of South Africa, states that everyone has the following rights (Table 5):

Table 7: Constitutional Rights

Constitutional right	IDWALA project response
The right to an environment that is not harmful to their health or wellbeing.	An EIA process has been followed to determine the impact of proposed activities to the environment. Mitigation measures have been recommended to minimise potential harm to receiving environment.
The right to have the environment protected for the benefit of the present and future generations through reasonable legislative and other measures that includes: • Prevent pollution and ecological degradation and promote conservation. • Promoting sustainable development and use of natural resources.	Alternatives sites and activities have been considered for the project for sustainable options with environmental consciousness. Contaminated runoff will be contained in onsite PCDs. Topsoil will be preserved for final rehabilitation. Concurrent rehabilitation of opencast pits will be conducted. Final land use was determined as grazing for post mining. Buffer zones were proposed for protection of surface water systems.
The right to information held by the State and to information held by other people that is required in the exercise or protection of a right.	Draft reports for Scoping and EIA were shared with the public and I&APs before they were finalised. A public participation programme was conducted to invite concerns and interests from external and affected people.

The right to just and procedurally fair administrative action.	Public participation is undertaken as part of the EIA and water use license application processes. Draft Scoping Report was availed for a 30-day comment period before finalisation. This draft EIA report will be made available for public review for a period of 30 days. The Appeal Process will be described to I&APs through the RoD notification process.

3.3. The Mineral and Petroleum Resources Development Act (MPRDA)

The Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) governs mineral extraction, exploration and related developments in South Africa. Requirements are summarised below in Table 6:

Table 8: MPRDA Requirements

Requirement	IDWALA Project response
Sections 10, 22 and 39 of MPRDA and Regulation 49 of the Act require scoping and EIA to be done for exploration and proposed mining projects.	Scoping was done for the proposed project. A draft Scoping report was released for public review. A final scoping report was submitted to the DMR KZN provincial office.
Public participation as guided by Section 6 of the NEMA EIA Regulations of 2017.	A public participation process was conducted during the EIA process, before scoping, review of draft scoping report as well as review of draft EIA report before they were submitted on finalisation. The appeal process will also be followed. Newspaper articles were published to notify the public about the proposed project. Site notices and public meetings were conducted as detailed in the public participation chapter 6.

3.4. National Environmental Management Act (NEMA)

The proposed activity is prescribed in Appendix 1 of the NEMA Act 107 of 1998 and in terms of Sections 24(2) and 24D; and identified as an activity that may not commence without authorisation of the competent authority. The competent authority has been identified as the Department of Mineral Resources and Energy, KwaZulu Natal province.

Before commencement of the proposed coal mining project at IDWALA should engage an independent Environmental Assessment Practitioner (EAP) to undertake an EIA. The EAP should assess the impact of proposed activity on the environment and seek environmental authorisation on behalf of the proponent. The environmental responsibility lies with the proponent to eliminate sources of pollution, reduce, avoid, or remediate consequences of pollution in all the environments including water, air, soil, and land. IDWALA is responsible for ensuring that the proposed activities at the mine comply to conditions of issued Environmental Authorisation (EA) and other applicable authorisations throughout the life cycle of the mining project.

The National Environmental Management Waste Act (NEM: WA) (Act no 59 of 2008) provides for the control of waste management activities likely to have a detrimental effect on the environment. The Act aims at waste management that targets the following, among other objectives:

- to protect health and the environment by providing reasonable measures to prevent pollution.
- to provide for institutional arrangements and planning matters.
- to provide for the licensing and control of waste management activities.
- to provide for the remediation of contaminated land.

Requirements are summarised in Table 8 below:

Table 9: NEMA Requirements

Requirement	IDWALA project response
GNR982 – EIA Regulations. GNR983 – Listing Notice 1. GNR984 – Listing Notice 2.	The proposed coal mining activity at IDWALA is subject to the Full Scoping and EIA process. Listed activities are identified in table 4.

GNR985 – Listing Notice 3.	An Environmental Authorisation application was submitted to the Competent Authority, DMR KZN reginal office. See Appendix 14.
Public Participation Guidelines (GNR807)	The Public Participation programme was conducted by a specialist, combined for both environmental authorisation and Water Use License application (WULA) processes. Details of the process and issues and response register are presented as Appendix 11 and 12.
NEMA Regulations pertaining to the financial provision for prospecting, exploration, mining, or production activities (GNR1147 –20 November 2015).	The calculated Financial Provision was conducted and will be provided for by means of an acceptable guarantee.
NEM: Waste Act 59 of 2008 as amended and its associated regulations. The regulations and various addendums pertaining to scheduled waste activities (GN R921, November 2013).	The proposed coal mining activity at IDWALA is subject to the Full Scoping and EIA process. Listed activities are identified in table 4. Included are the triggered waste management activities requiring authorisation.
NEMA: Air Quality Act (NEM: AQA), Act 39 of 2004 as amended and its associated regulation GNR893, November 2013 regarding Scheduled Listed Activities.	Atmospheric Emissions License (AEL) is currently not required. This should be assessed again when operations commence. See Section B of this report and Appendix 7.
GNR 625, August 2012: National Waste Information Regulation.	The IDWALA mine should register on the South African Waste Information System (SAWIS) when operational.
GNR 632, July 2015: Regulation on planning and management of residue stockpiles.	Mine discard is defined on location and proposed liner, according to the type of waste. Design and construction should consider the waste classification and maintenance plan.

GNR 633, July 2015: The establishment of a residue stockpile or residue deposit.	Location and design of discard dump will be approved by regulatory authority on proposed master plan before establishment.
GNR 634, August 2013: The Waste Classification and Management Regulations	Mine discard stockpile is defined as Type 3 waste and should be handled accordingly. A Class C equivalent liner was incorporated in preparation of the stockpile area.
GNR 635, August 2013: Assessment of Waste for Landfill	Coal discard and slurry are defined as Type 3 waste. The waste will be both stockpiled on the lined facility and used as backfill material for mined out pits.
GNR 636, August 2013: National Norms and Standards for the assessment of Waste for Landfill Disposal	Mine discard stockpile is defined as Type 3 waste and should be handled accordingly. A Class C equivalent liner was incorporated in preparation of the stockpile area.
GNR 921, November 2013: Construction of waste facilities and associated structures and infrastructure.	Mine discard facility will be constructed according to approved civil designs.
GNR926, November 2013: Norms and standards for the storage of waste on site.	The storage of discard and slurry on the stockpile dump was considered in the Environmental management programme (EMPr). Refer to Section B of this report.
National Environmental Management: Biodiversity Act (NEM:BA), Act 10 OF 2004 as amended and its regulations, including various regulations pertaining to protected species and to alien and invasive species.	Listed activities were listed in Table 4. Management of alien invasive species management system will consider the listed alien and invasive species published under NEM:BA. EMPr does recommend measures for protection of indigenous vegetation and faunal species around the area, as well as control of invasive alien species.

3.5. The National Water Act (NWA)

The National Water Act (NWA) (Act 36 or 1998) is the primary statute providing the legal basis for water management in South Africa and must ensure ecological integrity, economic growth and social equity when managing and using water. Use of water for mining and related activities is also regulated through regulations that were updated after the promulgation of the NWA (Government notice No. GN704 dated 4 June 1999). Authorisation of water uses is defined in Chapter 4 of the NWA. Section 21 of the NWA lists 11 water uses which can only be legitimately undertaken through the Water Use Licence (WUL) issued by the DWS.

The proposed coal mining project requires the use of water on various aspects of the mining activities and triggers Section 21 water uses. Areas with concentrated personnel such as the workshop areas and office spaces will require domestic water for drinking, sanitation and related water uses. Coal washing will also constitute a water demand. This water need will be met by underground abstraction through a borehole Abstraction of water triggers Section 21 (a) of the NWA:

Section 21(a) – Taking water from a water resource.

About four farm dams were identified within the Mining Rights Area (MRA). The dams were used as water storage points for cattle and other livestock watering for the farming activities. The dams will continue to store stormwater during the proposed mining period, and the storage triggers Section 21(b) of NWA:

Section 21(b): Storing water

The IDWALA site proposed for open cast mining, underground mining and establishment of a plant is situated in an area that drains into watercourses that run across the MRA. The activities are within 500m of watercourses and may affect the natural occurrence of the rivers and streams. This triggers Sections 21 (c) and (i) which are:

Section 21(c): impeding or diverting the flow of water in a watercourse.

Section 21 (i): altering the bed, banks, course, or characteristics of a watercourse.

Two PCDs are proposed at the plant area and close to the discard dump. When the mine dirty stormwater is collected in a PCD, the water is stored and made available for other uses such as dust suppression. The establishment of the two PCDs involves formation of a specified

depression of calculated measurements, lining the depression and allowing storage of stormwater from the dirty catchment as well as from the mine void dewatering. Water bowsers will abstract water from the PCD and suppress dust around the mining site. The stockpiles for the discard, product exposed overburden and Run of Mine (ROM) on site will potentially contaminate surface water during stormwater runoff. Site septic tanks are established underground and if management is inadequate, may overspill or leak. These uses may potentially contaminate underground water resources through infiltration and seepage, as well as direct contamination where clean environments are not separated from dirty catchments. This triggers section 21 (g) of the NWA:

> *Section 21(g) – Disposing of waste in a manner which may detrimentally impact on a water resource.*

The open cast and underground activities trigger the opening of underground aquifers which release their water into the mining voids. In order for the mining activity to proceed with the safety of the employees involved, the mine water should be removed. This triggers Section 21 (j) of the prescribed water uses:

> *Section 21(j) - Removing, discharging, or disposing of water found underground, if it is necessary for the efficient continuation of an activity or for the safety of people.*

Water Use License Application (WULA) is required in terms of the NWA before the project can commence, and this process is being conducted concurrently with the current Scoping and EIA process. Requirements re summarised in Table 9 below:

Table 10: NWA Requirements

Requirements	**IDWALA Project Compliance and Response**
Section 21: Water Uses as listed in the NWA, Act 36 of 1998.	A Water Use License Application (WULA) has been initiated by IDWALA with the Department of Water and Sanitation, Durban Office to seek authorisation for Section 21a, 21b, 21c, 21g, 21i and 21j water uses as identified on proposed activities. See Appendix 14.

GNR704 of the NWA, Regulations on the use of water for mining and related activities aimed at the protection of water resources.	The GN704 requirements were considered in the civil design and proposal for coal stockpiling areas, discard dump stockpile area, PCDs, dirty water channels as well as stormwater drains. A stormwater management plan was done to manage runoff onsite and protect watercourses. An Integrated Water and Waste Management Plan (IWWMP) will be compiled and submitted in support of the WULA.

3.6. Other Legislative Requirements

A few relevant legislative requirements pertaining to associated operations onsite are also considered, as in Table 10 below:

Table 11: Additional legislative Requirements

Legislative Requirement	IDWALA Project Compliance and Response
Amajuba District Municipality Air Quality By laws, 2022.	The IDWALA should abide by the district municipal by laws when enacted. Proposed mitigation measures to prevent and mitigate air pollution have been included within the EMPr for each stage of development.
National Heritage Resources Act (NHRA), Act No. 25 of 1999.	The heritage sites around the MRA were identified and studies by a heritage specialist. The impacts on heritage resources in the area were assessed and mitigation measures proposed (See Appendix 10). A palaeontological study has been completed for the proposed project and SAHRA has been consulted as a Regulatory Authority for the project. Any action on site heritage resources will have consultation with KZN Heritage authority.
Hazardous Substances Act, Act No. 15 of 1973.	Workshop area will have oils, grease, coolants, and other hazardous substances used during vehicle and machinery maintenance. The handling of hazardous substances

	handling on site will be done according to the specific material safety data sheets and comply with the prescription of this Act and general practices have been included in EMPr.
South African National Standard: SANS 10234:2008 - Globally Harmonized System of classification and labelling of chemicals (GHS).	Chemicals and reagents will be labelled as per the GHS system. Material Safety Data Sheets (MSDS) will be kept on site to guide handling, use and disposal of containers for all chemicals used around the mine site.
Spatial Planning and Land Use Management Act (SPLUMA), Act No.16 of 2013, Promulgated 1 July 2015.	The MRA is currently used for livestock grazing agricultural purposes. Land use change from agricultural to mining will require a change in land use.
Conservation of Agricultural Resources Act, Act 43 of 1983.	An assessment of the soils and land capability was carried out for the MRA. Impact assessment of proposed mining activity was done. Mitigation measures to preserve topsoil and indigenous vegetation seeds with preservation of soil fertility have been included in the EMPr. Management of invasive alien species is also proposed where they are identified during annual assessments.

4. NEEDS AND DESIRABILITY OF PROJECT

4.1. Motivation for the Development

This section will examine the need and desirability of the proposed iDwala Coal Mine project as well as the importance of coal as a resource and the desirability of coal mining rehabilitation operations at the proposed study area.

4.2. Motivation for Applicant Development

The applicant for this project is solely owned by a historically disadvantaged individual. The applicant initially bought the farms for livestock purposes until he discovered that the area has existing decommissioned historical mine. The applicant was fortunate to get in touch with the people with indigenous knowledge for the area. It was brought to the applicant's attention that the area has a lot of coal which was left unmined due to internal disputes between the miners during those years. The applicant applied for a prospecting right and explored the area. The results proved to be positive, then migrated to this mining right. The applicant is well resourced and is aware that qualified and competent contractors must be appointed to run the mining. Although iDwala Coal Mine is a new player in the mining space, it has competent team to manage and facilitate the mining using the contractors. The team will manage the project from environmental, geological, social, economic, and engineering perspective to allow compliance with all necessary legal requirements and project being developed sustainably.

The NEMA requires the use of the "best practicable environmental option" (BPEO) in environmental management; meaning the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Description of this option is done on consideration of alternatives in Chapter 5.

4.1. Ecological sustainable development

The proposed site is currently a grazing area on green fields sitting on mineable coal seams. South African mining and mining real estate remains attractive for development. Mining creates an environment that led the community to be more involved in the projects and result in more sustainable job creation strategies within the surrounding communities as well as attracting foreign investment. In recent years the importance of sustainable development has been steadily growing, especially when considering environmental issues associated with climate warming.

As a result of the global effects of environmental problems, increasing ecological awareness, as well as more and more restrictive and complex environment protection legislation, the conditions of operating business activities change too – especially in the power industry sector. That is why in the following years it will be more and more necessary to take actions aimed at reducing the emission of greenhouse gases, which result from the present problems of global climate changes.

4.2. Promoting justifiable economic and social development

In addition, the South African economy is currently very poor more than 34% of youth is unemployed, the economy heavily relies on the mining sector. The proposed mine will be boosting the current struggling national economy and create employment opportunities for communities within Utrecht (Emadlangeni) Local Municipality. The primary objective of the proposed project is to:

- Protect the environment and public health and safety by using safe and responsible mining practices.
- What the affected community want, the affected community gets.
- Reduce loss of biodiversity.
- Comply with the relevant local and national regulatory requirements!
- Minimize potential environmental effects, such as surface or ground water impacts.
- Remove any waste or potentially hazardous substances from site.
- Prevent further soil, groundwater, and surface water contamination!
- Develop landforms that, within reasonable and practical limits, blend with the surrounding terrain.
- Work towards achieving water quality standards in downstream watercourses consistent with the standards set in the National Water Act, 1998.
- Establish vegetation that is self-sustaining, perpetual and provide habitat for local fauna and successive flora species, and to achieve long-term stabilization and protection of the previously disturbed/artificial landforms consistent with the proposed end land use.
- Development of land use that takes into account the beneficial uses of the site and surrounding areas (which is predominantly residential use);
- Leave a rehabilitated site that does not represent a risk to the health and safety of the community.

- Reduce the requirement for long-term monitoring and maintenance by establishing stable rehabilitated areas.

Should the proposed mining operation be authorized, the following economic development activities will result:

- Job creation
- Development of skills
- Potential for business opportunities
- Establishment of bursaries and scholarships
- Stimulate economic activities in the local vicinity.

Newcastle will be enhanced to become a development spine for the ADM, together with other existing coal mines and farming communities. The opening of the proposed opencast pits and underground shaft will allow development of infrastructure around the mine to cater for increased production and the need to transport the product to the markets. Production from the proposed processing plant will produce Eskom quality and export thermal coal and middling coal products from the underground ROM with the current energy crisis in South Africa indicated by occasional load shedding schedules and loss of business and domestic production; and associated increasing coal prices, the project is economically supportive. The area is currently on a grazing area for the local farmers' livestock. Being a non-renewable resource, coal mining onsite will be done for the life of mine and rehabilitated such that the land use can still be realised for targeted post closure land use options.

The NLM is strategically located within the KZN province, and connect with major tourism routes, logistics, farming, and industrial activity. However, coal mining activities within the Newcastle area has declined significantly. For instance, the mining sector only contributes 1% towards local employment while the agricultural sector continues to shed jobs (N2S, 2022). The unemployed people within Newcastle were ranging from the seasonal workers who were presently unemployed, and individuals who cannot not find work. The current Covid-19 pandemic has also contributed to lesser employment opportunities and continued retrenchment of those who are employed.

4.3. Social Desirability

According to the Social Impact Assessment study done for the area (N2S, 2022), The district is predominantly rural and dominated by extensive commercial farmlands (Amajuba District Municipality, Growth and Development Plan Vision 2030 Composite Report). The main economic sectors are manufacturing (35.0%), community services (22.2%), financial and business services (15.2%), as well as trade (8.6%). The N11 and R34 are the main routes through the area (ibid).

In terms of demographics, Amajuba District experienced an increase in its total population figures from 468 037 in 2001, to 499 839 in 2011 (0.7% growth rate). Newcastle accounts for 72.7% of the district population (363 236 people), followed by Dannhauser with 102 161 (20.4%). Emadlangeni accounts for 6.9% of the population figures for the district (34 442).

Previous surveys done indicated that the population of Newcastle totalled 389 117 people, showing a 7.1 % increase over 5 years from the year 2011, with a significant increase in the total youth proportion of the population around the eastern areas, including Ngogo Utrech and Witklip farmers Townships. Collectively the youth in Newcastle (0 – 34 years) makes up 71% of the total population. The Newcastle Local Municipality remains the fastest growing municipality within the Amajuba District Municipality and accounts for 73% of the district population. Such significant young population profile puts severe pressure on educational facilities, job creation, as well as infrastructure and services. The highest concentration of the unemployed is amongst the female population as compared to the male population. The implementation of a new coal mine in Newcastle would improve chances of such disadvantaged groups as unemployed youths and women to have an opportunity to get jobs and sustain their livelihoods.

The proposed Idwala coal mine activity is needed and in a desirable location on greenfields, due to the proximity of the location to surrounding townships, Newcastle Town and the Majuba coal power station. A good transport and communication network also covers the area such that development is feasible, with maintenance of available services.

5. DETAILS OF ALTERNATIVES CONSIDERED

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 is discussed in this chapter. The site layout and master plan provided in Appendix 2 took into consideration all alternatives for location of infrastructure and activities on site, with location of coal reserves identified on the MRA, mining processes as well as the issues raised by interested and affected parties during the public consultation process. The proposed alternative was reached after a full evaluation of the environmental sensitivities of the site, towards sustainable development where background environmental settings are considered. Findings from specialist studies were considered to protect sensitive environments such as cultural areas, watercourses, and residential areas.

5.1. Proposed Development Alternative

This subsection describes the best practicable environmental option proposed for the development. The proposed project proposed both open cast and underground mining methods, such that the shallower seams are mined off by opencast methods while deeper seams are mined through an underground shaft. The area on the periphery of the mining area, southern part of the mine will be opencastable, with an area extent of 256 ha. A greater portion of the mining activity is considered underground, which gives the advantage on surface water courses and minimal disturbance of existing ecosystems. Currently there's less information on underground mining, as the mine will have to do more drilling to confirm the underground resource. Three pollution control dams are proposed along the opencast mining area and one discard dump. The discard dump stockpile is located close to the plant area to minimise the distance of movement of discard and slurry.

The topographical survey was used to verify the side slopes. Due to occurrence of desirable slope for gravitational flow, two separate Pollution Control Dams will ensure all dirty catchment water is contained. One will contain from discard dump area while the other will target plant area runoff. Two dams will also give adequate capacity where water found during mining need pumping out for safe continuation of mining activity especially during rainy season. In pit storage of water has also been applied for, to allow room for keeping water in opencast pits, as long as it does not interfere with the mining activity.

Any potentially significant environmental issues associated with the project will be managed in such a manner that benefits are maximised from both the environmental aspects as well as the manipulated coal seams. The proposed open cast mining being adopted together with underground mining for much deeper seams is considerate of potential surface impacts which can be avoided by underground mining. The status quo of the local receiving environment would be affected by the project-related activities in a manner that is manageable, and extraction of coal done with environmental consideration to the benefit of both the mining company and the environment that currently exist. This report is part of an environmental assessment process that considers environmental aspects potentially affected by the proposed project, to the success of the proposed project.

Should the proposed IDWALA project proceed, coal production will be increased in the Newcastle Local Municipality and Klip Rivier coalfields. Job creation is anticipated at IDWALA due to implementation of proposed project. More realisation of land value is anticipated when the grazing land in converted to mining land. The initial objectives of the Idwala on application of mining rights would materialise, with extraction of large volumes of ROM on the whole mining rights area and within the mining rights validity period. New contractors and unemployed skilled and disadvantaged groups have an opportunity to get employment and business opportunities at the coal mine, towards improved income and livelihood support.

Coal mining processes are differentiated by whether they operate on the surface or underground. Many coal seams extracted from both surface and underground mines usually require washing in a Coal Handling and Preparation Plant (CHPP). The most sensible and economical methods of coal extraction from coal seams were considered, including the depth and quality of the seams, the local geology, and the environmental factors. Consideration of such aspects would not only assist in successful extraction of coal in the Klip Rivier coalfields at iDwala, but also consider sustainability of the receiving social and ecological environment.

5.2. The No-action Alternative

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives. This means that if the proposed

project is not pursued, and the status quo is maintained, the no-go option should be considered. In this case of proposing coal mining and processing at IDWALA, current low coal supplies in the world due to the war between Russia and Ukraine, SA economic and industrial development in NLM is low.

Both domestic and Eskom coal markets will be failed if identified and explored reserves are not mined out and beneficiated. Considering the current energy crisis in South Africa, indicated by the frequent load shedding schedules, the no-go option would not be of assistance to addressing the energy crisis and associated economic challenges. The implications of the no-go option are as follows:

- The high demand for coal in internationally, domestic and Eskom market will not be supplied but rather its supply be reduced considering identified coal reserves remaining unexplored. Coal reserves will remain untouched while they have an opportunity to contribute to coal demands in the country, including for energy production at various power stations.
- A viable business opportunity would be lost leading to a loss of income, employment opportunity as well as economic development in the region and for the country. The opening of a mine at Witklip will boost various business opportunities around Newcastle, where raw materials, food supplies, mining supplies, transport needs and labour requirements can be sourced.
- Coal reserves in the area will not be exploited if this option is considered. This implies that, this will reserve the 30- year mining worth coal deposits at IDWALA. The coal will lie in the earth without potentially benefiting the communities, local and district municipalities where they occur. A 30-year job creation opportunity for both locals and nationals will be unrealised, that has potential to improve their livelihoods and service delivery.
- By not undertaking the proposed operations, the objectives of improved sustainability with regards to iDwala's operations will not be fully met. This will limit the potential for iDwala, as a HDI player in the mining of coal production industry, to ensure sustainability and resource productivity in their operations.

5.3. Mining method alternatives

5.3.1 Opencast Mining

Opencast mine is more appealing for first time miners due to low capital expenses involved. Open pit is one of the most common mining methods used and starts from the earth's surface, maintaining exposure to the surface throughout the extraction period. The excavation usually has stepped sides to ensure the safety of the miners and a wide ramp where equipment can travel, allowing the product to be removed efficiently from the site.

Open-pit mining is practical when the orebodies of the rock are large and located closer to the surface.

Advantages of open-pit mining include:

Powerful trucks and shovels can be used to move large volumes of rock.

Equipment not restricted by the size of the opening you are working in.

Faster production.

Lower cost to mine means lower grades of ore are economic to mine.

Ease-of-use for mass production

Small shut-down expense

Ability to mine selectively for certain grades of ore

Comparatively small crew size

Elimination of safety hazards that can accompany complex underground mining operations

Easy drainage of subsurface water

No machinery restrictions - even heavy and bulky machinery can be utilized

Lower capital and operating costs

There are mainly two types of mining methods, underground and open cast mining. The consideration of those mining method often depends at the depth, thickness, stripping ratio and overburden of the coal seam. For this project, the coal seam is seating between 0-60m in depth. This means that it can be mined economically using open cast mining as it is a surface deposit. Underground mining will be considered for the large portion of the mining area as the coal is seating at 90m and deeper.

The coal seam resource identified within all the proposed farm properties is suitably high-quality high strength production at a resource volume and magnitude suffice to provide raw materials for the industry for the next 30+ years. Idwala have not indicated an interest to prospect elsewhere for the resource but have restructured the footprint of the concession area to consider the environmental sensitivities raised by the stakeholders. Should iDwala not exploit the resource, or the mine right not be granted, it would likely be sought after by other players in the market due to the demand and quality of the coal seam in the area.

A concurrent underground shaft is therefore proposed to cater for deeper seams. The opencast strip-mining method proposed involves the following equipment:

- truck and shovel which operate by removing the topsoil and overburden,
- power shovels which scoop the overburden out of the pit area into trucks,
- large trucks which transport overburden and coal from the pit areas,
- conveyors that move material from one place to another.

In opencast mining, explosives are also used to break through the surface or overburden. Once the coal seam is exposed, it can then be drilled, fractured, and thoroughly mined in strips. The coal is then loaded onto large trucks (or conveyors from underground seams) for transport to either the coal preparation plant or directly to where it will be used. Open cast mining methodology alternative involves the use of the contour mining method, commonly used in areas with rolling to steep terrain. This involves the removal of overburden from the seam in a pattern following the contours. The limitations of contour strip mining are both economic and technical. When the operation reaches a predetermined stripping ratio between tonnes of overburden and tonnes of coal, it is not profitable to continue.

Opencast mining, compared to underground mining, has considerably more terrestrial life negative effects due to vast clearing of land and stripping of soil profile layers to expose the coal seams. Several stockpiles are expected, including topsoil, subsoil, overburden and the coal stockpiles of ROM and product. Many ground surface characteristics are affected, including

vegetation, faunal habitats, subsoil, and watercourses as well as areas of social and heritage importance. Movement of machinery associated with open cast mining method produce considerable dust and noise, which affect the receiving environment. However, several jobs are created since there are machinery operation, pit extraction, workshop maintenance and stockpile maintenance human resource skill requirements.

3.3.2 Underground Mining

Underground mining is used to extract coal body from below the surface of the earth safely, economically and with as little waste as possible. The entry from the surface to an underground mine may be through a horizontal or vertical tunnel, known as an adit, shaft or decline. iDwala coal will access underground resource through adit. Currently there is an existing adit, however it will not be used due to safety concerns associated with the abandoned adit. Underground mining is practical when:

1. The ore body is too deep to mine profitably by open pit.
2. The grades or quality of the orebody are high enough to cover costs.
3. Underground mining has a lower ground footprint than open pit mining.

Underground mining is used where the coal seems are deeper than 60m into the earth, or according to the stripping ratio. The board and pillar method progress along the seam, while pillars and timber are left standing to support the mine roof. Miners remove the coal in the pillars, thereby recovering as much coal from the coal seam as possible. Underground mining alone would imply inclined shafts underground, surface infrastructure is avoided. Being ideal for deeper coal seams, underground mining would reserve all existing terrestrial ecology as well as externally owned and public surface infrastructure.

Both open cast and underground mining are proposed at IDWALA. This is intended to cater for all seam levels identified. The targeted coal seams occur at various depths such that both mining methods would be ideal to extract the coal at minimised economic costs and environmental consequences. Both methods would mean that open cast pits will be used to access coal from top seams on the upper bands and providing an entrance to underground mining ideal for the deeper and lower bands. Much as the upper seams may be easy to reach by open cast methods; lower seams will require further pit deepening to expose the overburden to reach lower seams;

which can be preferably done by an underground shaft targeting only the lower seams. This would reduce chances of potential surface environmental implications and disturbance of the subsurface characteristics of the soil profile, which are important for surface water resources especially associated wetlands.

5.4. Alternatives operational aspects of the activity

Many factor influence the decision of selecting a shaft or decline/ramp to access an underground mine. Some of these factors include the depth of the deposit, geotechnical aspects, production rate, dimensions, availability of capital, and operating costs.

iDwala mine will mine through an adit, which is horizontal mining. The location and contours of the site allows for an entrance the underground portion of the mine, which is horizontal or nearly horizontal, by which the mine can be entered, drained of water, ventilated, and minerals extracted at the lowest convenient level. The coal resource is found on the side of the hill, which allows for the horizontal mining. The Adit will allow for less energy to require transporting miners and heavy equipment into and out of the mine. It will be much easier to bring coal or ore out of the mine.

The use of vertical mining will require sinking of a shaft, which requires a huge capital investment before mining may commence. Vertical mining requires a lot of investment in terms of mining infrastructure, i.e. ventilators to ensure that the shaft has air current. Furthermore, vertical mining development rate is slow and construction costs are very high. The issue of energy supply is also a considerable issue for iDwala mine. Using vertical shaft will require a lot of energy supply, currently South African energy supply is unrealistic. It is better to probe for horizontal mining which requires less energy supply than vertical mining. Although vertical mining has been a culture in SA, a lot of knowledge since mining in JHB was done through vertical mining.

Even though the mine will be through an adit, the incline shafts are regarded as labor intensive, and operationally not as efficient as a vertical shaft. Due to capital intensity of vertical shaft, iDwala will do adit mining.

5.5. The Transport Alternative

The proposed coal mining project can have either road transport or rail transport for the product from the mining site to the markets. The site has a railway line cutting few kilometres from the mine, hauling will occur for a 20 km road trip. Railways are still existing and used by Transnet to transport goods, siding for Transnet is almost 26km away from the RMA. The existing Transnet siding would ease movement of heavy coal product from site to targeted markets, and many railway trolleys would ferry more product efficiently compared to the use of trucks. A siding would mean creation of additional siding management jobs for locals. Trucks, however, require a good road connection to N11, and at the same time would increase traffic impact on the public roads. N11 is a very busy road, connecting three provinces, KwaZulu Ntatl, Mpumalanga and Free State. More trucks would carry the same amount of coal one railway wagon may be able to carry. However slower, more trucks may also create more jobs for truck drivers and tarpaulin management personnel. For road transportation, separate roads may be required for movement of heavy trucks and LDVs onsite to minimise site traffic congestion. The study conducted by Ntlazane Engineers, 2022 indicated that there will be no need for extra lanes to accommodate trucking of coal. The feasibility of these two alternatives is entirely dependent on costs associated with availability of slot at Transnet siding.

6. PUBLIC PARTICIPATION PROCESS FOLLOWED

As required by law, a combined Public Participation Process (PPP) was followed for both the EIA and WULA process from project inception stage through scoping phase to the EIA phase. This section summarises the PPP and gives an overview of the pre-scoping consultation that took place with directly affected landowners and occupiers and sets out the anticipated PPP to be undertaken throughout the required environmental regulatory process. The process is designed to provide Interested and Affected Parties (I&APs) with an opportunity to evaluate the proposed project, to provide the needed inputs and to receive feedback from the project team and/or proponent.

6.1. Identification of Stakeholders

Various methods were engaged to identify potential stakeholders and to ensure proper representation of affected parties in the project. These methods were utilised to develop a comprehensive stakeholder database, namely:

- Deeds Web searches for farm portions included in the Mining Rights and around the project site to verify land ownership and/or occupation and to obtain contact details.
- Desktop and online internet searches for previous studies done around the area.
- Use of existing stakeholder engagement database available from BGES consulting.
- Stakeholder networking and discussions to source additional stakeholder details.
- Site visits were also undertaken to identify landowners / occupiers to which details were insufficient.

The stakeholders who were identified as affected by or interested in the proposed project were grouped into the following broad categories (Table 11). A stakeholder database has been compiled which will be updated throughout the environmental regulatory process with new stakeholder details. These were used to target sharing of Basic Information Document (BID), arranging meetings to introduce the project and/or telephonic calls and emails.

Table 12: Stakeholder Groups

Category	Details
Government	National, Provincial, District and Local Authorities. These include Ministries and local government municipalities whose portfolio relates to mining and development, including: • Department of Mineral Resources Durban, KZN • Department of Water and Sanitation Durban, KZN • Department of Environmental Affairs Durban, KZN • Department of Economic Development Durban, KZN • Department of Transport, Pietermaritzburg, KZN • Department of Tourism and Environmental Affairs, KZN • Land claims commissioner • Amajuba District Municipality • Newcastle Local Municipality • Ward Councillor.
Parastatals	Various semi-Government entities.
Landowners	Directly or indirectly affected and adjacent landowners. Land ownership for MRA land portions were identified to include: • Ingonyama Trust Board • Newcastle Municipality Adjacent landowners were also consulted, as well as land claimants for targeted land portions.
Land occupiers	Directly or indirectly affected and adjacent to MRA. These include the small-scale farmers with livestock and cultivated land onsite, as well as the
Communities	Directly affected and adjacent communities. These include surrounding communities including: • Ngogo area • Ngogo Utrech sections • Witklip farmers township
Agriculture and Water	Farmers associations, entities responsible for water management and/or regulation, including:

	• Department of Agriculture, Forestry and Fisheries Pietermaritzburg, KZN • Department of Rural Development and Land Reform, Pietermaritzburg, KZN
Non-Governmental Organisations (NGOs)	Environmental organisations, community-based organisations • Ezemvelo KZN Wildlife • Endangered Wildlife Trust • KwaZulu Natal Heritage-Amafa.

6.2. Approach to PPP

The PPP for pre-scoping and scoping stage involved various activities done to engage with the interested and affected parties. Door to door visit was used. Daniel Lourens from DR Attorneys was used to reach out to the farms around the area. Stakeholders were also be provided with an opportunity to engage with the project team and raise their issues of concern.

6.2.1 Distribution of Basic Information Document (BID)

A BID was compiled and sent to stakeholders on the database from July 2021. The BID (See Public Participation Report, Appendix 11) was distributed during the site visit and consultation with I&APs. The BID provided stakeholders with the following details:

- Description of the proposed project.
- The Plan of Study to be undertaken in support of the proposed mining activity.
- Details about how stakeholders can register as an Interested and Affected Parties (I&APs) and be kept informed about the project developments.
- The public review and comment period.
- An invitation to attend a public meeting.

6.2.2 Electronic communications

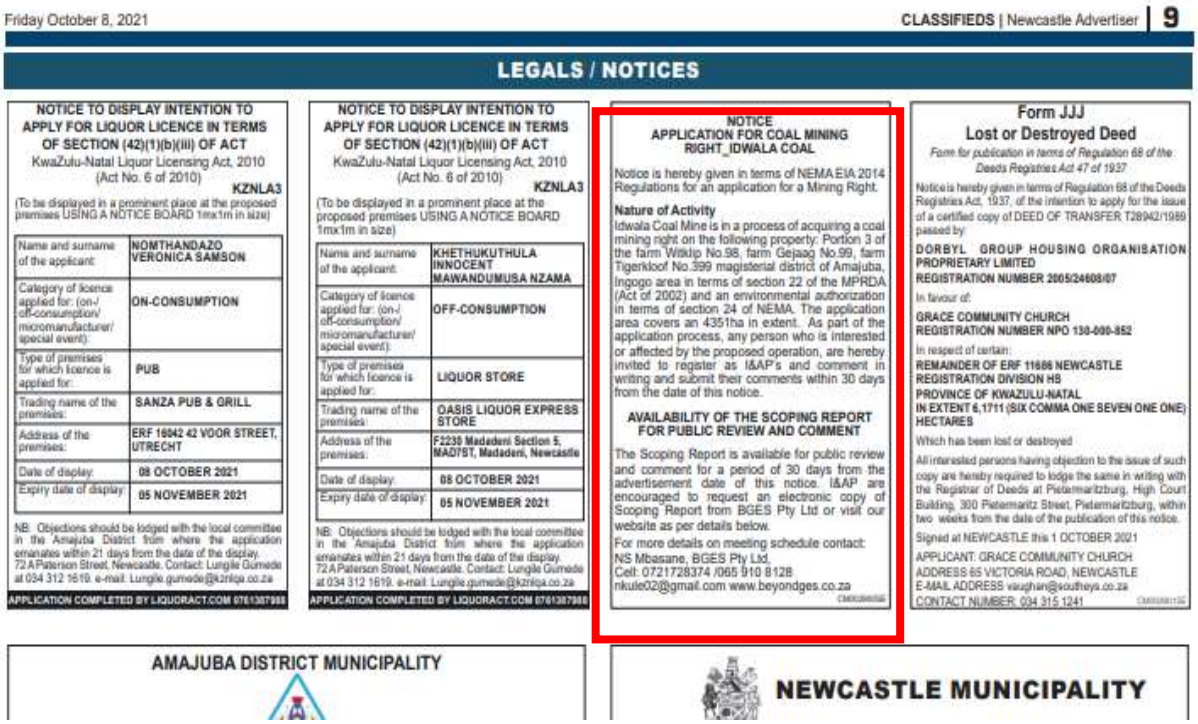
The existing registered I&APs for the IDWALA during Prospecting Rights phase were notified through electronic communications via e-mail. Identified stakeholders during current study were also consulted on emails and telephonic conversations, from the different identification methods in section 6.1. However, due to the long period that lapsed after the old database was created, many of the targeted respondents were no longer valid for the targeted parties, while some emails were no longer in use. A more recent list was created during the current PPP and

in the process of registering more I&APs. Further communication will be done for announcing this draft EIA and EMPr Report for comments.

6.2.3 Media Advertising

The media platform announcement of the proposed project was done through newspaper adverts to invite all Interested and Affected parties (I&APs) to register on the project database of their interests and concerns. A newspaper article was published in the Newcastle Advertiser newspaper on 08 October 2021 for public announcement of the project, request for comments and call for registration of I&APs. The newspaper advertisement (see Figure 4 below) provided the following details:

- Brief project description.
- Applicable listed activities.
- Registration as I&APs.
- Contact details of the public participation team.
- Information about availability of the Draft Scoping Report for public review and comment.



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LEGALS / NOTICES

NOTICE TO DISPLAY INTENTION TO APPLY FOR LIQUOR LICENCE IN TERMS OF SECTION (42)(1)(b)(iii) OF ACT
KwaZulu-Natal Liquor Licensing Act, 2010 (Act No. 6 of 2010)
KZNLA3
(To be displayed in a prominent place at the proposed premises USING A NOTICE BOARD 1mx1m in size)

Name and surname of the applicant:	NOMTHANDAZO VERONICA SAMSON
Category of licence applied for: (on-/off-consumption/ micromanufacturer/ special event):	ON-CONSUMPTION
Type of premises for which licence is applied for:	PUB
Trading name of the premises:	SANZA PUB & GRILL
Address of the premises:	ERF 16042 42 VOOR STREET, UTRECHT
Date of display:	08 OCTOBER 2021
Expiry date of display:	05 NOVEMBER 2021

NB: Objections should be lodged with the local committee in the Amajuba District from where the application emanates within 21 days from the date of the display. 72 A Paterson Street, Newcastle. Contact: Lungile Gumede at 034 312 1619. e-mail: Lungile.gumede@kzntga.co.za

APPLICATION COMPLETED BY LIQUORACT.COM 0761387988

NOTICE TO DISPLAY INTENTION TO APPLY FOR LIQUOR LICENCE IN TERMS OF SECTION (42)(1)(b)(iii) OF ACT
KwaZulu-Natal Liquor Licensing Act, 2010 (Act No. 6 of 2010)
KZNLA3
(To be displayed in a prominent place at the proposed premises USING A NOTICE BOARD 1mx1m in size)

Name and surname of the applicant:	KHETHUKUTHULA INNOCENT MAWANDUMUSA NZAMA
Category of licence applied for: (on-/off-consumption/ micromanufacturer/ special event):	OFF-CONSUMPTION
Type of premises for which licence is applied for:	LIQUOR STORE
Trading name of the premises:	OASIS LIQUOR EXPRESS STORE
Address of the premises:	F2230 Madadeni Section 5, MADTST, Madadeni, Newcastle
Date of display:	08 OCTOBER 2021
Expiry date of display:	05 NOVEMBER 2021

NB: Objections should be lodged with the local committee in the Amajuba District from where the application emanates within 21 days from the date of the display. 72 A Paterson Street, Newcastle. Contact: Lungile Gumede at 034 312 1619. e-mail: Lungile.gumede@kzntga.co.za

APPLICATION COMPLETED BY LIQUORACT.COM 0761387988

NOTICE
APPLICATION FOR COAL MINING RIGHT_IDWALA COAL

Notice is hereby given in terms of NEMA EIA 2014 Regulations for an application for a Mining Right.

Nature of Activity
Idwala Coal Mine is in a process of acquiring a coal mining right on the following property: Portion 3 of the farm Witklip No.98, farm Gejaag No.99, farm Tigerkloof No.399 magisterial district of Amajuba, Ingogo area in terms of section 22 of the MPRDA (Act of 2002) and an environmental authorization in terms of section 24 of NEMA. The application area covers an 4351ha in extent. As part of the application process, any person who is interested or affected by the proposed operation, are hereby invited to register as I&AP's and comment in writing and submit their comments within 30 days from the date of this notice.

AVAILABILITY OF THE SCOPING REPORT FOR PUBLIC REVIEW AND COMMENT

The Scoping Report is available for public review and comment for a period of 30 days from the advertisement date of this notice. I&AP are encouraged to request an electronic copy of Scoping Report from BGES Pty Ltd or visit our website as per details below.

For more details on meeting schedule contact:
NS Mbasane, BGES Pty Ltd,
Cell: 0721728374 /065 910 8128
nkule02@gmail.com www.beyondges.co.za

Form JJJ
Lost or Destroyed Deed
Form for publication in terms of Regulation 68 of the Deeds Registries Act 47 of 1937

Notice is hereby given in terms of Regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of DEED OF TRANSFER T28942/1989 passed by:

DORBYL GROUP HOUSING ORGANISATION PROPRIETARY LIMITED
REGISTRATION NUMBER 2005/24608/07

In favour of:

GRACE COMMUNITY CHURCH
REGISTRATION NUMBER NPO 130-000-852

In respect of certain:

REMAINDER OF ERF 11686 NEWCASTLE
REGISTRATION DIVISION HS
PROVINCE OF KWAZULU-NATAL
IN EXTENT 6,1711 (SIX COMMA ONE SEVEN ONE ONE) HECTARES

Which has been lost or destroyed

All interested persons having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds at Pietermaritzburg, High Court Building, 300 Pietermaritz Street, Pietermaritzburg, within two weeks from the date of the publication of this notice.

Signed at NEWCASTLE this 1 OCTOBER 2021

APPLICANT: GRACE COMMUNITY CHURCH
ADDRESS 65 VICTORIA ROAD, NEWCASTLE
E-MAIL ADDRESS vaughan@southeya.co.za
CONTACT NUMBER: 034 315 1241

AMAJUBA DISTRICT MUNICIPALITY

NEWCASTLE MUNICIPALITY

Figure 6: Newspaper article

6.2.4 Physical Meetings

During placement of site notices several neighbours were visited to introduce the project and participants were given the BID for more information and contact details should they wish to respond to the project call for inputs. There were farms within vicinity of the mine at which farm owners were not available. Means of getting their contacts were made and electronic communication was used in this regard.

A public meeting was held at Ngogo area. The purpose of the meetings is to ensure that I&APs are informed about the proposed project and indicate how they can be involved as I&AP. The details meetings done are listed below:

Table 13: Details of Public Meeting Held

Title	**Community meeting with the Ingogo Community for the proposed Idwala Coal Mining Project**
Date&Time	07- November-2021, 10am – 11am
Location	Ingogo Area
Meeting Called by	IDWALA MINING (PTY) LTD and Beyond Green Environmental Services
Participants	Local community

6.2.5 Site Notices

To inform the surrounding communities and adjacent landowners of the proposed project, several site notices were erected on site and at visible locations close to the site. This was mainly dependent on where the site notices were likely to find audience. For instance, notices were also placed at public places including the mentioned Police station & Ngogo clinic and ADM offices as well as around the proposed mine site. The information included in the site notice was the same as on the newspaper advertisement.

Figure 7: Location of Site Notices

6.2.6 Draft Scoping Report

The scoping report for EA and WULA of the proposed IDWALA coal mining project summarised the findings of the scoping exercise, as well as the background of the targeted area. The DSR was compiled and provided details regarding the anticipated impacts that the proposed mining activities might have on the environment during planning, construction, and operation thereafter. This DSR was agreed to be shared with I&APs during the period from 12 October 2021 for public comments through a 30-day period. The document was updated to a Final Scoping Report that was shared with DMR Durban office for KZN Province.

Public libraries were identified in the area for dissemination of information and sharing of documents with the public namely:

- Newcastle Library
- Ngogo Utrech Library.

The PPP will be an ongoing activity and will only be concluded once the required authorisations for the have been issued and there are no appeals. All I&APs will be informed of the final decision taken by the competent authority Department of Mineral Resources (DMR) (KwaZulu Natal Office) for approval of the EA and EMPr amendment, and the Department of Water and Sanitation (Durban Office) for the Water Use License.

6.3. Summary of Findings from PPP

A summary of the recorded issues from the above-mentioned public participation programme is summarised in the following table 13, with corresponding responses from the EAP:

Table 14: Issues and Responses Register

Note: A decent amount of *community members came out under the COVID-19 circumstances. An open day meeting (one on one session) was had with the community*
Mr Thulani Shabalala called the meeting into order at 10:00 am. He welcomed everyone and explained to the community why the meeting was called. He then introduced Miss Nomthandazo Ntuli from Beyond Green Environmental Services. Miss Nomthandazo Ntuli made a brief presentation about the proposed project, its impacts on the environment as well as the mitigation measures. (The presentation is attached). She then gave the community a chance to voice out their views, objections, comments and questions.
The meeting went as follows: **JS de Lange**: When will mining commence? **N. Ntuli**: Mining will commence once the mining right and environmental authorisation has been issued by the Department of Mineral Resources. The first year will be dedicated to site establishment, infill drilling and putting all the relevant structures in order. **JS de Lange**: Due to climate changes and pollution that coal causes during energy production, will the coal mine be able to sell its products? **N.Ntuli**: The world is indeed exploring other avenues where energy production is concerned, but coal remains the main source of energy across the world, so the mine will be able to sell its products. **JS de Lange**: The mining right is over a huge area, where exactly will the mining start. **N.Ntuli**: As mentioned before the first year will be dedicated into infill drilling in order to determine the most feasible position to put in the first box cut taking into account accessibility, stripping ratio and the coal quality. **Jabulani Nkosi:** With the increase in traffic that will be due to vehicles and trucks going in and out of the mine. Have you accessed the road and the safety of our children and cattle on the road. **N.Ntuli**: Specialists have been appointed to access such. The specialists will advise the client on how to haul coal in the safest way possible. **Jabulani Nkosi**: When will the specialists come on site? **N.Ntuli**: The specialists have been appointed already and should come onsite in the next month. **Jabulani Nkosi**: How many hectares does the mining right covers and what is the life span of the mine. **N.Ntuli**: The proposed mining project covers an area of approximately 4351.012 Hectares. The expected life of mine is 30 years.

Sphamandla Nzungane: When it comes to job opportunities how will people be appointed.

N.Ntuli: The community will have to work together with the mine to devise a plan that will work when it comes to appointment of employees, but the local people will be given preference when it comes to job opportunities unless the skill that is required is not available locally.

Jabulani Nkosi: What agreements do you have with the land owners regarding the start of mining.

N. Ntuli: So far there are no agreements, mining will commence once the mining right has been granted by the Department of Mineral Resources.

Jabulani Nkosi: The mine must commence as soon as possible in order to build a community hall as well as a sports ground.

N. Ntuli: Noted, this will be raised will the appropriate people who will be responsible for the SLP. What other projects does the community need?

Bongani Nkosi: The community also needs a library.

Sphamandla Nzungane: Will the houses surrounding the proposed operation be relocated due to blasting from the opencast operation?

N.Ntuli: Relocation will only be considered if the houses are within 500m radius from the operation. Specialists will be appointed to measure with seismographic instruments if blasting from the open cast operation will affects the houses nearby. Relocation will depend on the findings of the specialist report.

Bongiwe Kubheka: What if the blasting does not affect the houses but affects the water supply to the surrounding households

N.Ntuli: As mentioned before, specialists have been appointed to study the current state of the water resources in the area both underground and surface water and the possible impacts that the proposed project is going to have. The specialist will then advise on mitigation measures

Haward Mbatha: Does the mine only employ skilled people

N.Ntuli: No the mine also employees unskilled labourers to perform general duties.

Meeting was adjourned at 11:00:

7. ASSESSMENT OF ENVIRONMENTAL ATTRIBUTES

7.1. The Physical Environment

7.1.1 Geology

The geology of the area comprises of the Karoo Supergroup which is mainly represented by the Ecca Group represented by the Vryheid Formation and the Beaufort Groups (Figure 6).

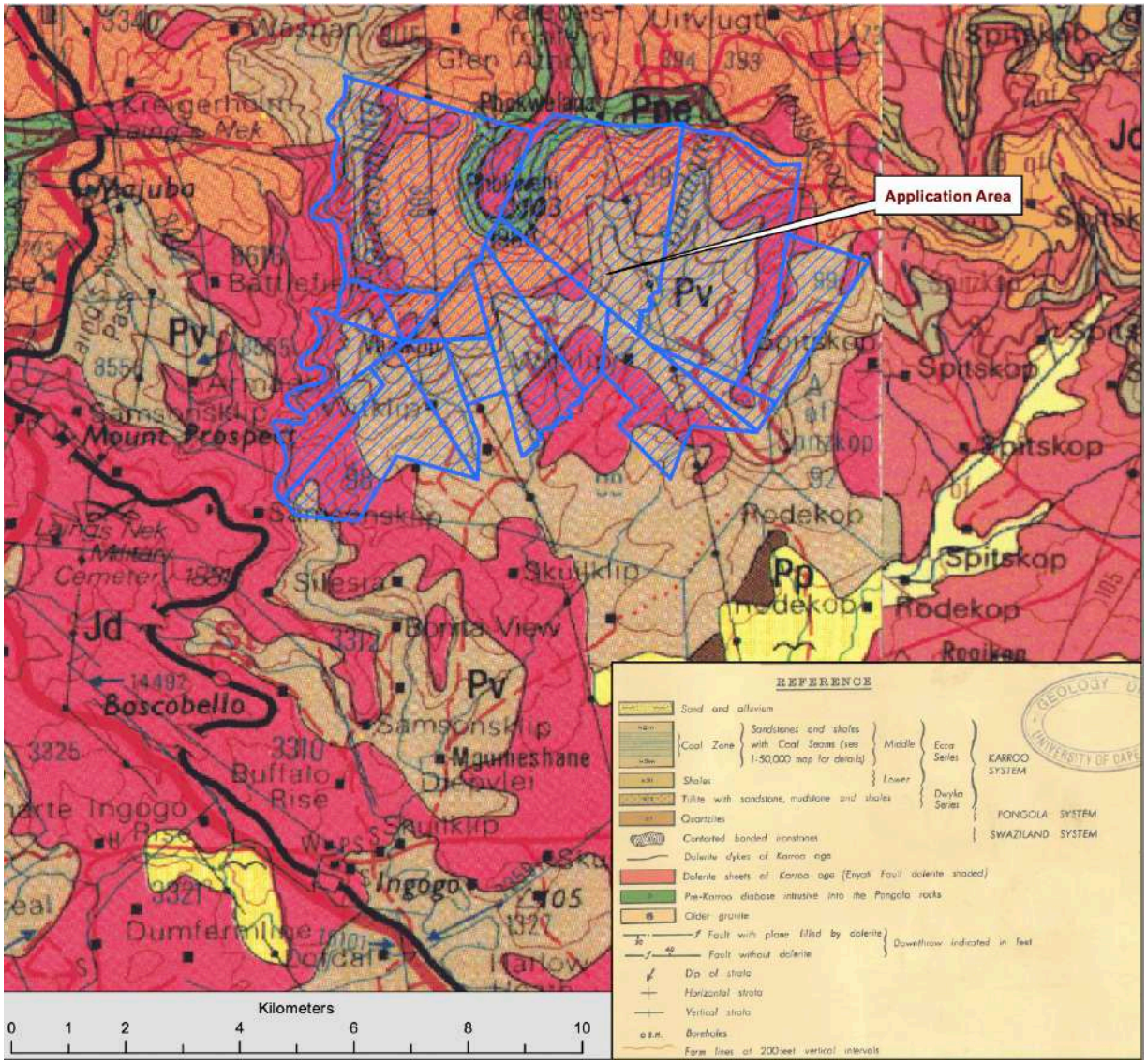


Figure 8: Geology Map

The area under consideration is located in the west sector of the Utrecht Coalfield. The western limit of the field is defined by a barren dolerite-intruded area which separates it from the Ingogo-Charlestown sector of the Kliprivier Coalfield. To the north, the Utrecht Coalfield adjoins the

Wakkerstroom sector of the Ermelo Coalfield with the boundary commonly taken to be the position of the Pongola River or the Loskop Fault. In the southwest, the Utrecht Coalfield is separated from the Newcastle-Dundee sector of the Kliprivier Coalfield by the valley of the Buffalo River along which the coal seams have been denuded.

The Dwyka Formation is thin or absent over most of the area and the Pietermaritzburg Formation shales of the Ecca Group usually lie directly on basement. The thickness of the Pietermaritzburg Formation ranges from about 20m to 70m and is controlled mainly by pre-Karoo palaeo-topography although there is a marked increase in thickness southwards towards the deeper parts of the main Karoo basin.

A typical stratigraphy of the Klip Rivier coalfield is indicated in Figure 7 below:

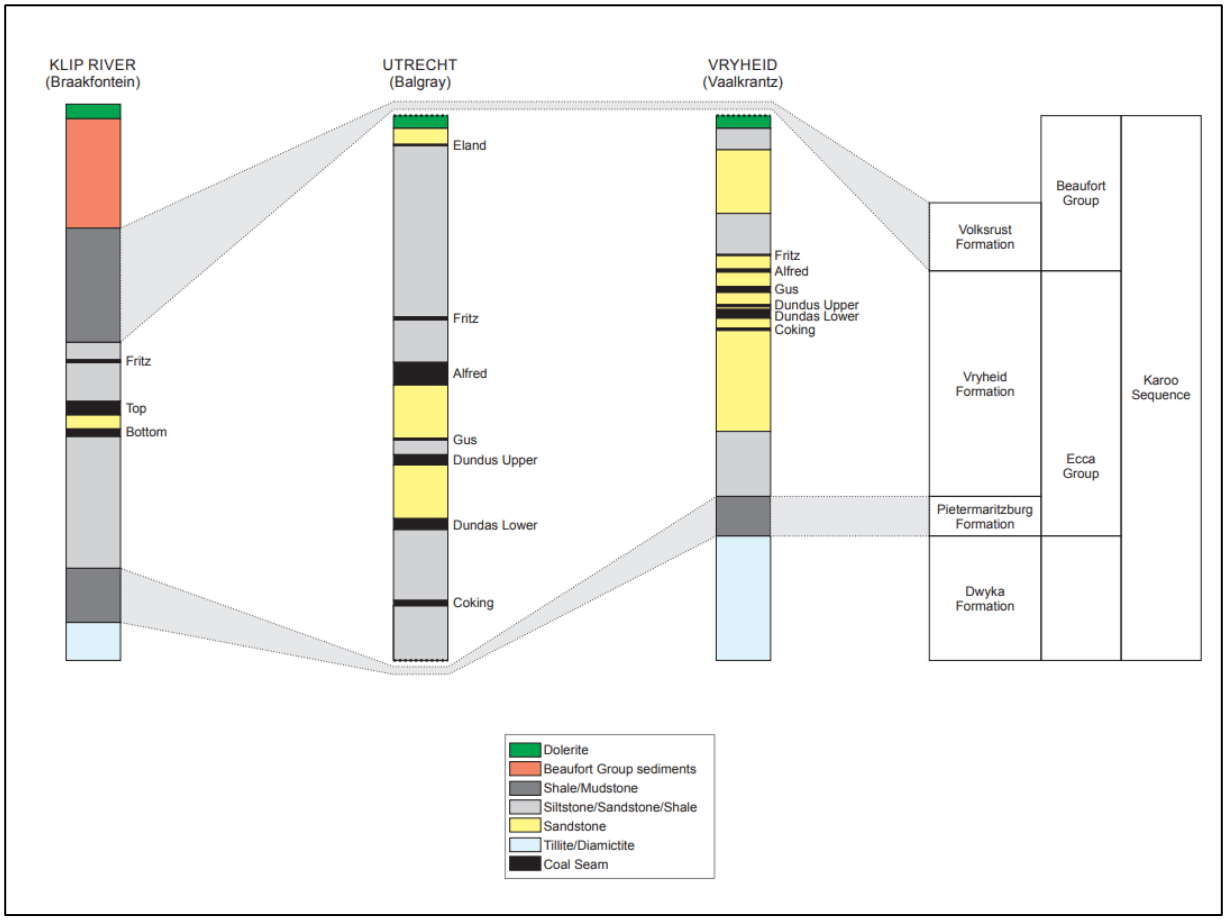


Figure 9: Typical Kliprivier Coalfield Stratigraphy

In the Utrecht Coalfield, the Coal Zone may contain up to a dozen seams of varying thicknesses however only four seams, Coking, Dundas, Gus and Alfred have been mined in the past. The other seams are generally too thin to be of economic significance. The Alfred and Gus Seams are the thickest and most consistently developed. The Dundas and Coking seams are also widespread but are usually considerably thinner. The Fritz and Eland Seams occur towards the top of the Coal Zone and are generally thin and of no economic significance. Similarly, the Targas Seam at the base of the Coal Zone is thin and impersistent.

Coal qualities vary from seam to seam, and also laterally and vertically within seams. Depending on the degree of thermal metamorphism resulting from the heat effects of dolerite intrusions, the coal rank can range from anthracitic through lean coal to bituminous.

7.1.2 Climate

The study area receives most rainfall during the summer season, in the period between November and January compared to the other months.

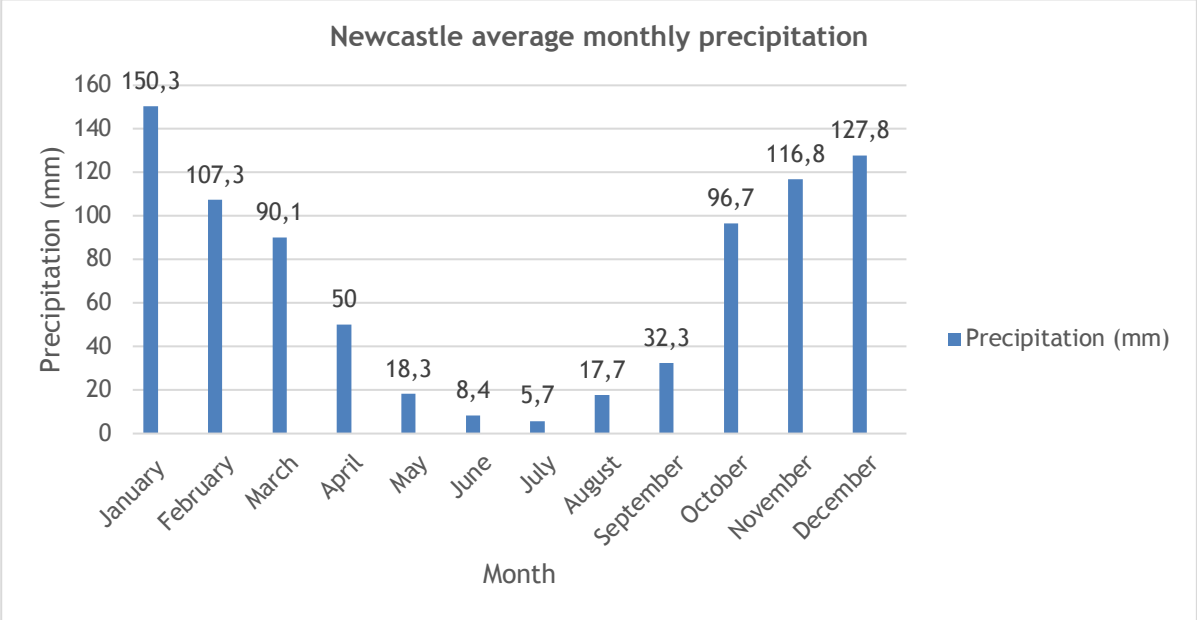


Figure 10: Newcastle monthly average precipitation

Minimum precipitation is noted in June and July as this is the area where it is the coldest (IDP, 2021). This means that precipitation is not uniform across a year, thus some months receive more precipitation than others (Figure 8). Patched rainfall and evaporation data were sourced

from the WR2012 database and span a period of 90 years (1920 – 2009). The calculated mean annual precipitation (MAP) is between 760 and 794 mm/a.

The IDWALA site has a cool-temperate climate with high extremes between the maximum summer and the minimum winter temperatures. Average temperatures for the town of Newcastle have an average of 20°C in the summer months (December to March) and 10°C in the winter months (June to August), with an average of 16.5^{0}C (Figure 9) (HIA, 2022). Frost incidences are a frequent occurrence during the winter months (Mucina & Rutherford, 2003 in WESST, 2021). Prevailing winds are from west to east (Figure 10).

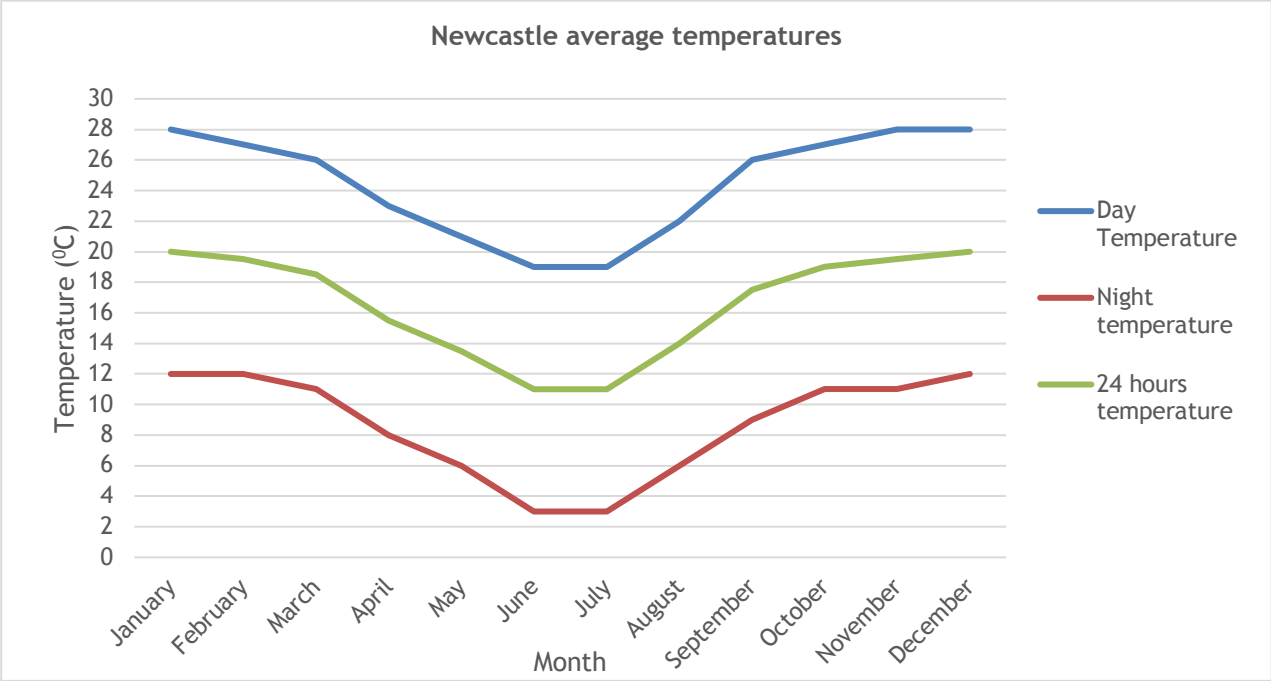


Figure 11: Newcastle monthly average temperatures

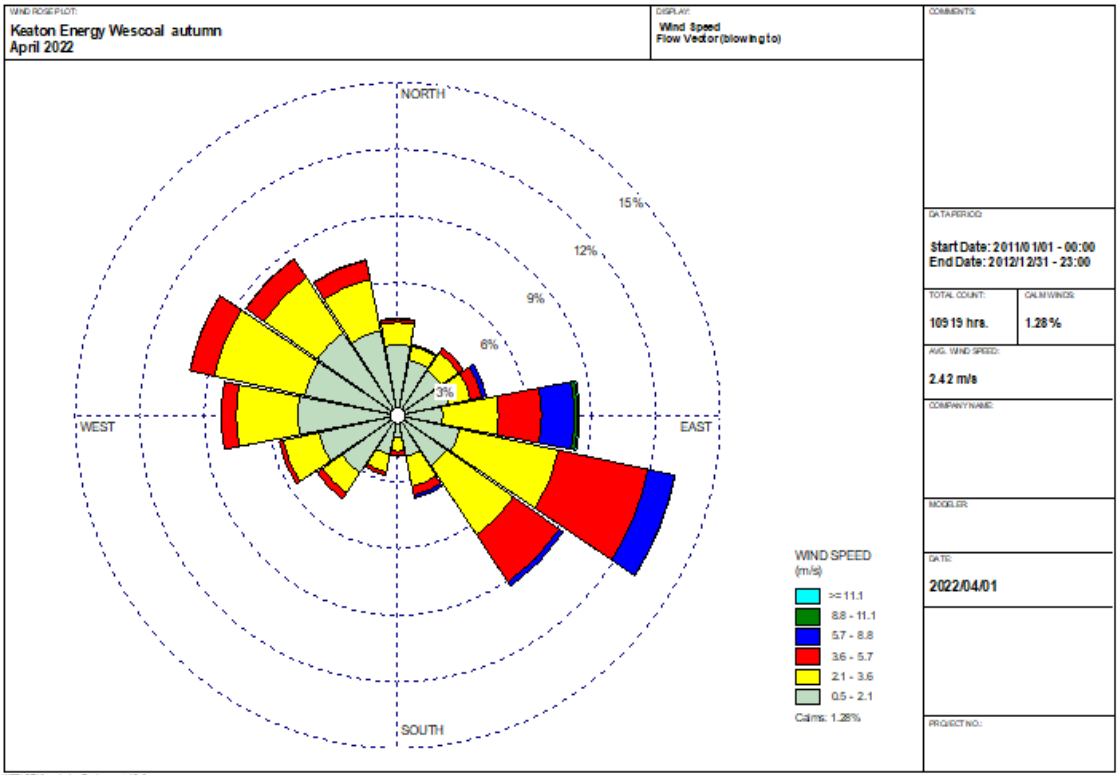


Figure 12: Windrose plot for wind direction around Newcastle

7.1.3 Topography

The surface topography is characterized by steep mountainous areas towards the north and broad valleys towards the east. The steep hills grade into low-lying undulating hills towards the south and east. The site topography ranges from `1287 mamsl in the south to 1906 mamsl in the north. The topography dips towards the numerous streams that drain the catchment area with overall drainage being towards the south. The proposed mine is located within quaternary catchment V31B of the Pongola to Mtamvuna Water Management Area (WMA4) (Refer to Figure 13).

In terms of topography, the five on-site sub-catchments are relatively similar is relative slope with an average slope of between 25 and 30%. The average drainage slope is however 7% implying relatively high flow velocities during storms.

Soil types in this area are classified as recharge soils (Shallow). These are shallow soils overlying relatively impermeable bedrock with limited storage capacity resulting in the generation of overland flow after rain events (van Tol et al., 2019). The Mispah soil form is an example of a shallow Responsive hydrological soil type which occurs in the project area. The

Mispah soils occurring within the project area, are medium-fine textured sandy loam (SaLm) with an estimated clay content of 10 – 35 % in the Orthic A horizon.

A presentation of the site topography is indicated on Figure 11 below.

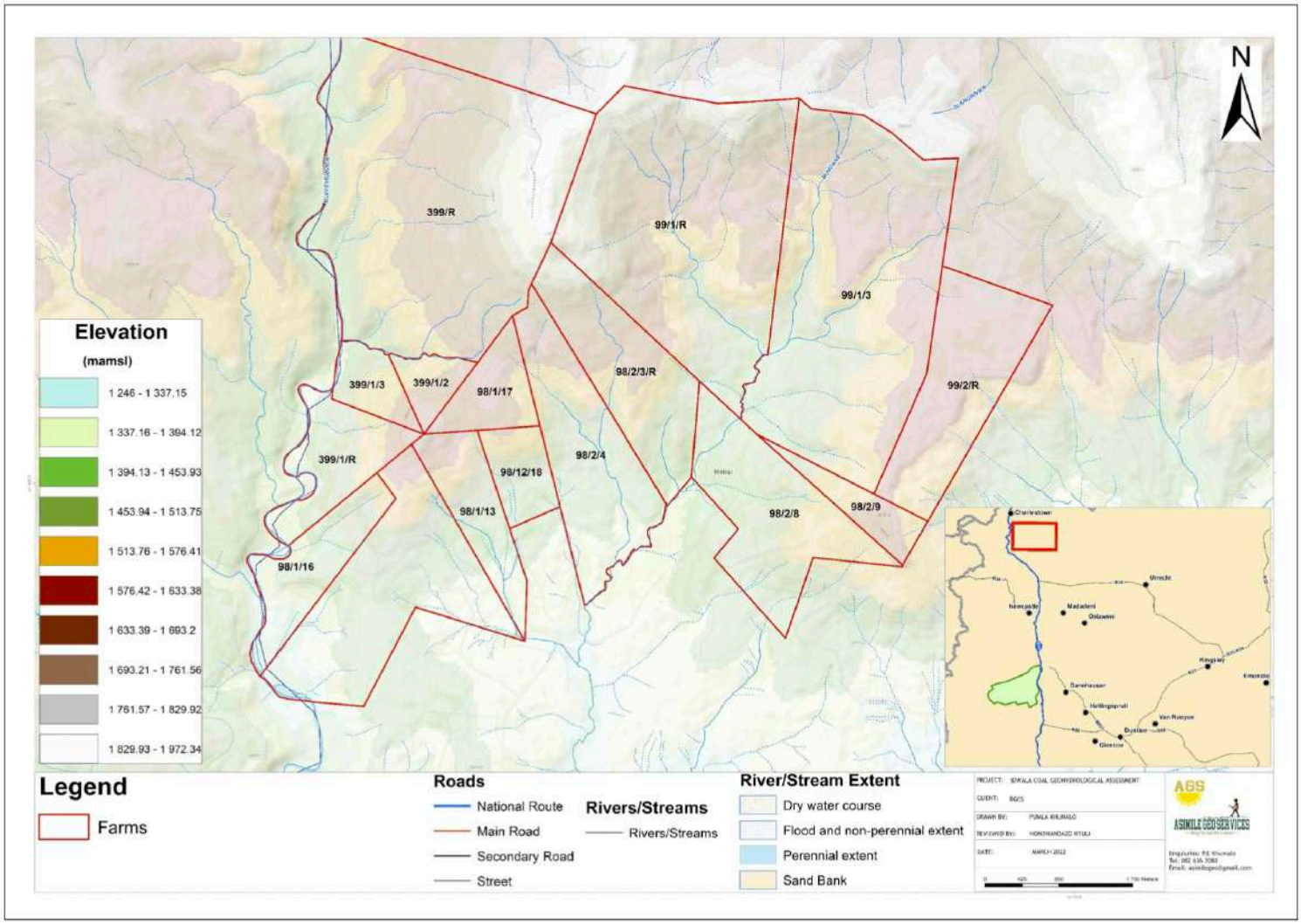


Figure 13: Topography of the IDWALA MRA(AGS, 2022)

The topography of the area is shown on the published Government topocadastral maps (numbers 2729 DD and 2730 CC) on a scale of 1:50 000. Also available for this area are published orthophoto plots at a scale of 1:10 000 with surface contour intervals of 5 meters (m), as well as aerial photography in monochrome at a scale of 1:30 000. The altitude is between 920 and 1440 m.

7.1.4 Soils and land Capability

A land type survey on a scale of 1:250 000 was conducted in the early 1970s to compile inventories of the natural resources of South Africa in terms of soil, terrain, and climate. The land type indicates the dominant soil forms and their occurrence in terms of percentages. The study area comprises of land types of Ac3 & Ac4, Bb55, Ea34, Fa24 and Ib50, as illustrated in Figure 14.

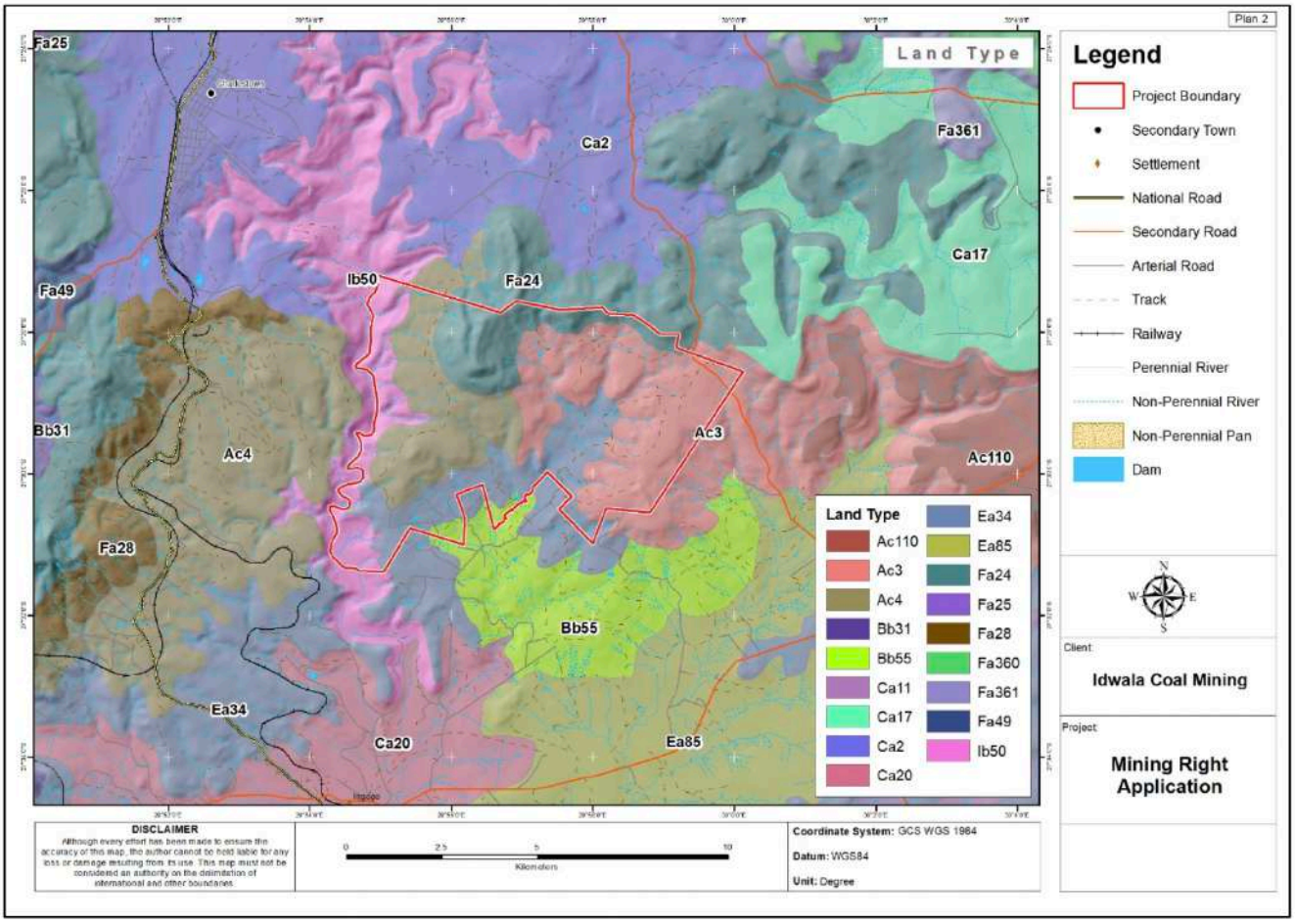


Figure 14: land types at the study area

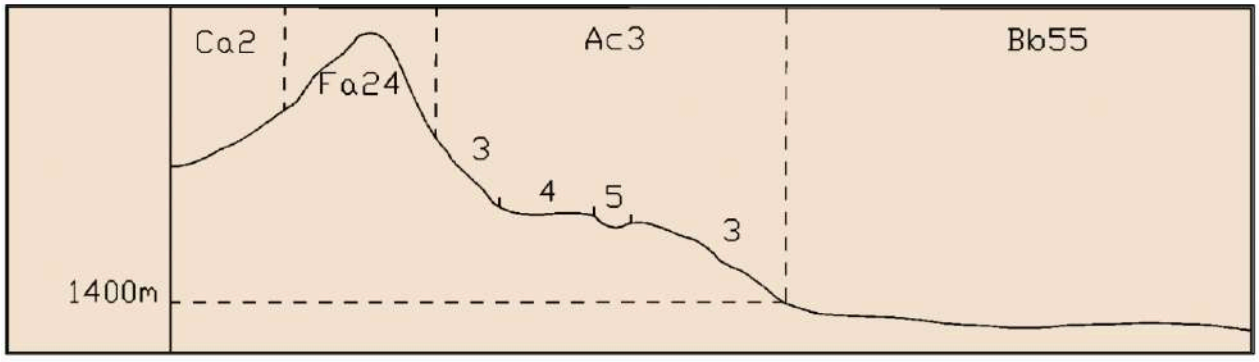
Land type Ac3 & Ac4, dominated by freely drained, red, eutrophic, apedal soils comprise >40% of the land type (yellow soils comprise <10%), Figure 15. The mid-slope and flat plain terrain units are dominated by deep soil of the Hutton form. The soil profiles in these areas are between 60 and 120 cm deep and the clay content ranges between 15% and 35%. The Ac3 land type is dominated by 2% crest, 68% mid-slope, 25%-foot slope and 5% valley bottom terrain unit

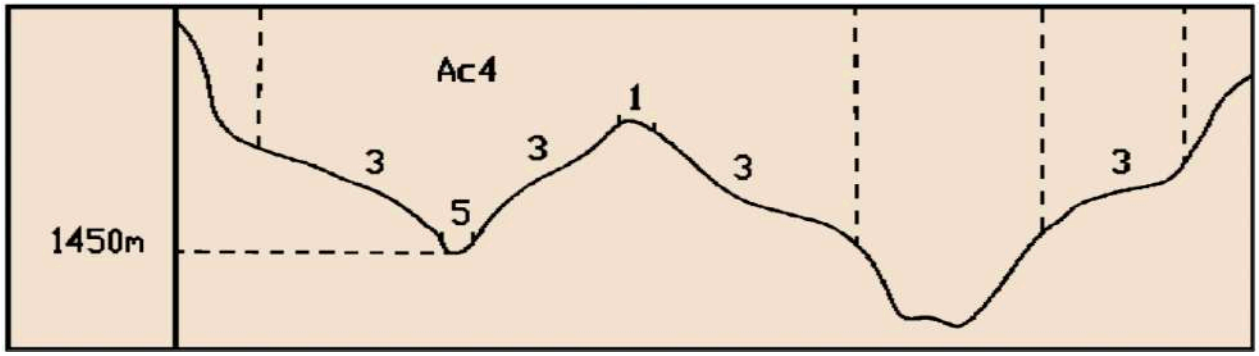
positions in the landscape. The Ac4 land type is dominated by 10% crest, 85% mid-slope, and 5% valley bottom terrain unit positions in the landscape. Land type Bb55, dominated by red and yellow, dystrophic/mesotrophic, apedal soils with plinthic subsoils (plinthic soils comprise >10% of land type, red soils comprise <33% of land type). The Bb55 land type is dominated by 85% mid-slope, 10%-foot slope and 5% valley bottom terrain unit positions in the landscape.

Land type Ea34, the geology of land type Ea34 is dominated by dolerite lithology, which weathers to swelling red or black clay soils, Figure 15. Land type Ea34 has all the topographical positions from crest to valley bottom, largely with short concave slopes. Black or red clays comprise >50% of land type. The Ea34 land type is dominated by 30% crest, 2% scarp, 63% mid-slope, and 5% valley bottom terrain unit positions in the landscape.

Land type Fa24, dominated by shallow soils (Mispah & Glenrosa forms) predominate, little or no lime in landscape, Figure 15. The Fa24 land type is dominated by 25% crest, 70% mid-slope, and 5% valley bottom terrain unit positions in the landscape.

Land type Ib50, Rock outcrops comprise >60% of land type, Figure 9. The Ib50 land type is dominated by 30% crest, 1% scarp, 65% mid-slope, 2%-foot slope and 2% valley bottom terrain unit positions in the landscape. The slope gradient in land type Ib50 generally makes it not suitable to cultivation.





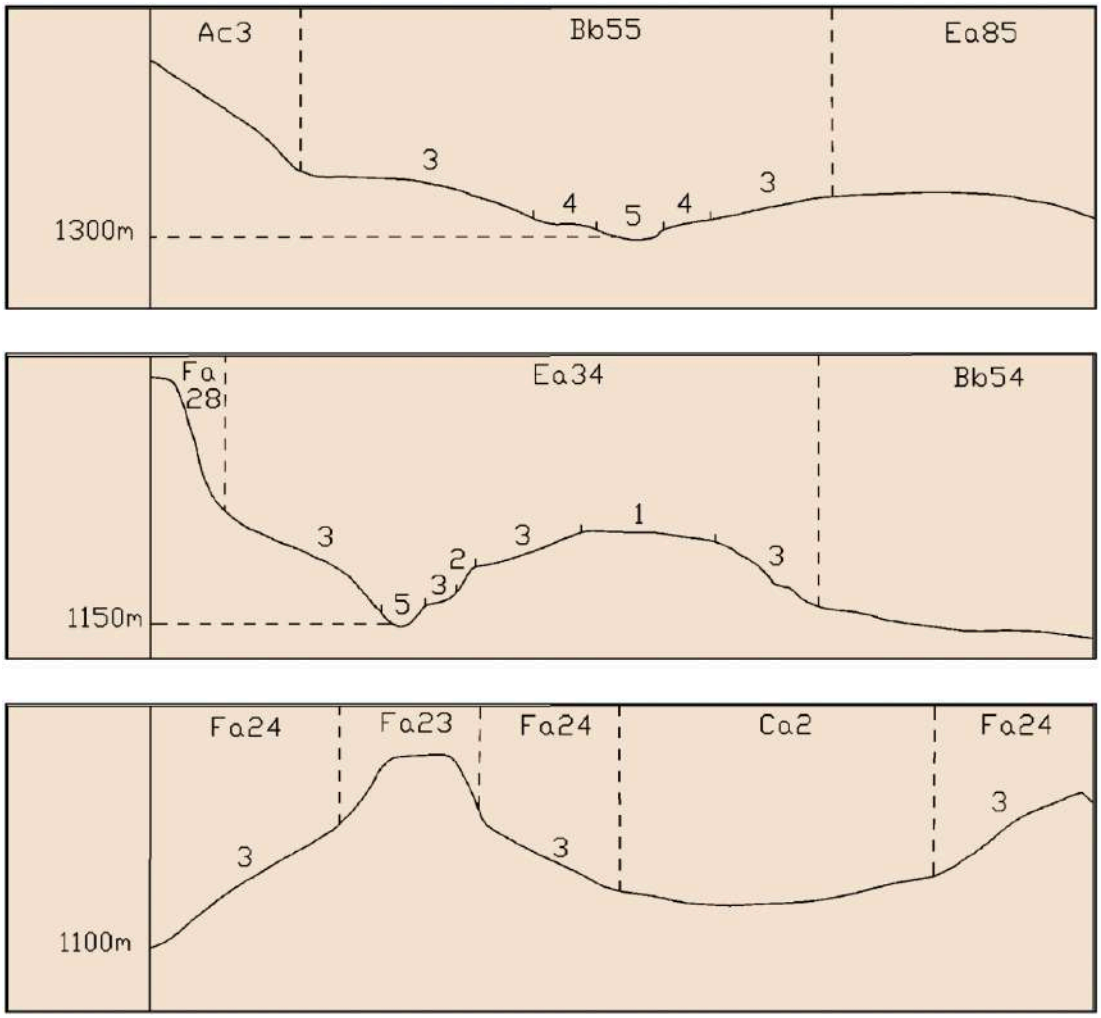


Figure 15: **Representative Terrain Form Sketch of the Land Types**

7.1.5 Land use

The existing infrastructure encountered included farmhouse, two artificial dams, and stables. Current land use in the area is dominated by farming activities (cattle, goats, and horse grazing as well as crop cultivation on small scale), historical mining footprint, coal dump stockpile, caved adit, nut plantation. Only small-scale cattle farming is currently taking place on farm Witklip. The land use currently at the proposed coal mining area is covered by natural land with portions overgrazed by livestock and most areas covered by grass. Several farm herds of cattle can be spotted at different areas grazing around the veld and along the rivers. Neighboring land uses include farms, Transnet coal siding, small community service center (clinic, police station, maize farming, mining industry (Uitkomst), water reservoirs as well as residential homes at Ngogo farm. Several graves exist around the MRA. The area is boarded with Buffels River on the western side of the mine.

7.1.6 Vegetation Biodiversity

At a local spatial scale, the vegetation is broadly represented by three communities that can be categorized in terms of composition, structure and condition. The vegetation communities were grouped as: Secondary Montane Grassland, Disturbed Highland Thornveld and Alluvial Vegetation.

In general, the vegetation composition with the study site can be described as – a natural mosaic of natural grasslands with widespread medium sized thorny trees and evergreen succulents. The remaining natural grassland community is gradually transitioning to agricultural land as a result of pressure from farming activities taking place within the wider study area. The grassland vegetation community is generally dense and represented by both tall tussock and rhizotomous grasses. The thorny trees and succulents are noticeably concentrated along drainage lines and in-between cliffs.

Disturbed Highland Thornveld

The Disturbed Highland Thornveld vegetation community is mainly concentrated on lower foothill of slopes, particularly at the western boundary of the study site and extents north-west, along the floodplains of the Buffalo River (See **Figure 5-2** for the map showing the distribution of the vegetation communities). Compared to other vegetation communities, the Thornveld vegetation accounts for less than 5% in extent.

The soils within this vegetation unit are generally shallow and susceptible to erosion. Gully erosion was pronounced especially where vegetation cover has been removed (**See Photo 1**).

Dominant plant species associated with the Highland Thornveld vegetation community are highlighted below:

Trees and Shrubs:

Woody plants recorded within the Disturbed Thornveld vegetation community consisted mainly of drought resistant species such as: *Acacia natalitia* (d), *A. nilotica* (d), A. *karroo (d), A. sieberiana* var. *woodii*, *Cussonia spicata*, *Ziziphus mucronata*, *Euclea crispa subsp. crispa, Diospyros lycioides* and *Canthium mundianum*

PHOTO 3: View of highly erodible midslopes dominated by yellow-brown soils.

Succulents: Succulent plants recorded within the footprint include: Aloe maculata and Aloe marlothii.

Grass: Graminoids recorded within the study site included: *Aristida congesta, Chloris virgata, Cynodon dactylon, E. superba, Andropogon appendiculatus, Sporobolus africanus, S.pyramidalis, Tristachya leucothrix, Eragrostis racemosa (d), Hyparrhenia hirta (d), Mirochloa caffra, Eragrostis curvula, E.plana, Heteropogon contortus*, *Setaria sphacelata*, *Hyparrhenia hirta*, *Hyparrhenia dregeana, Themeda triandra, Cymbopogon caesius* and *C. nardus*.

Herbs: Herbaceous plants recorded with the grasses included: *Vangueria macrocalyx, Hibiscus meyeri, Ipomoea carnea* and *Gerbera natalensis.*

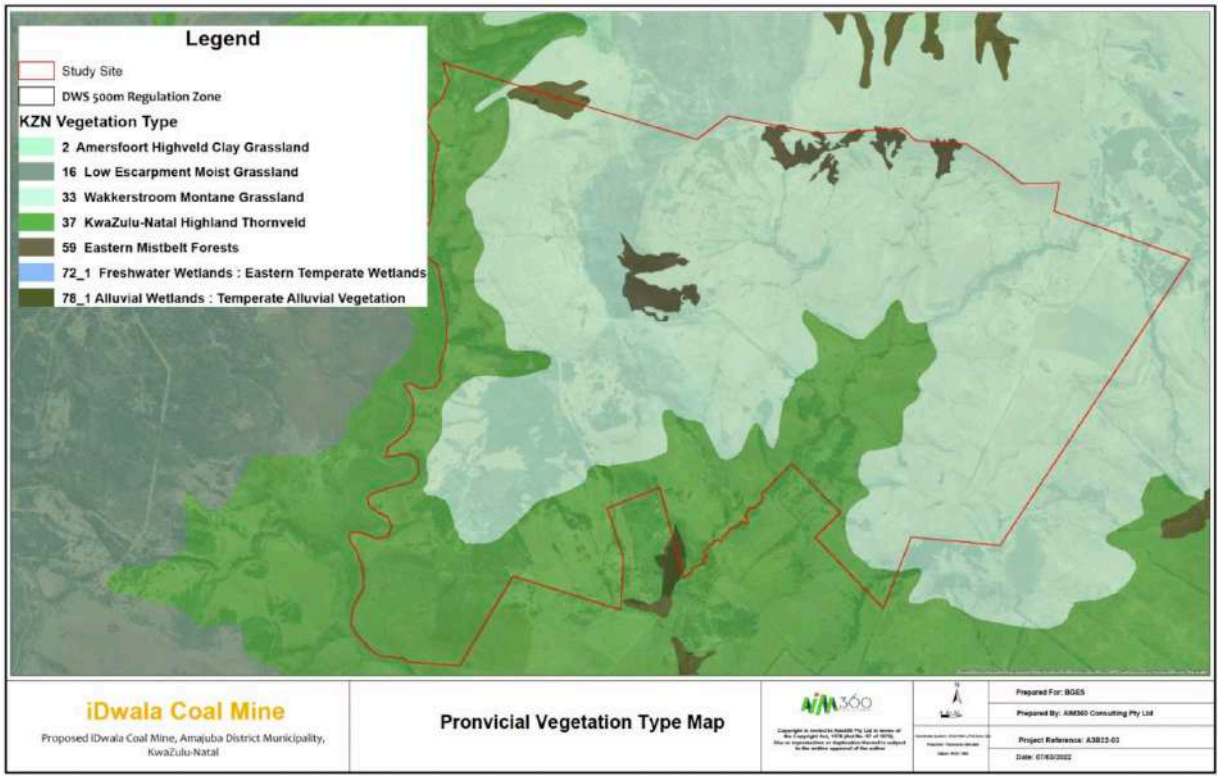


Figure 16: Vegetation Map

Source: AIM360, 2022.

Sections of the study area and its surrounding environment has been transformed due to historical and on-going anthropogenic activities, including grazing pressures, vegetation clearance for cultivation and gravel road construction, excavations and infilling of land mainly due to historical mining activities, as well as an old railway line that traverses the centre of the study area. These impacts have resulted in the proliferation of alien and invasive plant (AIP) species in some areas of the study area. Alien *Opuntia, Eucalyptus, Populus, Acacia* and *Melia* are becoming invasive in places, but probably the greatest threat to the remaining natural areas of this unit is bush encroachment. Erosion is very low (34%), low (29%), moderate (2%) and high (12%).

Various habitats, with four main habitat units, were identified within the study area including:

a. **Secondary Grassland Habitat Unit.**

he main components of a habitat are shelter, water, food, and space. A habitat is said to have a suitable arrangement when it has the correct amount of all of these. Sometimes, a habitat can

meet some components of a suitable arrangement. For a plant, a good habitat must provide the right combination of light, air, water, and soil. The following habitats are most likely to harbour species of conservation significance:

Natural Forests

A natural forest is defined under the National Forest Act (NFA) as a group of indigenous trees: (i) whose crowns are largely contiguous; or (ii) which have been declared by the Minister to be a natural forest under section 7(2) of the NFA. The legal definition has to be supported by a technical / scientific definition which defines a natural forest as: (i) A generally multi-layered vegetation unit. (ii) Dominated by trees that are largely evergreen or semi-deciduous. Iii) The combined tree strata have overlapping crowns, and crown cover is >75%. (iv) Grasses in the herbaceous stratum (if present) are generally rare. (vi)Fire does not normally play a major role in forest function and dynamics except at the fringes. (vii)The species of all plant growth forms must be typical of natural forest (check for indicator species, and (Vii) the forest must be a recognised national forest type.

No natural forests were identified within the study site which meet the above legal or scientific description.

Figure 17: Secondary Grassland Habitat Unit Site pictures

Source: AIM360, 2022

Small sections of the Secondary Grassland are situated within an area classified as being CBA optimal, however small and highly fragmented across the study area. The area is also not located within a threatened vegetation type, and so the high sensitivity assigned to the study area by the screening tool was not supported by the specialist study carried out (SAS, 2021). The Vegetative Index score was calculated at 14.5. No threatened floral species of conservation concern were recorded on site assessment. However, some could be possibly discovered in future due to the suitability of the habitat.

The SBH unit is currently moderately intact but subjected to anthropogenic influences including historic agricultural cultivation activities, livestock grazing pressures, soil excavation and infilling practices, and vegetation clearance for various reasons. This habitat unit comprises mostly indigenous subclimax species such as *Aristida adscensionis, Diheteropogon amplectens, Eragrostis gummiflua, Heteropogon contortus and Melinis nervigulmis*. A list of vegetation species in the unit, as well as alien species is summarised in Table 14 below:

Table 15: Secondary

Scientific name	Common name
Ardea Cineria	Grey Heron
Anas sparsa	African Black Duck
Apus apus	Common Swift
Apus affinis	Little swift
Ciconia ciconia	White Stork
Cisticola chiniana	Rattling Cisticola
Cisticola juncidis	Zitting Cisticola
Dicrurus adsimilis	Fork-tailed Drongo
Corvus albus	Pied Crow
Euplectes orix	Southern Red Bishop
Numida meleagris	Helmeted Guineafowl
Hirundo cucullata	Greater Striped Swallow
Ploceus subaureus	Yellow Weaver
Bubulcus Ibis	Cattle Egret
Streptopelia capicola	Cape Turtle-Dove
Trochocercus cyanomelas	Blue-mantled Crested-flycatcher
Myrmecocichla formicivora	Ant-eating Chat
Aplopelia larvata	Lemon Dove
Streptopelia semitorquata	Red-eyed Dove
Streptopelia senegalensis	Laughing Dove
Passer domesticus	House Sparrow
Ploceus velatus	Southern Masked Weaver
Malaconotus blanchoti	Grey-headed Bush-shrike
Lybius torquatus	Black-collared Barbet
Acridotheres tristis	Common Myna
Vidua paradisaea	Long-tailed Paradise-whydah
Ardea cinerea	Grey Heron
Passer Diffussus	Southern Grey-headed Sparrow

Grassland Floral biodiversity

b. Rocky Grassland Habitat Unit

Rocky outcrops

Rocky outcrops are usually associated with high plant diversity due to inaccessibility. Disturbances were markedly lesser in comparison to other terrain within the study area. The south-eastern portion of the study site has rocky outcrops that overlook the Buffels River. Herbaceous plants were mostly concentrated along these rocky outcrops. The potential of occurrence of threatened plant species such as *Aloe modesta, Barleria greenii* and *Aloe gerstneri* may be regarded as significantly high. (Figure 17).

Figure 18: Rocky Grassland habitat unit Pictures

The dominant floral species identified during field investigations are listed in Table below, with alien species indicated by a star.

Table 16: Dominant Floral Species in Rocky Grassland Habitat Unit

Grass/sedge/reed species	Tree/Shrub species	Forb species
Aristida bipartita	*Elephantorrhiza elephantina*	*Ocimum angustifolium*
Cymbopogon excavatus	*Helichrysum kraussii*	*Berkheya onopordifolia*
Cynodon dactylon		*Berkheya radula*
Eragrostis chloromelas		*Chironia palustris subsp. transvaalensis*
Eragrostis cilianensis		*Gladiolus sp.*
Eragrostis curvula		*Gynandriris simulans*
Hyparrhenia hirta		*Haplocarpa lyrata*
Setaria sphacelata var. sphacelata		*Hibiscus aethiopicus var. ovatus*
Sporobolus africanus		*Ipomoea crassipes*
Themeda trianda		*Ledebouria ovatifolia*
		Ledebouria sp.
		*Richardia brasiliensis**
		Scabiosa columbaria
		Hilliardiella oligocephalaHilliardiella elaeagnoides
		Wahlenbergia caledonica
		Walafrida densiflora

The unit does not fall within any areas classified as CBA or ESA, and it is not located within a threatened vegetation type (AIM360, 2022). The rocky nature of this habitat provides unique habitat for floral species that have an affinity for rocky areas. The Vegetative Index score was calculated at 14.5. The overall sensitivity of this habitat unit is intermediate, and no threatened floral SCC were recorded on site during any of the field assessments.

c. Freshwater Habitat Unit

The Freshwater Habitat Unit within mining area include those areas around farm dams, streams and various wetland environments delineated around the study area. Channelled valley bottom wetlands, several hillslope seep wetlands, artificial impoundments, and a perched wetland were mentioned by the wetland specialist study in the proposed mining area. Table 16 below lists the floral terrestrial species identified within the freshwater habitat unit during site assessments, including alien species indicated with a star.

Table 17: Dominant floral species within the Freshwater Habitat Unit

Permanent Zone	Temporary/Seasonal Zone	Terrestrial Zone
Andropogon eucomus	*Andropogon eucomus*	*Acacia mearnsii**
Typha capensis	*Aristida bipartite*	*Acacia sieberiana var. woodii*
Cyperus sp.	*Aristida congesta subsp. congesta*	*Andropogon eucomus*
	Ocimum angustifolium	*Aristida adscensionis*
	Berkheya onopordifolia	*Aristida bipartita*
	Berkheya radula	*Aristida congesta subsp. congesta*
	Brachiaria brizantha	*Ocimum angustifolium*
	Chironia palustris	*Cosmos bipinnatus**
	Crinum macowanii	*Bidens pilosa**
	Cymbopogon excavatus	*Canna indica**
	Cynodon dactylon	*Cymbopogon excavatus*
	Eragrostis chloromelas	*Cynodon dactylon*
	Eragrostis curvula	*Eragrostis chloromelas*
	Eragrostis gummiflua	*Eragrostis cilianensis*
	Eragrostis rigidior	*Eragrostis curvula*
	Eragrostis tef	*Eragrostis gummiflua*
	Gerbera ambigua	*Eragrostis rigidior*
	Gladiolus sp.	*Eragrostis tef*
	Gynandriris simulans	*Eucalyptus camaldulensis**
	Habenaria epipactidea	*Glenditsia triacanthus**
	Haplocarpa lyrata	*Gomphocarpus fruticosus*
	Helichrysum aureonitens	*Helichrysum aureonitens*
	Helichrysum kraussii	*Helichrysum kraussii*
	Helichrysum rugulosum	*Heteropogon contortus*
	Heteropogon contortus	*Hyparrhenia hirta*
	Hypoxis argentea	*Paspalum dilatatum*
	Hypoxis hemerocallidea	*Paspalum notatum*
	Hypoxis iridifolia	*Seriphium plumosum*
	Hypoxis rigidula	*Setaria sphacelata var. sphacelata*
	Imperata cylindrical	*Sporobolus africanus*
	Microchloa caffra	*Tagetes minuta**
	Monocymbium ceresiiforme	*Taraxacum officinale**
	Monopsis decipiens	*Themeda trianda*
	*Paspalum dilatatum**	*Tragopogon dubius**
	*Paspalum notatum**	*Verbena brasiliensis**
	Scabiosa columbaria	
	Setaria sphacelata var. sphacelata	
	Sporobolus africanus	
	Themeda trianda	
	Trachyandra spicatus	
	*Verbena bonariensis**	

The existing agricultural and industrial activities have since impacted the receiving freshwater systems, including wastewater discharges, animal waste, crop cultivation, erosion, waste dumping as well as grazing activities. The Vegetative Index score was calculated at 16.5. The wetland features within the study area perform an important function in terms of habitat provision for avifaunal and faunal species, including breeding grounds and sources of food and water. No threatened floral species of conservation concern were identified. The habitat unit is considered to have a

- moderate ecological functionality: providing dispersal and movement corridors for fauna and flora.
- moderate ecological sensitivity.
- moderate conservation value: providing migratory connectivity for faunal species as well as important habitats for several obligatory wetland floral species.

d. Transformed Habitat Unit.

The Transformed Habitat unit comprises of those areas which have been changed from the natural state to anthropogenic activities including cultivation, residential and infrastructural areas (Figure 17). Maize crop cultivation was observed around the centre of the southern side of the MRA, where a cattle kraal and the cultivated areas are fenced off. Several areas have been connected by farm roads that link residential areas to the farm activity areas. Farm dams also exist on the southern side, which store water for livestock watering and link with some of the surface watercourses. Several portions were dug for topsoil, showing evidence of surface scrapping and diggings.

Figure 19: Transformed Habitat Unit pictures

Source: AIM360, 2022.

The habitat is highly modified and transformed by human activities that are both historical and currently active. No floral species of conservation concern were recorded, and the habitat of low importance. Due to the disturbance by human interventions, the habitat is of poor ecological importance, with several alien floral species observed, contributing to low ecological functionality. The Vegetative Index score was calculated at 4.8. Table 17 below shows the listed floral species observed during site assessments, with alien species given stars.

Table 18: Floral species within the Transformed Habitat Unit

Grass/sedge/reed species	Tree/Shrub species	Forb species
Andropogon eucomus	*Acacia mearnsii**	*Berkheya onopordifolia*
Aristida adscensionis	*Eucalyptus camaldulensis**	*Berkheya radula*
Aristida congesta subsp. congesta	*Gomphocarpus fruticosus*	*Cosmos bipinnatus**
Cymbopogon excavatus		*Bidens pilosa**
Cynodon dactylon		*Haplocarpa lyrata*
Eragrostis capensis		*Richardia brasiliensis**
Eragrostis curvula		*Solanum rigescens*
Eragrostis gummiflua		*Tagetes minuta**
Hyparrhenia hirta		*Taraxacum officinale**
Melinis nervigulmis		*Tragopogon dubius**
Paspalum notatum		
Perotis patens		
Pogonarthria squarrosa		
Sporobolus africanus		

7.1.7 Protected Floral Species

Some medicinally important and provincially protected floral species were also identified in the study area throughout the identified habitats, including the following:

- *Hypoxis hemerocallidea*
- *Crinum macowanii*
- *Habenaria epipactidae*
- *Gladiolus sp.*

7.1.8 Invasive Alien Species

Several alien species (sixteen in total) were recorded in the study area, considering all identified habitats as indicated below:

a. Seven (7) species are listed under NEMBA Category 1b, declared weeds and prohibited plants which must be controlled or eradicated. These include
    - *Argemone ochroleuca*
    - *Glenditsia triacanthus*
    - *Canna indica*
    - *Cirsium vulgare*
    - *Ipomoea purpurea*
    - *Verbena bonariensis*
    - *Verbena brasiliensis.*

b. Two (2) species are listed under NEMBA Category 2, declared invader plants with a value. “Invaders” with certain useful qualities (i.e., commercial). These are only allowed in controlled, demarcated areas including:
    - *Acacia mearnsii*
    - *Eucalyptus camaldulensis.*
c. One (1) species is listed under NEMBA Category 3, which are mostly ornamental plants that may have escaped from, areas such as gardens, but are proven invaders. No further planting or trade in propagative material is allowed. One species observes was *Paspalum natalense*.
d. Seven (7) species are not listed under NEMBA but considered problem plants. Plants observed include the following:
    - *Paspalum dilatatum*
    - *Tragopogon dubius*
    - *Taraxacum officinale*
    - *Tagetes minuta*
    - *Richardia brasiliensis*
    - *Bidens Pilosa*
    - *Cosmos bipinnatus.*

7.1.9 Floral Sensitivity

The sensitivity of the identified habitats was mapped in terms of the presence or potential for floral species of conservation concern, habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity (compared to a reference type). Key disturbances that were noted as having negative impacts on the vegetation communities (and also the ecological habitat) include but are not limited to: (i) bush clearance for commercial crop production (ii) overgrazing and livestock pressure (iii) historical coal mining activity (iv) creation of dirt roads (v) rural settlement (vii) commercial tree plantation.

Despite the above notable disturbances on the vegetation and ecological habitat, the existing vegetation communities still provide foraging, breeding and roosting habitats for faunal species

to some degree. A summary of the ecological condition and sensitivity findings for the various vegetation/ecological habitat types is presented below as Table A below.

The floral sensitivity map is indicated below (Figure 20:

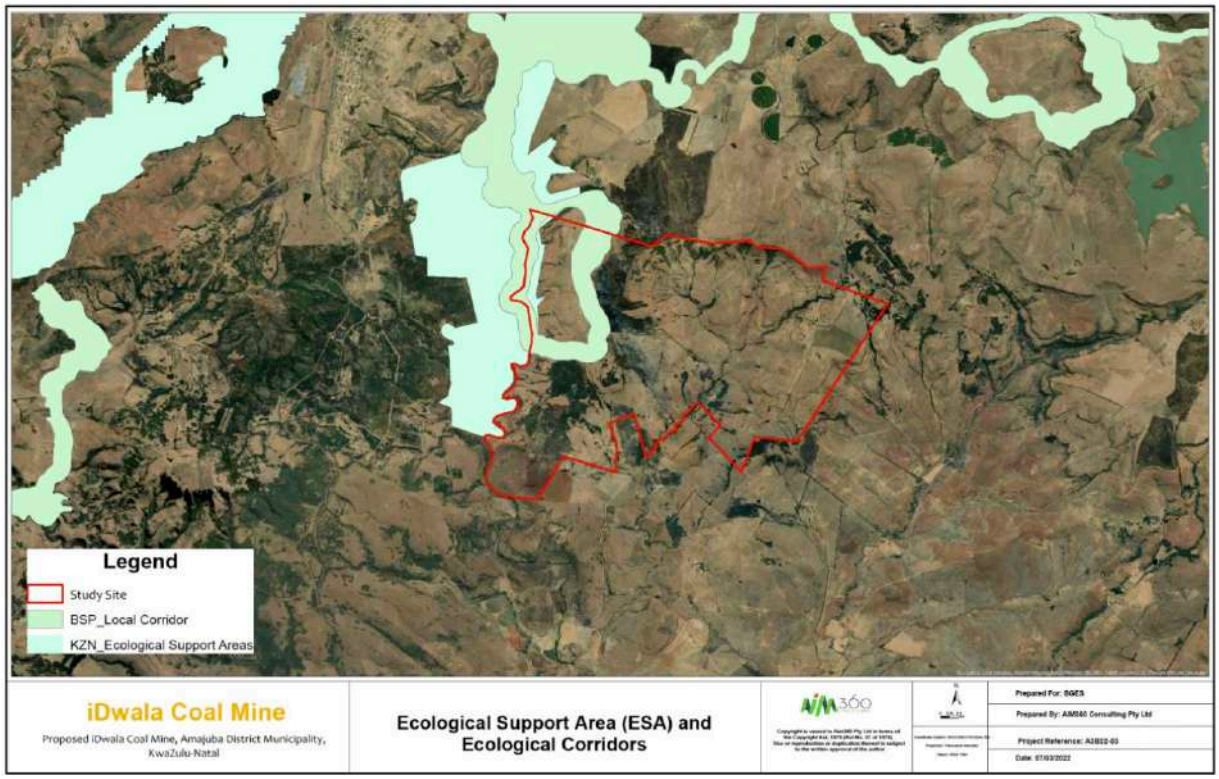


Figure 20: Floral Sensitivity

Source: AIM360, 2022.

7.1.3 Faunal Terrestrial Biodiversity

The area falls within the grassland biome of the sub escarpment grassland bioregion (Figure 10). The vegetation type is KwaZulu Natal Highland Thornveld (GS6). In terms of fauna, the area has potential occurrence of high sensitivity animal species. However, in flora, medium sensitivity was indicated on screening (Figure 19). Further studies through EIA will indicate details of findings from terrestrial studies onsite.

The IDWALA Mining Rights Area was assessed in terms of faunal habitats available. A number of faunal habitat units were identified according to the faunal species present. These, as described within the floral terrestrial biodiversity assessment include:

- Freshwater Habitat Unit

- Secondary Grassland Unit
- Rocky Grassland Unit and
- Transformed Habitat unit.

Each of the units were assessed on faunal species present. Much of the faunal species' abundance was already affected by the human activities surrounding the study area. Such activities as hunting, livestock grazing, crop cultivation impacted species abundance, assemblages, movement as well as their reproduction and multiplication. The following faunal groups were assessed.

The surface hydrology river system is a source of water for many species that may occur within the study area and surrounding habitat units, as well as species passing through the study area, whilst the wetland habitat provides, shelter, breeding opportunities and food sources to faunal species.

The rocky areas within the grassland provide supportive habitat and shelter to a variety of reptile, arachnid and small mammal species. This unit is highly fragmented, reducing the potential for genetic flow within the unit. As this habitat is comprises of a small percentage of the locality the potential to support viable populations in their isolated state is reduced.

This habitat unit provided very little habitat for faunal species, with only a few common avifaunal and invertebrate species being observed. Anthropogenic activities combined with the small stand of alien vegetation resulted in a very low faunal biodiversity within this habitat unit.

a. Mammals

No mammal species of conservation concern were identified during site assessments. However, at several areas, evidence of Orycteropus afer (Antbear) diggings were noted. According to distribution maps, four (4) different terrestrial mammals may potentially occur within the proposed mining area (Skinner and Chimimba 2005). However, given the disturbed nature of the study area due to rural settlements, farming practices, livestock grazing and previous mining activities, many of these species would not have resident populations within the study area. Table 19 below shows mammal species potentially occurring within the grid cells 2**729BD**.

Table 19: Mammal species potentially occurring within grid cells 2729BD

Species	Common name	Red List	Suitability of Habitat	Potential of Occurrence
Raphicerus campestris	Steenbok	LC	Inhabits open savannah country where they are reliant on adequate cover in the form of taller grass and clumps of bushes.	**Medium**
Canis mesomelas	Black-backed Jackal	LC	They prefer open terrain when foraging and resting. Where large predators have been exterminated, it adapts readily to dense habitat to avoid detection. Black-backed jackals may rest in holes in the ground, in rock crevices or among piles of boulders, preferring this more substantial cover to that of bush or tall grass.	**Medium**
Suricata suricatta	Meerkat	LC	Meerkats inhabit dry open areas, scrublands and savannas. They usually live in places where there is plenty of sandy soil where they can dig elaborate underground burrows.	Low
Proteles cristata	Aardwolf	LC	Aardwolves can occupy open and degraded grassland where there is high termite abundance.	Low
Papio usirnus	Chacma Baboon	LC	Grassland steppes, wooded highlands, savanna steppes, and sub deserts are among the preferred habitats for Chacma baboons.	High

b. Avifaunal species

The majority of the study area comprises of habitat suitable for common avifaunal species, although it does not fall within any Important Bird Area. Several bird species were identified within the secondary grassland, rocky grassland, and in and around the wetland areas located in the study area, including species of conservation concern including

- *Eupodotis senegalensis*
- *Geronticus calvus*
- *Falco biarmicus*
- *Falco amurensis.*

There remains the possibility that avifaunal species of conservation concern raptors may from time-to-time fly over the study area whilst foraging. Breeding of such raptors may be unlikely due to lack of tall trees and cliffs in the study area.

c. Amphibians

Two amphibian species including *Xenopus laevis* and *Cacosternum boetgeri* were the only amphibian species observed during the site assessment. One possibility is for the *Pyxicephalus adspersus* (Giant Bullfrog), as it remains buried within the soil up to 1 m deep for the majority of the year, emerging during periods of high rainfall to breed.

The watercourses adjacent to the tarred road could support *Pyxicephalus adspersus* (Giant Bullfrog) with potential breeding habitat while the species may forage within the surrounding secondary grassland. This species is not listed in the KwaZulu-Natal Nature Conservation Management, 1999 (Act No. 5 of 1999), however it is listed in the Threatened or Protected Species (TOPS) list of 2004 (Act No. 10 of 2004). Due to the proximity to existing settlements and the utilisation of the species as a foodstuff the potential for it to occur within the study area is low.

d. Reptiles

In the reptile faunal category, only one non-threatened reptile species, *Trachylepis punctatissima* (Montane Striped Skink) was found within the rocky grassland habitat.

e. Invertebrates

The invertebrate assessment conducted did not confirm any species of conservation concern but the majority of the species that were observed were of least concern and those not yet been assessed by the IUCN.

f. Arachnids

On assessment of arachnids, only one spider species *Olurunia ocellata* (Grass funnel-web spider). A probable baboon spider burrow was also noted.

g. Species of Conservation Concern

A total of four faunal species of conservation concern were identified during site assessments, namely

- Falco biarmicus (Lanner Falcon),
- Eupodotis senegalensis (White-bellied Korhaan),
- Geronticus calvus (Southern Bald Ibis) and

- Falco amurensis (Amur Falcon).

Another species, *Orycteropus afer* (Aardvark) was suspected due to signs of its feeding habits. Two reptiles namely Lamprophis *fuscus* (Yellowbellied Snake) and *Homoroselaps dorsalis* (Striped-Harlequin Snake) are known to occur within grasslands with termitaria, and the site habitat was suitable for their potential survival. A single baboon spider burrow was also observed, but not confirmed if of conservation concern.

Figure 19 indicates the faunal sensitivity map for the area under study:

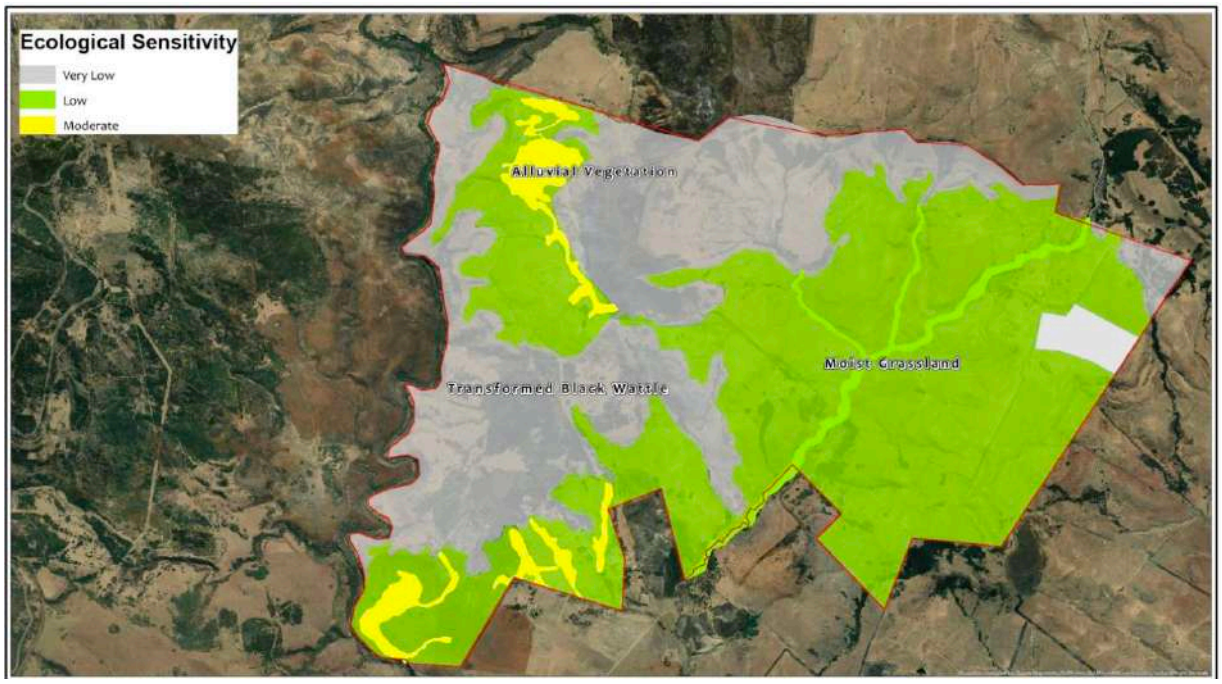


Figure 21: Faunal Sensitivity Map for the Study Area

7.1.4 Surface Hydrology and Wetlands

The proposed occurs within the Pongola-Mtamvuna Water Management Area 4 (WMA), which is situated in the northern part of kwa-Zula Natal, in the Limpopo Province. It is hydrologically situated in the quaternary catchment V31B (Figure 22), totalling (506.82 km^2), within the greater Buffels River (also known as the Buffalo River) secondary catchment (9 803.8 km^2 based on WR2012 Secondary Catchments GIS Dataset)) which drains into the greater Thukela River some 300 km downstream of the project site. The Buffels River originates in the northern hills of Volkrust east adjacent to the N11 National Road, a town that lies within the Mpumalanga

Province, and flows southwards across the border of Mpumalanga and Kwa-Zulu Natal as it leaves Volksrust to confluence with the Slang River just 2 km east of the town Charlestown.

Buffels River is fed primarily by the Slang River, associated with quaternary catchment V31A, which supplies river flow via the Zaaihoek Dam. Following the confluence of the Buffels with the Slang River, the Buffels River then flows for about 8.3 km until it enters the northwestern boarder of the site, and then flows a further 10 km west adjacent to the proposed opencast area leaving the Mining Right Area at coordinate Latitude -27.522412° Longitude 29.909602°

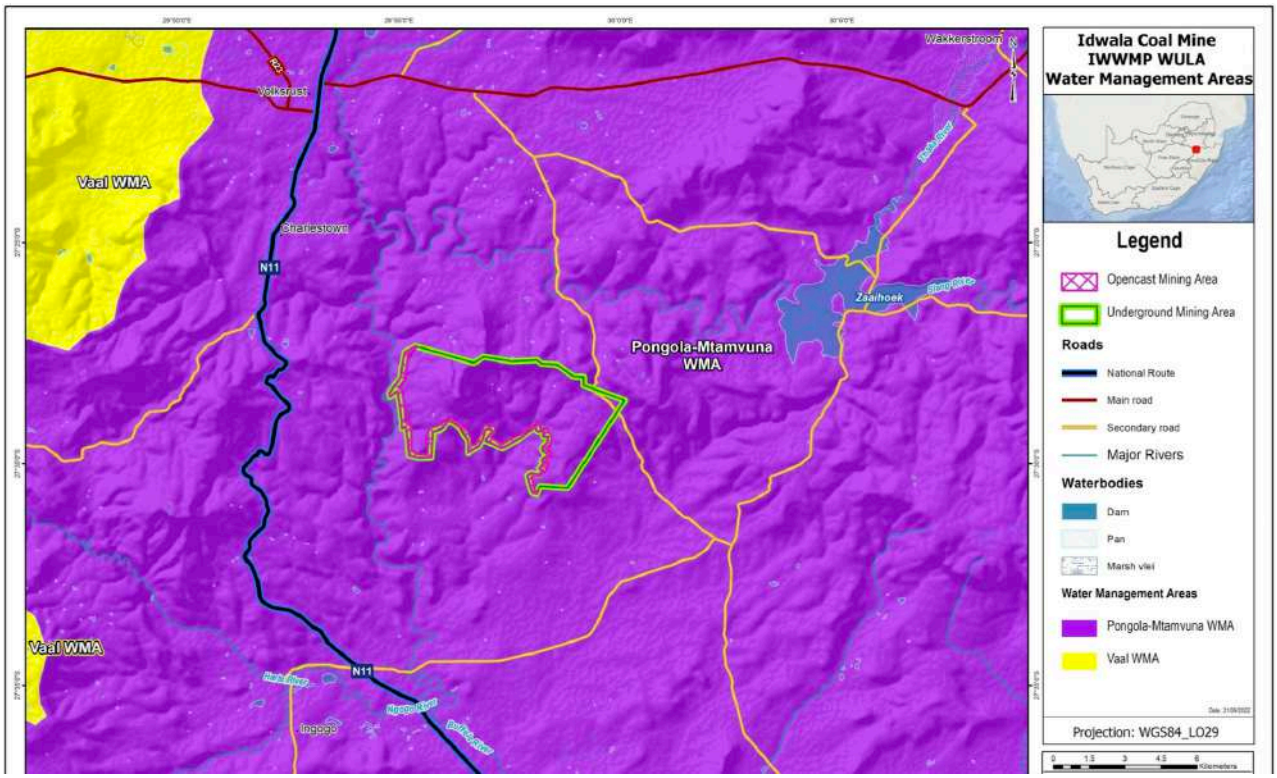


Figure 22: Quaternary catchment for IDWALA site

Preliminary studies indicated the occurrence of various NFEPA wetlands ranging from channelled valley bottom, flat, floodplain, seep, and valley head seep wetlands (Figure 10: SAS, 2021). Further studies will be carried out to investigate the extend of such wetlands. According to an NBA dataset, the Buffalo River is considered largely modified (Class C), poorly protected and least threatened although it is also a fish corridor for threatened fish species. Potential sources of impacts on the river include the use of roads, old power station, some effluent from mines, municipal water activities including water treatment, and wastewater treatment.

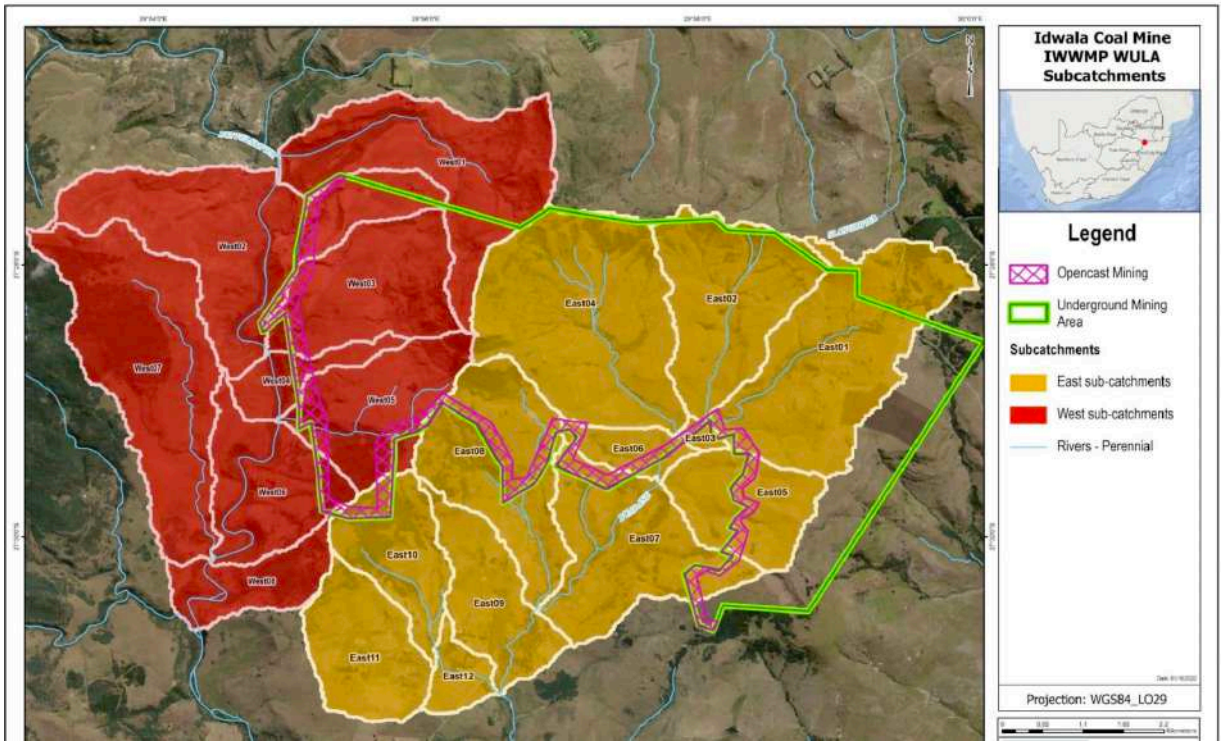


Figure 23: Delineated wetlands within IDWALA MRA (AIM360, 2022)

A description of the identified wetlands around the study area is presented in the following Table 18.

Table 20: Wetland systems onsite

Description	PES category	Human impacts	Ecology	EIS category
System 1				
Hillslope Seep (HSS) 1 to 4 Channelled Valley Bottom (CVB) 1 HGM units	C. Streamflow regulation. Sediment trapping. Flood attenuation. Recharge of the downstream system. Assimilation of nutrients and toxicants.	Wetlands used for pasture. Minimal infrastructure in the form of a railway line and informal road. Increased sediment loads. Scouring and bank incision.	No faunal or floral Species of Conservation Concern (SCC) were identified.	Moderate. Habitat for faunal and floral SCC. Migratory corridor. Important for the maintenance of biodiversity.
System 2				
Hillslope Seep (HSS) 5. Channelled Valley Bottom (CVB) 1 and Unchanneled Valley Bottom (UCVB) 1 HGM units.	C. Harvestable resources. Biodiversity maintenance. Streamflow regulation. Flood attenuation. Assimilation of excess nutrients and toxicants.	Increased runoff from impermeable surfaces. Informal discharge of domestic effluent. Encroachment of infrastructure within the various HGM units. Sand winning in close proximity to the wetland units. Grazing of domestic livestock.	No faunal or floral Species of Conservation Concern (SCC) were identified.	Moderate. Reduced ecological integrity. Valuable habitat to a number of faunal species. Faunal migratory corridor. Obligate and facultative floral species established.

		Vegetation clearance for subsistence crop cultivation. Religious ceremonies. Crop cultivation and watering of livestock.		
System 3.				
Hillslope Seep (HSS) 7 and Channelled Valley Bottom (CVB) 3.	C. Trapping of sediment. Assimilation of nutrients and toxicants. Streamflow regulation. Flood attenuation	Construction of infrastructure within the wetland areas. Disposal of litter and household refuse. Subsistence agriculture upstream of catchment.	No faunal or floral Species of Conservation Concern (SCC) were identified.	Moderate. Faunal migratory corridor. Sometimes dry.
System 4.				
Hillslope Seep (HSS) 6.	B. Biodiverstity maintenance. Erosion control. Flood attenuation. Sediment trapping)	An informal farm road which bisects the wetland. Fencing. Livestock grazing. Subsistence crop cultivation.	Not large enough to support significant populations of unique wetland-dependent species.	Moderate. Breeding habitat for smaller mammalian or amphibian. Vegetation is relatively intact. Floral SCC could potentially occur.

Perched Wetland.	B. Flood attenuation. Assimilation of nutrients.	Seasonal veld fires. Livestock grazing. Subsistence crop cultivation.	Not large enough to support significant populations of unique wetland-dependent species.	Low/Marginal.

7.1.5 Groundwater

The evaluation of the study area indicated that it is s predominantly underlain by an intergranular and fractured aquifer system comprising of compact sedimentary rock with deep weathering of crystalline rocks imparting intergranular properties to the weathered zone. The site is underlain by aquifers which are typically associated with average borehole yields of 0.5 – 2 L/s. There are two main hydro-stratigraphic units/aquifer systems inferred in the saturated zone including a shallow, weathered zone aquifer and a deeper fractured aquifer where groundwater yields can be expected to be higher than the weathered zone aquifer.

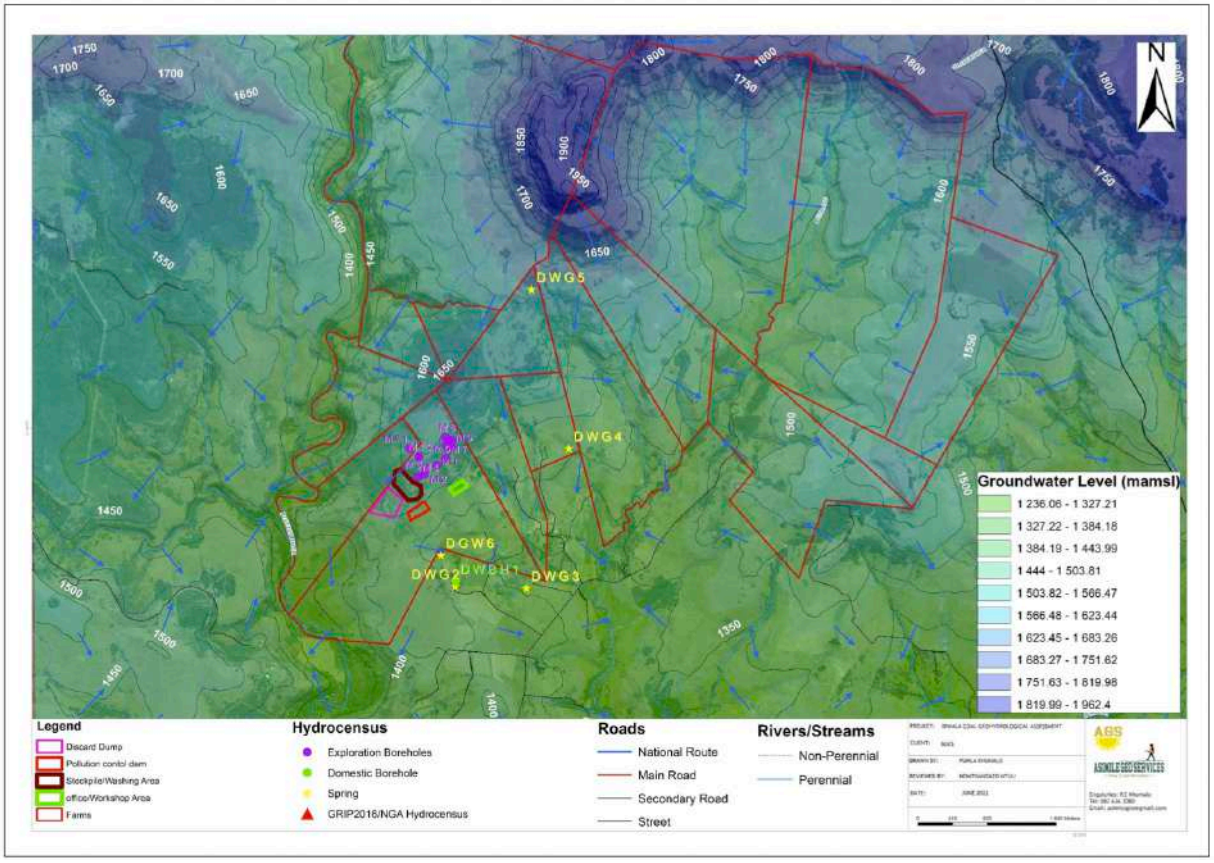


Figure 24: groundwater Flow Direction

Source: ASG, 2022

The groundwater recharge for quaternary catchment V31K is estimated to be approximately 45 mm/year, with the porosity and density of Karoo Supergroup shales varying between 2 to 10% and 2 400 to 2 600 kg/m^3 respectively (WESST, 2021). The aquifer underlying the study area is classified as a minor aquifer. This minor aquifer system can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable

permeability. The aquifers seldom produce large quantities of water but are important both for local supplies and supplying base flow to rivers. The IDWALA MRA and project area is underlain by an aquifer system with a "Moderate" vulnerability rating and a "Medium" susceptibility rating. Groundwater flow directions are indicated in Figure 22 above.

7.1.6 Air quality

Detailed study on potential air quality impacts of the proposed coal mining project will be done by an air quality specialist. Preliminary research on potential emission sources indicated several sources likely to contribute to recipients around the MRA (Figure 25).

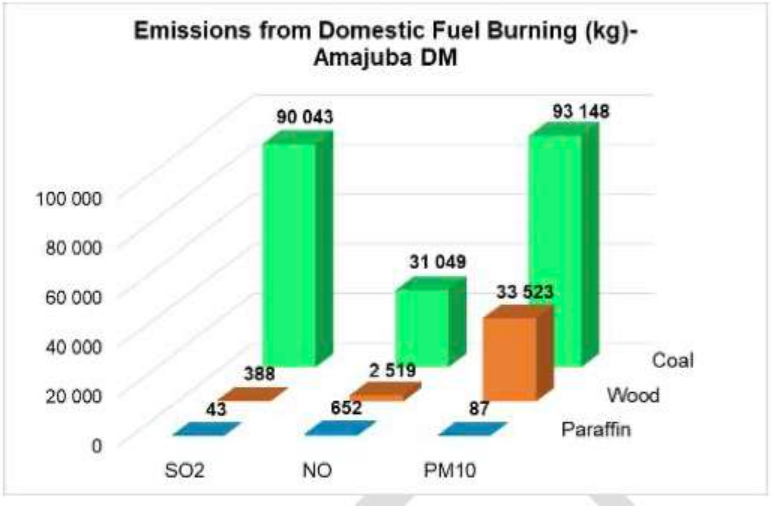


Figure 25: Potential air emission sources around MRA.

Major sources of air pollution in the immediate vicinity of the proposed project site include emissions from brick making industry, farming activities, traffic movement and manufacturing industry. Communities living around Mining area may also contribute through domestic fuel burning, biomass burning, and various miscellaneous fugitive dust sources such as agricultural activities, wind erosion of open areas, and vehicle entrainment of dust along unpaved roads.

7.1.7 Acoustic Effects

Due to the nature of proposed mining expansion, several activities trigger noise generation. This includes the preparation of infrastructure, construction activities, movement of machinery in the opencast pits, haul roads and access roads. During the operational phase the new mining activities may have a cumulative impact on the prevailing ambient noise levels. The blasting activity will also produce noise, as well as movement of vehicles to and from the mining sites.

The rehabilitation activities during the decommissioning phase may have a temporarily impact on the environment. The identified noise recipients around the proposed mining site are indicated in Figure 24 below:

Sample Location	Monitoring time	Geo-coordinate Location	L(A)EQ	Lmin (dBa)	Lmax (dBa)	L10	L90	Observation at each location
POINT 1 ENTRANCE GATE	15:55-16:05pm	27.303969 29.554403	46.8	22.3	72.3	48.2	31.8	- Cows - Birds - Heavy wind
POINT 2 SECURITY HOUSE GATE	16:10-16:20pm	27.302632 29.550960	60.0	23.4	87.0	44.3	32.0	- Trees - Birds - Cows - Heavy wind
POINT 3 AREA NEAR DAM	16:30-16:40pm	27.304409 29.550903	76.0	35.4	100.3	74.7	44.4	- Slight rain - Thunder - Birds - Wind & Trees
POINT 4 ASH DUMP AREA	16:59-17:09pm	27.302582 29.551451	73.3	22.5	98.7	68.5	30.4	- Birds - Trees - Individuals talking
POINT 5 CORNER AREA AFTER MAIN GATE	17:27-17:37pm	27.303547 29.555060	34.4	21.6	57.6	35.5	22.7	- Birds - Thunder
POINT 6 FARM HOUSE RESIDENCE	17:44-17:54pm	27.311374 29.553746	36.2	22.6	56.7	37.8	28.7	- Birds - Chicken - Thunder

Figure 26: Noise recipient areas around Mining area (dBA, 2022)

Traffic noise, distant railway noise, domestic type noises and distant industrial type noises contribute to the prevailing ambient noise level in the vicinity of the IDWALA mining area. There is currently no ground vibration as there are no mining activities in the vicinity of the MRA.

7.2 Socio Economic Environment

Various social groups residing around the IDWALA MRA, and surrounding areas influence the land use options. There are various population centres close to the proposed coal mine, including residential townships at Utrech, Ngogo & Newcastle and towards Newcastle (See Figure 17). A

brick making industry exists close to the MRA, as well as neighbouring farming homesteads. The Carbochem industry occurs upstream of the site, on the other side of the iNgagane River. An airstrip and airport also exist within the 7km radius, as well as basic community services around Ngogo Utrech including SAPS, hospitals and libraries.

A busy four-way robot intercession occurs where the road cuts through the MRA. Some portions of the farm were realised to have diggings, indicating the stripping and potential use and sale of topsoil. Mining and agriculture related services as well as skilled and unskilled workmanship are available from all neighbouring townships around Newcastle.

7.2.1 Institutions and social set up

The NLM is the third largest urban area within KZN, forming the border of KZN, with Phumelela in the Free State to the west and Pixley ka Seme in Mpumalanga to the north. The NLM area covers a total area of 1 855 square kilometres and is made up of 31 wards. Newcastle is the main urban centre and economic hub, with an increase of households realised from previous surveys done. Average household size is about 4.3 people per dwelling unit (N2S Consulting, 2021). Generally, the economy of the district municipality has been dominated by three sectors namely manufacturing, mining and community services. The district is predominantly rural and dominated by extensive commercial farmlands, with the main economic sectors including

- manufacturing (35.0%),
- community services (22.2%),
- financial and business services (15.2%), as well as
- trade (8.6%).

However, the local economy is currently dominated by the services sector in terms of output and employment. The contribution of the manufacturing sector is large in terms of output but significantly lower in terms of employment, indicating to the capital intensity of the sub-sectors that dominate in the Newcastle economy, i.e., steel, rubber manufacturing, heavy engineering, cement, chemicals, textiles. The local municipality has been noted to have huge backlogs in the delivery of basic services (electricity, water, sanitation), despite being a hive for economic activity in KZN.

The social institutions governing residents in the area include the local cooperative set ups, farming communities, local municipality, district municipality, national and international frameworks. The closest residential local community is the Ngogo area, Ngogo Utrech and Witklip farmers township communities located around the MRA.

7.2.2 Palaeontological Importance

A palaeontological specialist study done on the mining area farm concluded that no visible evidence of fossiliferous outcrops was found. the Vryheid Formation of the Ecca Group has a Very High Palaeontological Sensitivity, although no fossils were identified during the study. The proposed mining development is underlain by Jurassic dolerite as well as sandstone, shale and grit with coal and oil-shales beds of the Vryheid Formation (Ecca Group, Karoo Supergroup). According to the South African Heritage Resources Information System, the Palaeontological Sensitivity of Jurassic dolerite is Zero as it is igneous in origin and that of the Vryheid Formation is Very High.

The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the Witklip Colliery will be of a moderate significance in palaeontological terms. In cases where fossil remains may be discovered during any phase of construction, operation or closure of the proposed mining development, the Chance Find Protocol must be implemented by the ECO in charge of these developments, and the discoveries should be secured, with information sent to SAHRA so that a palaeontologist can undertake the proper mitigation (documented and collection).

7.2.3 Heritage Importance

A heritage specialist study was done pre-mining. Some graves were spotted during site assessment. A detailed study of the site by the heritage specialist indicated details of areas of heritage importance. Estimated proximity of the identified sites of heritage value to the proposed mining activities was established and mapped. This assisted in coming up with more effective and practicable mitigation measures for the preservation of areas of heritage value, according to the requirements of SAHRA. Inputs from Interested and Affected Parties, as well as surrounding dwellers would assist in identification of other areas of heritage value, as well as information about the identified sites (Figure 25).

7.2.4 Traffic

The relevant properties where mining activities are proposed is currently dissected by Road P93, where the portion north of Road P93 would entail the mining of three opencast pits, to be known as Pit 1, 2, and 3.

Five main road intersections were identified (Figure 26):

A. P93 and Ngogo Utrech Road at the robots, with traffic light traffic control. The point had more than 2000 vehicles passing during peak hours on Traffic count assessment.
B. P93 and Mine acess road, currently a dust farm road. The farm road is rarely used at the moment, but ocassionally.
C. P93 and Ngogo Utrech 12 streeet, with traffic light signal control. The point had more than 1500 vehicles passing during peak hours on Traffic count assessment.
D. P93, P296 road and Ngogo Utrech 8 street with traffic light control. The point had more than 1500 vehicles passing during peak hours on Traffic count assessment.
E. The point had more than 800 vehicles passing during peak hours on Traffic count assessment.

The Traffic Impact Assessment done concluded that basing on manual vehicle traffic counts, evaluations, and calculations, the relevant road sections of Road P93 between Points A and D is currently exceeding vehicle capacity towards Newcastle (Westbound) in the morning Pak Hour and from Newcastle (Eastbound) in the afternoon Peak Hour. Regardless of vehicle traffic anticipated to be generated by the proposed IDWALA Project, road upgrades are required.

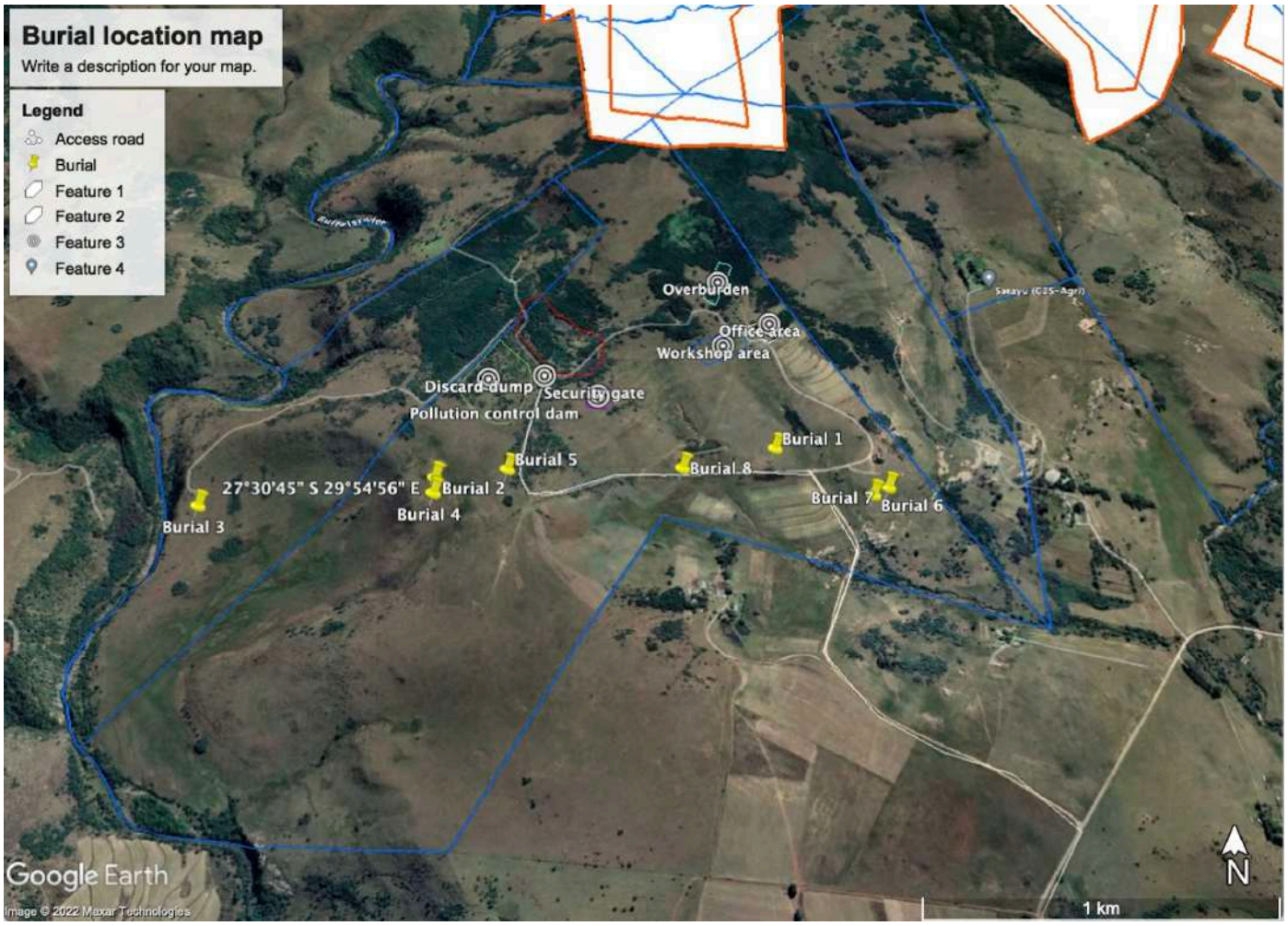


Figure 27: Heritage Sites

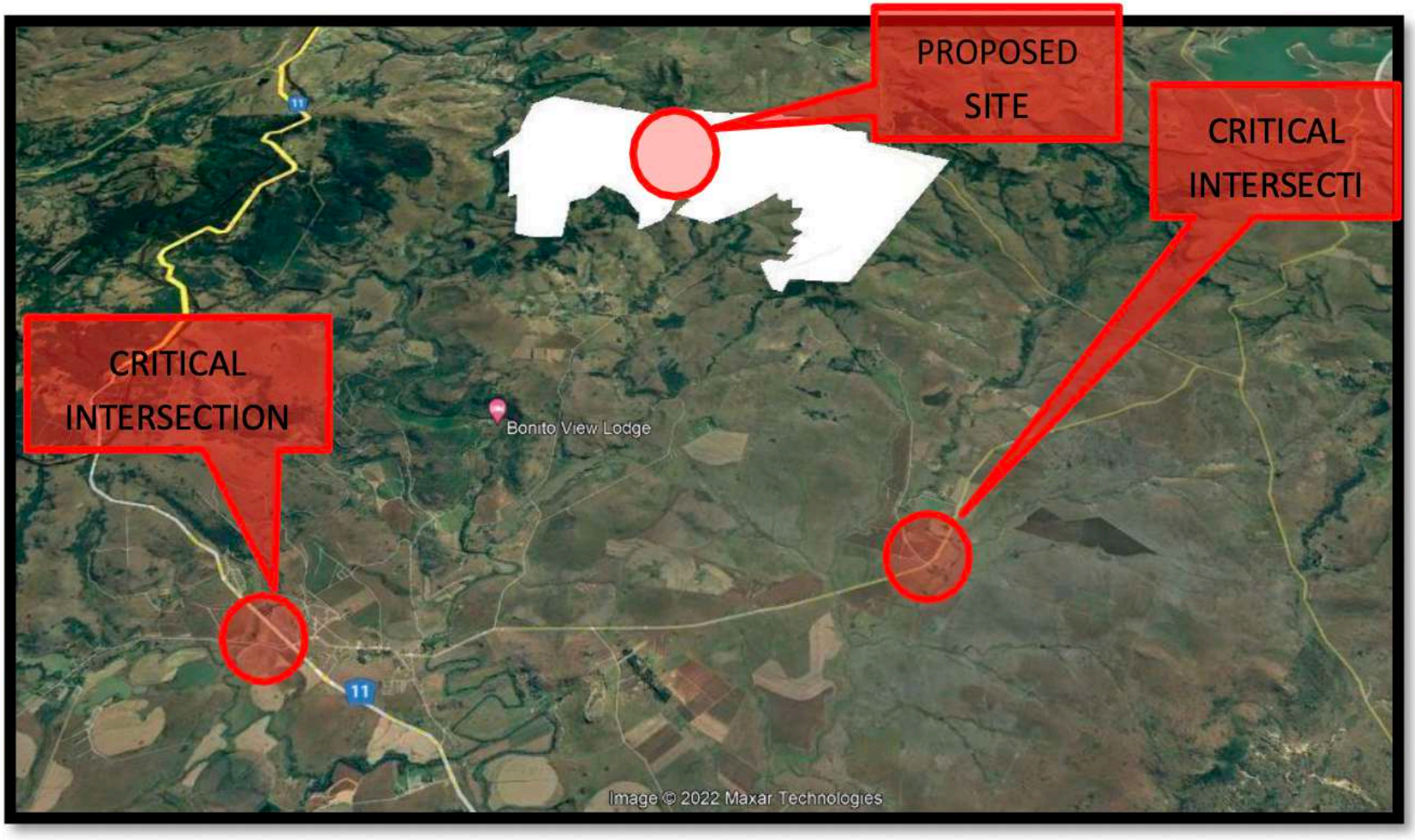


Figure 28: Sensitive Road intersection around proposed Mining Site

Source: Ntlazane, 2022

8. DESCRIPTION OF IMPACTS AND RISKS

Specialist studies were conducted to determine the positive and negative impacts of the proposed coal mining development on the remaining extend of farm Witklip, Dejaag & Tigerkloof near Newcastle. The nature of impacts was also determined, as direct or indirect, reversible or irreversible, cumulative as well as recommended actions of how the positive impacts can be enhanced and how negative impacts can be avoided, managed or mitigated.

The following studies were conducted, and findings of the specialists will be summarised in this chapter:

1. Geohydrological Impact Assessment
2. Surface Impact Assessment
3. Soil Survey and Hydro-pedological Impact Assessment
4. Freshwater Resources (Aquatic) Study
5. Terrestrial Ecology and Biodiversity Impact Assessment
6. Noise Impact Assessment
7. Heritage Study
8. Traffic Impact Assessment
9. Geotechnical Survey
10. Social Impact Assessment

The impacts are discussed according to each phase of the proposed development.

8.1 Planning and Pre-construction Phase

The anticipated potential impacts during the planning and pre-construction phase of development are summarised in Table 19 below. Recommended actions for their mitigation are also suggested.

Table 21: Environmental Impacts during Planning Phase

Activity	**Baseline studies and mine planning**			
Aspect	**Potential Impact**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
Soil	Selected areas are disturbed during soil sampling and study of subsoil strata.	Medium	Closure of all sampling dug holes during field studies.	Low
Surface plant ecology	Trampling during field surveys.	Medium	Existing walkways and farm roads should be used, and tracks used by local people. No plant species should be removed from the study site	Low
Social aspects	Raised social concerns from interested and affected parties as well as regulatory authorities about the proposed project.	Medium	Project intentions to be adequately explained to stakeholders and I&APs such that it is understood. Adequate consultations to be done. Al relevant authorisations should be obtained before commencement of activities.	Low
	Increased movement by specialists during site surveys, and during baseline sampling.	Medium	Consult the site access person and adequately inform residents of the	Low

			presence of specialists when visits are scheduled.	
	Raised concerns on effects of proposed activity on the Ngogo area residential community.	Medium	Stages of development to be clarified, as well as social implications at t farm portion. Project spatial scope and distribution of infrastructure should be explained from the master plan.	Low
	Raised expectations from communities and I&APs.	High	Adequate public consultation with true reflection of the social and labour plan. Engage I&APs throughout the EIA process, with capturing of all concerns raised. Share draft reports before submission to DMRE. Publish information about the project in the local newspaper.	Medium

8.2 Construction Phase of Development

The anticipated potential impacts during the construction phase of development are summarised in Table 20 below. Recommended actions for their mitigation are also suggested.

Table 22: Construction Phase Environmental Impacts

Activity 1	**Stripping and stockpiling of topsoil**			
Aspect	**Potential Impact**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
Land Capability	Stripping and stockpiling of topsoil, with removal of vegetation will diminish current land capability.	Medium	Land capability should be restored as far as possible in the final rehabilitation stage to grazing land as the final land use option.	Low/Medium
	Loss of agricultural grazing land due to excavations.	Medium	Use of underground mining method where applicable to reduce affected surface area coverage. Plan for rehabilitation of land to usable condition on closure.	Low
	Loss of residential land to mining.	Medium	Negotiation with farmers onsite for a working agreement.	Low
Soils	Deterioration in soil quality. Mixing of soil profile layers.	Medium	Minimal disturbances, sticking to targeted operational areas.	Low

	Contamination from hydrocarbon spillages from machinery and vehicle movement.		Separate stockpiling of soil layers. Reasonable stockpile height to preserve vegetation seeds. Remediation of contaminated soils. Immediate cleaning of spillages. Placement of drip trays where machinery is marked.	
Vegetation	Vegetation clearance to mark contractor camps and infrastructure areas. Vegetation disturbance on stockpiling of stripped topsoil.	Medium	Minimal disturbances, sticking to targeted operational areas. Preparation of stockpiling areas with preservation of vegetation seeds for final rehabilitation.	Low
Air Quality	Dust generation during soil stripping and vehicle and machinery movement.	Medium	Material handling should be limited, and distance to stockpiling area to as little as possible. Dust suppression to be done on all roads and material movement areas. Speed limits to be limited to less than 40km/hr within mining area.	Low

			Monitoring of dust fallout and particulate matter necessary to manage extreme levels.	
Noise	Noise generation during soil stripping, vehicle and machinery movements.	Medium	Construct berms around the mining areas to reduce noise to receptors. Install noise silencers in machinery. Provide noise protective equipment for operators.	Low
Social aspects	Soil stripping may affect existing heritage resources, especially graves.	High	Identify all grave sites around affected areas and avoid on location of soil stockpiles. Fence off graves to buffer them from mining activities.	Low
Activity 2	**Construction of Roads.**			
Soils	Clearance of vegetation may expose soils to erosion. Soil susceptible to contamination by hydrocarbons from construction machinery. Soil loss to nearby watercourses during rainy days. Compaction of soils on road construction and maintenance.	Medium	Immediate clean-up of spillages, with provision of adequate spill kits to act when spills occur. Use of drip trays for vehicles and machinery that stand overnight. Regular machinery servicing to reduce chances of drips and spillages. Construct during dry season.	Low

			Plan and implement a stormwater management plan. Rehabilitation and seeding of temporary roads on completion of construction phase.	
Vegetation	Clearance of vegetation along access route as well as haul roads. Loss of sensitive floral species of conservation concern.	Medium	Preservation of indigenous vegetation seeds for final rehabilitation. Identify and relocate species of concern before construction.	Low
Air Quality	Dust generation during road establishment, vehicle and machinery movement.	Medium	Material stripped should be used to berm roads to reduce distance of material movement. Dust suppression to be done on all roads and material movement areas. Speed limits to be limited to less than 40km/hr within mining area. Monitoring of dust fallout and particulate matter necessary to manage extreme levels.	Low
Noise	Noise generation during soil stripping, vehicle and machinery movements.	Medium	Construct berms around the mining areas to reduce noise to receptors.	Low

			Install noise silencers in machinery. Regular servicing of machinery to reduce unnecessary noise generation. Provide noise protective equipment for operators.	
Surface Hydrology	Encroachment into sensitive surface hydrology. Soil material can contaminate surface water through storm water run-off. Surface water contamination from hydrocarbon spillages through runoff.	Medium	Positioning of access roads and haul roads to avoid sensitive surface hydrology areas, with guidance of the delineated wetland map. Immediate clean-up of hydrocarbon spillages onsite. Plan and implement a stormwater management plan. Separate clean and dirty catchment areas with cut off trenches and berms to avoid mixing of dirty runoff into clean catchments. divert surface runoff from mining areas.	Low
Activity 3	**Construction of the opencast pits box cuts.**			

Topography	Excavations due to earthworks and civil works.	High	Demarcate construction sites to manage the ground surface and associated topographic changes. Have barrier signs to prevent access entry to excavated areas for safety reasons.	Medium
Land use	Establishment of mine areas will close off access of land to livestock grazing or other current land use options.	Medium	Establishment of final land-use option with final rehabilitation of all opened areas. Fencing off of mine area to indicate affected areas, while releasing unaffected areas for continued use for current land use options considering safety measures.	Low
Biodiversity	Floral species will be cleared on marking of box cut, with potential loss of species of conservation concern. Faunal habitats will be modified resulting in potential migration of invertebrates and small mammals. Avifaunal species may collide with structures onsite.	Medium	Restrict all construction activities to the immediate targeted area of development. Identify and relocate any floral species of conservation concern at targeted opencast pit mining areas. Honour the surface hydrology buffer zones, as well as flood lines for protection of aquatic life.	Low

			Prevent unnecessary destruction of natural habitats and animal life within the boundaries of the proposed area of development. Any animals may under no circumstances be handled, removed, killed or interfered with by the construction workers onsite. Target construction during winter or autumn when most avifaunal species hibernate. The recommendations of the terrestrial ecologist studies should be implemented	
Soils	Soil profile is disturbed during establishment of box cut.	Medium	Stockpile soil profile layers separately such that the same layers are repeated on closure of the mined-out areas.	Low
	Compaction of soil top layer.	Medium	Avoidance of soil compaction where necessary. Plan for rehabilitation of affected areas on closure.	Low

	Contamination (accidental spillages) by machinery oils and fuels	Medium	Use of spill kits and impermeable surfaces for machinery handling and servicing.	Low
Surface Hydrology	Encroachment into sensitive surface hydrology. Soil material can contaminate surface water through storm water run-off. Surface water contamination from hydrocarbon spillages through runoff.	Medium	Positioning of access roads and haul roads to avoid sensitive surface hydrology areas, with guidance of the delineated wetland map. Immediate clean-up of hydrocarbon spillages onsite. Plan and implement a stormwater management plan. Separate clean and dirty catchment areas with cut off trenches and berms to avoid mixing of dirty runoff into clean catchments. divert surface runoff from mining areas.	Low
Groundwater	Influx of groundwater into opencast pits. Contamination of groundwater by the exposed coal. Contamination of groundwater by pit machinery hydrocarbons.	Medium	Dewatering of water found underground in onsite pollution control dams. Regular removal of water found during mining for safe continuation. Regular maintenance of pit machinery.	Low

	Potential dewatering of surrounding boreholes.		Monitoring of pit water for TPH to manage hydrocarbon contamination. Hydro-census update each year to monitor groundwater level changes and compensate neighbouring users with alternative water sources when affected.	
Air quality	Dust generation during road establishment, vehicle and machinery movement. Increased fugitive dust generation, containing particulate matter which affect the health of recipients.	Medium	Material stripped should be used to berm roads to reduce distance of material movement. Dust suppression to be done on all roads and material movement areas. Dust suppressants or binding agents should be considered for dust suppression. Regulate speed limit to below 20km/hr within haul roads. Speed limits to be limited to less than 40km/hr within mining area. Establish speed humps along the driving ways to reduce speed.	Low

			Monitoring of dust fallout and particulate matter necessary to manage extreme levels. Maintain considerable topsoil heights to reduce chances of soil loss by wind erosion**.**	
Noise	Noise generation during soil stripping, vehicle and machinery movements. Increased noise for surrounding receptors around the proposed mining site.	Medium	Construct berms around the mining areas to reduce noise to receptors. Install noise silencers in machinery. Regular servicing of machinery to reduce unnecessary noise generation. Provide noise protective equipment for operators. Monitor noise at receptors around site and establish communication channels between project managers and noise receptors. Minimise noise producing activities to day shift and reduce noise at bight time.	Low
Social Aspects	Graves identified will be destroyed by the intended pits.	High	Relocate the identified graves which cannot be avoided with consultation of community for identification of relatives of the deceased.	Low

	A grave close to proposed topsoil stockpile area on the southern side of the MRA may be affected by site movements. Land conversion into mining area reduces grazing areas for local farmers with livestock.		Fence off graves close to proposed mining activities to clearly demarcate them and protect them from possible disturbances, with a 50m buffer zone. Fence off affected areas to allow use of unaffected areas for grazing.	
Traffic	Increased traffic around mining area will also increase traffic when construction workers move to and from work. Increased pressure at the junction of the access road into Witklip from R93 main road.	Medium	Manage movement to avoid usual traffic times. Construct an extra offramp space for movement of vehicles into the mine, without obstructing smooth movement of traffic along the main road. Encourage car-pool and bulk delivery of materials in order to reduce the number of trips generated daily.	Low
Activity 4	**Construction of onsite infrastructure (Pollution Control Dams, Stockpile areas, Offices, Workshop, weighbridge and Plant).**			
Surface hydrology	Encroachment of site infrastructure into wetlands and streams.	High	Honour the 100m buffer zones and flood lines or according to requirements of the	Low

			National Water Act 36 of 1998 and its regulations.	
	Increased sedimentation of surface hydrology due to increased runoff from bare grounds.	Medium	Plan and implement a stormwater management plan to contain site runoff from clean catchment.	Low
	Disturbance of sub surface flow due to compaction on movement, preparation of stockpile areas and other construction activities.	Medium	Sticking to necessary selected areas for movement and construction.	Low
	Contamination of surface water sources from construction debris.	Medium	Avoidance of potential surface water contamination by buffering water resources from construction work.	Low
	Loss of water from farm dams.	Medium	Maximal utilisation of farm dam water during mining construction, after authorisation. Avoidance of abstraction from unauthorised sources.	Low
Air quality	Dust generation during site establishment, vehicle and machinery movement.	Medium	Material stripped should be used to berm roads to reduce distance of material movement.	Low

	Increased fugitive dust generation, containing particulate matter which affect the health of recipients.		Dust suppression to be done on all roads and material movement areas. Dust suppressants or binding agents should be considered for dust suppression. Regulate speed limit to below 20km/hr within haul roads. Speed limits to be limited to less than 40km/hr within mining area. Establish speed humps along the driving ways to reduce speed. Monitoring of dust fallout and particulate matter necessary to manage extreme levels. Maintain considerable topsoil heights to reduce chances of soil loss by wind erosion**.**	
Social aspects	Supply chain opportunities will be created that could benefit local suppliers, with possibility of procurement from Newcastle and Utrecht.	Medium	Update the Social and Labour Plan on commencement. Procurement of suppliers must be as per the SLP and standards.	Highly positive

			Conduct a local skills assessment to ascertain what skills are available that may meet supply chain requirements.	
	Approximately 150 temporary employment opportunities will be created during the construction period, for purposes of site clearing, fencing, civil works, trench digging and construction etc. Influx of job seekers from residential areas around Amajuba District Municipality and other outside areas. Potential conflicts may arise due to competition between local job seekers and those from outside KZN.	Medium	Apply the SLP employment and procurement policies and procedures (e.g., do not employ at the mine gate) to prevent unnecessary influx by jobseekers. Ensure compliance with legal requirements such as BBEE and Mining Charter. Display construction periods on noticeboard along the R93 main road. Monitor the social performance of construction contractors and encourage communication among all site personnel and contracting companies with local leadership channels.	Highly positive
	Damage to areas of heritage value.	High	Avoidance of heritage sites where possible, or relocation of sites to reserve heritage value with consultation of relevant heritage authorities such as SAHRA expertise.	Medium

	Community health and safety: Increased road accidents where the R93 is branched off into mine access. Increased theft due to the new development activity, especially for diesel. Unauthorised access and trespassing. Increased fire hazard where site is under establishment. Increased HIV/AIDS and communicable disease proliferation among temporary workers.	Medium	Extra road surfacing to allow ease of offramp into mine area from main road. Fencing off mine site, with appropriate signage indicating mining area. Manned mine gate and security check point. Establish open fire areas, braai areas as well as designated smoking areas to control open fires. Provide appropriate PPE for mine workers for visibility both during day and night hours. Plan and implement an emergency and safety plan. Implement appropriate truck and mine vehicle tagging procedures for visibility both during day and night hours. Provide adequate water, sanitation and social support for employees. Safety barricades should be established whenever construction is underway, with	Low

			excavations and high walls for protection of passers-by.	
Visual aspects	Reduced aesthetic value due to clearance of vegetation on construction sites.	Medium	Land clearance only where necessary. Maintenance of topsoil stockpiles at considerable heights.	Medium
	General topography of the area disturbed, resulting in an unpleasant visual appearance.	Medium	Plan for rehabilitation of mined out areas at project closure.	Low
Biodiversity	Floral species will be cleared on establishment of site infrastructure, with potential loss of species of conservation concern. Faunal habitats will be modified resulting in potential migration of invertebrates and small mammals. Avifaunal species may collide with structures onsite. Potential failure to obtain permits (from the relative authorities) for protected floral species that must be removed/ relocated	Medium	Restrict all construction activities to the immediate targeted area of development. Identify and relocate any floral species of conservation concern at targeted opencast pit mining areas. Honour the surface hydrology buffer zones, as well as flood lines for protection of aquatic life. Prevent unnecessary destruction of natural habitats and animal life within the boundaries of the proposed area of development.	Low

	before the commencement of vegetation clearing activities.		Any animals may under no circumstances be handled, removed, killed or interfered with by the construction workers onsite. Target construction during winter or autumn when most avifaunal species hibernate. The recommendations of the terrestrial ecologist studies should be implemented. Identify threatened vegetation species and submit timely applications for potential permit requirements.	
	Loss of vegetation due to land clearance for open cast pits.	Medium	Reservation of topsoil rich in natural vegetation seeds for future use in rehabilitation. Complete closure on rehabilitation to re-establish the land use option.	Low
	Loss of habitats.	Medium	Reservation of topsoil rich in natural vegetation seeds for future use in rehabilitation.	Low

			Reservation of similar habitats around the proposed development area as potential migration sites. Relocation of potentially threatened species.	
Activity 5	**Construction of overhead conveyor belt.**			
	In addition to construction noise, air quality impacts:			
Site infrastructure	Encroachment into the power line infrastructure that runs parallel to the R93 main road passing through the MRA.	Medium	Observe the electricity line servitude and consider the height of the grid infrastructure versus the proposed height of the overhead conveyor belt. Consult Eskom for guidance on establishment of the conveyor belt.	Low
	Disturbance of movement along the R93 regional road passing through the MRA.	Medium	Observe road servitude requirements and regulations for conveyor belts crossing regional roads. Schedule disturbing activities to night times when traffic is minimal.	Low

Traffic	Obstruction of traffic during establishment of overhear conveyor belt, with potential temporary closure of the regional road.	Medium	Schedule disturbing activities to night times when traffic is minimal. Assemble conveyor components at free space with no traffic effects, and plan actual erection and construction activities above the road to allow disturbances only when necessary.	Low
	Traffic effect on additional traffic introduced as a result of mine construction activities. Increased load on existing P93 regional road.		A formal application for access to and from P279 / D377 would need to be done before the detail design phase at the KwaZulu-Natal Department of Transport. Detailed investigations should be conducted in conjunction with the relevant roads authority in terms of the existing quality and potential life span of the existing road surface layers of the roads where consumables, processed product and workers will be transported	

	Generating a high volume of vehicle trips with specific reference to heavy vehicles could contribute to a higher rate of deterioration of road surfaces and layers shortening the lifespan of a specific roadway.	High	A road maintenance plan should be prepared in conjunction with the relevant roads authority on public roads.	Medium
Social aspects	Safety during construction of the overhead conveyor belt.	Medium	Observed procedures and necessary precautionary measures for working at heights. Engage skilled personnel for establishment of the infrastructure for safety of workers as well as road users.	Low

8.3 Operation Phase of Development

The anticipated potential impacts during the operation phase of development are summarised in Table 21 below. Recommended actions for their mitigation are also suggested.

Table 23: Operation Phase Environmental Impacts

Activity 1	**Mining of coal at opencast pits and underground shaft.**	

Aspect	Potential Impact	Significance before mitigation	Mitigation measures	Significance after mitigation
Groundwater	Influx of groundwater into opencast pits and underground shaft. Contamination of groundwater by the exposed coal. Contamination of groundwater by pit machinery hydrocarbons. Potential dewatering of surrounding boreholes Potential generation of acid mine drainage.	Medium	Dewatering of water found underground into onsite pollution control dams. Containment of shaft water in underground sump. Regular removal of water found during mining for safe continuation. Regular maintenance of pit machinery. Monitoring of pit water for TPH to manage hydrocarbon contamination. Hydro-census update each year to monitor groundwater level changes and compensate neighbouring users with alternative water sources when affected. Treatment of the decant, if determined, may be viable, but all passive methods should be investigated first during the operational phase of the mine.	Low

	Effect of groundwater abstraction on recharge of soil water and wetland sustenance	Medium	Preserve buffer zones for wetland areas. Manage abstraction and consider environmental water requirements. Monitor groundwater levels for early warning of effects.	Low
Surface hydrology	Infrastructure encroaching into natural areas leading to extensive and unnecessary loss of important faunal habitat: opencast area originally showing encroachment into surface stream buffer zones.	High	Align activities to be outside of the sensitive Freshwater Habitat and to demarcate sensitive habitat occurring outside of the direct project footprint. Implement the approves Master Plan.	medium
	Impaired water quality and reduced flow of water within watercourses due to mining activities within drainage and wetland areas	High	Rehabilitation of mined out areas on closure, allowing free flow of surface water. Avoidance of wetland buffer zones on mining activities.	Medium
	Reduced coal reserves as coal will be continually mined out.	Medium	Positive impact. Increase coal extraction and improved energy production in the national economy.	Medium
Sociocultural	Graves were identified inside proposed areas.	High	Relocate graves if they cannot be avoided, before mining of these pits commences.	Low

Soils	Potential failure to concurrently rehabilitate bare or disturbed sites as soon as the mining activities have occurred will potentially result in loss of viable soils, increasing erosion risk and/or permitting the proliferation of AIPs.	Medium	Regularly assess potential erosion with immediate recovery of lost soils and closure of erosion gullies. Prioritise concurrent backfilling of mind out areas to minimise soil vulnerability to erosion.	Low
	Excavation and compaction of soil leading to increased runoff and sedimentation of downslope habitat during times of high rainfall.	Medium	Plan and implement a viable stormwater management plan. Vegetate bar grounds.	Low
Land Capability	Land subsidence from underground mine tunnels,	High	Adequate safety precautions on establishing mine shafts. Adequate training of personnel involved on underground mining activities.	Medium
Visual	The opening of opencast pits will have negative visual impacts on the surrounding residential areas, with deep excavations and concentration of mining machinery.	High	Establish a high wall to block visual impacts on adjacent residential areas. Walls/berms/barriers to be built as close as feasibly possible to the pit boundaries to a height of at least 2 - 3 m higher than the line of sight to the top of the stack and in relation to receptors.	Medium

Air quality	Dust will be generated due to machinery movement into and out of the opencast pit. Dust will also be generated during stockpiling of material and concurrent rehabilitation activities. Blasting will also produce considerable dust at blasting times.	High	Dust suppression should be done within pit access roads and ramps. Limited material movement should be done, with back filing of subsequent box cut to reduce material handling. Blasting times should be minimal and limited to daytime hours, following professional blasting procedures and post blasting assessments. Eco-friendly explosives should be used. Maintenance of berms should be targeted for wet days and slow wind speed days.	Medium
Biodiversity	Habitat fragmentation resulting from poorly rehabilitated areas and inadequate planning for migratory corridors following the proposed mining activities.	High	Relocation of identified species of conservation concern before establishment of pits.	Low
	Elimination of surface vegetation (This impact is more on open cast areas and less on underground mining area).	High	Revegetation of cleared areas on closure. Relocation of any threatened plant species. Vegetation clearance only on targeted pit areas around the site to minimise footprint.	Low

	Dust generation affects plant species through deposition on plant leaves.	Medium	Reduce potential dust generation by dust suppression and reduce onsite driving speed limits.	Low
	Dumping of overburden, topsoil and product outside of designated areas, leading to the loss of faunal habitat and promoting the establishment of AIPs in these disturbed areas	Medium	Stick to stockpiling at designated areas according to the approved master plan.	Low
Activity 2	**Stockpiling (Overburden, ROM and Product coal, discard)**			
Soils	Contamination of soils by coal material.	Medium	Handling of coal at designated stockpiling areas that are lined according to approved civil designs. Avoidance of material mixing.	Low
	Compaction of stockpiled topsoil leading to loss of viable soils for rehabilitation.	Medium	Avoidance of keeping stockpiles for long periods of time to avoid deep compaction.	
	Inefficient vegetating of stockpiled topsoil resulting in degradation of soils and limiting reuse for rehabilitation activities	Medium	Vegetation and seeding of stockpiles to preserve the soils and vegetation seeds.	
	Potential contamination of topsoil stockpiles with alien invasive species propagules.	Medium	Promote indigenous vegetation growth. Eradication of invasive alien species.	

	The movement, storage, and redistribution of soil during mining can disrupt the community of soil microorganisms and consequently nutrient cycling processes.	**Medium**	Rehabilitation or reclamation of affected areas on closure. **Minimise material handling.**	
Visual	High stockpiles giving hilly visuals to surroundings.	High	Utilise all stockpiles on closure and rehabilitation. Shape stockpiles to reduce chances of soil loss. Vegetate stockpiles to depict the natural environment.	Medium
Activity 3	**Operation of site infrastructure (weighbridge, workshop, site offices, Coal crushing, screening and washing plant, conveyor belts)**			
Soil	Contamination of soils from maintenance on bare grounds, coal spillages, hydrocarbon spillages and drips from machinery.	Medium	Regular servicing of machinery and vehicles. Containment of extra coal weight at the weighbridge. Use of drip trays when servicing machinery. Maintenance of machinery on lined grounds at the workshop. Immediate clean-up of coal spillages along the roads.	Low

			Provision of adequate spill kits. Awareness training of site employees on management of spillages.	
	Soil erosion due to exposed bare areas.	Medium	Set up and implement an Erosion Control Plan. Design adequate stormwater management measures for site management.	Low
Biodiversity	Spread of invasive alien species from the development footprint to surrounding natural habitat. Loss of floral habitat outside of the direct, authorised mining footprint.	Medium	Design and implement an Alien Invasive Plant (AIP) Management/Control plan before the commencement of operational activities. Biodiversity Management Plan to be developed and ready for implementation before commencement of mining activities.	Low
Surface hydrology	Impacts on water quality.	High	Collect all dirty runoff in onsite PCDs. Monitor surface water quality as directed by the water use license when issued. Establish stockpile areas according to approved liner requirements. Line all dirty runoff infrastructure to avoid seepage.	Medium

	Loss of freshwater habitat and ecological structure.	High	Maintain surface water buffer zones as no go areas for mine activities. Conduct biomonitoring biannually to establish changing trends during wet and dry seasons.	Medium
	Loss of wetland functionality.	High	Adequate baseline wetland specialist study and regular monitoring to determine extent of impacts, for recommendation of appropriate mitigation measures.	Low
	Potential erosion stemming from soil left bare leading to sedimentation of downslope faunal habitat, especially within Freshwater Habitats	High	Regularly assess erosion potential, with immediate closure of erosion gullies and erosion control site strategies such as use of gabions, vegetation of bare areas and terracing to reduce runoff velocity.	Low
	Impacts on the hydrology and sediment balance of the freshwater resource.	High	Avoid wetland encroachment by mine operations. Allow free flow of clean catchment runoff to recharge wetlands.	Medium

	Reduction of natural flow drainage to the environment as the runoff within mining area will be contained and not allowed to leave the mine as it used to before.	Medium	Conserve clean catchments to avoid contamination of natural flows by coal mining activities.	Medium
	Displacement and destruction of wildlife and faunal habitats.	Medium	Revegetation of affected areas on closure. Minimise affected areas.	Low
Activity 4	**Coal product transportation**			
Traffic	Location of a development access road from existing roads has a direct impact on the existing road operations, level of service and capacity.	Medium	Regular road maintenance should be scheduled and implemented. Mining development provide road safety training to all staff. Implement road improvement recommendations from Traffic Impact Assessment report.	Low
	Increased traffic poses safety concerns for all road users.	Medium	Implementation of speed measuring and law enforcement.	Medium
	Increased road accidents at intersections.	High	Implementation of dedicated turning lanes as part of design phase only.	Medium

			Provision of dedicated loading and off-loading facilities on site and at access intersections. Implement road improvement recommendations from Traffic Impact Assessment report.	
	The conflict between vehicles and pedestrians could lead to fatalities.	Medium	A split between pedestrians and vehicles should be opted for in order to create a safe environment for pedestrians. Possibility of revamping the railway and establishment of a railway siding would ease transportation and reduce risk of conflicts. Implementation of pedestrian walkways at access intersections and on site.	Medium
Activity 5	**Onsite services**			
Groundwater	Contamination of groundwater from leaking septic tanks.	Medium	Management of septic tank with scheduling of emptying and timely disposal offsite. Provision of adequate septic tank capacity for all onsite sanitary services. Monitoring of groundwater quality.	Low

	Drawdown from abstraction for water for domestic supply from a borehole.	Medium	Maintain abstraction within authorised volumes. Monitoring of groundwater levels and update of hydrocensus regularly.	Low
Surface hydrology	Contamination of surface water from septic tank overflows.	Medium	Management of septic tank with scheduling of emptying and timely disposal offsite. Provision of adequate septic tank capacity for all onsite sanitary services. Location of septic tanks at appropriate locations away from watercourses. Adequate servicing of movable chemical toilets at construction and mining sites.	Low
	Contamination of surface water from poor solid waste disposal and management.	Medium	Separation of waste types, with provision of adequate waste receptacles at lined grounds for collection and temporary storage of waste.	Low
Aesthetics	Littering and poor solid waste management onsite causing unpleasant aesthetic conditions onsite.	Medium	Provision of adequate waste receptacles with covers.	Low

			Avoid littering but educate site workers on waste management, with labelling of waste receptacles to guide waste disposal.	
Biodiversity	Loss of habitats and flora from fires that are started from site activities.	Medium	Allocate specific sites for open fires, including braai and smoking. Avoid open fires onsite.	Low
Soils	Compaction of soils due to establishment of parking areas and hard park, diesel bay and surface infrastructures.	Medium	Rehabilitation of compacted areas on closure. Plough and rehabilitate with seeing of vegetation.	Low
	Contamination of soils by sewage wastewater from poor septic tank disposal and management.	Medium	Management of septic tanks, with timely emptying and leak detection.	Low

8.4 Decommissioning and Closure Phase

The anticipated potential impacts during the decommissioning and closure phase of development are summarised in Table 22 below. Recommended actions for their mitigation are also suggested.

Table 24: Decommissioning Phase Environmental Impacts

Activity	**Decommissioning of site infrastructure including weighbridge, workshop, mine offices, diesel bay, conveyor belts.**

Aspect	Potential Impact	Significance before mitigation	Mitigation measures	Significance after mitigation
Groundwater	Reduced land use functions due to mining activity.	Medium	Rehabilitation mimicking original layers with overburden rock, subsoil, and topsoil on the ground surface to allow regeneration of natural soil profile.	Low
	Acid mine drainage towards the decant point.	High	Regularly update groundwater study to determine probability of AMD. If determined, recommended measures should be implemented to manage adverse effects of AMD. A detailed decant management plan will be developed at mine closure. If determined, water treatment solutions, either passive or active, should be implemented. Monitoring of the water table rebound will continue through closure and post-closure	Medium

			and the modelling updated to quantify the long-term impacts.	
Soils	Reduced infiltration due to compaction of mining areas.	Medium	Decompaction of affected soils and revegetation. Re-instatement of the stored soils onto areas of disturbance where infrastructure has been demolished and removed.	Low
Vegetation	Proliferation of alien species that colonise in areas of increased disturbances and that outcompete native species, including the further transformation of adjacent natural habitat.	Medium	A mix of indigenous grass seeds can be used during rehabilitation.	Low
	Potential failure to monitor the success of relocated floral species of conservation concern.	Medium	Monitoring the relocation process as well as success of floral species when relocated to new areas.	Low
	Vegetation succession and a possible reduction of faunal diversity and occurrence of potential faunal SCC over the long-term	Medium	Seeding of indigenous faunal diversity on closure and rehabilitation of mined out areas.	Low
	Potential poor management and failure to monitor rehabilitation efforts, leading to	Medium	Rehabilitation of all mined out areas on closure, to the original ground level.	Low

	fragmented landscapes and a decrease in faunal diversity;		No additional habitat is to be disturbed during the decommissioning & rehabilitation phase of the development.	
Air Quality	Generation of dust on digging out concrete surfaces and movement of machinery.	Medium	Dust suppression with water. Enhancement of natural revegetation through seeding and topsoil covering. Demolition should be performed during slow or non-windy and wet periods.	Medium
Surface Hydrology	Re-colonisation of rehabilitated mined out areas.	Medium	Enhancement of fauna re-colonisation through enhanced revegetation providing appropriate habitats for fauna.	Medium
Social aspect	Loss of employment on closure.	High	Potential expansion of mining activity to new areas. Skills development of mine employees for potential future employment in diverse fields through the implementation of the SLP.	Medium
Activity	**Closure of mining voids.**			
Groundwater	Contamination from coal and underground rock deposits.	Medium	Dewatering mine water for safe continuation of mining and avoid further contamination on adjacent underground water resources.	Low

			Monitoring and management of decant point, if applicable. All mined areas should be flooded as soon as possible to minimise oxygen from reacting with the remaining pyrite. Mining should remove as much coal as possible from the underground and separate acid forming and non-acid forming material.	
Surface Water	Reduced recharge from infiltration due to soil compaction.	Medium	Revegetation to re-instate subsurface soil moisture holding capacity on closure.	Low
	Contamination from mine pit seepages.	Medium	Adequate and sequential rehabilitation of pits and PCD areas.	Low
Soils	Compacted soil with reduced infiltration of water.	Medium	Revegetation of bare areas on closure of voids. Contour and stabilise slopes to be free draining and limit/control vehicle movement and dirty water outflows. Planting of required vegetative cover and irrigation if required, will reduce/mange	Low

			erosion, decrease compaction and stabilise the land capability.	
Surface Hydrology	Stressed wetland functions due to impacts of mining activities.	Medium	Rehabilitation on mining sites to encourage subsurface flow and wetland regeneration.	Low
Activity	**Topsoil rehabilitation and revegetation**			
Land capability	Restoration of land capability to end land use option of grazing. Rehabilitation (spreading of soil, re-vegetation & profiling/contouring) will be done. Reshaping and restructuring of the landscape will be done, with profiling of discard dump and waste rock to enhance vegetation cover and reduce wind erosion from such surfaces post mining.	Medium	Close all mining voids and utilise as much stockpile material as possible to restore the land topography to original ground levels. Allow and enhance revegetation of affected areas using indigenous grass species to allow land use for grazing. Enhance erosion control measures, as well as landscaping to improve land capability and aesthetics.	Low
Air quality	Increased dust generation during closure activities.	Medium	Dust suppression on the affected grounds. Use of dust suppressants.	Low
Noise	Increased noise levels from vehicle and machinery movements on the access and haul roads during decommissioning.	Medium	Noise suppression devices on machinery.	Low

8.5 Post Mining Stage

The anticipated potential impacts during the post mining phase of development are summarised in Table 23 below. Recommended actions for their mitigation are also suggested.

Table 25: Post Mining Phase Environmental Impacts

Environmental Aspect	Potential Impact	Significance before mitigation	Mitigation	Significance after mitigation
Aesthetic	Poor landscape due to stockpiled and dug out areas.	High	Rehabilitation of mined out areas and stockpiles to original ground level as far as possible. Utilise discard dump for backfilling of mined out voids.	Medium
Groundwater	Reduced ground water levels.	Medium	Enhancement of groundwater recharge. Continued monitoring pf groundwater quantity and quality.	Low
Surface Water	Contamination from mining site areas.	High	Rehabilitation of affected areas.	Medium

			Monitoring to detect environmental change and propose appropriate mitigation measures. Continued monitoring pf groundwater quantity and quality. A detailed decant management plan will be developed at mine closure. If determined, water treatment solutions, either passive or active, should be implemented. Monitoring of the water table rebound will continue through closure and post-closure and the modelling updated to quantify the long-term impacts.	
Social aspects	Isolated communities with reduced working sites in the area.	Medium	The impact will be minimal since the site is within a developing area, with surrounding industries and developed residential areas.	Medium

			Losed mine area can be made available for other land use options on closure. Counselling of mine workers and assistance poet employment should be offered. A retrenchment programme should be developed and communicated with mine workers.	

8.6 Cumulative Impacts

Cumulative impacts are herein described as the impacts that would be significant when combined with the same impact arising from another activity within and around the area of the proposed project. These include those that has been assessed as being insignificant, and significance may increase with time (Table 24).

Table 26: Summary of potential cumulative impacts

Activity	**Mining of coal from opencast pits and underground shaft areas.**

Environmental aspect	Potential impacts	Significance before mitigation	Mitigation measures	Significance before mitigation
Groundwater	The exposure of groundwater to coal deposits may lead to formation of acidic conditions and formation of acid mine drainage over time.	High	• It is highly recommended that the groundwater study be done every year to update the groundwater numerical model and prediction of AMD. • The hydro census should also be updated.	Medium
	There may be decant of mine contaminated water over the years towards a potential decant point.	High	• Annual groundwater study should be done with progress of the mine of life, and schedule of mining blocks, such that potential decant can be predicted and mitigation measures proposed.	Medium
Surface Hydrology	Wetland areas around the mining area may be lost especially in their hydrological functionality, as well as support of aquatic ecosystems.	High	• Wetland buffer zones should be honoured on implementation of the development project components. • Recommended mitigation measures should be implemented for wetland and surface watercourses such that the	Medium

			aquatic ecosystems may be maintained.	
Land capability	Land subsidence as a result of underground mining.	High	• There should be adoption and use of appropriate supporting structures underground during mining. • The correct implementation of proposed underground board and pillar mining method is important in minimising potential subsidence. • Remining and stripping of pillars for coal after areas have been mined out should be avoided or done after specialist studies on feasibility and potential impacts.	Medium
	Creation of sink holes on mined out areas. The proposed IDWALA mine, however, is a deep level hard rock underground mine and it is anticipated that subsidence and subsidence are unlikely to occur.	Medium	• Update groundwater studies as mine progresses to identify any new potential impacts and possibilities of land subsidence. • Proper rehabilitation of mined out areas should be done, with	Medium

			compaction and mimicking of natural soil layers in the oil profile.	
Soils	Indigenous vegetation seeds in topsoil may be lost for revegetation on closure if the topsoil stockpiles are left for a long time to harden and compact.	Medium	• Stockpiles should be utilised for concurrent rehabilitation, and not left for long period of time, reducing the exposure of soils to potential erosion and loss of vegetation.	
Biodiversity				
Floral diversity	Fragmentation of the identified habitats especially at the areas directly affected by the open cast pits and surface infrastructure will result in lose of floral species that are adapted to the four identified habitats.	High	• Avoidance of sensitive environments. • Relocation of floral species of conservation concern. • Disturbances should be limited to areas of development alone. • On closure, he finally rehabilitated land should mimic the environmental conditions before commencement of development activity.	Medium
Faunal diversity	Habitat fragmentation and edge effects will diminish the distribution and abundance of faunal species adapted to the disturbed	Medium	• Relocation of faunal species of conservation concern if identified, to alternative habitats around the area.	Medium

	ecosystems. The changes will also cause reduction in movement of remaining naturally occurring and isolation of pockets of vegetation as well as small animals living in such environments.		• Disturbances should be limited to areas of development alone.	
Socio-economic	The proposed IDWALA mining project will result in several economic benefits for local communities through direct and multiplier effects. These effects are usually stimulated by wage bills, procurements and investment into LED The proposed Project will contribute to positive impacts of mining development on local economic development by applying best practice in terms of local employment and procurement, as well as LED.	Highly positive	• Enhancement of positive impacts, to realise more unemployed groups benefiting, small and medium scale service providers from the community as well as skills development to improve local livelihoods. • Contributions to local development, with consultation of municipalities.	High
Visual impacts	The construction and operation phases with introduction of infrastructure at Witklip farm portion for IDWALA mine operations will increase the cumulative visual impact of mining	High	• Creation of a visual barrier around the mining area.	Medium

	infrastructure within the Amajuba District, at this area. The overland conveyor belt from northern side to the southern side over the main road will also change the outlook of the immediate surroundings.		• Proper rehabilitation of all mining voids on mine closure to restore land to original ground level. • The significance of the proposed IDWALA southern side mining activities will be medium as the main mining activities will happen underground and the footprint of the proposed surface infrastructure is relatively small.	
Traffic	From construction to the entire operational phase, operations at IDWALA will contribute to a regional increase in heavy vehicles on the roads in the region, as trucks come in and out of IDWALA mine to ferry coal product to the markets. Small vehicles will also increase on the roads as workers go in and out of the mining site for their different working shifts.	High	• The possibility of the railway siding could be explored to reduce number of truck loads required to carry product coal to the markets. • Busses and transport clubs should be considered to reduce the number of small vehicles required to bring workers to IDWALA. A workers' bus would carry more people at the same time rather than each individual	Medium

			coming to work with their own vehicle.	

9. SUMMARY OF SPECIALIST STUDIES

A number of specialist reports were done on the study area. The following table summarised recommendations from the specialist studies:

Table 27: Summary of specialist reports recommendations.

Study	Recommendations	Inclusion in EIA	Reference
Geohydrology	i. Mitigation and management measures as set out in this report should be implemented as far as practically possible. ii. It is recommended that groundwater monitoring as outlined in this report be implemented to serve as an early warning and detection system for the impact on environmental receptors and contaminant migration from the site. iii. Monitoring results should be evaluated and reviewed on a bi-annual basis by a registered hydrogeologist for interpretation and trend analysis for submission to the Regional Head: Department of Water and Sanitation. iv. It is recommended that additional monitoring boreholes be established with the assistance of a detailed geophysical survey aimed to site preferential pathways and potential drilling localities. v. Groundwater flow modelling assumptions should be verified and confirmed. The calibrated groundwater flow model should be updated once more detailed information becomes available with regards to the mine schedule. Going forward to model should be updated on a bi-annual basis as newly gathered	Yes	Impact tables 19 to 23

	monitoring results become available in order to be applied as groundwater management tool for future scenario predictions. vi. A detailed mine plan and mining schedule is required to accurately determine the potential decant rates as it contains information relating the possible conduits of the decant, such as the location of shafts and connections between the underground and opencast workings. The potential and rate of decant should be reassessed when detailed mine plans are available. vii. It is recommended that a geochemical update assessment be conducted to confirm the potential for acid generation once the mine is in its operational phase. viii. Water level recovery of the underground voids as well as backfilled opencast pits be monitored on a continual basis. ix. Alternative remedial options to reduce rainfall recharge and effective infiltration, which will lead to an increase in leachate volumes, should form part of the mine closure and rehabilitation strategy. x. All preferred groundwater flow pathways which are in direct connection with surface topography i.e., adits, ventilation shafts and/or unrehabilitated exploration boreholes should be sealed off and rehabilitated.		
Soils and Hydropedology	i. The following recommendations were provided by the hydropedologist specialist study:	Yes	Impact tables 19 to 23

	ii. CVB1 has a large source area in HSS4, which should be largely unaffected by the mining activities due to the soil type and underground mining below HSS4. HSS4 is dominated by Arcadia and shallow soils. iii. Therefore, surface runoff is a dominant flowpath. However, opencast area will have a large influence on CVB1. iv. The placement of all the original 7seven opencast pits is seriously concerning and not adhering to buffer regulations. It is reccomennded that the design of the mine be reevaluated.		
Biodiversity	The following recommendations have been made regarding the proposed mining layout: i. It is thus advised that no surface mining and infrastructure development occur within the Freshwater habitat. Development within the wetlands and rivers and associated zones of regulation be managed in consideration of the mitigation hierarchy as advocated by the DEA, 2013; and ii. Existing Transformed Habitat should be investigated and thus maximised for surface mining and surface infrastructure development over the placement thereby within more intact vegetation, including the Secondary Grassland and Rocky Grassland Habitats.	Yes	Impact tables 19 to 23
Air Quality	i. All complains from the neigbouring communitites with regards to air quality impacts of the mine must be logged in a register created and kept on site.	Yes	Impact tables 20 to 23

	communitites must be engaged frequently to understand if there are any compliants with regards to air quality. ii. Spraying of water on the paved and unpaved roads is must be conducted to reduce the emissions entrained in vehicles especially in the dry seasons or when the ground is dry. iii. moisture addition (wet suppresion techniques) must be used control emisions of dust, particularly when dry material is handled or stockpiled. iv. Top soil stockpiles and rehabilitated land must be re-vegetated. v. New ground must only be cleared, stripped and stockpiled only when absolutely necessary. vi. Surfaces should be re-vegetated or otherwise rendered non-dust forming when inactive. vii. Containment of loose soil materials must be sufficiently enclosed or efficient dust suppressing measures. viii. dropping height for material handled should be reduced to as low as practically possible with transfer schutes used to reduce emissions. ix. The conveyor x. Catalytic convetors must be present in every motor vehicle used for operation on-site.		

	xi.	Vehicle idle times must be as low as practically possible to reduce tail pipe emissions on site.		
	xii.	Roads must be paved where pratical.		
	xiii.	A speed limit of 15 km/h must be imposed on all the unpaved roads on site.		
	xiv.	Soil stabiliers must be applied on the unpaved roads where practical.		
	xv.	Wind breakers must be used were practical for protecting stockpiles from wind erosions.		
	xvi.	Continous PM 10 monitoring is recommended for both the North (Near Ngogo Utrech) and South (Near Ngogo area) to note any PM 10 exceedances on site which will have an impact on the neighbouring communitites.		
	xvii.	It is reccomended that dust fallout monitoring commences 6 months prior to constructions followed by the PM 10 monitoring and SO_2 and NO_x monitoring in the operational phase.		
	xviii.	If PM 10 and dust fallout emissions exceed the prescribed limits, the additional suppresions techniques must be investigated.		
	xix.	An emission model must be conducted to predict ground level concentrations for PM 10, PM 2.5, SO_2 and NO_x with and without the mitigation options prescribed in this study to compare to the legal thresholds.		
Surface hydrology	i.	The wetlands, and the associated 100m setback as defined in regulation GN704 should be demarcated and defined as a guideline as to the area in which no	Yes	Impact tables 20 to 23

	mining activities should be developed and should be marked as a no-go area unless it is unavoidable to mine these areas to ensure optimal and economically feasible mining of the resource. ii. It is recommended that a scientifically derived buffer considering hydro pedological principles be defined and used to guide the final extent of the mining pits unless it is deemed acceptable to mine through some wetland HGM units. iii. All stockpiles should be located outside of the 100m GN704 Zone of Regulation of the wetlands to prevent sedimentation of the wetlands. iv. All overburden should be stockpiled so as to limit any material from entering the wetlands and should not expand beyond the proposed and approved footprint areas. v. The design of linear developments traversing the wetlands such as roads or pipelines should ensure adequate flow, hydraulic conditions and connectivity between the upgradient and downgradient portions of the wetlands using either culvert structures or pipe culverts or a combination of both. These structures should be sized to accommodate a 1:100-year flood event and spread flow across the entire wetland and not lead to concentrated flow. vi. The pollution control facilities (PCDs) should be lined with an appropriate liner and be monitored on an ongoing basis for any potential seepage.		

	vii. Sufficient storm surge capacity must be maintained in all PCDs to avoid decant in a 1:50 year flood event. viii. An action plan must be in place to deal with any seepage if it is found to occur. ix. Dirty water areas should be kept as small as possible and should be expanded progressively to ensure that the volume of clean surface runoff supplying the wetlands is optimised. x. The dirty water management systems should be adequately sized as per the GN704 Regulatory Requirements, to prevent failure thereof and ultimately, discharge of contaminated water into the wetlands. xi. Strict monitoring of the footprint area and the height of the waste rock dumps (WRDs) should be implemented, in order to prevent encroachment thereof into the 100m GN704 Zone of Regulation or into the wetlands. xii. Edge effects from the mining infrastructure within very close proximity to the wetlands should constantly be monitored in order to prevent any impacts, such as contaminated runoff, from entering the wetlands. xiii. Material from the overburden stockpiles should be used to backfill the open cast pit areas after which very careful attention should be paid to replacing soils in the right order to re-instate the hydro pedological processes in the landscape. xiv. The final backfilled opencast landscape should be free draining and geological and hydro pedological processes reinstated as best possible so as to allow		

	recharge of the wetland resources in the landscape and the greater catchment. The post-closure recharge of the catchment should also be as near natural as possible. xv. Any decant must be treated either by active or passive methods until such time as water quality rebounds to conditions which are acceptable and support the Environmental Water Requirements (EWR) and Resource Quality Objectives (RQOs) for the local area.		
Wetland Study	i. The footprint area of the proposed Witklip Colliery development should be limited to the minimum feasibly footprint to ensure optimal and safe mining. ii. Construction should be initiated by first constructing clean and dirty water separation systems thus ensuring that as site clearing takes place, dirty water runoff is appropriately managed. iii. Throughout the life of the mine, non-essential personnel and non-essential vehicles are not to be permitted within demarcated riparian zones. iv. Contractor laydown areas, and material storage facilities to remain outside of the watercourses and the 100m GN704 Zone of Regulation. v. All vehicle re-fuelling is to take place outside of the water course and the 100m GN704 Zone of Regulation.	Yes	Impact tables 20 to 23

	vi. Special care must be taken to ensure that no waste relating to the construction or mining process is disposed of within the riparian habitat or the active channel of the watercourses. vii. As far as possible, mining surface infrastructure (including soil stockpiles and any temporary structures) should remain out of the riparian zones and associated zone of regulation in line with the requirements of Regulation GN704 of the National Water Act. Any activities which encroach on the riparian zone must be authorised by the relevant authorities, and such activities must be managed in a responsible manner in line with the mitigation hierarchy as advocated by the DEA et al (2013). viii. The watercourse, and the associated 100m setback as defined in regulation GN704 should be demarcated and defined as a guideline as to the area in which no mining activities should be developed and should be marked as a no-go area unless it is unavoidable to mine these areas to ensure optimal and economically feasible mining of the resource. ix. Limit the footprint area of the construction activity (including the placement of temporary infrastructure) to what is absolutely essential in order to minimise the loss of clean water runoff areas and loss of catchment yield which recharge the receiving aquatic environment.		

	x. The management and mitigation measures as recommended in the geohydrological study should be implemented to mitigate the potential impacts arising from decant of contaminated water from the mine into the receiving environment. xi. No dirty water runoff (as defined by Regulation GN704 of the NWA) must be permitted to reach the aquatic resources during the entire life of the mine, and clean and dirty water management systems must be maintained and operated efficiently to prevent any contaminated runoff from entering the receiving aquatic environment. xii. The associated Pollution Control Dams (PCDs) must have capacity to cater for a 1:50 year flood occurring over a 24-hour period and the PCDs must be lined with an appropriate liner. xiii. Adequate stormwater management must be implemented and maintained in accordance with the stormwater management plan, in order to prevent erosion and the associated sedimentation of the riparian and instream areas. In this regard special mention is made of: • Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed; • Runoff from paved surfaces should be slowed down by the strategic placement of berms; and • All overburden stockpiles and waste stockpiles must have berms and/catchment paddocks at their toe to contain runoff from the facilities.		

	xiv. Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up, however the topsoil and overburden stockpiles may not exceed 2m in height. xv. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later usage as backfill material. xvi. All exposed soils must be protected for the duration of the construction phase in order to prevent erosion and sedimentation of the downgradient watercourse. xvii. With regards to concrete mixing on site, no mixed concrete may be deposited outside of the designated construction footprint. xviii. Concrete spilled outside of the demarcated area must be promptly removed and taken to a suitably licensed waste disposal site. xix. Pollution prevention through infrastructure design, in order to prevent, eliminate and/or control potential pollution of soils, groundwater and surface water should be implemented. xx. Implement a monitoring program to detect and prevent the pollution of soils, surface water and groundwater. xxi. Reduce airborne dust during blasting activities through: • Damping dust generation areas with freshwater (although not in sufficient quantities to generate runoff); and • Use of hessian or brush barrier fences.		

	xxii.	Blasting should be carried out with extreme caution to avoid cracking of the underlying parent material of the adjacent areas, which might lead to leakages of the impermeable underlying material which might alter the hydro-pedological properties of the surrounding area.		
	xxiii.	Any areas where decant points may be determined by a geohydrological assessment, need to be carefully managed throughout the life of the mine.		
	xxiv.	Water levels need to be strictly managed to ensure they are kept below any decant level while ensuring that a significant cone of depression impact does not take place.		
	xxv.	If decant does occur, all water is to be treated to the background water quality values prior to release into the receiving environment; and		
	xxvi.	Any decant must be treated either by active or passive methods until such time as water quality rebounds to conditions which are acceptable and support the Environmental Water Requirements (EWR) and Resource Quality Objectives (RQOs) for the local area.		
	xvii.	Runoff from areas within the dirty water area should be captured in the sump and pumped to a PCD that is lined with an appropriate liner, before being re-used as process water of the mine; and		
	xviii.	Implement a biomonitoring programme; incorporating bi-annual in situ water quality analysis, Whole Effluent Toxicity (WET) testing and diatom analysis,		

	which will indicate point sources of pollution during the construction and operational phases.		
Noise Study	i. Baseline environmental noise levels to be collated and recorded. ii. All acoustic screening measures must be in place before commissioning the mining project. iii. Environmental noise monitoring to be carried out during the different phases of the project. iv. Permanent stations to monitor ground vibration and air-pressure levels. v. All noise sources at the different mining areas to be identified and registered. vi. An environmental noise complaint system must be in place for residents to register noise complaints. vii. The noise (Noise Control Regulations, 1994) and/or guidelines to be always adhered to.	Yes	Impact tables 20 to 23
Palaeontology	i. The EAP and ECO/site manager must be informed that the Vryheid Formation of the Ecca Group has a Very High Palaeontological Sensitivity. ii. If fossil remains are discovered during any phase of construction, the Chance Find Protocol must be implemented by the ECO in charge of these developments. These discoveries should be secured, and the ECO/site manager must alert SAHRA so that a palaeontologist can undertake the proper mitigation (documented and collection).	Yes	Impact tables 20 to 23

	iii. These recommendations should be included in the Heritage Management Plan and EMPr for the idwala .		
Heritage Study	i. The remains of a large Historical Period settlement area (is of low significance due to the poor state of preservation of the sites and features. Sections of the site is located within areas demarcated for surface infrastructure and other sections are located in the general landscape around areas demarcated for surface infrastructure for the mine. A negative direct impact as well as negative peripheral impacts on the site are anticipated and it is recommended that destruction permits be obtained from the relevant Heritage Resources Authorities prior to alteration or destruction of the site. Generally, the site should be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains. ii. The sites are highly significant in terms of heritage value and negative direct impact on the sites are anticipated. As a primary measure, SAHRA guidelines require a 50m conservation buffer for all burials and it is primarily recommended that the placement of surface infrastructure be reconsidered in order to avoid impact on the burial sites and proposed conservation buffers. It is further recommended that the burial sites be fenced off with palisade fencing of a minimum height of 1.8m placed no closer than 2m from the burials. Access gates should be erected, and access control should be applied to the sites. Notice	Yes	Impact tables 20 to 23

	boards should be positioned on the fence indicating the heritage significance of the site and contact details of a mine representatives responsible for visitation arrangements should be provided in the sign. A heritage Site Management Plan (SMP) should be compiled for the burials to stipulate conservation measures, responsible persons and chance find procedures for further heritage mitigation. The developer should carefully liaise with the heritage specialist and SAHRA with regards to the management and monitoring of any human grave or cemetery in order to detect and manage negative impact on the sites. iii. Should impact on any human burial prove inevitable, full grave relocations are recommended for these burial grounds. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum B). iv. Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed		

	during construction activities, all activities should be suspended, and the archaeological specialist should be notified immediately.		
Traffic study	i. A formal application for access to and from Road P93 would need to be done before the detail design phase at the KwaZulu-Natal Department of Transport. ii. Detailed investigations should be conducted in conjunction with the relevant road authority in terms of the existing quality and potential life span of the existing road surface layers of the roads where consumables, processed product and workers will be transported. iii. A road maintenance plan should be prepared in conjunction with the relevant road authority on public roads where trucks will operate as soon as the project has been approved in order to ensure that the consumables, processed product, and workers can be transported at all times. iv. Provide reflective road studs at strategic points (LED if possible) to ensure the safe operation of the relevant intersections under investigation at night-time and during power outages. v. Provide mine and contractor workers with training on road safety. vi. Road safety and awareness campaigns should be run at the mine. vii. Provide reflective road studs at strategic points (LED if possible) to ensure the safe operation of the relevant intersections under investigation at night-time and during power outages.	Yes	Impact tables 20 to 23

	viii. Provide required road traffic signs for the relevant intersections. ix. Provide relevant road markings at relevant intersections under investigation (highway paint recommended). x. Provide paved pedestrian walkways to create a safe environment for pedestrians to move around and within the intersections at Points A, C, D, and E. xi. Provide pedestrian crossings at the Points A, C, D, and E.		

10. ENVIRONMENTAL IMPACT STATEMENT

This chapter is summarised in the following statements for each environmental aspect, based on the potentially high impact assessed through specialist studies:

10.1. Geology

The proposed opencast pits and underground shaft at IDWALA change the general physical properties of the rocks around Witklip mining site where the mining will be conducted, due to removal of the targeted coal seams. The impacts are direct and irreversible. With mitigation, impacts are reduced from high to medium through correct backfilling of disturbed layers according to natural profile, and backfilling of coal discard into mined out areas.

10.2. Topography

Topography is more likely to be affected with the proposed seven opencast pits both at the northern and southern sides of the MRA at Witklip/Dejaag & Tigerkloof. Effective mitigation through rehabilitation of mined out areas will reduce topographical impacts from high to medium, with replacement of soil layers, soil levelling, and revegetation of rehabilitated areas.

10.3. Groundwater

The most significant impact anticipated will be groundwater quality and quantity changes due to potential seepage from the mining areas and subsequent dewatering. Removal of groundwater for safe continuation of mining will also cause reduced quantity in aquifers. The potentially high impacts will be reduced to medium with reuse of the water, pumping to the surface as well as enhanced infiltration on closure. Continuous groundwater monitoring throughout the life of mine will be necessary to quantity the impacts.

10.4. Surface water and Wetlands

The proposed mining activities will be detrimental to the state of the watercourses within vicinity of IDWALA, including streams which are tributaries to the Ingagane River and wetlands around the mine site. Anticipated high impacts will be reduced to medium where dirty catchments are separated to clean catchments, and wetland buffer zones are not encroached. Water quality and biomonitoring of surface watercourses is necessary to analyse changes.

10.5. Soils

The most significant impact on soils and land capability will be caused by the construction and operation activities especially on the opencast mining areas and establishment of surface infrastructure. The high impacts will be reduced to low where rehabilitation of affected areas is done through to revegetation for restoration of land capability. The underground shaft is less likely to have significant surface topsoil impacts.

10.6. Land use

Land use change from farming to mining is the major impact. However, the natural landscape has been continuously modified through the cultivation and grazing over the years, hence the transformed habitats identified onsite. The direct land use impact will be reduced to low, where on mine closure land use will be changed again to grazing, with restoration of affected areas and revegetation with indigenous habitat characteristics. Post mining land use will then be shifted back to grazing.

10.7. Terrestrial Biodiversity

Underground mining will not have significant negative impacts on terrestrial biodiversity. Open cast mining areas will have potentially high impacts, with removal of vegetation and potential loss of species of conservation concern as mainly the secondary grassland and rocky grassland habitats are modified. Impacts will be reduced to moderate with mitigation and revegetation on closure.

10.8. Heritage

Several graves were identified close to proposed surface infrastructure. Two graves were identified within opencast, posing high impacts. Relocation with consultation, as well as fencing off of near graves will reduce the potentially high impacts to medium.

10.9. Social aspects

Creation of additional 300 mining jobs in the Newcastle and Amajuba municipalities pose highly positive impacts, with creation of small to medium scale business opportunities. The positive impacts will be enhanced during the life of mine. Closure of mine and loss of all opportunities will require implementation of Social and Labour Plan with consultation of municipal IDPs and community forums to maintain the high positive impact of the proposed IDWALA project.

Occupational risks to personal health and safety from the operation of machinery and heavy-duty vehicles both on-site and off-site affect the workforce. Risks pertain specifically to the presence of heavy mechanised vehicles and excavation machinery which is aggravated by poor visibility as a result of increased dust. Attention and awareness of health and safety to all workers onsite will reduce potential risks.

The perceptions and concerns of surrounding communities as well as I&APs regarding the proposed project may in themselves constitute a social impact. If concerns are negative on the potential effect of project on their lives, regardless of whether or not this perception is justified, they are likely to be resistant to the proposed development. This constitutes a source of social risk to the project.

All raised concerns should be noted and addressed throughout the project lifeline. Regular updates on project could assist to keep the community up to date with project progress. A complaints register should be kept onsite to capture all raised concerns. Appropriate and timely mitigation measures to specific realistic concerns received will reduce negative social impacts.

10.10. Traffic

Increased traffic on the P279 / D377 main road few kilometers from the MRA is likely, where trucks will ferry coal offsite to the markets. Increased traffic for product and employees' movements will be medium risk, and reversible if roads are maintained, extra movement lanes and appropriate signages are implemented.

10.11. Noise

High noise produced from construction through operation until rehabilitation stages is inevitable. Operators of machinery and trucks should use proper PPE; and mechanical methods to reduce noise production from the operations. Potentially high noise impacts can be reduced to medium with noise control measures. Monitoring of noise levels and implementation of mitigation measures is necessary.

10.12. Visual impacts

Night lighting will have more visual impacts and if operations are limited to daytime, they would be reduced. Stockpiling should maintain reasonable heights of not more than 8m to reduce visual effects. Although already modified on the landscape aesthetics, considering

surrounding modified land use options, the MRA for can be bunded off by visual barriers for road users and surrounding residents.

10.13. Air Quality

Dust generation throughout the mine life is inevitable but manageable through dust suppression, lower speed of movement and use of proper PPE. High dust generation impacts on employees, residents and vegetation can be reduced to medium with mitigation. Revegetation on closure would reduce anticipated impacts. Continuous monitoring of duct fallout is necessary.

11. ENVIRONMENTAL ASSESSMENT METHODOLOGY

The impact assessment and rating methodology was developed in-house by BGES Personnel guided by the NEM: Environmental Impact Assessment Regulations as amended in 2017. The same methodology was adopted for consistence in proposed specialist studies for the study area. The impact assessment's purpose is to quantify the impact before and after possible mitigation options are considered. Each of the impact assessment components was rated 1 to 5, where one indicated lowest score and five the highest score. The risk assessment key adopted was involving the following issues:

- Severity
- Spatial scale
- Duration
- Frequency of activity
- Frequency of incident
- Legal Issues

The following tables summarise the rating for each of the components of impact assessment methodology.

Table 28: Reversibility Rating

Irreversible	The activity will lead to an impact that is permanent.
Partially reversible	The impact is reversible to a degree e.g., acceptable revegetation measures can be implemented but the pre-impact species composition and/or diversity may never be attained. Impacts may be partially reversible within a short-, medium- or long-term timeframe.
Fully reversible	The impact is fully reversible, within a short-, medium- or long-term timeframe.

Table 29: Risk rating tables

TABLE 27.1 - SEVERITY
How severe does the aspects impact on the environment and resource quality characteristics?

Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful and/or wetland(s) involved	5

TABLE 27.2 – SPATIAL SCALE
How big is the area that the aspect is impacting on?

Area specific	1
Whole site	2
Regional / neighbouring areas	3
National	4
Global	5

TABLE 27.3 – DURATION
How long does the aspect impact on the environment and resource quality?

One day to one month	1
One month to one-year areas impacted will have no change in status	2
One year to 10 years, impacted area to a lower environmental value status but can be improved over this period through mitigation	3

Life of the activity environmental importance permanently lowered	4
More than life of the mine/operation	5

TABLE 27.4 – FREQUENCY OF THE ACTIVITY

How often do you do the specific activity?

Annually or once off	1
Six monthly	2
Monthly	3
Weekly	4
Daily	5

TABLE 27.5 – FREQUENCY OF THE INCIDENT/IMPACT

How often does the activity impact on the environment?

Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

TABLE 27.6 – LEGAL ISSUES

How is the activity governed by legislation?

No legislation	1
Fully covered by legislation (e.g., wetlands are legally governed)	5

TABLE 27.7 – DETECTION

How quickly can the impacts/risks of the activity be observed on the environment (water resource quality characteristics), people and property?

Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

TABLE 27.8: CALCULATIONS

Consequence = Severity + Spatial Scale + Duration
Likelihood=Frequency of Activity + Frequency of Incident +Legal Issues + Detection
Significance \Risk= Consequence X Likelihood

Table 27.9: Rating Classes

TABLE 8: RATING CLASSES		
RATING	**CLASS**	**MANAGEMENT DESCRIPTION**
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to the environment small and easily mitigated. Wetlands may be excluded.
56 – 169	M) Moderate Risk	Risk and impact on environment are notable and require mitigation measures on a higher level, which costs more and affect sensitive areas.
170 – 300	(H) High Risk	Always involves sensitive environments. Impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the natural Reserve.

A summary of each development activity causing potential impacts was rated in a table that described the activity's

- Risks and impacts posed
- Development phase where it is likely to be encountered
- Type of impact, whether it is direct, indirect or cumulative
- Score of the impact assessment components as described in preceding tables
- Mitigation and monitoring requirements to correct or minimise the anticipated impacts

The impact significance rating table adopted is exemplified below:

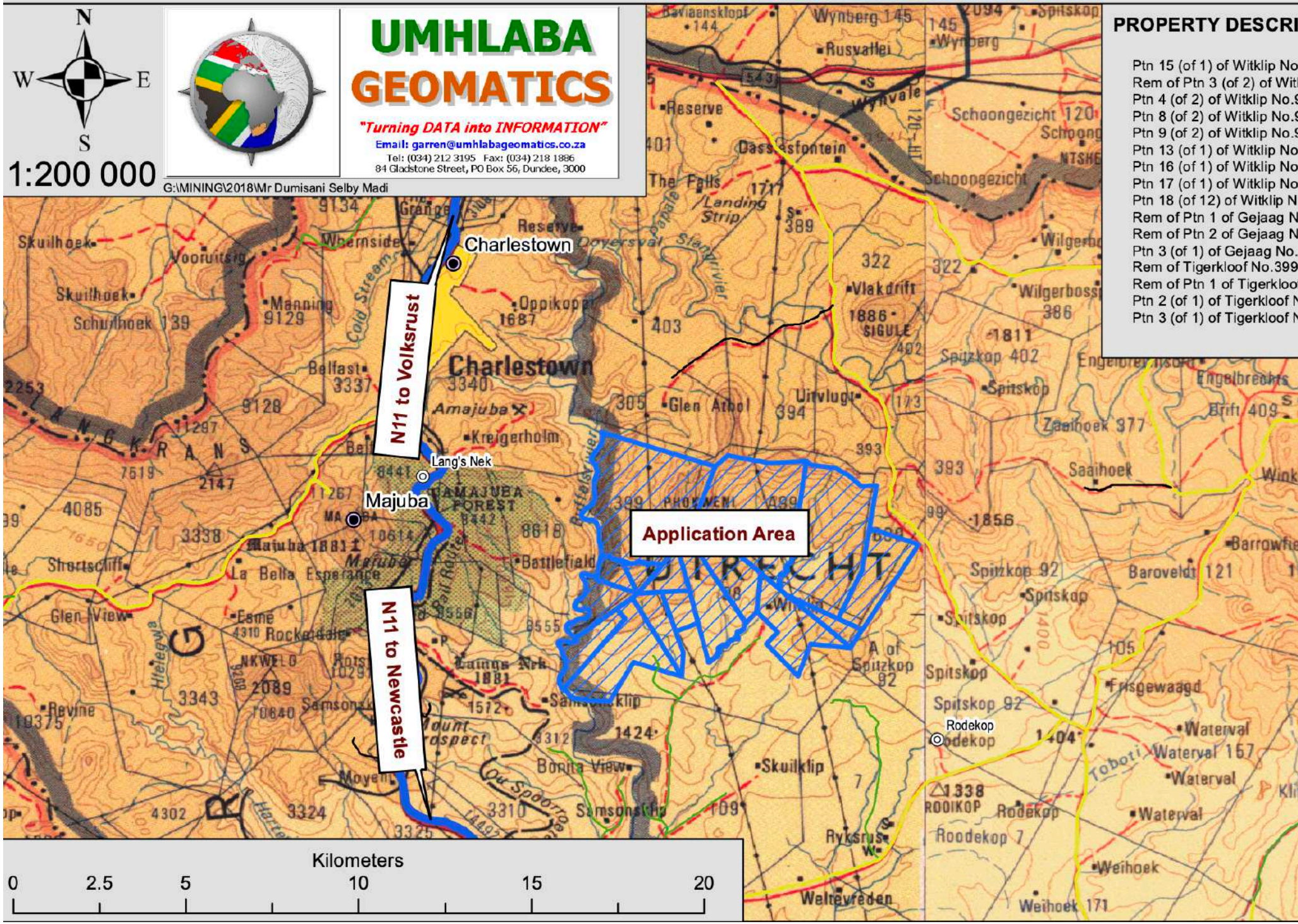
Table 30: Impact Significance Rating table

Impact Component	**Impact 1**	**Significance prior to Mitigation**	**Significance with Mitigation**
Activity			
Risk/ Impact			
Project Phase CL = Closure and post-closure Nature of Impact			
Type of Impact			
	Define Significance Categories	Significance Prior to Mitigation	Significance With Mitigation
Severity			
Spatial scale			
Duration			

Frequency of activity			
Frequency of incident/impact			
Legal issues			
Detection			
Consequence	Severity + Spatial scale + Duration		
Likelihood	Frequency of Activity + Frequency of incident + Legal issues + Detection		
Impact/Risk	Consequence x Likelihood		
Mitigating and Monitoring Requirements			
Required Management Measures			
Required Monitoring (if any)			
Responsibility for implementation			

The significance rating before mitigation was comparted to the one calculated after mitigation to find out the change. Effective mitigation measures reduced the initial risk before mitigation.

12. FINAL SITE MASTER PLAN MAP



13. ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

The following assumptions and limitations have been identified with regards to the environmental baseline, impacts and mitigation measures:

- Sampling of environmental aspects was done, meaning that not all areas were practically scrutinised for prediction of impacts. Some aspects of terrestrial, soil and hydro-pedological characteristics may have been overlooked in this assessment. However, it is the opinion of the professional study team that this assessment was carried out with adequate sampling of sufficient detail to make informed decisions.
- Limitations were experienced in the direct participation of all anticipated players. The public participation process has been sufficiently effective in identifying the critical issues that needed to be addressed through specialist investigations and/or by the EAP. It is assumed that where participation has been sought from the organizational representative/s, that these parties have the authority to comment on behalf of their organisation
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. It is, however, expected that the wetland resources within the MRA have been accurately assessed and considered, based on the field observations undertaken.
- The effects climate change dynamics and sustainability calculations were not considered as part this environmental assessment. It is therefore recommended for continuous improvement and assessment through the life of mine.

14. EAP UNDERTAKING

EAP undertaking **this EIA and EMPr report** is presented as Appendix 1.

15. DEVIATIONS FROM SCOPING REPORT

No deviations from the submitted scoping report

PART B

16. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

16.1. Impacts to be mitigated in the different Development Phases

16.1.1 Construction phase

The activities associated with the construction phase were identified in the table below. Potential environmental impacts as well as mitigation measures to avoid, reduce and manage the anticipated impacts are also listed as the important aspects of the EMPr for the proposed operations at . General impacts associated with the entire construction phase are also listed. The mitigation measures should be implemented onsite with the lead of the Environmental Officer and Mine Manager, ensuring regular auditing of level of compliance to the proposed mitigation measures. Construction activities onsite, which may occur during operational phase should be considered for implementation of suggested mitigation measures towards environmental management of the entire site.

Table 31: Construction phase Impacts and Mitigation Measures

Environmental Aspect	Potential impacts	Mitigation measures	Standards to be achieved	Compliance with standards
Activity 1: Stripping of topsoil				
Vegetation	The removal of vegetation to create and make space for infrastructure and roads will result in loss of floral species, some of which may be species of conservation concern in the ecosystem. Loss of the four habitat units researched around the area, including rocky grassland, secondary grassland, freshwater and transformed habitat units.	▪ Relocation of species of conservation concern. No red data species were mentioned on specialist studies done. ▪ Mark all major trees which need to be preserved around the development area. ▪ Preservation of vegetation seeds through topsoil stockpiling, for reinstating on closure and rehabilitation. ▪ Vegetation clearance should be done exclusively on targeted infrastructure development areas. ▪ Prioritise transformed habitat unit for development since this is already impacted. Sensitive areas such as the wetlands should be avoided to conserve the unique vegetation species.	Reduce the loss of indigenous vegetation species.	Develop a Biodiversity Management Plan

		▪ Topsoil should not be sold such that indigenous seeds are preserved within the MRA.		
Soils	Stockpiling of soils result in compaction of originally lose and vegetation rich topsoil and subsoil due to movement of vehicles and machinery on land preparation.	▪ Topsoil and subsoil stockpiles should be separated. ▪ Soil height should be reasonable, not more than 8m to preserve any potential seeds and regrowth potential. ▪ Soil stockpiles should not be kept for long period of time to avoid hard compaction and loss of vegetation seeds.	Preservation of soil quality.	
	Soil contamination from vehicle and machinery hydrocarbon drips and spillages.	▪ Servicing and maintenance of vehicle and machinery during construction phase should be on the impermeable surface i.e., bunded area. ▪ Hydrocarbon spillages should be immediately cleaned on discovery. ▪ Soil remediation area should be marked for cleaning of contaminated soils.	Prevention of soil contamination.	GN 37603: Norms and standards for remediation of Contaminated soils.

		▪ Machinery parked overnight with potential hydrocarbon spills and drips should have drip trays.		
	Soil layers may be mixed during the process of stockpiling.	▪ Natural soil profile should be followed on stockpiling, with separate stockpiling after every layer such that the same sequence is later followed on closure and rehabilitation of opened areas.	Preservation of soil quality.	
Land Capability	The current land capability will cease from the time of soil stripping until the affected areas are completely rehabilitated.	▪ Preserve soil layers on stockpiling, and mimic original soil layers on closure and rehabilitation to reinstate land capability.	Restoration of land capability.	
Land use	Removal of topsoil will also remove vegetation that defined the current land use of livestock grazing.	▪ Complete closure of affected areas and rehabilitation to original ground level with seeding of indigenous vegetation to restore land use. ▪ Determine land use at the end of development at the end of life of mine.	Restoration of land use.	
Activity 2: Construction of access and haul roads				

Vegetation	Vegetation loss on removal to prepare the travel routes as access and haul roads connecting mine components.	▪ All considered access roads should be kept to existing roads as to reduce fragmentation of existing natural habitats. ▪ No other routes will be used by vehicles or personnel for the purpose of gaining access to the site. ▪ Roads should avoid sensitive areas such as all wetlands identified onsite. ▪ Topsoil stripped should be stockpiled to preserve indigenous vegetation species. ▪ Vegetation clearance should be done only along the access and haul roads routes, with berming of topsoil containing natural vegetation seeds along the roads.	Reduce indigenous vegetation loss.	Biodiversity Management Plan.
Soils	Soils will be stripped and compacted, causing mixing of soils and hardening for establishment of access road and haul roads.	▪ Roads will be maintained such that no new roads will be established without necessity throughout the life of mine. ▪ Mine roads will be ploughed and revegetated on closure. Stripped topsoil will be used to finally rehabilitate and vegetate with indigenous species.	Preservation of topsoil.	

	Due to the presence of vehicles and equipment, hydro-carbon spillages may occur impacting on the quality of the soils.	▪ Non-carbonaceous and/or contaminated material should be used for road construction. ▪ Spill kits should be availed with adequate absorbent, shovel, and scooping tools for cleaning of minor as well as major spillages as soon as they occur.	Prevention of soil contamination.	GN 37603: Norms and standards for remediation of Contaminated soils.
Land use	Change in land use from livestock grazing area to road use.	▪ Complete rehabilitation of roads on mine closure will restore the land use option.	Restoration of land use.	
Activity 3: Construction of site infrastructure including mine offices, stockpiling areas, conveyor belts, plant area and discard dump stockpile.				
Vegetation	Clearance of vegetation for infrastructure establishment will result in direct habitat loss and fragmentation especially for secondary grassland and rocky grassland.	▪ Species of conservation concern should be relocated when identified. ▪ Bare areas should be vegetated with loan or shrubs to bind the soil against erosion. ▪ All infrastructure areas should be reclaimed on decommissioning and mine closure.	Restoration of vegetation.	
Activity 4: Construction of water infrastructures: Proposed two PCDs (Plant PCD and Mining and Discard PCD)				

Vegetation	Vegetation loss at the targeted areas of the two dams' footprints, as well as their silt traps, dirty water trenches and cut off drains.	▪ Peg footprints for the dams and restrict disturbances to targeted zone. ▪ Follow approved civil design drawings for the dams, with implementation of recommended management measures according to engineering design specifics. ▪ Revegetate dam edges around the dam with indigenous vegetation stripped to void erosion of affected areas.	Preserve indigenous vegetation.	Biodiversity Management Plan
Land use	Establishment of PCDs and water trenches will cease current land use to site water management infrastructure.	▪ Demolish concrete and HDPE lining material on all water infrastructure on closure. ▪ Plough the compacted soils and revegetate affected areas to reinstate indigenous grass species.	Restoration of land use.	
Soils	Topsoil will be stripped to clear PCD and water trench footprints, causing potential soil layer mixing.	▪ Soil layers should be stripped separately and stockpiled according to soil horizons.	Soil preservation.	
	Movement of construction machinery during construction will compact the soils both within the	▪ On demolition of the water management infrastructure at closure, soil will be	Restoration of land use.	

	infrastructure areas and around them.	ploughed, and topsoil reinstated at the topmost layer for revegetation.		
	Machinery and vehicles may cause soil contamination from hydrocarbons used within the machinery.	▪ Regular servicing of machinery should be done to avoid unnecessary spillages and drips. ▪ Both minor and major spillages should be cleaned as soon as they occur. ▪ Contaminated soils should be remediated.	Prevention of soil contamination.	GN 37603: Norms and standards for remediation of Contaminated soils.
Activity 4: Establishment of opencast box cut areas and underground shaft area.				
Biodiversity	Vegetation clearance on establishment of box cuts for mining will cause habitat fragmentation and loss of secondary and rocky grassland habitats.	▪ Commence construction activity during dry season when most birds are not reproducing or migrating; and when plants are unlikely to disperse seeds. Opencast pits should observe the 100m buffer zones and flood lines around the freshwater habitats, as indicated on the Master Plan. ▪ No vegetation should be cleared where underground mine is established, since adit is through opencast pit (Pit 4) footprint.	Restoration of biodiversity.	

		▪ Topsoil stripped, rich in indigenous vegetation should be preserved for rehabilitation. ▪ Concurrent rehabilitation to be implemented to ensure soil layers are replaced as soon as possible. ▪ Indigenous vegetation should be encouraged to establish on the topsoil and subsoil stockpiles to avoid vegetation seed losses. ▪ Removal of vegetation should be restricted to the relevant infrastructure footprints only.		
Groundwater	Groundwater contamination through active mining areas.	▪ A leak/spill detection plan should be devised and implemented for all possible areas of leaks/spillages. ▪ Regular (quarterly) groundwater monitoring from existing and proposed monitoring boreholes	Protection of groundwater quality	Water Use license conditions

		▪ The source of the pollutants will be identified, and the applicable remediation measures will be implemented. ▪ Total petroleum Hydrocarbons (TPH) should be monitored in pit water samples to determine any contamination by hydrocarbons from the diesel generator used for pumping water out of pit.		
Common impacts applicable for the construction phase of development for all mentioned activities				
Vegetation	Introduction of new construction machinery onsite may introduce invasive alien species from other external sources.	▪ Mark off the development site with a mine fence, to indicate targeted disturbance area. ▪ Specific recommendations of the biodiversity specialist study (See Appendix 5) must be implemented. ▪ Avoid construction of any infrastructure within sensitive habitats especially the freshwater habitat but target transformed habitat.	Avoidance and eradication of alien species	Alien and Invasive Control Plan

		▪ Clean construction machinery before they leave site to contain any site vegetation seeds. ▪ Preventing the unnecessary destruction of any natural habitat and animal life within the boundaries of the proposed area of development and adjacent areas. ▪ Hunting, trapping and capturing of animals is strictly prohibited on the IDWALA site by visitors, contractors, employees or any workers.		
Traffic	Introduction of construction machinery on Witklip will increase traffic around the farm portion.	• Geometric upgrading of all road junctions to the D377 ▪ main road passing through the MRA is crucial to ease vehicle movement and improve road capacity at this point. ▪ Appropriate signage for turning vehicles, speed limit as well as indication of site operations should be established along the D377 road for information to road users and for management of traffic movement.	Reduce traffic congestion.	

		▪ An extra access intersection moving line for vehicles turning into and out of the mine site should be established to avoid hinderance of traffic already moving on the D377 main road. ▪ Traffic lights with direction arrows would ease control of traffic and avoid piling of on-ramping and off-ramping traffic.		
Noise	Increased noise around the mine MRA due to construction machinery movement, topsoil stripping, digging and drilling during construction activities.	From the view of both traffic and noise assessments, the following must be considered in establishing a barrier wall around the mine site, as an affective acoustical screen: ▪ Walls/berms/barriers to be built as close as feasibly possible to the stack ▪ The height of the barrier should be at least 2 - 3 m higher than the line of sight to the top of the stack and in relation to receptors ▪ Barriers must be sufficiently dense and sufficient in thickness e.g., a brick wall	Maintain noise levels below 85dB (decibels)	Quarterly Acoustical Measurement & Audit Programme

		▪ The wall should be sufficiently long to block the line of sight from receptors to the sides of the stack. ▪ The wall should have no aperture, gaps, or entrances ▪ Quarterly Acoustical Measurement & Audit Programme should be drafted and implemented throughout the life of mine.		
Air quality	Increased dust fallout from construction movement of machinery and vehicles onsite, soil stripping and land preparation during construction of infrastructure.	▪ Dust suppression by dirty water from the PCDs onsite should be done as and when necessary. ▪ Suppression should be more frequent during dry season and windy days and reduced during rainy days using water bowsers. ▪ Apply wet suppression on unpaved roads in combination with soil stabilisers on unpaved roads to create binding crust which stabilisers the soil. ▪ Reduce speed limits to as low as practically possible (suggested 15 km/h) as speed is	Prevent dust related health effects.	

		directly proportional to vehicle entrained emissions (50 % reduction in speed will result in 50% reduction in vehicle entrained emissions). ▪ Reduced machinery speed during grading and other construction activities. ▪ Grading for road construction and ground maintenance should be done to minimise dust, erosion or undue surface damage. ▪ Adequately service all vehicles and machinery to reduce emissions from exhausts. ▪ Efficient use of minimal vehicles and machinery required onsite. ▪ Switch off engines when machinery is not in use. ▪ Pave and compact access road. ▪ An air quality monitoring exercise should be developed and implemented from Figure 7-1 of the Air Quality specialist study Appendix 7 of the EIA Report.		

		▪ The sampled parameter during construction includes dust fallout monitoring only and improved to particulate matter monitoring when a continuous live source of power is made available. ▪ Stockpiles must be built at an angle of 45^{o} to reduce the wind erosion with a rough apex.		
Surface water	Due to vegetation clearance, soils are exposed to water erosion and may be carried as silt in runoff on construction site into wetlands and surface watercourses.	▪ Commence construction when rainfall is low or unlikely preferably in dry season. ▪ Separate clean and dirty site catchments onsite, according to the developed stormwater management plan. ▪ Construct cut off drains and berms. ▪ Berm off the mining site to avoid escape of dirty catchment runoff to clean catchments but direct towards dirty water infrastructure. ▪ Encourage revegetation on topsoil and subsoil stockpiles to limit soil loss.	Water quality monitoring. Implementation of Stormwater management Plan.	

		▪ The wetlands, and the associated 100m setback as defined in regulation GN704 should be demarcated and defined as a guideline as to the area in which no mining or related activities should be developed and should be marked as a no-go zone area.		
	Uncleaned hydrocarbon spillages may be scooped into the surface water systems and contaminate water quality.	▪ Clean all minor and major hydrocarbon spillages immediately when they occur. ▪ Contaminated and hazardous waste including empty hydrocarbon containers should be collected separately from general wastes and disposed offsite at an approved waste disposal facility. ▪ Design of infrastructure should be environmentally sound and all vehicles in a good working condition, and all possible precautions taken to prevent potential spills and /or leaks. ▪ Surface water quality monitoring programme will be implemented to detect any impacts.	Protect surface water quality	Resource Quality Objectives

Groundwater	Construction of shaft will cause influx of water into the void, and reduction of water supply to other groundwater users.	▪ Adequate sealing of incline shaft walls to allow groundwater levels to reduce and re-establish the cone of depression. ▪ Provide affected borehole users with alternative sources of water, should their groundwater volumes be impacted on. ▪ Update the hydrocensus annually to confirm boreholes users' yield and groundwater quality around the shafts area. ▪ Regular removal of excess groundwater for safe continuation of mining activity. ▪ Regular (quarterly) monitoring of water levels and groundwater quality.	Protection of groundwater quantity.	
	Groundwater contamination through opencast pits and underground shaft mining areas.	▪ A leak/spill detection plan should be devised and implemented for all possible areas of leaks/spillages. ▪ Regular (quarterly) groundwater monitoring from existing and proposed monitoring boreholes	Protection of groundwater quality.	WUL conditions

		▪ The source of the pollutants will be identified, and the applicable remediation measures will be implemented. ▪ Total petroleum Hydrocarbons (TPH) should be monitored in pit water samples to determine any contamination by hydrocarbons.		
	The formation of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden.	▪ Regular annual update of the groundwater study to determine AMD generation potential as mine schedule progresses. ▪ Sampling and analyses of core samples from the mining areas. ▪ Ensure that all coal and carbonaceous material is removed from the overburden before placement on the stockpile. ▪ Coal stockpiles to be placed on lined grounds, constructed according to civil designs. ▪ The civil engineering design for leachate control and storm water management must	AMD management	AMD management plan from groundwater Model

		be undertaken and submitted to DWAS for approval. ▪ Should AMD be eminent, an AMD mitigation and management plan for wetlands should be developed.		
Social	Some graves were identified within targeted opencast pit 2 and pit 4 footprint, some close to the discard dump stockpile.	▪ A marked grave situated in the infrastructure area must be avoided, if impossible relocated to a new area and reconstructed with consultation of the deceased relatives. ▪ Any activity on the area of the grave has to be applied for through the SAHRA, prior to any avoidance and or relocation exercise.	Protection of all Heritage Resources	National Heritage Resources Act 25 of 1999
	Recruitment and job creation for local individuals, companies, and small and medium enterprises.	▪ Update the Social and Labour Plan for IDWALA and implement as directed. ▪ Consider the locals for recruitment of new employees for available jobs. ▪ Consideration of local small businesses for available tenders according to required skills and services.	Local development	

		▪ Empower local groups in supply of mine goods and services. ▪ Skills development and trainings, internships according to the approves SLP.		

16.1.2 Operation phase

The potential impacts associated with operational phase of the mining development are summarized in Table below. Recommended mitigation measures to avoid, minimise, reduce and curb the impacts should be implemented.

Table 32: Operational Phase EMPr

Activity 1: Operation of all surface infrastructure				
Land capability	Cessation of land capability at the mine infrastructure footprints of all structures.	▪ Impact will remain until end of life of mine. ▪ Complete rehabilitation of the mine infrastructure areas to mimic original environment.	Restoration of land capability	
Land use	Operation of mine infrastructure will change land use from grazing to mining.	▪ Determine end of life land use option and rehabilitate on closure to realise the grazing land when all infrastructure has been demolished and removed.	Restoration of original land use	

Biodiversity	Habitat fragmentation at infrastructure areas within the farm portion. Affected habitats include freshwater habitat, rocky grassland and secondary grassland. Loss of faunal habitat, species and faunal species of conservation concern.	▪ All proposed infrastructure, including temporary infrastructure like contractor camps should be placed outside of more sensitive habitat units, i.e., Freshwater Habitat, Rocky Grassland Habitat and Secondary Grassland units. ▪ A walkdown of the footprint area should take place prior to vegetation clearing whenever each site infrastructure is constructed. This walkdown must coincide with the flowering period of all potentially occurring species of conservation concern. ▪ Any red listed plants should be avoided if identified, or on second option relocated (prior to disturbance) to suitable habitat outside of the direct footprint area as part of compensation for their loss. Permit applications will be required from the KwaZulu-Natal Nature Conservation Board trading as Ezemvelo KZN Wildlife.	Protection of biodiversity	

		▪ The relocation of species (potentially occurring red listed plant species) must take place prior to the commencement of the mining phase. ▪ Good record-keeping will be necessary to record this process and to document all successes and failures associated with the relocation of such species.		
Surface water	Contaminated runoff from workshop, wash bay, plant area and associated stockpiles may contaminate surface watercourses.	▪ Clean and dirty water separation measures will be constructed around the plant and stockpile areas to separate the dirty areas from the clean areas. ▪ The contaminated water will be collected and diverted via an HDPE lined water channel to the PCDs. ▪ Spill kits will be provided at areas handling hazardous substances for timeous clean-up of spillages. ▪ Develop and implementation of the stormwater management plan.	Protection of surface watercourses	Catchment Resource Quality Objectives (RQOs)

Air quality	Dust generation from the plant area through the crushing, screening, and tipping of coal into and out of the plant. Also, on movement of coal on the conveyor belts.	▪ Dust suppression through spays along the conveyor in the plant.	Prevention of dust related health effects.	
	Dust generation from open soil stockpiles as well as from the discard dump.	▪ Enhance vegetation growth on stockpiles. ▪ Maintenance and compaction of discard. ▪ Suppression of roads towards discard dump to reduce dust generation during discard machine movements.		
Social aspects	Safety and health effects on operators at the plant area.	▪ Use of appropriate PPE, including o hard hats for head protection, o earmuffs for noise regulation, o safety shoes for slippery surfaces, o reflective vests and safety overalls for better visibility, and o googles for eye protection. ▪ Appropriate signage to indicate the full PPE requirements for plant area for both employees and visitors.	Protection of human health and safety.	Occupational Health and Safety Act (Act 85 of 1993)

		▪ Mark safety passage points for all pedestrian movements crossing under the plant area. ▪ Mark the emergency assembly point for plant area. ▪ Mark the designated smoking area at plant area. ▪ Mark the open fire point here open fires are only allowed.		
Activity 2: Mining of coal at opencast pits and underground shaft areas				
Biodiversity	Habitat fragmentation where pits are established.	▪ No additional vegetation removal should be done after construction stage and marking of mining footprints. ▪ No vegetation should be removed on top of underground mining extent. ▪ Concurrent rehabilitation of opencast pits all soil layers removed are replaced as soon as possible. ▪ Encourage natural vegetation establishment on the topsoil and subsoil stockpiles.		

		▪ Avoidance of sensitive habitats and areas during the site selection process.		
Soils	Disturbance of soil profile, erosion and exposure of soil surfaces which may cause loss of topsoil.	• Concurrent rehabilitation of mined out box cuts should be done. • Replacement of soil should mimic natural soil layers. • Regularly monitor and curb soil erosion on rehabilitated areas. ▪ Stockpile soil layers separately to allow separate replacement on rehabilitation. ▪ Preserve all removed topsoil for rehabilitation.	Preserve topsoil.	
Visual aspects	The operational visual impact on the surrounding residential areas, industries, land and road users will be realised as pits are dug, conveyor belt operates and mine machinery movement around the mine site. The topsoil and overburden stockpiles, discard dump and conveyor belt, and related surface infrastructure will be visible for the entire life of mine	▪ Construct a visual barrier around the mining areas to reduce visual impact. ▪ A visual barrier should block visibility from road users along the main road cutting through the MRA, as well as on all boundaries with residential and other land users neighbouring the Witklip farm portion.		

Surface water	Loose material as well as the contaminated overburden material can contaminate surface water during rainfall events resulting in dirty water runoff into surface watercourses and changes in water quality.	▪ Develop and implement a stormwater management plan specifically for the mining site. ▪ The SWMP should be updated whenever new infrastructure is introduced onsite. ▪ Clean and dirty water separation measures such as cut off trenches and berms should be constructed at the upstream of mining areas. ▪ Dirty catchments within the mining area should be delineated. ▪ Dirty catchment runoff should be channelled to the onsite constructed PCDs. ▪ Waste will be collected separately according to waste types in closed receptacles around the mine site. ▪ Collected wastes will be removed from the site and disposed offsite at a designated waste management site. ▪ The waste skips will be clearly labelled and located at bunded areas to contain any	Protection of surface water quality.	RWQOs.

		seepage or contaminated water especially from hazardous wastes. ▪ The waste storage area will be paved with concrete, covered and provided with bunds and drainage facilities to collect and contain any spills or adversely affected runoff. ▪ Waste oil will be managed well at the workshop, with adequate storage at a bunded storage area. ▪ Used oils will be emptied timeously to avoid overflows. ▪ Bunded containment and settlement facilities will be provided for all hazardous materials, such as fuel and oil. ▪ All contaminated runoff and spills that escape bunded areas will be collected and contained in the PCDs. ▪ Water quality monitoring in accordance to approved monitoring programme designed by specialist at all streams around the		

		MRA sill be done monthly to detect any deterioration.		
	Runoff containing hydro-carbon spillages may cause deterioration in surface water quality.	▪ Ensure that spills are cleaned up immediately to avoid surface water contact and contamination. ▪ Hydrocarbon spillages will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, diesel bay etc.). ▪ Wash off runoff from workshop activities will be contained in a trench that directs it into a collection sump. ▪ Regular inspection and maintenance will be implemented on the dirty storm water system to ensure their functionality.		
	Runoff will likely enter the underground workings and be in contact with carbonaceous material.	▪ Underground adit area will have upstream cut off berm to divert runoff from entering the underground such that the only minimal input would be from direct rainfall.		

		▪ Clean runoff will be diverted around the designated dirty areas by means of cut-off canals, sized to accommodate at least the 1:50 year peak flow event. ▪ Adequate erosion protection will be provided at the clean catchment discharge locations. ▪ All spills will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, etc.). should be directed to the water channels and onsite PCDs.		
Groundwater	Seepage from the coal stockpiles and discard dump stockpile can contaminate the groundwater immediately below the stockpile as well as adjacent areas.	▪ Stockpile ground should be lined according to approved civil designs. ▪ Construction engineer should sign to confirm construction of stockpile pads according to designs at the establishment of the stockpile areas. ▪ Ensure that dirty water and clean catchments are separated through establishment of cut-off drains and berms.	Protection of groundwater	

		▪ Dirty catchment surface seepage should be contained and diverted to the onsite PCDs. ▪ Develop and implement stormwater management plan. ▪ Geochemical testing of the backfill material and pillar material should be conducted to aid in the prediction of contaminant release and potential geochemical changes induced in the subsurface.		
	Groundwater contamination from septic tanks and dirty water infrastructure.	▪ The water channels and onsite PCDs should be lined according to approved civil designs. ▪ Clean and dirty water catchment systems should be separated by berms and cut off trenches. ▪ Septic tanks should be established by credible company which lines the housing, with adequate lining material. ▪ Leak detection should be installed on septic tanks for control of seepage.	Groundwater protection	

		▪ Timely removal and emptying of sewage should be done by an accredited service provider. ▪ Disposal of sewage should be done at a licensed wastewater discharge point. ▪ Movable chemical toilets should be provided for pit and construction sites, with timely servicing.		
	Lowering of groundwater levels from regular dewatering of mining areas.	▪ Reuse of dewatered volumes onsite for maximal usage. ▪ Reduced freshwater abstraction but enhanced reuse of dirty water. ▪ Water conservation and demand management on all water use streams onsite. ▪ If it can be proven that the mines are indeed affecting the quantity of groundwater available to certain users, the affected parties should be compensated.	Groundwater protection	WUL conditions

		▪ Additional boreholes for water level monitoring should be done to replace any mined-out boreholes. ▪ The numerical model should be updated during operation of the mine by using the measured inflows, water levels and drilling and pump test information to re-calibrate and refine the impact prediction. ▪ Monitor static groundwater levels on a quarterly basis in all boreholes within a zone of one kilometre surrounding the mines. ▪ Determine groundwater flow direction and have a groundwater specialist interpret annual groundwater quantity and quality data and propose recommendations for groundwater management.		
	Formation of acid mine drainage (AMD).	▪ Optimise the storage of mine water in the underground sump, to minimise exposure to oxygen.		

		▪ Sample and analyse the quality of groundwater following an approved groundwater monitoring programme. ▪ Should pollution be identified within the groundwater resources, the source of the pollutants will be identified, and the applicable remediation measures will be implemented. ▪ Mining should remove as much coal as possible from the underground and separate acid forming and non-acid forming material. ▪ Update groundwater model annually to predict the pollution plume.		
Air quality	Dust generation from machinery and vehicle movements, as well as excavations at the pits. Fugitive dust (containing TSP, as well as PM10 and PM2.5) will be produced due to suspension of friable materials from earth roads.	▪ Dust suppression on all dust generating areas by water bowsers using dirty water stored in the PCDs. ▪ Implement speed limits of at most 40km/hr inside the mining area. ▪ Compact and seal roads, with regular grading and maintenance.		

		▪ Monitor dust fallout around the mine site sources and receptor points as guided by the Air Quality specialist report. ▪ Establish tree wind breaks around the prevailing wind direction at the boundary of the mine site. ▪ Minimise bare areas with exposed loose soil but encourage vegetation around the disturbed areas. ▪ Use of wind breakers such as transfer chutes for conveyor belts to ensure that less dust blown by wind during mass transfer.		
	Dust generation from topsoil and subsoil stockpiles.	▪ Minimise the time of soil stockpiling by concurrent rehabilitation and use of the stockpiles. ▪ Encourage vegetation growth on the stockpiles to reduce soil susceptibility to wind erosion.		
	Emissions from machinery and vehicles exhaust.	▪ Regular servicing of all mine machinery to reduce emissions.		

		▪ Regular monitoring of particulate matter onsite, with meteorological data to inform appropriate mitigation measures to be adopted.		
	Dust generated from material handling areas such as the ROM, plant area and product pad.	▪ Water sprays at the material handling points including conveyor belts and ROM discharge bin. ▪ Covering of conveyor transfer points in the direction of the predominant wind direction. ▪ Providing a controlled fine water spray system that directs water onto the input material before it enters the crusher and screen.		
	Dust generation during drilling and blasting activities in the opencast pits.	▪ Use of water sprays to add moisture to the soil before drilling. ▪ Use of fabric filters. ▪ Blasting must be conduction during daytime (Ideally between 12h00 to 15h00) when there is no inversion and there is		

		vertical turbulence of emissions to ensure vertical mixing and maximum dispersion. ▪ The surrounding area of the blast must be watered to reduce the dust and PM emitted before the blast. ▪ Wind direction measurements must be taken into consideration when blasting. i.e., when wind is towards the North, Northeast and Northwest (residential areas) blasting must be delayed occur on the North portion of the mine. ▪ An onsite monitoring station is required to capture the windspeed and direction around the mining area to assist with blast planning.		
Noise	Noise will be generated by ADTs, dump trucks and graders working in mining areas.	▪ Ensuring that equipment is well maintained and fitted with the correct and appropriate noise abatement measures. ▪ Acoustical mufflers (or silencers) should be considered on equipment exhausts.		

		▪ Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. ▪ Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised. ▪ All machinery working within the mine site, as well as vehicles should have reverse hooters for alertness of neighbours and other operators using the same roads or mining point. ▪ Ear protection PPE should be provided for all machinery operators. ▪ Communication between the receptors outside the mine site and the mine operators need to be implemented and maintained ▪ A communication channel should be developed where information on noise monitoring can be conveyed.		

		▪ Noise and vibration monitoring programme should be developed and implemented, with adequate representation of monitoring points at receptor sites.		
Social aspects	Employment creation at the different operational components at IDWALA.	▪ Update and implement the IDWALA SLP. ▪ Implement requirements of the Department of Mineral Resources (DMR) through specifications in the Mining Charter. ▪ Maximise local economic benefits through engagement of the local communities through representatives and community liaison office. ▪ The social performance of contractors for local employment, local procurement targets, skills development, etc. should be managed through the social management plan. ▪ Local employment should be emphasised and workers that reside closest to the	Local community development	Social management plan

		mining area should first be considered for employment. ▪ Establish a labour office with representatives of community, Ward Councillors and Newcastle Local Municipality.		
	Impact on neighbouring land market value, and borehole yields surrounding mining site.	▪ Establish complaints register at the mine where all affected parties can lodge their concerns. ▪ Establish a committee for addressing complaints as and when they are received. ▪ Implement measures to enhance land value, such as planting of trees, vegetation of stockpiles, establishment of visual barriers and traffic management) to reduce negative impacts to neighbouring landowners and users. ▪ Monitor groundwater quantity and quality. ▪ Compensate any affected groundwater users with alternative water supply.	Protection of land ownership and value.	

	Skills development for locals.	▪ Do a skills analysis of the local community members in collaboration with the Amajuba and Newcastle municipalities and Ward Councillors. ▪ ensure that locals from surrounding communities including Ngogo, Utrecht, Newcastle etc are considered first for employment and training. ▪ Engage continuously with all stakeholders as well as I&APs on employment and training opportunities through the mine Community Liaison Officer. ▪ Only if skills are not available locally (nearby settlements and local municipal area) will personnel be sourced elsewhere. ▪ IDWALA mine must get involved with a relevant Local Economic Development Projects as identified in the IDP of the Newcastle and Amajuba municipalities.	Local community development	
	Blasting	▪ Inform landowners of the blasting schedule through electronic	Prevent blast related	

		communication, SMS and updates on noticeboards. ▪ Limit blasting to daytime hours between 08H00 and 16H00. ▪ Undertake a full risk assessment in order to address the aspects and to put proper controls in place before blasting occurs. A pre-blasting report should be developed. ▪ Engage a skilled and professional blaster. ▪ Develop a post blasting report on completion of blasting. ▪ Engage reputable explosive company for supply of environmentally friendly explosives.	safety and health effects.	
	Roads over use	▪ Engage local roads agency and Newcastle municipality on road modifications such as extra turning lanes and overhead conveyor belt. ▪ Inform the Newcastle Local Municipality of damage to road surfaces and potholes.		

		▪ Fix all road damages and potholes regularly and cooperate with local roads agency on road maintenance. ▪ Fix appropriate road signage at the mine site for traffic control.		
	General impacts associated with the overhead conveyor belt across road P93.	▪ Fencing of the mining area and the conveyor belt for safety. ▪ Erect appropriate signboards that warn of the dangers of the conveyor belt and indicate areas that are off limits for the public. ▪ Regularly maintain conveyor belt to full functionality to avoid potential accidents.		
	Impacts on land and land use changes.	▪ Keep the development footprint as small as practically possible. ▪ Verify land claims that may be received on portion 0 or remaining extent of Witklip with the KZN Regional Land Claims Commissioner.		

		▪ Restrict vehicle movement over freshwater habitats to maintain social benefits downstream. ▪ Rehabilitate affected areas on closure to restore land capability especially grazing land for livestock. ▪ Maintain visual barriers for protecting neighbours and road users.		
	Employee safety and health impacts.	▪ Provide all appropriate PPE for onsite workers and visitors. ▪ Educate employees on use, storage and disposal of PPE material. ▪ Provide and fix all appropriate safety and health signage around mine site for information. ▪ Post different educative environmental topics on site noticeboards to raise awareness on Safety, health and Environmental (SHE) issues each month.		

		▪ Dust monitoring around mining site, followed by appropriate mitigation of exceedances. ▪ Service mine machinery and vehicles regularly. ▪ Enforce vehicle, machinery and truck speed limits on site. ▪ Provide safe and potable drinking water for consumption onsite. ▪ Provide serviced ablution facilities adequate for employees onsite. ▪ Instil regular water breaks and fatigue break for all working shifts for hydration and rest. ▪ Implement awareness campaigns for such chronic illnesses as heart disease, stroke, diabetes, HIV/AIDS/TB, blood pressure, Body Mass Index for all employees, with site basic clinical or first aid services. ▪ Improve knowledge in the workplace on general health, stress and counselling		

		services on general health and enhance during pandemics. ▪ Provide and service fire extinguishers for emergency management. ▪ Monitor occupational hygiene aspects such as noise exposure among employees.		
	Surrounding community health and safety related impacts.	▪ Dust suppression on haul and access roads. ▪ Dust monitoring with pints representing residential receptors. ▪ Monitoring of ambient air quality including PM10 and PM2.5. ▪ Implementation of mitigation measures following exceedances of dust standards. ▪ Monitoring of noise and vibration at receptor sites. ▪ Open communication channels to all stakeholders and I&APs. ▪ Only allow one or two access gates to manage movement in and out of mine site.		

		▪ Ensure a manned main gate with 24- hour security and other relevant security measures. ▪ Fence off mining site to control access to any mining operation without approval. ▪ Fire break round about the mine site. ▪ Engage with stakeholders on quarterly basis to hear their concerns and share monitoring results.		

16.1.3 Rehabilitation and Closure phase

The various activities associated with the closure phase include the following:

- Demolition of site infrastructure, including water infrastructures, offices, conveyor belts and plant area.
- Closure of mining voids.
- Closure of roads and compacted areas.
- Removal of mine fence.
- Rehabilitation of disturbed areas, including replacement of soil, spreading of soil, revegetation and profiling and contouring.

Common environmental impacts and associated mitigation measures are summarised in Table 31 below:

Table 33: Closure and Rehabilitation Phase EMPr

Environmental aspect	Environmental Impact	Mitigation measures	Standards to be achieved	Compliance with standards
Land capability	Mining development is closed.	▪ Restoration of land capability through rehabilitation of affected areas. ▪ Properly rehabilitate mining voids, stockpiles and infrastructure areas to allow land restoration.	Restoration of land capability	Rehabilitation Plan
	Stripping and stockpiling of topsoil for the opencasts, plant, PCDs and workshop.	▪ Replacement of topsoil according to their soil profiles will restore the original land capability to some extent depending on the standard of rehabilitation.		
Land use	Mining development is ceased, and a new land use option can be implemented.	▪ Properly rehabilitate, with closure of all voids, revegetation of compacted areas and use and vegetation of stockpiles to restore grazing land use.	Restoration of land use options.	Rehabilitation plan
Topography	Rehabilitation and replacement of soil layers will result in subsidence of the rehabilitated area, increase in the recharge	▪ Follow natural layers on closure of mining voids.	Avoid subsidence	Rehabilitation Plan

	into the mined-out workings and ponding of stormwater.	▪ Replace topsoil as the last layer, with levelling off the ground surface such that that the profile of the rehabilitated area is free draining. ▪ Establish a slope similar to the pre-mining slope with proper rehabilitation procedures according to the rehabilitation plan. ▪ Revegetate rehabilitated areas as soon as possible and inspect the areas for possible subsidence areas. ▪ Where subsidence has occurred, re-grade and fill the area to ensure free draining. ▪ Maintain routine topographical surveying of mine area for provision of scientific data and information essential for rehabilitation.		
Soil	Site infrastructure is removed from site, availing affected areas for rehabilitation.	▪ Plants with roots that bind the soil, and vegetation cover should be used that breaks the impact of falling		

		raindrops, thus preventing potential wind and water erosion. ▪ Plants used for re-vegetation should be indigenous to the area, and preferably hardy, fast-growing, nitrogen-fixing, provide high plant cover, be adapted to growing on exposed and disturbed soil (pioneer plants). ▪ The area of disturbance must be limited to disturbed areas requiring rehabilitation. ▪ Replacement and spreading of soil must be performed on less windy days. ▪ Regularly monitor and curb soil erosion on rehabilitated areas.		
	The soil profile is replaced on mined out areas.	▪ The bare soil will be prone to erosion and therefore there is need to reduce the velocity near the surface of the soil by re-vegetation.		

		▪ Soil replacement should mimic natural soil layers.		
		▪		
Vegetation	Disturbed areas are rehabilitated.	▪ Enhance the positive impacts of revegetation, with good choices of vegetation species adapted to the site, indigenous and fast growing, soil binding and good for erosion control. ▪ Engage specialist biodiversity and seeding specialists for revegetation process. ▪ Consider revegetation during rainy season to allow ease of growth for vegetation.		
	Proliferation of invasive alien species during rehabilitation.	▪ Ensure that indigenous vegetation is established on the rehabilitated area of the IDWALA site, similar to the identified habitats including secondary grassland, rocky		

		grassland, and freshwater habitat vegetation. ▪ Control growth and proliferation of alien vegetation in this area. ▪ Wash all trucks and machinery before they leave site, to control transfer of alien vegetation species to new areas.		
Air quality	Increase in dust fallout and particulate matter generation due to rehabilitation activities.	▪ Construction phase mitigation measures should be implemented.		
Noise	Increase in noise generation from rehabilitation machinery and demolition activities.	▪ Construction mitigation options be adhered to.		
Traffic	Increase in heavy machinery movement from site, low beds and abnormal loads.	▪ Manage transport of machinery from site using proper handling, transport and escort such that potential accidents are avoided. ▪ Schedule machinery movement in such a way that they are removed form site on different days to allow		

		normal traffic flow for local road users. ▪ Engage professional lowbed movers and serviced transporters.		
Surface water	Infiltration is enhanced by rehabilitation of compacted areas.	▪ Enhance infiltration for recharge of both surface and groundwater resources.		
	Rehabilitation activities and movement of machinery increase turbidity and total dissolved solids in surface waters due to disturbances of the soil surface.	▪ Manage rehabilitation activities not to contribute to surface water pollution. ▪ Control runoff from rehabilitation areas not to pollute surface water. ▪ Rehabilitate all dirty catchment areas and revegetate to avoid surface water pollution.		
	Increased ssedimentation and contamination from rehabilitation activities will reduce effective storage capacity and increase downstream silt loads.	▪ Soils should be managed to reduce silt loads towards surface watercourses during rehabilitation. ▪ Exposed areas should be immediately revegetated to reduce	Protection of surface water quality.	

		washing off of topsoil into surface watercourses. ▪ Waste from site activities must be discarded in an approved manner, with separation of waste types and offsite disposal at designated sites. ▪ Spills should be cleaned up immediately.		
Groundwater	Recharge of groundwater resources due to improved infiltration from rehabilitated areas.	▪ Encourage infiltration to improve groundwater quantity.	Groundwater recharge	
	Formation of AMD where pyrite containing material is exposed to excessive oxidation.	▪ Place carbonaceous material at pit points where it does not contaminate groundwater. ▪ Close discard material used in backfilling mined areas and revegetate closed areas. ▪ The mined areas should be flooded as soon as possible to minimise oxygen from reacting with the remaining pyrite.		

		▪ Update geochemical assessment and numerical groundwater model to determine the post closure quality of mine water associated with the mining areas. ▪ Optimise storage of mine water in mined-out underground sections. ▪ Install high pressure seal in the incline underground development to the mined-out workings. ▪ The underground mining shafts should be sealed, backfilled and closed. ▪ Rehabilitated areas should be made free draining. ▪ Groundwater quantity and quality monitoring should continue. ▪ A detailed decant management plan will be developed at mine closure.		

	Influx of groundwater into the underground workings leading to dewatering of the above lying aquifer on closure of underground shaft.	▪ Ensure stability and integrity of the overlying strata, specifically the weathered zone. ▪ Mine according to the design mine stability safety factor. ▪ All fractures encountered while mining must be sealed by grouting, both on inflow and outflow areas.		
Social aspects	Loss of mine employment and opportunities for contractors.	▪ Communication with employees and contractors on the end of life of mine. ▪ Offer counselling and assistance in collaboration with the workers and union representatives. ▪ Communicate and execute proper retrenchment procedures to overcome shock and distress among affected workers. ▪ Where the Wescoal Group has opportunities in other operational mining sites, redeployed employees		

		in other ventures, should employees get interest. ▪ Communicate and terminate contracts for suppliers in an amicable and procedural manner. ▪ Adequately rehabilitate the affected areas such that land use options are possible on mined out areas, to allow communities surrounding Witklip access and opportunities to utilise the land as before mining. ▪ Rehabilitate mined out areas to reduce visual impacts and unsafe areas for people and livestock passing through the area. ▪ Removal all mine infrastructure from site to avoid potential squatters. ▪ Revegetate compacted areas to allow revegetation and restoration of aesthetic value of the land.		

16.1.4 Post closure phase

Potential impacts and recommended mitigation measures for the post mining phase are listed in Table 33 below:

Table 34: Post closure phase EMPr

Environmental Aspect	Potential impact	Mitigation measures	Standards to be achieved	Compliance with standards
Groundwater	Formation of AMD and decant.	Monitoring of the water table rebound will continue post-closure for 3 to 4 years. Update groundwater model to quantify the long-term impacts. Where decant and AMD are concluded, the management measures should be revised based on the modelling results.	AMD management Decant management	WUL
Land use	New land use option after mine closure.	Enhance implementation of a new land use option. Farming is the post mining land use option.		

16.2 Opinion on authorisation

The proposed project should be authorised since it does not pose any severe environmental impacts with implementation of mitigation measures.

Conditions of authorisation should be the mitigation measures proposed in the EMPr for all development phases.

16.3 Proposed period of authorisation

The period of authorisation required is for 30 years until 2037.

Post mining monitoring will be required for two years.

REFERENCES LIST

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8. Ntlazane (2022) Traffic Impact Assessment Report for IDWALA Colliery.
9. www.statssa.gov.za accessed on 18 January 2022.
10. ASG, 2021. Geohydrological Impact Assessment Study, IDWALA.

APPENDIX 1

Declaration of the EAP

I, Nonkululeko Mbasane, declare that –

- I act as the independent environmental practitioner in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations. and all other applicable legislation.
- I will consider, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority.
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application.
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report.
- I will keep a register of all interested and affected parties that participated in a public participation process.
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.
- All the particulars furnished by me in this form are true and correct.

Signed: Date: 21 October 2022

Curriculum vitae