



agriculture & environmental affairs

Department:
Agriculture
& Environmental Affairs
PROVINCE OF KWAZULU-NATAL

(For official use only)

EIA File Reference Number:
NEAS Reference Number:
Waste Management Licence Number:
(if applicable)
Date Received:

BASIC ASSESSMENT REPORT

Submitted in terms of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

This template may be used for the following applications:

- **Environmental Authorization** subject to basic assessment for an activity that is listed in Listing Notices 1 or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- **Waste Management Licence** for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

Kindly note that:

1. This **basic assessment report** meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Agriculture & Environmental Affairs. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

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9. The KZN Department of Agriculture & Environmental Affairs may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. **Please note that this report must be handed in or posted to the District Office of the KZN Department of Agriculture & Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).**

DEPARTMENTAL REFERENCE NUMBER(S)

File reference number (EIA):	Ref No: DC26/0007/2014: KZN/EIA/0001423/2014
File reference number (Waste Management Licence):	

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	Prime Resources (Pty) Ltd		
Physical address:	The Workshop 70 7 th Avenue Parktown North Johannesburg 2193		
Postal address:	PO Box 2316 Parklands		
Postal code:	2121	Cell:	072 602 3164
Telephone:	011-447-4888	Fax:	011-447-0355
E-mail:	jonathan@resources.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Jonathan van de Wouw	BSc(Hons) Microbiology and Biotechnology		6
Zoe Gebhardt	MSc Hydrology and Business Management		2
Jonathan Shippon	BSc(Hons) Geography and Environmental Management		3
Louise Kendall	MSc Environmental Sciences		1
Elize Botha	BSc(Hons) Environmental Management		1

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3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D
Strategic Environmental Focus (Pty) Ltd	BSc, BSc (Hons), MSc (Aquatic health)	Terrestrial Ecology Aquatic Ecology Wetlands	Specialist Assessment	Flora, Fauna, Aquatics, Wetlands Impact Assessments
Future Flow GPMS	Nat. Dip. (Public Health), Nat. Dip. (Water Care)	Geohydrology	Specialist Assessment	Geohydrology Impact Assessment
Archeatnos	BA, BA(Hons), MA (Archaeology), DPhil (Archaeology), Man Dip (TUT), DPhil (History)	Heritage	Specialist Assessment	Heritage Impact Assessment
UWP	BSc Eng Civil	Traffic	Specialist Assessment	Traffic Impact Assessment

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

Mbila Anthracite Mine – Underground Mining Activities at G-Block

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

Mbila Resources (Pty) Ltd is the holder of a Mining Right for anthracite (coal) of the Beaufort and Ecca Groups in the KwaZulu-Natal Province, approximately 20km east of the town of Nongoma within the Mandlakazi Tribal Authority. The project area according to the approved Mining Right is a **portion of Portion 9 of the Farm Reserve Number 12 | 15832 HU (being 19 180Ha in extent)**.

This Basic Assessment Report thus includes mining activities that will commence within a section of the Mining Right area entitle “G-Block” (where the Ecca Group coal will be targeted) and will involve the development of a **box-cut portal and adit infrastructure at the G-block as well as a coal handling and preparation plant within the mining right area and near the Tribal Court at Esiphambanweni**. The mining method will be by underground means utilising the bord-and-pillar method. Mined coal will be **trucked via a new haul road to the proposed coal handling and processing plant**. The proposed plant will batch treat approximately 20 000 tonnes of coal per month, with residue material reporting to a surface discard dump.

Electricity to the Mine will be supplied by Eskom. Coal product will be sold as “free-on-truck” from the beneficiation plant site. Water management at all mine facilities will be via pollution control dams, berms and trenches designed to accommodate a 50-year return event and divert clean runoff around mine infrastructure while reducing the extent of contaminated runoff areas. Water supply will be via boreholes as per agreement with Zululand District Municipality.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June2010), Listing Notice 3 (GNR 546, 18June 2010) or Category A of GN 718, 3 July 2009 (Waste Management Activities) which is being applied for as per the project description:

Number and date of the relevant listing notice:	Activity No (s) (in terms of the relevant or notice):	Describe each listed activity as per the project description:
R.544 (2013)	11	For the construction of stream crossings / causeways over watercourses
R.544 (2013)	18	
R.544 (2013)	22	For the construction of proposed haul / access road which will be greater than 8m wide
R.544 (2013)	23	For the transformation of land greater than 1ha but less than 20ha for development of the adit, plant and haul road
R 544 (2013)	13	For diesel tanks where storage capacity is greater than 80m ³ but less than 500m ³
GNR546 (2010)	According to Point 4 of the Acknowledgement of Application received from the Department, dated 25 February 2014, “the proposed box – cut / adit at	

	G-block and access roads are not in Listing Notice 3 sensitive areas, but the beneficiation plant and residue facility falls in geographical sensitive area, but the potential impacts to be created in this site, the department is of opinion that they will be dealt with in the EIA process that is underway. Moreover, Ezemvelo KZN Wildlife and Amafa Akwa Zulu Natal as the provincial agency on biodiversity conservation and cultural resources protection will be given an opportunity comment on the project".
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4. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Sections B 5 – 15 below should be completed for each alternative.

5. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Proposed box-cut / adit at G-Block

	Latitude (S):			Longitude (E):		
Alternative: Alternative S1 ¹ (preferred or only site alternative)	27°	52'	35.17"	31°	43'	50.72"

¹ "Alternative S.." refer to site alternatives.

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Alternative S2 (if any)	0	'	"	0	'	"
Alternative S3 (if any)	0	'	"	0	'	"

Proposed coal handling and processing plant (CHPP) and residue facility (central point of this facility has been given for reference purposes

Alternative:	Latitude (S):			Longitude (E):		
Alternative S1 ² (preferred or only site alternative)	27°	54'	21.56"	31°	45'	51.51"
Alternative S2 (if any)	0	'	"	0	'	"
Alternative S3 (if any)	0	'	"	0	'	"

In the case of linear activities:

Proposed haul / access road between the G-Block and the plant which will be 8m wide

Alternative:	Latitude (S):			Longitude (E):		
Alternative S1 (preferred or only route alternative)						
• Starting point of the activity	27°	52'	35.17"	31°	43'	50.72"
• Middle point of the activity	27°	53'	17.83"	31°	44'	51.89"
• End point of the activity	27°	54'	0.49"	31°	46'	31.08"
Alternative S2 (if any)			"			"
• Starting point of the activity	0	'	"	0	'	"
• Middle point of the activity	0	'	"	0	'	"
• End point of the activity	0	'	"	0	'	"
Alternative S3 (if any)			"			"
• Starting point of the activity	0	'	"	0	'	"
• Middle point of the activity	0	'	"	0	'	"
• End point of the activity	0	'	"	0	'	"

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

6. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Haul Road between plant and G-Block

Alternative:	Size of the activity:
Alternative A1 ³ (preferred activity alternative)	42 420 m ²

² "Alternative S.." refer to site alternatives.

Alternative A2 (if any)
Alternative A3 (if any)
or, for linear activities:

	m ²
	m ²

CHPP and residue facility

Alternative:
Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)

Size of the activity:	
	100 000 m ²
	m
	m

Surface Adit

Alternative:
Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)

Size of the activity:	
	50 000 m ²
	m
	m

7. SITE ACCESS

Does ready access to the site exist?
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

	NO
	5 280m

There are two tarred provincial roads that will be utilised to gain access to the proposed processing plant, namely: the R66 and R618. The R66, which leads to Nongoma, approaches the south-western boundary of the study area where it joins the R618 at Nongoma. The R618 then leads to the centre of the mining right area. The R618 is the provincial road link between Nongoma and the N2, the road is surfaced with conditions ranging from average to good.

A dedicated haul road will be constructed which links the proposed box-cut / adit to the P234 from where the CHPP will be accessed. The proposed haul road will cover a distance of approximately 5 280m.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site. See Appendix A.

8. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this report.

The site or route plans must indicate the following:
8.1. the scale of the plan which must be at least a scale of 1:500;

³ "Alternative A.." refer to activity, process, technology or other alternatives.

- 8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
- 8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 8.4. the exact position of each element of the application as well as any other structures on the site;
- 8.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 8.6. walls and fencing including details of the height and construction material;
- 8.7. servitudes indicating the purpose of the servitude;
- 8.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers, streams, drainage lines or wetlands;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);
- 8.9. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 8.10. the positions from where photographs of the site were taken.

9. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

10. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

11. ACTIVITY MOTIVATION

11.1. Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development phase of the activity?

R 109 000 000	
R 156 000 000	
YES	NO
YES	NO
150	

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What is the expected value of the employment opportunities during the development phase?	R 2 500 000 per month
What percentage of this will accrue to previously disadvantaged individuals?	90%
How many permanent new employment opportunities will be created during the operational phase of the activity?	150 (not counting contractors)
What is the expected current value of the employment opportunities during the first 10 years?	R 27 000 000 per annum for 7 years
What percentage of this will accrue to previously disadvantaged individuals?	85%

11.2. Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

Coal deposits found in the region are of a very high quality. There are two distinct types of anthracite that have been preserved, namely: the Ecca and Beaufort group. Mbila Resources aims to exploit the Ecca Coal resource at the G-block for local as well as international markets. The anthracite found in this region is of such a high quality which enables it to be used by titanium producers such as: Richard's Bay Minerals, Ticor, Namakwa Sands and Corridor Sands; these producers need large quantities of anthracite (characterised by low ash, phosphorus and calcium levels) as it is used as a primary reductant in their smelting process. The Ecca group to be mined at the G-block is one of the few anthracite seams which fulfils these requirements.

Producers of ferrochrome such as Samancor and Xtrata also require anthracite with low phosphorus levels such as those to be mined at the G-block and are therefore ideal for use by these producers. Additionally, the target anthracite may be used in electrode paste production which requires low ash levels. Other target markets for the Mbila anthracite include brick / clay producers and Brazilian pellitizing plants.

The high quality and diverse uses of the target anthracite makes it a lucrative resource, anthracite of such high quality is a scarce resource and consequently there is a great demand for it. In order for an anthracite mine to be viable it should be located in close proximity to markets and mining conditions should be favourable; the Mbila Anthracite Mine is located within reasonable proximity to markets and the mining process is relatively simple, lending to its viability.

Indicate any benefits that the activity will have for society in general:

- Social and developmental projects through the local economic development programme
 - Improvement of existing infrastructure
 - Skills development and training
 - Local and National taxes and royalties
- Refer also to the description provided above

Indicate any benefits that the activity will have for the local communities where the activity will be located:

This phase of mining together with the foreseen future mining developments will provide the following benefits:

Socio-Economic Benefits

The project is located in a rural and undeveloped region of low econo-agricultural potential, representatives from the Zululand district council and the Nongoma local council have acknowledged the fact that mining is the only large-scale economic development option in the area.

There are ample Socio-economic benefits associated with the Mbila Anthracite project. The mine aims to recruit the majority of its employees from the communities in its immediate vicinity.

Mbila Resources' Human Resources Development Programme will ensure that communities and HDSA (Historically Disadvantaged South African) companies are offered an opportunity to develop economically and educationally. Additionally, the plan will ensure that the employees are offered opportunities to acquire portable skills.

Water is a scarce resource in the Mandlakazi tribal area. The proposed project will make it possible for more members of the community to access clean water. The communities which stand to benefit are those located in close proximity to the mining project.

In addition to direct economic spinoffs there are indirect opportunities associated with the project, Mabila has indicated that they will make a significant commitment to the training and development of community members that will provide them with the necessary skills and knowledge to operate SMME's that will service the mine and other small parties.

The proposed project falls within the Zululand District and Nongoma Local Municipalities. It is anticipated that a significant portion of its workforce will be sourced from this area.

In addition to the above the following community development are proposed:

Skills Development Programme

Technical knowledge (skills) is acquired academically (education) and practical knowledge (skills) is obtained from the work environment (on-site training). This can be complemented by formal training courses. Competence will be a product of academic and practical learning. Ideally this requires relevant education requirements and development of technical, administrative and managerial skills at the workplace. In this way an individual develops a career path through employment for life.

The objectives of this plan are to:

- Ensure illiteracy eradication
- Ensure education of employees
- Ensure training and development of skills of employees
- Ensure that a talent pool of necessary skills and competencies is established

Human Resources Development Programme

Mine specific skills training and development will be offered to mine workers. Mabila Resources (Pty) Ltd will ensure that communities are offered an opportunity to develop educationally and economically. The plan will ensure that the employees are offered opportunities to acquire portable skills. Five plans, namely the skills development plan, a career progression plan, mentorship plan, an internship / bursary plan and an employment equity plan will be used to achieve the abovementioned objectives.

Mentorship Plan

The objective of this plan is to ensure that employees (especially HDSA's) with potential are coached, guided and prepared for higher positions. The Mentorship Plan will be implemented in line with the Skills Development Plan and Career path plan.

Career Progression Plan

The objective of this plan is to ensure that through proper communication and investment in education and training, mining skills are made available to the employees, especially HDSA's and skilled employees are promoted to higher positions in the organisation.

Internship and bursary plan

The objective of the plan is to ensure that employees with potential and grade 12 pupils from the surrounding community schools are offered a chance to study further and to obtain experience after and during their studies. The implementation of this plan will continue every year for the LOM.

Employment equity plan

Through the employment equity plan, measures will be taken to ensure that suitably qualified persons especially HDSA's (Historically Disadvantaged South Africans) are given equal opportunity and are equitably represented in all occupational levels and categories in the mines workforce. These include elimination of employment barriers and unfair discrimination, furthering of diversity in the workforce, making reasonable accommodation for HDSA's and retaining and developing HDSA's.

In conjunction with the above, it should also be noted that Mbila has developed the Sithokozile crèche and Pre-School which was developed next to the Ngxongwane Primary School in the Ekubungazeleni Community.

12. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
The National Environmental Management Act (No. 107)	Department of Environmental Affairs	1998
Environmental Impact Assessment Regulations	Department of Environmental Affairs	2010
The Mineral and Petroleum Resources Development Act (No. 28)	Department of Mineral Resources	2002
National Environmental Management: Air Quality Act (No.39)	Department of Environmental Affairs	2004
The National Heritage Resources Act (No. 25)	South African Heritage Resources Association	1999
The National Water Act (No. 36)	Department of Water	1998

	Affairs	
The National Environmental Management: Waste Act (No. 59)	Department of Environmental Affairs	2008
The National Environmental Management: Biodiversity Act (No. 10)	Department of Environmental Affairs	2004
EKZN – Conservation Plan (C-Plan)	Ezemvelo KZN Wildlife	

13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

13.1. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

If yes, what estimated quantity will be produced per month?

YES	NO
<ul style="list-style-type: none"> Waste that is associated with construction activities will be generated during the construction of the proposed CHPP, haul road and surface infrastructure at the. Waste typically associated with construction includes: building materials (gravel, aggregate, concrete, empty containers, waste cable, metals, wood, plastics, glass, plumbing fixtures etc.), land clearing debris and other general waste. The exact quantity of waste that will be produced per month is unknown; however, no more than 100m³ of general waste will be temporarily stored on-site at any given time. 	

How will the construction solid waste be disposed of? (describe)

Solid construction waste will be temporarily stockpiled at the construction sites where after this waste will be removed by either the construction contractor as part of the service agreement, or by an appointed waste contractor and ultimately removed to the nearest suitably licensed solid waste disposal facility (landfill).

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Where will the construction solid waste be disposed of? (provide details of landfill site)

If not forming part of the service level agreement with the construction contractor, an independent waste handling and removals company will be contracted to collect and truck the solid construction waste from the site to a suitably licensed waste disposal facility / landfill site.

Will the activity produce solid waste during its operational phase?

~~YES~~

NO

If yes, what estimated quantity will be produced per month?

- General waste will be produced by the workers and contractors on-site during the operational phase of the proposed project which include wastes such as domestic and building waste.
- Industrial wastes will be produced such as wood, rubber, paper and refurbishable wastes (pumps, valves etc.)
- Hazardous wastes such as hydrocarbon or chemical contaminated solid wastes will be produced
- The exact quantity of general waste that will be produced per month is unknown; however, no more than 100m³ of general waste will be temporarily stored on-site at any given time.
- The exact quantity of hazardous waste that will be produced per month is unknown; however, no more than 35m³ of hazardous waste will be temporarily stored on-site any given time.

How will the solid waste be disposed of? (provide details of landfill site)

General Waste

A temporary storage site for general waste will be developed on-site, with the capacity to hold no more than 100m³ of general waste at any given time. General waste will be removed at a pre-determined frequency from site in order to ensure that no more than 100m³ of waste will be present in the storage site at any given time. Mbila will secure a waste removal contract with a reputable company that will remove this waste on a frequency that is deemed suitable or on as-and-when required basis for disposal at a suitably licensed general waste disposal facility (landfill). Certificates for all disposal activities will be kept on-file at the Mine.

The closest General Waste Disposal Sites are as follows:

- Ulundi: Babanango General Waste Disposal Site;
- Hlabisa: St Lucia General Waste Disposal Site;
- Umhlabuyalingana: Kwangwanase General Waste Disposal Site; and
- Uthungulu: Mtunzini General Waste Disposal Site

Hazardous Waste

A temporary hazardous industrial waste storage area will be developed on-site with the capacity to hold no more than 35m³ of hazardous waste at any given time. Hazardous waste streams include main industrial lubricants, chemicals or petroleum products or any containers or materials contaminated by these substances. Mbila will secure a waste removal contract with a reputable company that will remove this waste on a frequency that is deemed suitable or on as-and-when required basis for disposal at a suitably licensed hazardous waste disposal facility (landfill). Certificates for all disposal activities will be kept on-file at the Mine.

The closest Harardous Waste Disposal Sites are as follows:

- Newcastle: Ballengchei Hazardous Waste Disposal Site;
- uMhlathuze: Delkor Hazardous Waste Disposal Site;
- Enviroserv Richard’s Bay Depot Hazardous Waste Disposal Site; and
- Uthungulu: Mhlathuze Hazardous Waste Disposal Site.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

See details above describing the disposal of the various solid wastes.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

The above point is noted; however, solid waste will only be disposed of at registered landfill and municipal waste management sites as discussed above

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
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If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

The above point is noted; however, the proposed project will generate minimal amounts of hazardous wastes (lubricants, chemicals and petroleum products and materials contaminated by these substances) that will be temporarily stored on site in an area that will not be capable of holding more than 35m³ of hazardous waste at any given time, which is the threshold value for which no Waste Management License is required.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
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If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

13.2. Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
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If yes, what estimated quantity will be produced per month? m³

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO
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If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Temporary, containerised sewage and grey water treatment plants will be installed at the proposed adit and the proposed processing plant. The aforementioned plants will treat domestic type water stemming from the ablution facilities. Water discharged from the sewage plants will be pumped into the reticulation system for re-use on-site. The sewage plant will be of such a nature that solid waste in the system will be pumped and disposed of at a municipal waste management site. The combined daily throughput capacity of these facilities will be less than the threshold of 2000m³ for which environmental authorisation is required.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
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As indicated previously the details required below will be acquired during the implementation phase of the proposed project

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

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13.3. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

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13.4. Generation of noise

Will the activity generate noise?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

The area in which the proposed project is to be developed comprises undulating hills with a few homesteads present in and around the project area and is considered to be a rural area. According to SANS 10103:2004, average noise levels in such areas are typically 45 dBA during the daytime and 35 dBA during the nighttime.

Noises that are typically associated with such a mining project include those stemming from: construction of the proposed surface infrastructure and surface adit (temporary during the construction phase), heavy vehicles (including haul trucks traversing from the adit to the processing plant and in and out of the area during the operational phase), operation of the CHPP and coal loading operations.

During the construction phase of the proposed surface adit noises will be emanating from the following activities: drilling, shovelling and truck loading. Some limited, short duration and temporary blasting may be required during construction of the adit. Assessments done on similar projects measured that the noise associated with the aforementioned construction activities will generally emit a combined noise of approximately 87 dBA at approximately 15 metres. Bearing this in mind, and considering that the nearest settlements to the proposed surface adit are located approximately 500 m away (Google Earth), as well as the fact that all construction activities will be undertaken during daylight hours only, it is safe to assume that such operations will exert negligible noise influence on surrounding communities. Noise levels during the decommissioning phase will be similar to those during construction.

Noise generating activities that will be evident during the operational phase of the proposed project will be associated with surface activities at the adit (handling of men and materials as well as mined coal), hauling of coal material, operation of the CHPP and residue handling. Studies undertaken at similar operations suggest average noises emitted to be of 77 dBA at 25 metres. The nearest settlements to noise generating activities at the adit are approximately 450 metres away (Google Earth) whereas the nearest settlements located to noise generating activities at the CHPP are approximately 200 metres away; at these distances it is safe to assume that such operations will exert negligible noise influence on surrounding communities.

An EIA prepared by Synergistics for Mbila Resources in 2007 utilised to prepare the EMP attached to the Mining Right identified noise emanating from heavy vehicles as being the biggest contributors or sources of vehicle noise. Noise impacts from haul trucks are difficult to calculate considering that sections of land that will be traversed during the hauling of coal do not consist of any settlements whilst other sections have rural villages located within 50 metres of the proposed haul road. Such noise will thus have differing consequences depending on the varying distances from noise sensitive areas. The previously mentioned EIA found that increases in noises of up to 12 dBA could be expected at settlements and schools that are located within 50 metres of the proposed haul road. It should however be noted that the EIA presenting this data considered the proposed mine on a larger scale comprising underground mining and adits at four different locations as opposed to just the G-block which forms the current scope, and hence fewer vehicles involved in hauling material will be entailed.

The significance of noise impacts on surrounding communities is thus considered to be negligible, however, measures by which to further limit impacts in this regard are provided in the attached EMP.

14. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
-----------	-------------	------------------------	----------------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

6 380 m ³ per month

Does the activity require a water use permit from the Department of Water Affairs?

YES	NO
----------------	----

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report. **WULA was prepared by Prime Resources (Pty) Ltd and was submitted in August 2012 to the Department of Water Affairs, KZN-Region, the WULA is currently being considered by the Department.**

15. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The capital estimate for the project allows for the installation of an outdoor containerised 22kV substation which is to be complete with switchgear, Reactor Capacitor Inductive System (RCL) and harmonic Power Factor Correction (PFC) system. The aforementioned technologies will ensure that a Power Factor (PF) of 0.98 will be achieved at a load of 2.5 megavolt amperes (MVA). The installation of a PFC system is a requirement by Eskom as it will allow for a reduction in power

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

None

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No.

A

(e.g. A):

- Subsections 1 - 6 below must be completed for each alternative.

SECTION C A: PROPOSED BOX-CUT / SURFACE ADIT: SEE APPENDIX C, FIGURE 1

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1. GRADIENT OF THE SITE

Indicate the general gradient of the site. (measured as average gradient across entire site)

Alternative S1:

Steep	1:50 1:20	-	1:20 1:15	-	1:15 – 1:10	1:10 1:7,5	-	1:7,5 – 1:5	Gentler than 1:5
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Alternative S2 (if any): N/A

Steep	1:50 1:20	-	1:20 1:15	-	1:15 – 1:10	1:10 1:7,5	-	1:7,5 – 1:5	Gentler than 1:5
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Alternative S3 (if any): N/A

Steep	1:50 1:20	-	1:20 1:15	-	1:15 – 1:10	1:10 1:7,5	-	1:7,5 – 1:5	Gentler than 1:5
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2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

Underground Section (1)

Alternative S1: (preferred site):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?

YES	NO
----------------	----

If YES, please complete the following:

Name of the specialist:	Martiens Prinsloo		
Qualification(s) of the specialist:	Geohydrologist at Future Flow GPMS		
Postal address:	P.O. Box 161 , Menlyn , Pretoria		
Postal code:	0063		
Telephone:	+27(0)12 345 1337	Cell:	+27(0)83 633 4949
E-mail:	martiens@ffgpm.co.za	Fax:	+27(0)86 695 3846
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES	NO	
If YES, specify and explain:	See Groundcover Section below		
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO	

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If YES, specify and explain:	See Groundcover Section below		
Are any further specialist studies recommended by the specialist?	YES	NO	
If YES, specify:			
If YES, is such a report(s) attached in <u>Appendix D</u> ?	YES	NO	

Signature of specialist:	Details derived from the specialist report attached – the specialist did not physically complete the section. Please refer to specific specialist declarations in Appendix D	Date:	Report date March 2014
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Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	YES	NO	YES NO
Dolomite, sinkhole or doline areas	YES	NO	YES NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES NO
Any other unstable soil or geological feature	YES	NO No major adverse conditions have thus far been detected by the geotechnical study. The boreholes indicate a reasonable sandstone horizon above the Seam	YES NO
An area sensitive to erosion	YES Soil specialist John Phipson (2014) identified the site as an area sensitive to erosion, which was also confirmed by the Biodiversity specialist Byron Grant (see Section 4 below)	NO	YES NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities.

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Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUND COVER

Has a specialist been consulted for the completion of this section? YES NO

If YES, please complete the following:

Name of the specialist:	Byron Grant		
Qualification(s) of the specialist:	Ecologist at Strategic Environmental Focus (Pty) Ltd		
Postal address:	P.O. Box 74785 Lynwood Ridge Pretoria		
Postal code:	0040		
Telephone:	+27(0)12 349 1307	Cell:	
E-mail:	sef@sefsa.co.za	Fax:	+27(0)12 349 1229

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain:

Fauna:

A number of avifaunal species of conservation concern were confirmed to occur in the study area, namely:

Common name	Latin name	Conservation Status	
		RSA	IUCN
Woolly-necked Stork	<i>Ciconia episcopus</i>	Near-Threatened	Least-Concern
Lanner Falcon	<i>Falco biarmicus</i>	Near-Threatened	Least-Concern
Southern Bald Ibis	<i>Geronticus calvus</i>	Vulnerable; Endangered	Vulnerable
White-backed Vulture	<i>Gyps africanus</i>	Vulnerable	Least Concern
Black-bellied Bustard	<i>Lissotis melanogaster</i>	Near-Threatened	Least-Concern
African Marsh Hairrier	<i>Circus ranivorus</i>	Vulnerable	Least-Conern

Refer to Figure 1 Appendix G

Flora:

No floral species of conservation concern were identified in the actual area associated with the proposed surface adit and associated infrastructure; however, species of conservation concern were identified within the greater study area (on surface above the proposed underground workings, and near the proposed haul road. Refer to Figure 2, Appendix G for the exact positions thereof). These included: *Hypoxis hemerocallidea*, *Boophone disticha* and *Gladiolus papilio*.

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain:

- The study undertaken by S.E.F classified the area associated with the surface adit as an area of high faunal sensitivity.
- The study classifies the area associated with the entire project as having a medium floral sensitivity. See Figure 2, Appendix G.
- The proposed surface adit is located within a hillslope seep connected to a watercourse wetland as delineated by S.E.F (Figure 3, Appendix G). Although this is not classified as an NFEPA wetland (Figure 4, Appendix G).

Are any further specialist studies recommended by the specialist? YES NO

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If YES, specify:

If YES, is such a report(s) attached in Appendix D? YES NO

Signature of specialist: Details derived from the specialist report attached – the specialist did not physically complete the section. Please refer to specific specialist declarations in Appendix D

Date: Report date February 2014

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s). **Refer to Images referenced in sections above.**

Natural veld - good condition^E	Natural veld with scattered aliens^E	Natural veld with heavy infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character			Description
Natural area	YES	NO	
Low density residential	YES	NO	The community of Nkabane is located to the north / north-east. Refer to Figure 19 and 20, Appendix G.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	The community of Nkabane is located to the north / north-east. Refer to Figure 19 and 20, Appendix G.
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
Medium industrial	YES	NO	
Heavy industrial	YES	NO	
Power station	YES	NO	
Office/consulting room	YES	NO	
Military or police base/station/compound	YES	NO	
Spoil heap or slimes dam	YES	NO	
Quarry, sand or borrow pit	YES	NO	
Dam or reservoir	YES	NO	
Hospital/medical centre	YES	NO	
School/ creche	YES	NO	
Tertiary education facility	YES	NO	

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Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
Train station or shunting yard	YES	NO	
Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	
Agriculture	YES	NO	Part of the surface adit and associated infrastructure is to be located in fallow land. Small-scale subsistence agricultural farms and grazing land is also located within 500 metres of the proposed surface adit. Refer to Figure 5, Appendix G.
River, stream or wetland	YES	NO	<p>There is a non-perennial tributary of the Mona River located to the west of the proposed adit. There is a non-perennial tributary of the Mona River located to the east. Both of the aforementioned are located within 500 metres of the proposed surface adit and associated surface infrastructure. Refer to Figure 19, Appendix G.</p> <p>There are also FEPA and non-FEPA wetlands located within 500m of the proposed surface adit and associated infrastructure. Refer to Figure 4, Appendix G. There are also wetlands that were delineated by S.E.F located within 500m of the proposed surface adit and associated infrastructure. Refer to Figure 4, Appendix G.</p>
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	The proposed adit and associated infrastructure are to be located on a gentle slope.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	There are also FEPA and non-FEPA wetlands located within 500m of the proposed surface adit and associated infrastructure. Refer to Figure 4, Appendix G. There are also wetlands that were delineated by S.E.F located within 500m of the proposed surface adit and associated infrastructure. Refer to Figure 4, Appendix G.
Graveyard	YES	NO	
Archaeological site	YES	NO	A Heritage Impact Assessment was conducted in 2006 by the National Cultural History Museum; this study found that there are sites of archaeological significance located within 500 metres of the proposed surface adit and haul road (Figure 19, Appendix G). A follow up study, applicable to the new

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	NO	project scope, was conducted by Archaetnos Culture and Cultural Resource consultants in 2014. The latter study referenced the findings of the former study; however, the recent study only identified two sites of cultural / heritage significance (both of which are located within 500 metres of the proposed haul road see Figure 6 Appendix G).
Other land uses (describe)	NO	

6. CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?

YES	NO
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If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report. (Heritage Impact Assessment attached at Appendix D)

Briefly explain the recommendations of the specialist:

Although no sites of cultural or historically significant elements were found within 20m of the site, the specialist recommended that the graves and the cattle kraal (see Heritage study attached as Appendix D) identified within 500m of the haul road are preserved as they are not directly impacted upon.

Will any building or structure older than 60 years be affected in any way?

YES	NO
YES	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

SECTION C: HAUL ROAD: SEE APPENDIX C, FIGURE 2

7. GRADIENT OF THE SITE

Indicate the general gradient of the site. (measured as average gradient across entire site)

Alternative S1:

Steep	1:50	-	1:20	-	1:15 - 1:10	1:10	-	1:7,5 - 1:5	Gentler than 1:5
	1:20		1:15			1:7,5			

Alternative S2 (if any): N/A

Steep	1:50	-	1:20	-	1:15 - 1:10	1:10	-	1:7,5 - 1:5	Gentler than 1:5
	1:20		1:15			1:7,5			

Alternative S3 (if any): N/A

Steep	1:50	-	1:20	-	1:15 - 1:10	1:10	-	1:7,5 - 1:5	Gentler than 1:5
	1:20		1:15			1:7,5			

8. LOCATION IN LANDSCAPE

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Indicate the landform(s) that best describes the site (Please cross the appropriate box).

Underground Section (1)

Alternative S1: (preferred site):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

9. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?

YES	NO
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If YES, please complete the following:

Name of the specialist:	Martiens Prinsloo		
Qualification(s) of the specialist:	Geohydrologist at Future Flow GPMS		
Postal address:	P.O. Box 161 , Menlyn , Pretoria		
Postal code:	0063		

Telephone:	+27(0)12 345 1337	Cell:	+27(0)83 633 4949
E-mail:	martiens@ffgpm.co.za	Fax:	+27(0)86 695 3846

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES	NO
---	-----	----

If YES, specify and explain:

See Groundcover Section Below

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
--	-----	----

If YES, specify and explain:

See Groundcover Section Below

Are any further specialist studies recommended by the specialist?	YES	NO
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If YES, specify:

--

If YES, is such a report(s) attached in Appendix D?	YES	NO
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Signature of specialist:	Details derived from the specialist report attached – the specialist did not physically complete the section. Please refer to specific specialist declarations in Appendix D	Date:	Report date March 2014
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Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO

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Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO
Soil specialist John Phipson (2014) identified the site as an area sensitive to erosion, which was also confirmed by the Biodiversity specialist Byron Grant (see Section 4 below)						

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

10. GROUND COVER

Has a specialist been consulted for the completion of this section? ~~YES~~ NO

If YES, please complete the following:

Name of the specialist:	Byron Grant		
Qualification(s) of the specialist:	Ecologist at Strategic Environmental Focus (Pty) Ltd		
Postal address:	P.O. Box 74785 Lynwood Ridge Pretoria		
Postal code:	0040		
Telephone:	+27(0)12 349 1307	Cell:	
E-mail:	sef@sefsa.co.za	Fax:	+27(0)12 349 1229

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? ~~YES~~ NO

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If YES, specify and explain:

<u>Fauna:</u>			
A number of avifaunal species of conservation concern were confirmed to occur in the study area, namely:			
Common name	Latin name	Conservation Status	Conservation Status
		RSA	IUCN
Woolly-necked Stork	<i>Ciconia episcopus</i>	Near-Threatened	Least-Concern
Lanner Falcon	<i>Falco biarmicus</i>	Near-Threatened	Least-Concern
Southern Bald Ibis	<i>Geronticus calvus</i>	Vulnerable; Endangered	Vulnerable
White-backed Vulture	<i>Gyps africanus</i>	Vulnerable	Least Concern
Black-bellied Bustard	<i>Lissotis melanogaster</i>	Near-Threatened	Least-Concern
African Marsh Hairrier	<i>Circus ranivorus</i>	Vulnerable	Least-Conern
For the locations of where the aforementioned species were found refer to Figure 1, Appendix G			
<u>Flora:</u>			
No floral species of conservation concern were identified in the actual area associated with the proposed haul road; however, species of conservation concern were identified within the study area (on surface of the proposed underground workings, and near the proposed haul road refer to Figure 2 Appendix G for the exact positions thereof). These included: <i>Hypoxis hemerocallidea</i> , <i>Boophone disticha</i> and <i>Gladiolus papilio</i> .			

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
If YES, specify and explain:	The S.E.F specialist study found that the proposed haul road will be constructed over a small portion of a FEPA (Freshwater Ecosystem Priority Area) Wetland and will also traverse Non-FEPA Wetlands. Refer to Figure 4, Appendix G	
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached in Appendix D?	YES	NO

Signature of specialist:	Details derived from the specialist report attached – the specialist did not physically complete the section. Please refer to specific specialist declarations in Appendix D	Date:	Report date February 2014
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The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s). Refer to Images referenced in sections above.

Natural veld - good condition^E	Natural veld with scattered aliens^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

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If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

11. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character	YES	NO	Description
Natural area	YES	NO	
Low density residential	YES	NO	Communities of Cabowakhe and Phumanyova. Refer to Figure 19 and 20, Appendix G.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	Communities of Cabowakhe and Phumanyova. Refer to Figure 19 and 20, Appendix G.
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
Medium industrial	YES	NO	
Heavy industrial	YES	NO	
Power station	YES	NO	
Office/consulting room	YES	NO	
Military or police base/station/compound	YES	NO	
Spoil heap or slimes dam	YES	NO	
Quarry, sand or borrow pit	YES	NO	
Dam or reservoir	YES	NO	There is a man-made dam located within 500m of the proposed haul road. Refer to Figure 19, Appendix G.
Hospital/medical centre	YES	NO	
School/ creche	YES	NO	There is a school located within 500m of the proposed haul road in the village of Phumanyona. Refer to Figure 19 and 20, Appendix G.
Tertiary education facility	YES	NO	
Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
Train station or shunting yard	YES	NO	
Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	There is a sports facility associated with the school in Phumanyona. Refer to Figure 19 and 20, Appendix G.
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	

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Plantation	YES	NO	
Agriculture	YES	NO	Part of the haul road will traverse through fallow land. Small-scale subsistence agricultural farms and grazing land is also located within 500 metres of the proposed haul road. Refer to Figure 5, Appendix G.
River, stream or wetland	YES	NO	The proposed haul road will traverse a tributary of the Mona River. Additionally the Mona River as well as a tributary of the Ngangula River are located within 500 metres of the proposed haul road. There are also FEPA and Non-FEPA wetlands located within 500 metres of the proposed haul road. Refer to Figure 19, Appendix G. Additionally there are wetlands as delineated by S.E.F located within 500 metres of the proposed haul road. Refer to Figure 4, Appendix G.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	The proposed haul road will traverse a gently undulating plane.
Museum	YES	NO	
Historical building	YES	NO	A late stone-age cattle kraal was found within 500 metres of the haul road. See Figure 6 Appendix G
Protected Area	YES	NO	There are FEPA and Non-FEPA wetlands located within 500 metres of the proposed haul road. Refer to Figure 4, Appendix G.
Graveyard	YES	NO	A graveyard containing at least 32 graves was found within 500 metres of the proposed haul road. See Figure 6 Appendix G.
Archaeological site	YES	NO	A Heritage Impact Assessment was conducted in 2006 by the National Cultural History Museum; this study found that there are sites of archaeological significance located within 500 metres of the proposed surface adit and haul road (Figure 19, Appendix G). A follow-up study, applicable to the new project scope, was conducted by Archaetnos Culture and Cultural Resource consultants in 2014. The latter study referenced the findings of the former study; however, the recent study indicated two sites of cultural / heritage significance (both of which are located within 500 metres of the proposed haul road see Figure 6, Appendix G).
Other land uses (describe)	YES	NO	

12. CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?

YES	NO
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If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report. (Heritage Impact Assessment attached at Appendix D)

Briefly explain the recommendations of the specialist:

Due to the location of the graveyard and cattle kraal heritage sites (both located far enough from the proposed haul road to not be directly affected by the proposed mining activities) the following recommendations have been made:

- The Heritage Impact Assessment is regarded as ample mitigation for the cattle kraal as the kraal is regarded to have low cultural significance, and may be demolished if required; and
- Should further intervention be required by SAHRA a consultation meeting will be arranged with SAHRA in order to inform a possible conservation management plan for the graveyard. In addition to this, the site should be fenced to ensure no unlawful entry is gained to the site, and to ensure that mining activities do not affect the site.

Will any building or structure older than 60 years be affected in any way?
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
YES	NO

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

SECTION C – C: PROPOSED BENEFICIATION PLANT AND RESIDUE FACILITY: See Appendix C, Figure 3

13. GRADIENT OF THE SITE

Indicate the general gradient of the site. (measured as average gradient across entire site)

Alternative S1:

Steep	1:50 – 1:20	–	1:20 – 1:15	–	1:15 – 1:10	–	1:10 – 1:7,5	–	1:7,5 – 1:5	Gentler than 1:5
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Alternative S2 (if any): N/A

Steep	1:50 – 1:20	–	1:20 – 1:15	–	1:15 – 1:10	–	1:10 – 1:7,5	–	1:7,5 – 1:5	Gentler than 1:5
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Alternative S3 (if any): N/A

Steep	1:50 – 1:20	–	1:20 – 1:15	–	1:15 – 1:10	–	1:10 – 1:7,5	–	1:7,5 – 1:5	Gentler than 1:5
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14. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

Underground Section (1)

Alternative S1: (preferred site):

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Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative: N/A

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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15. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?

YES	NO
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If YES, please complete the following:

Name of the specialist:	Martiens Prinsloo		
Qualification(s) of the specialist:	Geohydrologist at Future Flow GPMS		
Postal address:	P.O. Box 161 , Menlyn , Pretoria		
Postal code:	0063		
Telephone:	+27(0)12 345 1337	Cell:	+27(0)83 633 4949
E-mail:	martiens@ffgpm.co.za	Fax:	+27(0)86 695 3846

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain: See Groundcover Section Below

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain: See Groundcover Section Below

Are any further specialist studies recommended by the specialist? YES ~~NO~~

If YES, specify:

If YES, is such a report(s) attached in Appendix D? YES NO

Signature of specialist: Details derived from the specialist report attached – the specialist did not physically complete the section. Please refer to specific specialist declarations in Appendix D Date: Report date March 2014

Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	YES	NO	YES NO	YES NO
Dolomite, sinkhole or doline areas	YES	NO	YES NO	YES NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES NO	YES NO
	Plant located within 500m of SEF delineated and Non-FEPA Wetlands (see Figure 4, Appendix G)			

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Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO
Soil specialist John Phipson (2014) identified the site as an area sensitive to erosion, which was also confirmed by the Biodiversity specialist Byron Grant (see Section 4 below)						

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

16. GROUND COVER

Has a specialist been consulted for the completion of this section? ~~YES~~ NO

If YES, please complete the following:

Name of the specialist:	Byron Grant		
Qualification(s) of the specialist:	Ecologist at Strategic Environmental Focus (Pty) Ltd		
Postal address:	P.O. Box 74785 Lynwood Ridge Pretoria		
Postal code:	0040		
Telephone:	+27(0)12 349 1307	Cell:	
E-mail:	sef@sefsa.co.za	Fax:	+27(0)12 349 1229
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES		NO

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If YES, specify and explain:

<u>Fauna:</u>			
A number of avifaunal species of conservation concern were confirmed to occur in the greater study area, namely:			
Common name	Latin name	Conservation Status	Conservation Status
		RSA	IUCN
Woolly-necked Stork	<i>Ciconia episcopus</i>	Near-Threatened	Least-Concern
Lanner Falcon	<i>Falco biarmicus</i>	Near-Threatened	Least-Concern
Southern Bald Ibis	<i>Geronticus calvus</i>	Vulnerable; Endangered	Vulnerable
White-backed Vulture	<i>Gyps africanus</i>	Vulnerable	Least Concern
Black-bellied Bustard	<i>Lissotis melanogaster</i>	Near-Threatened	Least-Concern
African Marsh Hairrier	<i>Circus ranivorus</i>	Vulnerable	Least-Conern
See Figure 1, Appendix G			
<u>Flora:</u>			
No floral species of conservation concern were identified in the actual area associated with the proposed processing plant and discard dump.			

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
If YES, specify and explain:	It should be noted that the SANBI database indicates that the proposed beneficiation plant will be developed within 500m of a SEF delineated and non-FEPA wetland See Figure 4, Appendix G.	
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached in <u>Appendix D</u> ?	YES	NO

Signature of specialist:	Details derived from the specialist report attached – the specialist is not directly involved.	Date:	Report date February 2014
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The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s). **Refer to Images referenced in sections above.**

Natural veld - good condition ^E	Natural veld with scattered aliens^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

17. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character	YES	NO	Description
Natural area	YES	NO	
Low density residential	YES	NO	The communities of Esiphambene and Phumanyova. See Figure 19 and 20, Appendix G.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	The communities of Esiphambene and Phumanyova. See Figure 19 and 20, Appendix G.
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
Medium industrial	YES	NO	
Heavy industrial	YES	NO	
Power station	YES	NO	
Office/consulting room	YES	NO	
Military or police base/station/compound	YES	NO	
Spoil heap or slimes dam	YES	NO	
Quarry, sand or borrow pit	YES	NO	
Dam or reservoir	YES	NO	
Hospital/medical centre	YES	NO	
School/ creche	YES	NO	
Tertiary education facility	YES	NO	
Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
Train station or shunting yard	YES	NO	
Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	There is a plantation located in close proximity to the proposed residue facility, this falls within 500m. Refer to Figure 19, Appendix G.
Agriculture	YES	NO	The proposed processing plant and discard dump will be developed in an area that is considered to be fallow land.
River, stream or wetland	YES	NO	Small, non-perennial streams are located to the east and the west of the proposed processing plant and discard dump.

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	YES	NO	There are FEPA, Non-FEPA as well as wetlands delineated by S.E.F located within 500m of the proposed beneficiation plant and residue facility. (See Figure 4 and 14, Appendix G).
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	The proposed processing plant and discard dump will traverse a gently undulating plane.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	There are FEPA, Non-FEPA as well as wetlands delineated by S.E.F located within 500m of the proposed beneficiation plant and residue facility. (See Figure 4 and 14, Appendix G).
Graveyard	YES	NO	A graveyard containing at least 32 graves was found within 500 metres of the proposed haul road. See Figure 6 Appendix G.
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

18. CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?

YES	NO
-----	---------------

If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report. (Heritage Impact Assessment attached at Appendix D)

Briefly explain the recommendations of the specialist:

--

Will any building or structure older than 60 years be affected in any way?

YES	NO
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Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	---------------

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

SECTION D: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

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- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
- (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;

An A1 Zulu site notice and an A3 English site notice, describing the proposed project, the environmental process to be followed, how to register as an Interested and Affected Party (IAP), where further information could be obtained, as well as contact details for the EAP, were displayed at the proposed project site and at surrounding locations with a high foot traffic volume (refer to the list below) on 27 February 2014 (copies of the site notices are included as Appendix 4 of the Comments and Responses Report (Appendix E)).

- The Mandlakazi Tribal Court;
- The Nongoma Local Municipality;
- The fence at a position near the G-Block adit;
- The fence near the proposed CHPP.

- (b) giving written notice to—
- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the local and district municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
 - (vii) any other party as required by the competent authority;

The land is held in trust by the Ingonyama Trust Board. The legal occupant is the Mandlakazi Traditional Authority. Both have been notified of the activities to take place. The Mandlakazi Traditional Authority signed a Landowner Notification document on 4 November 2013 attached as Appendix 2 of the Comments and Responses Report (Appendix E). Mbila Resources are engaging with the Ingonyama Trust. The surface lease for mining application form and the traditional council written consent forms have been submitted for the Ingonyama Trust's consideration.

All local residents situated in the proximity of the site and at the greater local municipal level were given a 14 day period to register as IAPs by contacting the EAP either by phone, fax, post or email or by smsing their name and contact details to a number provided. The public were

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notified of this registration period and supplied with the contact details of the EAP through media and site notices (see below and above for further details). See Appendix 1 of the Comments and Responses Report (Appendix E) for the IAP Database.

The municipal councillor of the ward/s, the local and district municipalities and any organ of state having jurisdiction in respect of any aspect of the activity are listed as IAPs (see Appendix 1 of the Comments and Responses Report (Appendix E) for the IAP Database) and will be provided with a copy of this draft Basic Assessment Report (BAR) and Environmental Management Programme (EMP) for review and comment for a period of 40-days. These draft documents will also be placed in the public domain (at the Nongoma Local Municipality, Mandlakazi Tribal Court and the Ekubungazeleni Clinic) for review and comment for a period of 30-days. Following this period, all comments received will be updated into the comments and responses report and, if necessary, the draft BAR and EMP will be revised accordingly and registered IAPs / State Departments will be provided with the final documents for review and comment for 21 days.

- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

A media notice, which provided a brief description of the proposed project, the environmental process to be followed, how to register as an IAP, where further information could be obtained, as well as contact details for the EAP, was published in Zulu in the Ilanga newspaper on 27 February 2014 (proof of publication is included as Appendix 3 of the Comments and Responses Report (Appendix E)).

- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and

Activities will not result in impacts that will extend beyond the boundaries of the metropolitan or district municipality in which they will be undertaken.

- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

All site notices and media notices were posted and published in the most widely spoken local language, Zulu, as well as in English.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that an application for environmental authorization has been submitted to the KZN Department of Agriculture & Environmental Affairs in terms of the EIA Regulations, 2010;(ii)
 - (iii) a brief project description that includes the nature and location of the activity to which the application relates;
 - (iv) where further information on the application can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

The media notice (Appendix 3 of the Comments and Reponses Report attached as Appendix E) published as well as the site notices posted (Appendix 4 of the Comments and Reponses Report attached as Appendix E) stated that an application for environmental authorization had been submitted to the KZN Department of Agriculture & Environmental Affairs in terms of the EIA Regulations, 2010 for the listed activities being applied for; included a brief project description; listed where further information could be obtained, the manner in which this information could be obtained and how the EAP could be contacted. See Appendix E for further detail in this regard.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

An A1 Zulu site notice and an A3 English site notice, describing the proposed project, the environmental process to be followed, how to register as an IAP, where further information could be obtained, as well as contact details for the EAP, were displayed at the proposed project site and at surrounding locations with a high foot traffic volume (refer to the list below) on 27 February 2014 (copies of the site notices are included as Appendix 4 of the Comments and Reponses Report (Appendix E)).

- The Mandlakazi Tribal Court;
- The Nongoma Local Municipality;
- The fence at a position near the G-Block adit;

- The fence near the proposed CHPP

A media notice, which provided a brief description of the proposed project, the environmental process to be followed, how to register as an IAP, where further information could be obtained, as well as contact details for the EAP, was published in Zulu in the Ilanga newspaper on 27 February 2014 (proof of publication is included as Appendix 3 of the Comments and Responses Report (Appendix E)).

4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Agriculture & Environmental Affairs as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

The public consultation process was aligned to meet the requirements in terms of both the National Environmental Management Act No. 102 of 1998 (NEMA) as indicated in the flow-diagram below

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

A draft Comments and Responses Report (Appendix E) contains an issues trail of any comments and responses received to-date, although it should be noted that until now, IAPs have been afforded the opportunity to register as such. The formal process of comment on the draft BAR / EMP will commence with the publication hereof during which time the CRR will be updated throughout the public consultation process. The issues trail will detail all the comments raised as well as the responses made. Once the commenting period has closed, the final BAR in terms of NEMA will be prepared, including the updated issues trail.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the

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environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Not as of yet – please see above for a description of the process of engagement followed. This draft BAR and the attached EMP will be provided to the district municipality for comment for a period of 40-days and any comments received and responses made will be captured and updated into the Final BAR / EMP following the commenting period.

Has any comment been received from the local municipality?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Not as of yet – please see above for a description of the process of engagement followed. This draft BAR and the attached EMP will be provided to the local municipality for comment for a period of 40-days and any comments received and responses made will be captured and updated into the Final BAR / EMP following the commenting period.

Has any comment been received from a traditional authority?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Not as of yet – please see above for a description of the process of engagement followed. This draft BAR and the attached EMP will be provided to the traditional authority for comment for a period of 40-days and any comments received and responses made will be captured and updated into the Final BAR / EMP following the commenting period.

The site notice and media notice provided IAPs with 14 days to register via SMS as an IAP, while the database of State Department Stakeholders was prepared in consultation with KZN-DAE. An SMS notification will be sent out informing all IAPs of the availability of the draft BAR and draft EMP (Appendix F) for perusal and comment (Appendix 5 of the Comments and Responses Report (Appendix E)) at the Nongoma Local Municipality, Mandlakazi Tribal Court and the Ekubungazeleni Clinic. In terms of NEMA, Authorities will have 40 days to comment and registered IAPs will have 30 days to comment, after which the report will be revised if necessary along with the CRR with the feedback obtained. This revised Final BAR and attached EMP will be made available to registered IAPs and State Departments for a further 21-day commenting period if required and submitted to KZNDAE thereafter.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Not as of yet – please see above for a description of the process of engagement followed. This draft BAR and the attached EMP will be provided to the stakeholders for comment for a period of 30-days and any comments received and responses made will be captured and updated into the Final BAR / EMP following the commenting period.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

The main impacts foreseen as being associated with the proposed development as determined by the EAP considering input received from specialist service providers are contained in this draft BAR and attached EMP for consideration by IAPs. Further issues raised during the commenting period will be further addressed or elaborated on as required.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

See above.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

The following methodology was utilised in the rating of significance of impacts

A quantitative environmental risk assessment was utilised to determine the significance of potential impacts and is based on:

- Consequence of occurrence in terms of:
 - Nature of the impact (negative / positive);
 - Extent of the impact, either local, regional, national or across international borders;
 - Duration of the impact, either short term (0-5 years), medium term (6-15 years) or long-term (the impact will cease after the operational life of the activity) or permanent, where mitigation measures by natural processes or human intervention will not occur;
 - Intensity of the impact, either being low, medium or high effect on the natural, cultural and social functions and processes.
- Probability of occurrence which describes the likelihood of the impact actually occurring and is indicated as:-
 - Improbable, where the likelihood of the impact is very low;
 - Probable, where there is a distinct possibility of the impact to occur;

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- Highly probable, where it very likely that the impact will occur;
- Definite, where the impact will occur regardless any management measure.

In order to assess each of the factors for each impact the ranking scales below are used.

Magnitude (M)	Duration (D)
10 – Very high (or unknown)	5 – Permanent
8 – High	4 – Long-term (ceases at the end of operation)
6 – Moderate	3 – Medium-term (5-15 years)
4 – Low	2 – Short-term (0-5 years)
2 - Minor	1 – Immediate
Scale (S)	Probability (P)
5 – International	5 – Definite (or unknown)
4 – National	4 – High probability
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site	1 – Improbable
0 – None	0 – None

SIGNIFICANCE = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum value of significance points (SP) is 100. Environmental impacts are rated as either high (H), moderate (M), or low (L) significance on the following basis:

- More than 60 points indicates high (H) environmental significance
- 30 – 60 points indicate moderate (M) environmental significance
- Less than 30 points indicates low (L) environmental significance

Management measures need to be identified to mitigate, prevent and /or reduce the risk. Significance must be determined both **pre-mitigation** and **post-mitigation**.

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

Alternative S1 (preferred alternative)

The design and planning phase has already been undertaken and no direct, indirect or cumulative impacts were identified during this phase. The outcome of the design and planning phase was a Feasibility Study which defined the project, the target resource, the mining method, CHPP details, operational parameters and haul routes. This information formed the scope of work for the environmental authorisation process.

Considering the above, only one site alternative was identified during the planning and design phase, as the site position is dependent on the location of the *in situ* coal resources to be mined. The resulting layout, technical and process alternatives are then further discussed in the relevant section below.

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

Alternative S2

--	--

b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

As discussed, the preferred site alternative was defined as per the feasibility report which then further serves to define the preferred site layout, process and technology alternative which are described below:

- The position of the coal resources defines the position of the adit by which to access the underground workings, specifically in that the coal seams are situated nearer to surface at the adit position, thereby allowing for a shallow adit. The underground mining method, i.e. bord and pillar using conventional machinery, was selected in order to optimise the recovery of coal and is also ideal considering the thickness of the coal seams and further to maximise the potential for labour utilisation. The decision was made to not utilise continuous miners due to the floor conditions, geological disturbances and mining heights which are not conducive to continuous miner deployment.
- The position of the haul road was orientated to minimise the haul distance between the adit position and the proposed CHPP while also considering aspects such as topography and watercourses in order to limit the extent of both direct and indirect disturbance and to connect directly to the existing road (P234).
- The position of the CHPP was selected for its position adjacent to an existing road (P234) at a central position in the mining right area which allows for easy access by coal trucks while also allowing for the proposed future expansion of mining activities

into other mining areas to utilise the same plant. Its position was further selected to prevent sterilisation of potential future mineable resource. The plant process and equipment was selected based on the expected mineable coal quality and the market requirements for the coal product. As such the plant design will be dense medium processing plant which will entail crushing and screening of mined coal and washing through a series of cyclones and spirals and screens to produce the coal product. This process produces approximately 2/3 product and 1/3 waste discard material which will be dewatered through a belt press thickener to maximise water recovery and produce coarse and fine discard. The plant will be modular in design to allow for future expansion into additional mining areas.

As such there are no further alternatives other than the preferred alternative.

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:

Alternative A2:

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2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Alternative S1 (preferred site)

All potential impacts, include those which are direct, indirect and cumulative, arising from the

proposed development are discussed further under **b. Process, technology, layout or other alternatives**, below.

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

All measures by which to manage potential impacts identified during the construction phase of the proposed development are indicated under **b. Process, technology, layout or other alternatives**, below.

Alternative S1

Alternative S2

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b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Flora

1. *Destruction of floral habitat*

During the construction of the proposed haul road, CHPP, surface adit (and associated surface infrastructure) the natural vegetation will be stripped for the establishment of surface infrastructure, which will lead to the destruction of the floral habitat. According to Figure 2 (Appendix G) it appears as though the floral species of conservation concern, although in close proximity to the proposed haul road, will not have to be directly removed during the

construction of the surface infrastructure that is associated with the proposed mining development.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	5 [4]	1 [1]	5 [4]	High [Medium]	60 [36]

2. Introduction and spread of alien flora

During the construction of the proposed infrastructure at the adit and CHPP, natural vegetation will be removed and soils will be disturbed. Disturbed habitats are prone to being inundated by weeds and alien vegetation. Additionally, contractors and construction vehicles moving in and through the study area can introduce and spread alien floral species.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [4]	5 [3]	3 [1]	4 [2]	High [Low]	64 [16]

3. Introduction of contaminants and interference with the floral habitat

Hazardous substances (chemicals, lubricants, hydrocarbons) and materials contaminated by these which are used in the construction process have the potential to contaminate soils, watercourses and ground water. These are natural resources on which floral species are dependent on; any negative impacts inflicted thereon (hydrocarbon leakage from heavy vehicles, spills etc.) during the construction phase will have a direct impact on the floral diversity of the affected areas.

Additionally, during the construction of the proposed haul road the natural vegetation will be cleared along the entire extent of the proposed haul road which will lead to fragmentation of the floral habitat.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	5 [2]	2 [1]	4 [2]	Medium [Low]	52 [14]

4. Increase in erosion potential of affected land causing impact on flora

The removal of natural vegetation and subsequent hardening of construction areas will lead to an increase in the erosion potential of the affected areas as rain water will runoff hardened surfaces as it will not be able to infiltrate through the hardened areas. This may affect surrounding areas that are prone to erosion; ultimately leading to a net loss in the floral diversity of the affected areas.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	3 [2]	1 [1]	3 [1]	Low [Low]	24 [5]

Fauna

1. *Destruction of faunal habitat*

During the construction of the proposed haul road, processing plant, surface adit (and associated surface infrastructure), the natural vegetation will be stripped which will lead to a loss of suitable faunal habitat. This, in conjunction with noise associated with construction activities, will result in faunal life fleeing the impacted areas in search of other areas which are of a suitable habitat. This will lead to a net loss in the overall faunal diversity of the affected areas as suitable habitat is destroyed.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	5 [4]	1 [1]	5 [4]	High [Medium]	60 [36]

2. *Introduction and spread of alien fauna*

During the construction-phase activities, it is possible that construction workers and contractors may introduce domesticated fauna that may exert a negative impact on the local indigenous faunal species. Additionally, there are certain species that are attracted to areas of increased human activity i.e. *Acridotheres tristis* (Common Myna) and *Rattus rattus* (Black Rat) which will exert a negative impact on the local biodiversity.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	5 [3]	2 [1]	3 [2]	Medium [Low]	39 [16]

3. *Interference with faunal behavioural activities*

Construction personnel will be present on construction sites this may bring about negative interactions between construction personnel and naturally occurring fauna (which includes poaching, trapping as well as vehicle collisions with fauna). Furthermore, construction activities may disturb faunal life as construction activities generate noise and vibrations.

The aforementioned could result in a localised decrease in faunal diversity as species flee from the construction areas and re-establish in surrounding undisturbed areas.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [4]	5 [2]	2 [1]	4 [2]	High [Low]	60 [16]

4. *Habitat fragmentation*

Construction of the proposed haul road (being a linear development) will cause habitat fragmentation which will exert a negative impact on faunal populations. Linear developments create physical barriers to movement (limiting movement between and access to natural areas) and limits access to grazing areas etc if the haul road is fenced-in).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	4 [2]	3 [1]	4 [2]	Medium [Low]	52 [14]

Aquatic Ecology

1. *Altered hydrology*

Despite the non-perennial expression of the alluvial river channel during the dry season, the clearing of natural vegetation and the construction of impermeable surfaces within the proposed infrastructure, such as the surface adit, CHPP and haul road, may result in increased surface runoff directly into the associated drainage lines and in turn, into the Mona River. In addition to the landscape already being largely modified by overgrazing, crop cultivation on hillsides and the limited vegetative basal cover, a further increase in surface runoff may increase the sediment-carrying capacity of the watercourse and smother any currently available habitat within the isolated pools that exist within the system. These pools are important to the survival of some more sensitive species as they act as refugia for aquatic biota during times of low flow.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	2 [2]	2 [2]	4 [2]	Medium [Low]	32 [12]

2. *Surface water pollution*

Hydrocarbon-based fuels and/or lubricants either spilled or leaked from vehicles used during the construction phase, materials incorrectly stockpiled, and litter deposited by construction workers may be washed into the Mona River and associated drainage lines. Deterioration of the water quality may occur, which would deter aquatic biota from occurring within these sections of the watercourse.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [2]	2 [2]	2 [1]	3 [2]	Medium [Low]	30 [10]

Wetlands

1. *Degradation of wetlands*

Collectively, major wetland loss has occurred within the study area as a result of overgrazing and agricultural practices on soils not suitable for cultivation. This has in turn resulted in a high run-off regime which initiated major erosion processes leading to severe donga formation and loss of wetlands. PES and associated wetland functionality within the study area were therefore low as a result of these anthropogenic impacts, with the majority of wetlands scoring a PES category of E and F, representing seriously to critically modified systems. PES scores obtained for all the wetlands associated with the proposed layout for the area associated with the proposed development are represented in Figure 22 (Appendix G). Further, based on the determination of PES of the wetlands identified within the study area, the wetlands were confirmed to not be in a state reflective of their FEPA rank and therefore can no longer be considered FEPA wetlands.

The clearing of land and removal of topsoil during the construction phase may result in increased erosion, which could exacerbate the siltation of wetland systems. This may further alter geomorphologic functioning, the movement of water through the system (hydrological functioning) as well as having an impact on water quality within the resource.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [4]	2 [2]	2 [1]	4 [3]	Medium [Low]	32 [21]

2. Pollution of wetland resources

Hydrocarbon-based fuels or lubricants leaked or spilled from construction vehicles; materials that are not properly stockpiled; and litter deposited by workers may be washed into the surface water bodies unless adequately contained on-site. The mobilisation of sediments, excavations, removal and disturbances to vegetation. Should appropriate toilet facilities not be provided for construction workers at the construction crew camps, the potential exists for surface water resources and surroundings to be contaminated by raw sewage. The utilisation of the water courses for disposal of water used for washing will decrease the abundance and diversity of aquatic macroinvertebrates inhabiting the section of the wetland areas associated with the proposed development and further downstream. Contaminated runoff from concrete mixing and sediment release may lead to the infiltration of toxicants into the groundwater.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [4]	2 [2]	2 [2]	3 [2]	Low [Low]	24 [16]

Groundwater

1. Dewatering of the underground mining area

The underground mining area will be accessed via an adit and the groundwater level will be breached during the construction hereof which will have to be removed to ensure a dry, safe working environment. Groundwater inflow rates are not expected to exceed 1.5 m³/ day during construction. The zone of influence of the drawdown cone (decrease in local groundwater

levels) is estimated to be negligible at these volumes during the construction phase.

Surface construction of the discard dump, plant and haul roads will not breach the groundwater level and is therefore not expected to have any impact on the groundwater levels or quality. In general it can be said that the impacts during construction will be negligible.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
2	2	1	3	Low	15

Traffic

A traffic study was conducted by UWP in February 2014 to determine the potential impacts the proposed mine may have on traffic and roads in the area (see Appendix D). During construction the R618 and P234 are expected to be impacted by the proposed development by light vehicle and heavy vehicle (construction truck) trips. For the purpose of the study, the P234 was divided into two sections: 1) the first 2.5km from the R618 to the proposed haul road and 2) the remainder of the P234 going northwards. Intersections that are included in this study that could potentially be impacted are shown in Figure 8 Appendix G and are:

- Intersection 1: Intersection of R618 and P234;
- Intersection 2: Intersection of unnamed existing road and P234;
- Intersection 3: Intersection of D1880 and P234;
- Intersection 6: New intersection of the proposed haul road and P234 and
- Intersection 7: Access of processing plant onto the P234.

The road / routes and intersections considered to potentially be impacted were assessed per road, where the following characteristics were assessed:

- Road Environment – An assessment of activities outside the road reserve, such as villages and schools, along the edge of the road, within the road reserve, such as pedestrians and cyclists. These activities affect how the road should be classified in terms of function, which in turn identifies speed limits, geometric requirements and road safety measures. The level of activity of non-motorised transport (NMT), i.e. pedestrians and cyclists at intersections was also assessed, as this will impact on the suitability of intersection control;
- Geometry – The geometry of the road in terms of road width, shoulder, sidewalks, horizontal alignment, vertical alignment and road profile has also been assessed, since this impacts on the performance and maintenance requirements of the road, its capacity for motorised and NMT, the recommended speed limit and road safety needs;
- Traffic Conditions – The current traffic conditions needed to be assessed to determine what the current traffic volumes on the roads and intersections are, the current road safety concerns and the current annual traffic loading that is occurring on these roads;
- Road Pavement – The materials along each road section were also assessed to determine the current pavement condition of each road condition and the main pavement failure types. The unsurfaced roads were assessed in accordance with

Department of Transport guidelines entitled: TMH 12 (2000): Standard Visual Assessment Manual for Unsealed Roads, Version 1.

Taking these factors into account, the overall impact for each section of road and the intersections was assessed during the construction phase as follows:

Road Section	Magnitude	Duration	Scale	Probability	Significance	
					Rating	Value
Local Roads and Intersections	8 [6]	1 [1]	2 [2]	4 [3]	44 [27]	Medium [Low]

Heritage

No heritage resources were identified within development footprint, however, if any further significant heritage resources are uncovered during mining, the heritage management programme in the EMP should be adhered to.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	2 [2]	1 [1]	3 [2]	Low [Low]	21 [10]

Palaeontological

The fossil coal floras of South Africa are of international interest, and represent an important part of our local heritage. Any loss of this heritage due to clearing during construction activities at the adit is permanent, and should be regarded as a highly significant negative impact as detailed below.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [+8]	5 [+5]	5 [+5]	4 [+4]	High [Positive High]	72 [+72]

Alternatively, discovery of well-preserved fossils during excavation, followed by effective mitigation in collaboration with a palaeontologist, would result in the curation of new intact fossil material. The development could therefore potentially have a positive, beneficial impact on South Africa's palaeontological heritage (as indicated in the table above).

Indirect impacts:

Aquatic Ecology

1. Increased erosion and sedimentation affecting faunal survival

The transport of eroded soil into surrounding surface water resources will increase the Total Suspended Solids (TSS) and turbidity of the water, which may adversely affect the aquatic fauna in a number of ways. These include the increase of invertebrate drift (the rate at which

aquatic macroinvertebrates move by floating downstream) due to increased sediment deposition, an effect on the respiration due to the deposition of silt on the gills of biota, and the interference with hunting efficiency of fish. Although 'smothering' of more sensitive stones and vegetation biotopes is also known to limit aquatic habitat in this dynamic sand-dominated section of the river, it is expected that the impact will be minimal as these biotopes were not substantially available at the selected sites during the current assessments.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [2]	2 [2]	2 [2]	4 [2]	Medium [Low]	40 [12]

Wetlands

1. Increased erosion

The clearing of natural vegetation and the stripping of topsoil will result in an increase in mechanical erosion, and thus increased runoff of sediment from the site into watercourses, such as the Mona River. Water flowing down trenches and access roads, as well as movement of construction vehicles and personnel, could cause additional erosion processes and sediment to accumulate within the wetland areas. Hardened surfaces and bare areas are likely to increase surface run off velocities and peak flows received by wetlands. Further, the installation of clean and dirty water separation infrastructure could cause concentrated flows to reach the wetlands and initiate new erosion processes, or add to the present erosion problems.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	2 [2]	2 [2]	4 [3]	Medium [Low]	40 [24]

Heritage

No heritage resources are situated near enough to proposed areas for development and will thus not have to be relocated or otherwise disturbed, however, secondary impacts may arise as a result of the presence of workers on-site, construction vehicles etc., which may affect the graveyard, as workers may enter the graveyard and inadvertently or otherwise, cause damage to it. The graveyard should be cleared signposted and demarcated as per the heritage management programme in the EMP.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	2 [2]	1 [1]	3 [2]	Low [Low]	21 [10]

Cumulative impacts:

Decrease in biodiversity due to habitat destruction and degradation

The areas associated with the proposed project have already been disturbed by human settlement and activities, with the majority of the area being comprised of fallow land which has historically been manipulated by agricultural activities. This fallow land is starting to show signs of recovery as it returns to a more natural state providing suitable habitat for many faunal and floral species. Construction activities have the potential to cause further degradation to an already degraded terrestrial ecosystem thus limiting its ability to recover.

Alternative A2

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Flora

A floral specialist assessment was undertaken in February 2014 by Strategic Environmental Focus (S.E.F) (refer to Appendix D for the full report).

The aforementioned study divided the project (and broader) area into three broad vegetation groups, namely: fallow land, drainage lines and wooded grassland (refer to Figure 5, Appendix G). Drainage lines, which were identified as eroded wetlands, were recorded in the areas associated with the proposed haul road and were identified on surface above the proposed underground mining blocks. A floral species of conservation concern, namely: *Hypoxis hemerocallidea* was confirmed to occur within the aforementioned drainage line areas.

Approximately 187ha of the surveyed area was classified as wooded grassland (surface infrastructure that is relevant to the wooded grassland area includes the proposed haul road and a portion of the box-cut / adit, see Figure 5, Appendix G), large areas of which are comprised of recovered fallow land. Few herbaceous species were recorded in this area; however, two species of conservation concern were confirmed to occur in this area, namely: *Hypoxis hemerocallidea* and *Boophone disticha*, both of which are provincially protected plant species.

The majority of the area surveyed was considered to be fallow land (surface infrastructure that is relevant to the fallow land includes: a portion of the box-cut / adit, portions of the haul road and the entire CHPP and residue facility). This area was cultivated in the past but has subsequently been fallow for a long period. A low diversity of herbaceous species was identified in this area; however, two species of conservation concern were confirmed to occur in this area, namely: *Hypoxis hemerocallidea* and *Boophone disticha* both of which are provincially protected plant species. For a graphical representation of the aforementioned vegetation groups as well as an indication of where the floral species of conservation were

identified on site please refer to Figure 18 (Appendix G).

Fauna

A faunal specialist assessment was undertaken in February 2014 by Strategic Environmental Focus (S.E.F) (refer to Appendix D for the full report).

The aforementioned study assessed the proposed project area in terms of its sensitivity (from a faunal perspective). The areas considered to be of the highest sensitivity in this regard were those associated with drainage lines, rivers, moist pan-like depressions and man-made dams. These areas support breeding amphibian species and serve as corridors for movement through the landscape for fauna. Proposed surface infrastructure that will be located in the aforementioned areas of high sensitivity include the proposed adit (and associated surface infrastructure).

The majority of the area located between the proposed adit and processing plant was considered to be of medium-high faunal sensitivity. These habitats support the majority of the faunal species encountered, which included avifaunal species of conservation concern such as *Lissotis melanogaster* (Black-bellied Bustard).

The proposed CHPP and discard stockpile is to be located in an area that is considered to be of medium faunal sensitivity. These areas are considered to be disturbed and no-longer support viable populations of faunal species.

All areas modified by settlement, cultivation and roads were considered to be of medium-low sensitivity from a faunal perspective. While these areas do not support any faunal communities, certain faunal species are known to utilise these areas for foraging purposes. For a graphical representation of the aforementioned faunal sensitivity as well as an indication of where the faunal species of conservation were identified on site please refer to Figure 1 Appendix G.

Aquatic Ecology

Five sampling sites were identified at the proposed Mbila Underground Mine. Sites G1 and G2 (Figure 7, Appendix G) were dry at the time of the sampling, and thus only 3 sampling sites (G3 – G5) were used (Figure 7, Appendix G). The Invertebrate Habitat Assessment System (IHAS) was used to determine the habitat conditions at the three sampling sites that could be accessed. Sampling habitat values obtained at each of the assessed sites reflected **poor** habitat conditions. The sampling habitat value obtained at Site G3 (IHAS score: 42) generally reflects the nature of the watercourses in which it is located, i.e. channelled valley-bottom wetland. In comparison, the riverine habitats present at Site G4 (IHAS score: 20) and Site G5 (IHAS score: 25) were largely limited by the low water level at the time of the survey, which provided no/limited contact with vegetation and the dominance of a sandy substrate with occasional large boulders and/or bedrock surfaces, provided by bridge foundations. There was also evidence of livestock crossings and walking paths at numerous locations along the associated watercourses, which was most likely a result of the use of the study area for grazing

purposes.

The South African Scoring System, Version 5 (SASS5) is a biological index which determines the health of a river based on the aquatic macroinvertebrates present, whereby each taxon is allocated a score based on its perceived sensitivity / tolerance to environmental perturbations. Scores over 140 equate to a good river health, scores between 140 and 85 equate to an intermediate river health and scores below 85 equate to a poor river health. SASS5 surveys were undertaken at each of the three sampled sites and a total of 22 different aquatic macroinvertebrate taxa were collected, ranging between 11 and 16 taxa per site. The SASS5 scores ranged between 55 and 72, whilst the associated average score per taxon (ASPT) values ranged closely between 4.50 and 5.00.

SASS5 data obtained during the present assessment was used in the Macroinvertebrate Response Assessment Index (MIRAI) in order to determine the Present Ecological State (PES). Based on the results obtained, each of the assessed sites were defined to be in a poor condition and characterised as seriously modified from its natural state (PES Category E). Furthermore, this state indicates the absence of most sensitive macroinvertebrate forms and an extensive loss of basic ecosystem function.

Assessment of the Present Ecological State (PES) of the fish assemblage of the Mona and Ngagalu rivers associated with proposed development was conducted by means of the Fish Response Assessment Index (FRAI). Based on results obtained following the application of the FRAI, it was determined that the PES of the fish assemblages in both the Mona and Ngagalu Rivers represented a largely modified state (PES Category D) with fewer families present than expected, due to a loss of most intolerant forms

Wetlands

Four different types of wetland areas were classified within the study area and were categorised into hydro-geomorphic (HGM) units. A total of a 43 separate HGM units were identified and classified within the study area. These included valley bottom wetlands with a channel, valley bottom wetlands without a channel, hillslope seepage wetlands not feeding a watercourse and hillslope seepage wetlands feeding a watercourse. HGM 16, HGM 24, HGM 25, HGM 26, HGM 27, HGM 28, HGM 29, HGM 30, HGM 36, HGM 37, HGM 38, HGM 39, HGM 40, HGM 41 were associated with the proposed layout for G Block underground mining and are presented graphically in Figure 3 (Appendix G). Collectively these HGM units can be grouped into four wetland types, namely channelled valley-bottom wetlands, hillslope seepage wetlands connected to a watercourse, hillslope seepage wetlands not connected to a watercourse and valleyhead seepage wetlands.

Collectively, major wetland loss has occurred within the study area as a result of overgrazing and agricultural practices on soils not suitable for cultivation. This has in turn resulted in a high run-off regime which initiated major erosion processes leading to severe donga formation and loss of wetlands. PES and associated wetland functionality within the study area were therefore low as a result of these anthropogenic impacts, with the majority of wetlands scoring a PES category of E and F, representing seriously to critically modified systems. PES scores obtained

for all the wetlands associated with the proposed layout for the area associated with the proposed development are represented in Figure 22 (Appendix G). Further, based on the determination of PES of the wetlands identified within the study area, the wetlands were confirmed to not be in a state reflective of their FEPA rank and therefore can no longer be considered FEPA wetlands.

The Ecological Importance and Sensitivity (EIS) assessment was undertaken to rank water resources in terms of:

- Provision of goods and service or valuable ecosystem functions which benefit people;
- Biodiversity support and ecological value; and
- Reliance of subsistence users (especially basic human needs uses).

Despite the vulnerable status of the supporting terrestrial habitats (Northern Zululand Sourveld and Zululand Lowveld) as well as some red data faunal species on site, wetlands received a low score for Ecological Importance and Sensitivity (between 1.32 and 1.67 for all the wetland units, the maximum rating being 4) which could largely be attributed to the severe degradation and associated low PES of wetlands on-site.

Groundwater

Two aquifers occur in the area. These two aquifers are associated with a) the upper weathered material, and b) the underlying competent and fractured rock material.

2. Upper weathered material aquifer

The upper aquifer forms due to the vertical infiltration of recharging rainfall through the weathered material being retarded by the lower permeability of the underlying competent rock material. Groundwater collecting above the weathered / unweathered material contact migrates down gradient along the contact to lower lying areas.

Aquifer thickness data shows that the upper aquifer has an average thickness of approximately 15 m, and can range between 9 and 23 m in thickness.

3. Lower fractured rock aquifer

The primary porosity of the Ecca Group rocks does not allow significant groundwater flow, except where the porosity has been increased by subsequent secondary structures. Groundwater flow in the fractured aquifer is often associated with the abundant dolerite dykes and sills in the area. The groundwater quality in the fractured aquifer is generally of a poorer quality than the weathered aquifer due to the concentration of salts. This may be attributed to a less dynamic system and a longer residence time of rainfall recharge within the aquifer.

4. Depth to groundwater level

The general depth to groundwater level ranges between 3.28 and 39.47 m below surface. The shallowest groundwater levels are found in boreholes BMA042, BMA043 and BMA044 (see Figure 9 Appendix G); this is due to the boreholes' proximity to the Mona River indicating that there is some level of surface and groundwater interaction. The deeper groundwater levels are

found in the boreholes situated at a higher topographical elevation.

For a full detailed report see Appendix D.

Traffic

The proposed mining activities are situated on the west side of the P234 and just north of the R618 / P234, as shown in Figure 8 Appendix G. The G-Block Underground mine will have only one access point via the proposed haul road, linking the mine to the P234 on the east. The position of the CHPP is also planned on the east side of the P234, approximately 1km north of the R618.

Heritage

A Heritage Specialist Assessment was undertaken by Archaetnos (for the full report, refer to Appendix D) in February 2014. This study involved a site survey as well as a desktop level survey of literature and studies previously conducted in the area.

The survey was conducted according to generally accepted practices and was aimed at locating all possible objects, sites and features of cultural significance in the area of proposed development. When necessary, people from local communities are interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography.

During the site survey two sites of cultural heritage significance were found in the surveyed area. Details as follows:

- Site 1: Grave yard - This is a graveyard containing at least 32 graves (for the position of this feature refer to Figure 6, Appendix G). Most of the graves are stone packed some with and some without headstones. A few have cement dressings and headstones. Only one surname could be identified, being Mzulu. The oldest date of death found was 1966 and the youngest 1992, but these were the only two graves with dates. This means that two of the three categories of graves is present being those with an unknown date of death (to be handled as those older than 60 years, called heritage graves) and those younger than 60 years. Due to the sensitivity of this issue, graves are always regarded as having a high cultural significance.
- Site 2: Late Iron Age / Historical Cattle Kraal - This is a circular stone walled enclosure, used as a cattle kraal (for the position of this feature refer to Figure 6, Appendix G). The walls are still about 1.20 m thick and 0.40 m high. The circle is about 50 m in diameter. A lower grinding stone is built into the wall and an upper grinder is placed on top thereof. A monolith is also found on the wall. No other archaeological features are found nearby. The site is not very old and may even still be in use. It therefore is regarded as having a low cultural significance.

It should be noted that a Heritage Impact Assessment was conducted in 2006 by the National Cultural History Museum; this study found that there are sites of archaeological significance located within 500 metres of the proposed surface adit and haul road. The recent study by Archaetnos (detailed above), applicable to the new project scope, referenced the findings of the former study; however, the recent study indicated only two sites of cultural / heritage significance (detailed above) which could be affected by the proposed development.

Palaeontological

The underlying rocks in the project area fall within the palaeobotanically highly significant **Vryheid Formation**. Any sedimentary rocks of the Vryheid Formation, and particularly those in close spatial proximity to coal seams, have a high potential for containing fossilised plants.

The Early Permian, coal associated, *Glossopteris*-dominated floras of South Africa are World famous, and this reputation has been built on fossils described from only a handful of localities. The most well-known and best documented localities are the quarries near Vereeniging in the Gauteng Province, and at Hammanskraal, north of Pretoria in Mpumalanga Province. Very little is known about the Vryheid Formation floras in KwaZulu-Natal.

SAHRA (South African Heritage Resources Agency) lists the Vryheid Formation as being of 'very high' palaeontological significance, and of global importance with 'rich fossil plant assemblages of the Permian *Glossopteris* Flora (lycopods, rare ferns and horsetails, abundant *glossopterids*, cordaitaleans, conifers, ginkgoaleans), rare fossil wood and diverse palynomorphs'. Turner et al. (1981) documented a diversity of scarce trace fossils in the deltaic Vryheid Formation successions of the Nongoma Graben, including *Skolithos*, *Diplocraterion*, *Helminthopsis* and *Planolites*.

The entire area is densely vegetated, with outcrop only exposed in road cuttings, erosion gullies and stream and river beds. Well-preserved *Glossopteris* leaves were observed at site P7 (see Figure 18 of Appendix G). Morphologically, some of these were identical to the most common form found at the Hammanskraal locality north of Pretoria (those found attached to '*Hirsutum*' *leslii* in Anderson & Anderson, 1985), in the Springbok Flats Basin (Vryheid Formation equivalent deposits). *Glossopteris* leaf fragments were observed at P8 and P9. Although preservation was not very good, venation details were still visible, and density of fossils (in leaf mats) was high. Sites P10, P11 and P12 are not in the immediate vicinity of the underground mining area, however they do provide some local context, and provide insights as to the frequency of plant occurrences in the Vryheid Formation in the Nongoma area (see Figure 18 of Appendix G).

At any one time on the site of a mine there might be no good quality fossil localities exposed, but certainly during the lifetime of a mining endeavour on a commercial scale, it is highly likely that multiple fossil sites of significance will be exposed. It should also be noted that it is not just the actual bone/plant material/shell etc. itself that is of interest and importance to a palaeontologist. Increasingly, scientists appreciate the value of information evident in the immediate vicinity of fossils that is not necessarily inherent to the fossil itself, such as the

geology of the host rock stratum, the orientation of individual fossil organs, organism associations and preservational aspects. This type of information can provide important clues about past environments, and can help to place fossils within their original context. This type of information can be lost through indiscriminate sampling/attempted mitigation by untrained parties.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:

Alternative A2:

Alternative A1:	Alternative A2:
<p><u>Flora</u></p> <ul style="list-style-type: none"> • Where possible, any infrastructure should be developed outside of areas containing vegetation which is deemed to have a medium-high conservation importance and ecological sensitivity. • Three plant species that were confirmed to present within the study area, namely: <i>Gladiolus papillio</i>, <i>Hypoxis hemerocallidea</i> and <i>Boophone disticha</i> are protected in terms of schedule 6 and 7 of the KwaZulu-Natal Conservation Management Amendment Act, 1999 (Act No.5 of 1999) positions thereof are indicated in Figure 2, Appendix G. These plant species are to be protected and avoided at all costs. Should it be deemed necessary to remove, relocate or destroy such species a permit needs to be obtained from Ezemvelo KZN Wildlife. • All plant species of conservation concern or species that are nationally or provincially protected should be cordoned off during construction activities. An education programme should be compiled for all contractors, sub-contractors. • An education programme should be compiled for all contractors, sub-contractors and workers to ensure that proper conduct is shown in areas of natural habitat. • Existing roads and pre-disturbed areas should be utilised (where feasible) • The construction of surface stormwater drainage systems during the construction phase must be done in a manner that would protect all natural drainage areas as well as the alluvial river channel; • Construction activities should be planned to occur during the dry winter season when rainfall, and an associated runoff, is least expected so as to prevent any significant changes to the flow 	

regime disturbances to the associated watercourse;

- Refer to the wetland and stormwater management programme in Section 4.5 of the EMP.
- Additionally refer to the biodiversity management programme in Section 4.3 of the EMP (Appendix F).

Fauna

- Construction activities should be undertaken during the winter months if possible so as to minimise the possible negative impacts that may be inferred on breeding fauna.
- An education programme should be compiled for all contractors, sub-contractors and workers to ensure that proper conduct is shown in areas of natural habitat.
- As far as possible, construction should be undertaken during daylight hours, this would limit the need for artificial lighting at night which has the potential to interfere with the behavioural activities of fauna.
- It is recommended that a fence is erected around construction areas as this will limit the interaction of people and fauna. This fence should be 1-2m high with a curved top; additionally, this fence should be covered with fine mesh such as shade cloth to prevent or limit fauna such as reptiles and amphibians from entering the area. Furthermore the aforementioned fence should be buried at least 30cm deep, this will prevent burrowing animals from gaining access into the construction footprint areas.
- Where possible locate surface infrastructure outside of areas of high faunal sensitivity.
- Existing roads and pre-disturbed areas should be utilised (where feasible)
- Refer to the biodiversity management programme Section 4.3 of EMP (Appendix F).

Aquatic Ecology

- Wherever possible, avoid all construction activities within the drainage channels through proper planning, demarcation and appropriate environmental training;
- The design of drainage systems and clean and dirty water separation infrastructure (including a pollution control dam) must ensure there is no contamination, eutrophication or increased erosion of the study site, natural drainage lines, alluvial floodplain and Mona River;
- The construction of surface stormwater drainage systems during the construction phase must be done in a manner that would

protect all natural drainage areas as well as the alluvial river channel;

- Construction activities should be planned to occur during the dry winter season when rainfall, and an associated runoff, is least expected so as to prevent any significant changes to the flow regime disturbances to the associated watercourse;
- The pollution control dam should be over-engineered and lined with an impermeable layer so as to ensure no overflow or seepage of water can occur; and
- Littering and contamination of water sources during construction must be mitigated by effective construction camp management;
- Please refer to the aquatic ecology management programme in Section **Error! Reference source not found.** of the EMP (Appendix F)

Wetlands

- The design of drainage systems and clean and dirty water separation infrastructure must ensure there is no contamination, eutrophication or increased erosion of the wetland areas. Drainage systems should be maintained regularly in order to minimise the runoff of harmful chemical substances into the wetland areas;
- The wetland monitoring programme should be initiated at the start of the construction phase (see Section 5.4 of the EMP, Appendix F). The Environmental Control Officer (ECO) should be briefed by a wetland specialist on specific monitoring issues. An inspection of clean and dirty water separation infrastructure and stormwater infrastructure needs to take place after each large rain event;
- The crossing of natural drainage systems for new roads should be minimised and only constructed at the shortest possible route, perpendicular to the natural drainage system and lateral surface and subsurface flows should not be blocked by these crossings. Where possible, bridge crossings should span the entire stretch of the flood line or buffer zone;
- The construction of surface stormwater drainage systems during the construction phase must be done in a manner that would protect the quality and quantity of the downstream system;
- Littering and contamination of water sources during construction must be mitigated by effective construction camp management;
- Please refer to Section 4.5 in the EMP (Appendix F) for the wetland and stormwater management programme
- For a detailed discussion of the buffer widths proposed for the affected wetlands, please refer to Section 8.2 of the Wetland study

<p>in Appendix D.</p> <p><u>Groundwater</u></p> <p>The impact of dewatering the adit during construction cannot be mitigated as dewatering will be essential for mining to continue.</p> <p><u>Traffic</u></p> <p>Collaborate with the relevant Roads Authority to:</p> <ul style="list-style-type: none"> ○ set up a road maintenance plan to widen shoulders and maintain the relevant road network on which heavy vehicle movement is anticipated; ○ erect signage to increase safety and reduce current speed limits where necessary <p>Refer to Section 4.8 of the EMP (Appendix F) for the traffic management programme which includes the measures to be implemented to mitigate the road safety impacts.</p> <p><u>Heritage</u></p> <p>Mitigation and management measures proposed for the heritage sites on-site include the following:</p> <ul style="list-style-type: none"> ● The graveyard site should be left <i>in situ</i> and should be fenced in to ensure no unauthorised access is obtained, as the site is regarded to have high cultural significance, but is also far enough from the proposed haul road to not be directly affected ● A suitable buffer zone should be created around the graveyard ● If any further significance heritage resources are uncovered during mining the heritage management programme in the EMP should be adhered to (Appendix F) ● The Heritage Impact Assessment is regarded as ample mitigation for the cattle kraal as it is regarded to have low cultural significance. <p><u>Palaeontological</u></p> <p>When the potential exists for new fossils to be exposed through excavations, it is the responsibility of the on-site ECO to monitor excavation activities and report the occurrence of any well preserved fossiliferous material, that is worth collecting, to SAHRA and an appropriate palaeontological expert, to allow the material to be thoroughly assessed, recorded and professionally excavated or sampled (Refer to heritage management programme in Section 4.9 of the EMP, Appendix F)</p>	
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2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

Alternative S1 (preferred alternative)

All potential impacts, include those which are direct, indirect and cumulative, arising from the proposed development are discussed further under **b. Process, technology, layout or other alternatives**, below.

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S2 (if any)

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

Alternative S2

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b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Flora

1. *Contamination of the floral environment*

Runoff emanating from dirty water catchment management areas may contaminate soils, watercourses and groundwater if not managed properly, which are natural resources that floral life is directly dependant on. Additionally, haul trucks will be traversing in and out of the area; haul trucks will generate dust which may affect the photosynthetic ability of plants. Additionally, coal and coal dust may fall off the haul trucks which may pollute soils.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [4]	4 [2]	2 [1]	4 [2]	Medium [Low]	56 [14]

2. *Fragmentation of the floral habitat*

The proposed haul road is a linear development that will fragment the floral habitat. Habitat fragmentation affects the fitness of floral populations (as plant populations become more isolated which influences biotic interactions between floral communities).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8	4	2	4	Medium	56

Fauna

1. *Contamination of the natural environment*

Hazardous and industrial materials used in the mining process and associated with dirty water catchment management areas on-site have the potential to contaminate soils, watercourses and ground water. These are natural resources on which faunal life are dependent on, any negative impacts inflicted thereon by mining activities during the operational phase will have a direct impact on the faunal diversity of the affected areas.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [4]	4 [2]	3 [1]	5 [2]	High [Low]	75 [14]

2. *Fragmentation of the faunal habitat*

The proposed haul road is a linear development that will fragment the floral habitat. Habitat fragmentation affects the fitness of floral populations (as plant populations become more isolated which influences biotic interactions between floral communities).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8	4	2	4	Medium	56

Aquatic Ecology

Many of the above-mentioned impacts expected during the construction phase are likely to remain applicable during the operational phase. The following additional impacts are described during the operational phase:

1. Surface water pollution

The surface adit and CHPP will be classified as dirty water catchment management areas likely to entail the generation of polluted runoff with various contaminants such as diesel and oil, cleaning detergents, exposed soils, and discarded coal. If these contaminants enter the surrounding watercourse, aquatic biota can become physiologically stressed and migrate away from the affected area. Furthermore, the incorrect implementation of clean and dirty water infrastructure may directly affect the quality of the related runoff from these areas. Also, if the clean and dirty water systems are not properly maintained, associated contaminants from the mining process will most likely enter the surrounding watercourse through surface runoff. These contaminants are likely to affect the water quality of the system and potentially cause significant changes to the biota colonising this section of the river, as well as further downstream.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [2]	4 [4]	2 [2]	4 [1]	Medium [Low]	48 [8]

Wetlands

Impacts described in the construction phase are in most instances also applicable to the operational phase and vice versa. The following are additional impacts during the operational phase:

1. Decrease in surface water quality

Water quality within the receiving environment is likely to deteriorate due to the further loss of functions relating to already degraded wetlands within the area affected by the proposed activity. Additionally, site-based pollution sources from dirty water catchment management areas at the adit and CHPP, may occur as runoff water from this area and enter into the wetland system should the water management infrastructure fail under any circumstance, thereby resulting in water quality impairment.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	4 [4]	2 [2]	3 [2]	Medium [Low]	36 [20]

Groundwater*1. Groundwater Volumes*

The mine floor elevations in the underground mining areas are below the general groundwater level thus causing groundwater flows into the underground mining area from the surrounding aquifers during operations. The mining area will need to be actively dewatered by pumping water that seeps into the underground mine area to the surface, which will ensure a safe working environment and the continuation of mining.

A drawdown in groundwater level and the associated cone of depression will develop over time as the mining progresses and continues to pump groundwater out of the mine. The maximum drawdown in the groundwater level from pre-mining levels is estimated to be between 28m and 36m in the lower fractured aquifer (please refer to Figure 10 Appendix G). The drawdown will extend up to 400m from the mine area “the zone of influence”. The zone of influence is not expected to impact the Mona River nearby.

The mine inflow volumes are expected to range on average between 1 and 305 m³/day during the course of the life of mine. The inflow volumes show an increasing trend over the initial 26 months due to the increase in mined out area, and the associated increase in seepage wall area. The mine inflows are expected to decrease during the later months of the life of mine. This is due to less new, saturated rock being broken. This reduced release of groundwater from storage will reduce the overall mine inflows.

2. Groundwater Quality

During mining operations the groundwater flow gradients will be directed towards the underground mine due to the mine dewatering that will take place. Therefore, little contamination is expected to migrate away from the mining area towards the surrounding aquifers (see Figure 11, Appendix G).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6	2	2	5	Medium	50

The discard area falls outside the zone of influence of the groundwater level drawdown cone around the underground mine area. Therefore, any poor quality leachate from the discard material that enters the underlying aquifers can migrate away from the discard area. However, in order to minimise migration the floor of the discard area has been designed to be lined with compacted clay material. The compacted clay lining typically has a very low vertical hydraulic conductivity which will retard vertical infiltration of leachate from the surface discard stockpile towards the underlying aquifers.

Results from the numerical contaminant migration modelling show that the contaminant plume migration away from the discard dump is expected to be limited to the surface infrastructure area (CHPP and discard area) during the operational phase, due to the compacted clay lining. Please refer to Figure 11 (Appendix G) for a depiction of the expected contaminant plume away from the discard area at the end of the life of operations.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value

4	2	2	4	Low	24
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Traffic

The processed coal will be sold “free-on-truck” (FOT) at the processing plant, where it is foreseen that most of the companies purchasing this coal will transport this coal to Richards Bay. Having observed the condition and road environment as well as travel time for various routes from Richards Bay to the site, it is envisaged that the N2 and R618 to site will be the preferred route. Access routes to and from the underground mine and plant were assessed as indicated in Figure 8 Appendix G.

Therefore, roads R618 and P234 are expected to be impacted by the proposed development by light vehicle and heavy vehicle (coal truck) trips. For the purpose of the study, the P234 was divided into two sections: 1) the first 2.5km from the R618 to the proposed haul road and 2) the remainder of the P234 going northwards. Intersections that are included in this study that could potentially be impacted are detailed in section 2.1 and shown in Figure 8 Appendix G.

The road / routes and intersections considered to potentially be impacted were assessed per road, where the following characteristics were assessed:

- Road Environment – An assessment of activities outside the road reserve, such as villages and schools, along the edge of the road, within the road reserve, such as pedestrians and cyclists. These activities affect how the road should be classified in terms of function, which in turn identifies speed limits, geometric requirements and road safety measures. The level of activity of non-motorised transport (NMT), i.e. pedestrians and cyclists at intersections was also assessed, as this will impact on the suitability of intersection control;
- Geometry – The geometry of the road in terms of road width, shoulder, sidewalks, horizontal alignment, vertical alignment and road profile has also been assessed, since this impacts on the performance and maintenance requirements of the road, its capacity for motorised and NMT, the recommended speed limit and road safety needs;
- Traffic Conditions –The current traffic conditions needed to be assessed to determine what the current traffic volumes on the roads and intersections are, the current road safety concerns and the current annual traffic loading that is occurring on these roads;
- Road Pavement – The materials along each road section were also assessed to determine the current pavement condition of each road condition and the main pavement failure types. The unsurfaced roads were assessed in accordance with Department of Transport guidelines entitled: TMH 12 (2000): Standard Visual Assessment Manual for Unsealed Roads, Version 1.

Taking these factors into account, the overall impact for each section of road and the intersections was assessed during the operational phase as follows:

Basic Assessment Report

Road Section	Magnitude	Duration	Scale	Probability	Significance	
					Rating	Value
R618 (West Approach)	0 [0]	0 [0]	0 [0]	0 [0]	Low [Low]	0 [0]
R618 (East Approach)	4 [3]	2 [2]	2 [2]	3 [3]	Low [Low]	24 [21]
P234 (Start to 2.5 km at haul road)	8 [6]	2 [2]	2 [2]	3 [3]	Medium [Medium]	36 [30]
P234 (2.5 km to end)	0 [0]	0 [0]	0 [0]	0 [0]	Low [Low]	0 [0]
Intersections 1, 2, 3, 6 & 7	0 [0]	0 [0]	0 [0]	0 [0]	Low [Low]	0 [0]

Palaeontological

During the operation phase underground mining activities may expose further fossil coal floras as the Vryheid Formation sediments and coal beds will only be exposed during the mining operations. Any loss of this heritage due to clearing during mining activities is permanent, and should be regarded as a highly significant negative impact as detailed below. The discovery of well-preserved fossils during mining operations, followed by effective mitigation in collaboration with a palaeontologist, however would result in the curation of new fossil material. The development could therefore potentially have a positive, beneficial impact on South Africa's palaeontological heritage (as indicated in the table below).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [+8]	5 [+5]	5 [+5]	4 [+4]	High [Positive High]	72 [+72]

Indirect Impacts:

Wetlands

2. Altered hydrology of the site

The presence of new hard impermeable surfaces will result in a change in the stormwater runoff volume and velocity entering wetland areas. The increase in surface water runoff and the decrease of infiltration may result in an increase in erosion potential and sedimentation.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [4]	4 [4]	2 [1]	4 [3]	Medium [Low]	40 [27]

Groundwater

Monitoring borehole MGWM-06 (see Figure 9 Appendix G for this location) is the only borehole occurring within the zone of influence of dewatering expected to be impacted upon by the underground mining activities during the operational phase. The maximum drawdown expected in MGWM-06 is 1.6 m. It is considered that this drawdown in groundwater level at the borehole will not have a significant impact on the sustainable yield of the borehole as it is less than the anticipated seasonal fluctuation in groundwater level in that area.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6	2	2	5	Medium	50

Heritage

No heritage resources are situated near enough to proposed areas for development and will thus not have to be relocated or otherwise disturbed, however, secondary impacts may arise as a result of the presence of workers on-site, construction vehicles etc., which may affect the graveyard, as workers may enter the graveyard and inadvertently or otherwise, cause damage to it. The graveyard should be cleared signposted and demarcated as per the heritage management programme in the EMP.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	2 [2]	1 [1]	3 [2]	Low [Low]	21 [10]

Cumulative impacts:

Loss of biodiversity

The areas associated with the proposed project have already been disturbed by human settlement and activities, with the majority of the area being comprised of fallow land which has historically been manipulated by agricultural activities. This fallow land is starting to show signs of recovery as it returns to a more natural state providing suitable habitat for many faunal and floral species. Operation activities have the potential to cause further degradation to an already degraded terrestrial ecosystem thus limiting its ability to recover

Alternative A2

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Refer to the No-go Alternative Section 2.2b in the construction phase.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1

Alternative A2

Flora

The impact of habitat fragmentation from the proposed haul road cannot be mitigated; management measures contained in the biodiversity management programme (Section 4.3 of the EMP, Appendix F) should be implemented on-site in order to prevent the pollution of the floral environment.

Fauna

- It is recommended that a fence is erected around surface infrastructure areas as this will limit the interaction of people and fauna. This fence should be 1-2m high with a curved top; additionally, this fence should be covered with fine mesh such as shade cloth to prevent or limit fauna such as reptiles and amphibians from entering the area. Furthermore the aforementioned fence should be buried at least 30cm deep, this will prevent burrowing animals from gaining access into the construction footprint areas.
- The impact of habitat fragmentation from the proposed haul road cannot be mitigated

Additionally refer to management measures indicated in the biodiversity management programme (Section 4.3 of EMP, Appendix F).

Aquatic Ecology

- Please refer to the aquatic ecology management programme in Section **Error! Reference source not found.** of the EMP (Appendix F) for a discussion on the management measures pertaining to impacts on aquatic ecology;
- Additionally, refer to Section 4.7 for the hydrocarbon management programme

Wetlands

- Please refer to Section **Error! Reference source not found.** of the EMP (Appendix F) for the wetland and stormwater management

programme detailing measures to mitigate impacts on wetlands at the proposed Mabila Anthracite Mine.

Groundwater

- The impact of dewatering the underground mine during operation cannot be mitigated as dewatering will be essential for mining to continue.
- Dewatering of the mine will ensure groundwater flow gradients are directed towards the mine, thus ensuring any contaminated groundwater is removed through dewatering and cannot migrate towards surrounding aquifers.
- The impact of contaminant migration from the discard dump will be limited to the surface infrastructure area as a result of the compacted clay lining and cannot be further mitigated.

Traffic

Collaborate with the relevant Roads Authority:

- to implement the road maintenance plan i.e. to maintain the relevant road network on which heavy vehicle movement is anticipated;
- Maintain signage to increase safety and reduce current speed limits where necessary

Refer to Section 4.8 of the EMP (Appendix F) for the traffic management programme which includes the measures to be implemented to mitigate the road safety impacts.

Heritage

Mitigation and management measures proposed for the heritage sites on-site include the following:

- The graveyard site should be left *in situ* and should be fenced in to ensure no unauthorised access is obtained, as the site is regarded to have high cultural significance, but is also far enough from the proposed haul road to not be directly affected
- A suitable buffer zone should be created around the graveyard
- If any further significance heritage resources are uncovered during mining the heritage management programme in the EMP should be adhered to (Appendix F)
- The Heritage Impact Assessment is regarded as ample mitigation for the cattle kraal as it is regarded to have low cultural significance.

Palaeontological

When the potential exists for new fossils to be exposed through excavations, it is the responsibility of the on-site ECO to monitor

<p>excavation activities and report the occurrence of any well preserved fossiliferous material, that is worth collecting, to SAHRA and an appropriate palaeontological expert, to allow the material to be thoroughly assessed, recorded and professionally excavated or sampled (Refer to heritage management programme in the EMP, Appendix F).</p>	
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2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

Alternative S1 (preferred alternative)

All potential impacts, include those which are direct, indirect and cumulative, arising from the proposed development are discussed further under **b. Process, technology, layout or other alternatives**, below.

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

Alternative S2

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b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Flora

1. Improper rehabilitation leading to the degradation of the floral habitat

The improper rehabilitation of areas disturbed by the mining process can lead to a loss in floral diversity (post-closure) due to the establishment of grass monocultures and invasion by alien plant species.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8 [6]	5 [4]	3 [1]	5 [3]	High [Medium]	80 [33]

2. Introduction of contaminants into the floral habitat during decommissioning

During the decommissioning phase, heavy vehicles will be utilised to transport the decommissioned infrastructure off-site. The equipment utilised in decommissioning activities also has the potential to generate pollutants. Any such pollutants such as hydrocarbons may enter and contaminate soils on which floral life is directly dependant on if the dirty water management infrastructure is removed prior to the removal of all sources of contamination off-site and the finalisation of rehabilitation activities.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	3 [2]	1 [1]	2 [1]	Low [Low]	16 [5]

Fauna

1. Improper rehabilitation leading to the degradation of the faunal habitat

Should rehabilitation activities not fulfil the target requirements for areas disturbed by the proposed development, the result can lead to a loss in faunal diversity as faunal life will leave an area that cannot support their functioning.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
8	5	3	5	High	80

[6]	[4]	[1]	[3]	[Medium]	[33]
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Aquatic Ecology

1. Surface water pollution

Following closure of the mine, groundwater levels in the mined-out underground area will recharge. There is a possibility for chemical interactions with the host geology and for the generation of poor quality groundwater which may emanate as decant on surface (see the groundwater section below for further details). Consequently, if sufficient seepage or decant occurs, the current state of erosion may worsen and/or the water chemistry in the associated watercourse may be affected.

Site specific leach test results for the groundwater study are still being awaited from the laboratory and will be included into the final BAR. For the purpose of this draft BAR reference is made to literature in order to determine the likely element leach concentrations in the post-operational environment at the Mabila Anthracite Mine. The literature suggests that the coal seam and portions of the carbonaceous material could be expected to form Acid Mine Drainage (AMD) conditions in the short term. From this it is concluded that groundwater flowing from the un-submerged area and decanting via the adit will display some AMD type character (see the groundwater section below for further details).

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [2]	5 [5]	3 [3]	3 [2]	Medium [Low]	42 [20]

Wetlands

1. Decreased surface water quality

Contaminated groundwater base-flow may occur in the watercourses associated with the project area thereby affecting the quality of the affected wetland areas.

As discussed in the groundwater section below, contamination is expected to migrate towards an unnamed non-perennial stream. The aquifer can be expected to contribute poor quality leachate to stream flow volumes through baseflow contribution during the rainy season. It is possible that during the dry season the impact through this aquifer may be minimal due to the seasonal reduction in groundwater level in the aquifer.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6 [4]	4 [4]	2 [2]	4 [3]	Medium [Low]	48 [30]

Groundwater

1. Recovery of groundwater levels

In the post-operational environment, groundwater levels and flow patterns in the area will continue to recover to near pre-operational levels. The time required for recovery of the groundwater levels to near pre-operational levels in the study area will be dependent on a number of factors:

- There will be inflows into the underground mine from the surrounding aquifers. The inflow rate will depend to a large extent on the groundwater flow gradient between the surrounding aquifers and the water level in the underground mine.
- Recharge from rainfall into the underground mine has been shown to range around 1 % of the mean annual rainfall. This will contribute to the flooding of the underground mine.

It is currently estimated that the groundwater level in the rehabilitated underground mining area will rise to pre-mining levels 65 years after mine closure. This is considered to be a **positive** impact.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
2	5	1	5	Medium	40

2. Point decant from the adit

The proposed underground mine is located within a hill. The adit / access area is located on the western side of the mining area, against the side of the hill. The coal seam elevations generally rise from the adit area towards the east. Thus, the coal seam elevations for a large portion of the proposed underground mine will be above that of the adit. Due to this, decant from the mining area via the adit area will start almost immediately after closure once the mine dewatering stops and the groundwater levels start to rise. This also assumes that any connection with the southern mining areas situated at elevations lower than the adit will be closed off. Should there be a hydraulic connection with the lower lying southern mining areas the water from the high lying areas will first accumulate in the southern lower lying areas until the lower lying areas are submerged to the level of the adit (calculated to be approximately 65 years after closure) before decant commences.

The decant volume from the adit is expected to start at around 160 m³ / day. As the groundwater levels and hydraulic gradient in the aquifer surrounding the underground mine recover to near pre-operational levels the decant volume is expected to increase to 275 m³/ day. Decant from the adit is expected to continue indefinitely.

Because the underground mine area occurs at elevations above that of the adit, it is not expected to be submerged and thus it is assumed that oxygen will be abundantly available in those areas. This will allow oxidation of the exposed coal seams and carbonaceous shale and sandstone to continue. According to the Acid Base Accounting (ABA), the coal seam and portions of the carbonaceous material have the potential to form AMD conditions, however, due to the **low concentrations of Sulphide-S** identified through the ABA it is **unlikely that the**

AMD conditions will be sustained in the long term.

It should be noted that site specific leach test results are not yet available due to laboratory delays, but will be included into the final BAR / EMP. For the purpose of this draft BAR / EMP reference is made to existing scientific literature (Hodgson, Usher, Scott, Zeelie, Cruywagen, & de Necker, 2001) in order to determine the likely element leach concentrations in the post-operational environment at the Mbila Anthracite Mine.

From this it is concluded that groundwater flowing from the un-submerged area and decanting via the adit will display some AMD type character in the short-term. This will include aspects such as:

- pH: 5 to 6
- Sulphate: 1 000 to 1 900 mg/L;
- Calcium: 150 to 250 mg/L;
- Magnesium: 40 to 100 mg/L; and
- Sodium: 150 to 380 mg/L

3. Diffuse decant from the submerged southern portion of the underground mine

The southern portion of the proposed underground mine area has floor elevations lower than that of the adit area. Therefore, in this area there will be an accumulation of groundwater up to the elevation of the adit and this portion of the underground mine will be submerged.

Coal seam contacts with the over- and underlying shales are known to be good conductors of groundwater flows. Due to the underground mine area extending up to close to the side of the hill, there exists a possibility of diffuse decant occurring along the edge of the hill where the groundwater accumulating within the southern portion of the underground mine seep along the coal seam / shale contacts towards the edge of the hill. The expected diffuse decant area is illustrated in Figure 12 (Appendix G).

Because this southern portion is submerged, oxygen will be displaced in this area, thereby reducing the chemical activity and the possibility for AMD conditions to form due to oxidation of the exposed coal seam and carbonaceous shale and sandstone. Therefore, any diffuse seepage from this area is expected to be alkaline in nature. This will entail:

- pH: 8.5 to 9.5;
- Sulphate: 500 to 1 200 mg/L;
- Calcium: 80 to 220 mg/L;
- Magnesium: 10 to 50 mg/L; and
- Sodium: 50 to 150 mg/L

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4	4	2	4	Medium	40

[2]	[4]	[1]	[3]	[Low]	[21]
<p><i>4. Contaminant Migration</i></p> <p>As mentioned above, the site specific leach tests results are not yet available. These results will be incorporated into the final BAR and EMP. For the purpose of this section reference is made to the existing scientific literature (Hodgson, Usher, Scott, Zeelie, Cruywagen, & de Necker, 2001) in order to determine the likely element leach concentrations in the post-operational environment</p> <p>As discussed above, a large portion of the underground mine area has a floor elevation higher than that of the adit and it is considered to be unlikely that the adit can be feasibly completely sealed off. Therefore, those areas where the floor elevation is higher than that of the adit will not be submerged and will continue to act as a “drain” where the groundwater level is drawn down to the elevation of the adit due to continuous decant from the mine area via the adit.</p> <p>In the southern portion of the underground mine, the floor elevations are lower than that of the adit, and it is expected that groundwater will accumulate in this area. The groundwater level will rise to the level of the adit and the lower lying areas will be submerged. The water contained within this mined area will exert a driving force that enables contaminant migration away from the submerged underground mining area.</p> <p>Expected element concentrations, as derived from the WRC research report (Hodgson, Usher, Scott, Zeelie, Cruywagen, & de Necker, 2001) are:</p> <ul style="list-style-type: none"> • Sulphate: 500 to 1 200 mg/L; • Calcium: 80 to 220 mg/L; • Magnesium: 10 to 50 mg/L; and • Sodium: 50 to 150 mg/L. <p>Based on the above, an average sulphate concentration of 850 mg/L was used to simulate the expected impacts from contaminant migration on the surrounding aquifers and surface water bodies.</p> <p>The expected contaminant plume at 25, 50, 75, and 100 years after closure migrating away from the submerged underground mining area is shown in Figure 13 to Figure 16 (Appendix G). From the figures it can be seen that the contaminant plume development is expected to follow topography and migrate south of the proposed underground mine area. The contaminant plume from the discard area is also expected to follow topography and migrate up to 220 m north-west and 170 m south-east of the surface infrastructure area.</p> <p>It should be noted that, for the purpose of this study, a conservative approach was taken and constant source concentrations for 75 and 100 year contaminant plume estimations were assumed. However, the ABA results found Sulphide-S concentrations to be low and it is</p>					

therefore **unlikely that AMD conditions would be sustained in the long term.**

Groundwater with the chemical characteristics indicated above is expected to migrate towards two unnamed non-perennial streams; located south and east of the underground mine and discard areas respectively. The aquifer can be expected to contribute groundwater with elevated salt concentrations (between 5 and 105 mg/L) to stream flow volumes through baseflow contribution during the rainy season. It is possible that during the dry season the impact through this aquifer may be minimal due to the seasonal reduction in groundwater level in the aquifer.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6	5	2	4	Medium	52

Traffic

During decommissioning the R618 and P234 are expected to still be impacted by increased light vehicle and heavy vehicle (truck) trips as some staff will still be commuting to and from site and construction vehicles will be used for decommissioning. The overall impact of these additional vehicles, in terms of reduced safety and wear on the road surfaces on the R618 and P234 however, if mitigation measures are implemented, is low.

Road Section	Magnitude	Duration	Scale	Probability	Significance	
					Rating	Value
Local Roads and Intersections	8 [6]	1 [1]	2 [2]	4 [3]	44 [27]	Medium [Low]

Palaeontological

During decommissioning, no further excavation should be conducted resulting in no fossils being exposed. The decommissioning phase should therefore not have a negative impact on any fossil coal floras on site.

Indirect impacts:

Groundwater

The potential contaminant plume is expected to impact only one monitoring borehole (MGWM-06), the sulphate concentration in borehole MGWM-06 is expected to increase to 200 mg/L during post closure

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
6	5	2	4	Medium	52

Heritage

No heritage resources are situated near enough to proposed areas for development and will

thus not have to be relocated or otherwise disturbed, however, secondary impacts may arise as a result of the presence of workers on-site, decommissioning vehicles etc., which may affect the graveyard, as workers may enter the graveyard and inadvertently or otherwise, cause damage to it. The graveyard should be cleared signposted and demarcated as per the heritage management programme in the EMP.

Magnitude	Duration	Scale	Probability	Significance	
				Rating	Value
4 [2]	2 [2]	1 [1]	3 [2]	Low [Low]	21 [10]

Cumulative impacts:

Alternative A2

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Refer to the No-go Alternative Section 2.2b in the construction phase.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1

Alternative A2

Flora and Flora

- Rehabilitation programmes should be advised by biodiversity management programme to increase species diversity in rehabilitated areas, refer to biodiversity management programme, Section 4.3 of EMP (Appendix F).
- All alien vegetation emerging should be removed before it becomes established as per the biodiversity management programme, see Section 4.3 of EMP (Appendix F).
- A qualified botanist should be consulted to assist during the rehabilitation to increase species diversity;
- Rehabilitation should be done with indigenous trees, shrubs and

grasses species propagated from species dominating the surrounding vegetation types;

- The hydrocarbon management programme should be adhered to as per Section 4.7 of the EMP (Appendix F).

Aquatic Ecology

- Please refer to Section 4.6 of the EMP (Appendix F) for the groundwater management programme detailing measures to manage impacts on groundwater at the proposed Mbila Anthracite Mine;
- Please refer to Section 5.5 of the EMP (Appendix F) for the monitoring programme associated with groundwater at the proposed Mbila Anthracite Mine; and
- Please refer to Section 4.4 of the EMP (Appendix F) for the aquatic ecology management programme.

Wetlands

- When designing a rehabilitation programme, care should be taken to consider the structure (topography) and rehabilitation measures (e.g. irrigation) of the mine;
- Please refer to Section 4.5 of the EMP (Appendix F) for the wetland and stormwater management programme detailing measures to mitigate impacts on wetlands at the proposed Mbila Anthracite Mine;
- Please refer to Section 5.5 of the EMP (Appendix F) for the monitoring programme associated with groundwater at the proposed Mbila Anthracite Mine; and
- For a detailed discussion of the layout of crossings, weirs and gabions proposed for rehabilitation of the wetlands please refer to Section 8.1 of the wetland study in Appendix D.

Groundwater

- Groundwater level monitoring (as described in Section 5.5 of the EMP, Appendix F) should be implemented in order to assess the post closure impacts;
- Decant management as described in Section 4.6 of the EMP (Appendix F) should be adhered to, including:
 - Channelling and management / treatment of decant from the adit area;
 - Regular monitoring for diffuse decant along the side of the hill near the submerged southern portion of the underground mine;
 - Channelling of intercepted diffuse decant towards the evaporation pond/ artificial wetland constructed for managing

<p>decant from the adit.</p> <p><u>Traffic</u> For decommissioning purposes, collaborate with the relevant Roads Authority to ensure the road maintenance plan is still implemented during decommissioning activities in order to maintain the relevant road network on which heavy vehicle movement is anticipated; Refer to Section 4.8 of the EMP (Appendix F) for the traffic management programme which includes the measures to be implemented to mitigate the road safety impacts.</p> <p><u>Heritage</u></p> <ul style="list-style-type: none"> • The graveyard site should be left <i>in situ</i> and should be fenced in to ensure no unauthorised access is obtained, as the site is regarded to have high cultural significance, but is also far enough from the proposed haul road to not be directly affected. • The graveyard should be cleared signposted and demarcated as per the heritage management programme in Section 4.9 of the EMP (Appendix F). • The Heritage Impact Assessment is regarded as ample mitigation for the cattle kraal as it is regarded to have low cultural significance. 	
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2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)

Alternative S2

<p>The outcome of the design and planning phase was a Feasibility Study which defined the project, the target resource, the mining method, CHPP details, operational parameters and haul routes. This information formed the scope of work for the environmental authorisation process.</p> <p>Considering the above, only one site alternative was identified during the planning and design phase, as the site position is dependent on the location of the <i>in situ</i> coal resources to be mined. The resulting layout, technical and process alternatives are then further discussed in the relevant section below.</p>	
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Alternative A1 (preferred alternative)

Alternative A2

<p><u>Flora</u> The aim of long term vegetation monitoring is to understand the direction,</p>	
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cause and results of change in vegetation which are usually brought on by various management (or human) actions.

The objectives of vegetation monitoring in the study area include:

- Monitoring of mining impacts such as habitat destruction, pollution and fire;
- Monitoring of threatened/rare/protected/relocated and/or; and
- Monitor structural change over time.

Vegetation monitoring techniques

The following vegetation monitoring techniques are recommended:

- Permanently marked plots to quantitatively assess compositional change: Permanent plots are used to assess animal impact on vegetation, determining long-term trends in exotic weeds, quantifying changes in soil erosion and evaluating vegetation after disturbance (Wiser & Rose, 1997). Permanent plots often rely on rigorous scientific methods to ensure repeatability and will be suitable for the objectives at Mbila;
- Measuring individually tagged plants to study growth rates: The aim of this monitoring technique is to quantify survival and recruitment of individuals of species. Two plant species of conservation concern as well as one provincially protected plant species have been confirmed at Mbila and since the main focus of this technique is individual species monitoring it is recommended that some of these species are mapped to quantify survival and recruitment;
- Mapping of individual plant positions and quantify survival and recruitment: This technique is used to map species of conservation concern / rare / protected / relocated and / or species harvested for medicinal purposes. It is therefore recommended that this technique is used to monitor these species; and

Repeat / fixed point photography to determine change: Fixed point photography is used at a detailed level to record temporal change at marked sites over different time periods. This method is suitable to determine structural vegetation changes over a period of time. This is a robust and effective method to monitor vegetation and it is recommended that fixed points are established at Mbila.

Fauna

To maintain ecological integrity (habitat and species) natural areas should be kept free of invasive alien species and bush encroachment must be controlled. Clearing of alien invasive plant species needs to be approached

systematically according to the recommendations made with regard to alien species in Section 4.3 (biodiversity management programme) of Appendix F (EMP).

Appropriate management of fire and grazing can be used to avoid or limit bush encroachment, especially in grassland areas. In areas not directly forming part of the development footprint Basal cover must be maintained as a loss of basal cover increases the vulnerability of the grassland to infestation by invasive alien species and to soil erosion.

Should the proposed activity take place, faunal habitats within the study area that should be monitored for deterioration include all wetland habitats, such as the Mona River and its tributaries, the eroded drainage lines and the moist areas within the wooded grassland such as the pan-like depression observed, as well as certain areas of the wooded grassland.

Please see Figure 1, Appendix G for GPS coordinates of suggested monitoring points. It is recommended that both the avifauna and the persistence of amphibians in the area are monitored.

Bearing the above monitoring points in mind, the following is recommended with regards to avifaunal and amphibian monitoring:

Avifauna

It is recommended that the avifaunal diversity of the area is closely monitored as birds are often considered the most reliable indicators of terrestrial biological richness and environmental condition and a decline in bird species richness and composition usually means the decline of general biodiversity and deteriorating habitat condition. This should be remembered when monitoring is undertaken at the aforementioned monitoring points.

Amphibians

Amphibians are widely used as bio-indicators mainly due to their sensitivity to changes in environmental conditions. They are also important and useful indicators of environmental health.

Factors that make frogs sensitive to environmental deterioration include a permeable skin that absorbs water and any solvents that may be present; sensitivity to extreme temperature; susceptibility to ingesting chlorinated compounds and heavy metals in their environment. They are exposed to both the aquatic and terrestrial environment and are thus affected by changes to both.

Amphibians usually have specific habitat requirements resulting in patchy distribution. Habitat losses may isolate surviving populations putting them under risk of extinction. Amphibians are visually and acoustically

conspicuous which makes them accessible for survey. In order to establish the persistence of amphibians in the study area, it is recommended that annual amphibian surveys are conducted in summer after sufficient rains have fallen. Both night time and day time surveys must take place.

Aquatic Ecology

It is recommended that a responsibility-driven approach towards the management of the aquatic ecosystem associated with the proposed development be followed. In order to enable an adequate description of the aquatic environment and monitor the PES and potential impacts of the mine on the aquatic biota of the Mona and Ngagalu Rivers, the monitoring of several stressor, habitat and response indicators are recommended. Such indicators may include:

- Stressor indicators:
 - Water quality assessment, including the measurement of *in situ* water quality parameters (temperature, pH, electrical conductivity, and dissolved oxygen); and
 - Evaluation of existing water quality results (conducted by means of an independent SANAS-accredited laboratory) and the identification of variables of potential concern to the aquatic environment (where available).
- Habitat indicators:
 - Adapted Invertebrate Habitat Assessment System (IHAS).
- Response indicators:
 - Macroinvertebrate assessment - the determination of Present Ecological State (PES) is to be done utilizing the South African Scoring System Version 5 (SASS5) and the Macro-Invertebrate Response Assessment Index (MIRAI);
 - Ichthyofaunal assessment - the determination of PES is to be done utilising the Fish Response Assessment Index (FRAI); and
 - Diatom assemblage assessment - this approach may be a more valuable at sites with low water levels during most of the year.

In the event of a fish kill event involving more than 25 individual fish, and in order to determine the mechanism and cause of the fish kill, a suitably qualified aquatic specialist should, at a minimum, undertake the following:

- Collection of visual clues;
- Identify the extent of the fish kill (i.e. species- and/or size-specific);
- Collection of appropriate water (and algae) samples within the fish kill area, as well as upstream and downstream of the fish kill area, for the assessment of:

- Major inorganic constituents (e.g. NH₃, NO₂, NO₃, Total Nitrogen, SO₄, PO₄,
- Total Alkalinity, pH, TDS, F, K, etc.);
- Minor inorganic constituents, including trace metal analysis (B, Al, V, Cr, Mn,
- Fe, Ni, Cu, Zn, As, Sr, Mo, Cd, Ba, Pb, etc.);
- Chemical Oxygen Demand;
- Phytoplankton Enumeration and Microcystin analysis
- Acute Toxicity Screening Tests utilising Daphnia (Water Flea) and Poecilia
- (Guppy);
- Collection of a moribund (dying) fish specimen for post mortem examination, including autopsy, histological analysis and bacterial determination.

For an in-depth discussion on the aquatic ecology and surface water monitoring programme, please refer to Section 5.3 of the accompanying EMP (Appendix F).

Wetlands

In order to design an effective monitoring programme for the proposed Mbila Underground Mine, specific aspects and principles of the Wet-Health tool should be used to compare the conditions of the wetlands on site with the baseline PES scores obtained. An important feature of the Wet-Health tool is that it also allows diagnosis of the problem/s impacting on wetland health which can be used to inform management interventions.

Healthy wetlands are known to provide important habitats for wildlife and to deliver a range of important goods and services to society. Management of these systems is therefore essential if these attributes are to be retained within an ever changing landscape. The primary purpose of the assessments is to evaluate the eco-physical health of wetlands, and in so doing promote their conservation and wise management.

The proposed monitoring program identifies two components to ensure effective wetland monitoring, including:

- Assessing PES of selected hydro-geomorphic units (achieved by calculating a combined score of the hydrology, geomorphology and vegetation components); and
- Assessing hydrological and geomorphic stability of wetlands by monitoring the presence of erosion channels and areas of sediment deposition.

For an in-depth discussion on the wetland monitoring programme, please

refer to Section 5.4 of the accompanying EMP (Appendix F).

Groundwater

It is recommended that a groundwater level and quality monitoring program be implemented. Mbila groundwater boreholes installed around the mine areas should be used to monitor changes in groundwater and quality due to the proposed development.

Chemical elements that should be analysed for includes:

- General chemistry such as pH, TDS and EC;
- Major elements such as calcium, magnesium, sodium, potassium, sulphate, nitrate;
- An ICP scan of minor elements including aluminium, manganese, cadmium, mercury, chromium, vanadium and zinc.
- This data must be captured into a database, which will be utilised for long term monitoring and will assist in provided the DWA or KZN-DAE with necessary monitoring information when required.

During the initial 12 month period it is recommended that the monitoring program be implemented on a monthly basis in order to obtain a background indication of seasonal changes in the area. Once the initial 12 month period is completed the time increments can be increased to quarterly sampling runs, depending on the outcome of the first 12 months of monitoring.

The 3D numerical model should be updated toward the end of life of mine in order to assess the mine post closure impacts in the model area.

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative S1 (preferred site)

The outcome of the design and planning phase was a Feasibility Study which defined the project, the target resource, the mining method, CHPP details, operational parameters and haul routes. This information formed the scope of work for the environmental authorisation process.

Considering the above, only one site alternative was identified during the planning and design phase, as the site position is dependent on the location of the *in situ* coal resources to be mined. The resulting layout, technical and process alternatives are then further discussed in the relevant section below.

Alternative S2

Alternative A1 (preferred alternative)

Flora

The aforementioned study divided the project (and broader) area into three broad vegetation groups, namely: fallow land, drainage lines and wooded grassland. Species of conservation concern were recorded in the aforementioned areas, these include: *Hypoxis hemerocallidea* and *Boophone disticha*

During the construction of the proposed haul road, processing plant, surface adit (and associated surface infrastructure) the natural vegetation will be stripped which will lead to the destruction of the floral habitat.

During the construction of the proposed infrastructure natural vegetation will be removed and soils will be disturbed. Disturbed habitats are prone to being inundated by weeds and alien vegetation. Additionally, contractors and construction vehicles moving in and through the study area introduce and spread alien floral species.

Hazardous materials used in the construction and mining processes have the potential to contaminate soils, watercourses and ground water. These are natural resources on which floral species are dependent on.

The floral habitat will be fragmented by the proposed haul road linear development.

Fauna

The entire proposed project area is contained within a 'Biodiversity Area' as listed in the Ezemvelo KZN Wildlife (EKZNW) Conservation Plan (C-Plan), such areas are considered as areas which contain high biodiversity in terms of their irreplaceability measures.

The aforementioned study assessed the proposed project area in terms of its sensitivity (from a faunal perspective). The areas considered to be of the highest sensitivity (from a faunal perspective) were those associated with drainage lines, rivers, moist pan-like depressions and man-made dams.

During the construction of the proposed haul road, processing plant, surface adit (and associated surface infrastructure) the natural vegetation will be striped which will lead to a loss of suitable faunal habitat. This in conjunction with noise associated with construction and mining activities will result in faunal life fleeing the impacted areas in search of other areas which are of a suitable habitat. This will lead to a net loss in the overall faunal diversity of the affected areas as suitable habitat is destroyed.

During the construction and operation of the mining project it is possible that the construction workers, contractors and mining personnel may bring with them domesticated fauna that may exert a negative impact on the local indigenous faunal species.

Personnel will be present on construction sites and mining workers will be present on-site

during the operational phase this may bring about negative interactions between people and naturally occurring fauna (which includes poaching, trapping as well as vehicle collisions with fauna).

Construction of the proposed haul road (being a linear development) will cause habitat fragmentation which will exert a negative impact on faunal populations.

Aquatic Ecology

The clearing of natural vegetation and the construction of impermeable surfaces within the proposed infrastructure will result in increased surface runoff directly into the associated drainage lines and the Mona River. The increase in surface runoff may increase the sediment-carrying capacity of the watercourse and smother any currently available habitat within the isolated pools that exist within the system. The transport of eroded soil into surrounding surface water resources will increase the Total Suspended Solids (TSS) and turbidity of the water, which may lead to an increase of invertebrate drift, an effect on the respiration due to the deposition of silt on the gills of biota, and the interference with hunting efficiency of fish.

Hydrocarbon-based fuels and/or lubricants spilled from vehicles, materials incorrectly stockpiled, and litter deposited by construction workers may be washed into the Mona River and associated drainage lines. If these contaminants enter the surrounding watercourse, aquatic biota become physiologically stressed and migrate away from the affected area.

Following closure of the mine, there is a potential for surface and ground water to fill the shaft and the mined-out underground area over time. This water is likely to dissolve various exposed metals within the rock and remnant contaminants within the underground area and can become acidic and/or toxic. Consequently, if sufficient seepage or decant occurs, the current state of erosion may worsen and/or the water chemistry in the associated watercourse may be affected

Wetlands

The footprint of the site infrastructure, i.e. the haul road and plant area, could infringe on or destroy wetland habitats. The potential siltation of the wetland system, due to erosional processes, would alter geomorphologic functioning. The clearing of natural vegetation and the stripping of topsoil will result in an increase in mechanical erosion, and thus increased runoff of sediment from the site into watercourses, such as the Mona River. Hardened surfaces and bare areas are likely to increase surface run off velocities and peak flows received by wetlands.

Hydrocarbon-based fuels or lubricants spilled from vehicles; materials that are not properly stockpiled; and litter deposited by workers may be washed into the surface water bodies. The mobilisation of sediments, excavations, removal and disturbances to vegetation, mobilisation of sulphur, hydrocarbon and pyrite compounds could have various negative impacts on wetlands and their associated functionality.

Contaminated groundwater base-flow may occur in the watercourses associated with the project area. A drop in topography, due to subsidence cause by underground mining, would completely change the hydrological and geomorphological processes which govern the functions the wetlands perform. Subsidence of the wetland areas will likely affect the ecology

and wetlands within and downstream of the proposed project area, should the quality of the water in the subsided area become polluted.

Groundwater

The underground mining area will be accessed via an adit and the groundwater level will be breached. Groundwater inflow rates are not expected to exceed 1.5 m³/ day. The zone of influence of the drawdown cone is estimated to be negligible. Surface construction of the discard dump, plant and haul roads will not breach the groundwater level and is therefore not expected to have any impact on the groundwater levels or quality. In general it can be said that the impacts during construction will be negligible.

The maximum drawdown in the groundwater level from pre-mining levels is estimated at between 28 and 36 m in the lower fractured aquifer. The zone of influence of the drawdown cone will extend up to 400 m from the mining area. The zone of influence is not expected to impact the Mona River.

The coal seam elevations for a large portion of the proposed underground mine will be above that of the adit. Due to this, decant from the mining area via the adit area will start almost immediately after closure unless the adit can be successfully sealed to prevent decant. Should there be a hydraulic connection with the lower lying southern mining areas the water from the high lying areas will first accumulate in the southern lower lying areas until the lower lying areas are submerged to the level of the adit (calculated to be approximately 65 years after closure) before decant commences.

The groundwater leach test results are not yet available and will be incorporated into the final BAR and EMP. For the purpose of this report reference is made to literature in order to determine the likely element leach concentrations in the post-operational environment.

It will be almost impossible to seal the adit in such a way that all decant from the adit will be stopped. The decant volume from the adit is expected to start at around 160 m³ /day. As the groundwater levels and hydraulic gradient in the aquifer surrounding the underground mine recover to near pre-operational levels the decant volume is expected to increase to 275 m³/day. Decant from the adit is expected to continue indefinitely. The groundwater flowing from the un-submerged area and decanting via the adit will display some AMD type character in the short-term. However, a conservative approach was taken and constant source concentrations were assumed for the modelling of contaminant migration 75 and 100 years post closure.

The southern portion of the proposed underground mine area has floor elevations lower than that of the adit area. Therefore, in this area there will be an accumulation of groundwater up to the elevation of the adit and this portion of the underground mine will be submerged.

Due to the underground mine area extending up to close to the side of the hill, there exists a possibility of diffuse decant occurring along the edge of the hill where the groundwater

accumulating within the southern portion of the underground mine seep along the coal seam / shale contacts towards the edge of the hill. Any diffuse seepage from this submerged southern area is expected to be alkaline in nature.

Traffic

The road / routes and intersections considered to be impacted were assessed per road, where the following characteristics were assessed: road environment, geometry, traffic conditions and road pavement. The most significant impacts were those associated with non-motorised transport (NMT), i.e. pedestrians and cyclists at intersections and therefore road safety, speed limits and road conditions. It is recommended that the gravel road P234 be tarred and widened in order to protect NMT receptors and ensure that road degradation as a result of coal trucks is better managed.

Heritage

Secondary mining activities i.e. workers driving on the haul road, and walking about on-site, may inadvertently, or otherwise, damage the graveyard by either littering at the graveyard, or vandalising it.

Palaeontological

The fossil coal floras of South Africa are of international interest, and represent an important part of our local heritage. Any loss of this heritage due to clearing during construction activities or mining during operational activities at the adit is permanent, and should be regarded as a highly significant negative impact. The discovery of well-preserved fossils during mining operations, followed by effective mitigation in collaboration with a palaeontologist, however would result in the curation of new fossil material. The development could therefore potentially have a positive, beneficial impact on South Africa's palaeontological heritage.

Alternative A2

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No-go alternative (compulsory)

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SECTION F. RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAPr sufficient to make a decision in respect of this report?

If "NO", please contact the KZN Department of Agriculture & Environmental Affairs regarding the further requirements for your report.

YES	NO

Basic Assessment Report

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

All relevant management and mitigation measures are contained in the EMPr (Appendix F) and should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

SECTION G: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Figures

Appendix H: Existing Environmental Management Programme