NEMA APPLICATION: PLAN OF STUDY KEBRAFIELD (PTY) LTD

REPORT

24/02/2014

REF 13 14/AUTH - 016: (PLAN OF STUDY)

2014

ENVIRONMENTAL & PROJECT MANAGEMENT PROFESSIONALS

Email: info@ecoelementum.co.za
Contact: 012 348 5214 /
082 690 9105

Key Project Information	
Project Title:	Kebrafield Roodepoort Colliery
Farm Description:	Roodepoort 151 IS Portion 17
SG Code:	T0IS000000000115100017
Mining Right Reference Number:	MP30/5/1/2/2/479 MR
District Municipality:	Nkangala District
Local Authority:	Steve Tshwete Local Municipality
Nearest Town:	Pullenshope
Site Midpoint Coordinates:	26° 0'25.87"S 29°34'41.21"E

Project applicant:	Kebrafield (Pty) Ltd		
Trading name (if any):	Kebrafield		
Contact person:	Wayne van der Burgh c/o Burgh Group Holdings (Pty) Ltd		
Physical address:	54 Guinea Fowl Str, Silver Lakes, Pretoria		
Postal address:	P.O. Box 71986, Die Wilgers		
Postal code:	0041	**Cell:**	
Telephone:	012 807 0229	**Fax:**	012 807 0339
EAP:	Ilze Ueckermann for Eco Elementum (Pty) Ltd		
Contact person:	Henno Engelbrecht (Project Manager)		
Postal address:	26 Greenwood Crescent, Lynnwood Ridge, Pretoria		
Postal code:	0040	**Cell:**	082 6909 105
Telephone:	012 348 5214	**Fax:**	086 714 5399
E-mail:	henno@ecoelementum.co.za / info@ecoelementum.co.za		
Qualifications & relevant experience	Masters Degree specializing in Environmental Management 10 Years' experience in Environmental Consultancy		
Professional affiliation(s) (if any)	Chartered Environmental Assessment Practitioner South Africa (CEAPSA)		
Landowner:	Joseph Christiaan van Wyk - ID 7604145228088		
Contact person:	Van Wyk Attorneys, 48 Mouton Street, Hendrina, 1095		
Postal address:	PO Box 22, Hendrina		
Postal code:	1095	**Cell:**	
Telephone:	013 293 0505	**Fax:**	013 293 0530

Table of Contents

Glossary 4

1. Introduction 5

1.1 Project Background 5

1.2 Legislative Context 5

1.3 Purpose of the Plan of Study 6

1.4 Details of the Applicant 7

1.5 Details of the Environmental Assessment Practitioner 7

2. Project Description 8

3. Process to Assess Alternatives 11

3.1 Property or Location Alternatives 11

3.2 Type of Activity to be Undertaken Alternatives 12

3.3 Design or Layout Alternatives for the Activity 13

3.4 Technology Alternatives 14

3.5 No-go Alternative 14

4. Environmental Impact Assessment Approach and Methodology 15

4.1 Scoping Phase Process 15

4.2 EIA Phase Process 16

4.3 EIA Programme and Opportunities for I&AP and Authority Involvement 16

4.4 Information Gathering 18

4.5 Identified Impacts during the Scoping Phase 18

4.6 Specialist Assessments 20

4.6.1 Geohydrological / Groundwater Study 22

4.6.2 Hydrology/Surface Water Study 23

4.6.3 Wetlands Study 25

4.6.3 Ecology – Terrestrial and Aquatic 25

4.6.4 Baseline Noise Assessment 27

4.6.5 Baseline Air Quality Assessment 27

4.6.6 Archaeology (Phase 1 Heritage Assessment) 27

4.6.7 Socio-economic Study 28
4.6.8 Visual Impact Assessment 29
4.6.9 Land Capability and Soils Assessment 30
4.6.10 Traffic Study (Including Representation to the relevant Roads Agency) 31
4.6.11 Blast & Vibration Risk Assessment Study 31
4.6.12 Paleontological Impact Assessment 32
5. EIA Impact Assessment Methodology 33
5.1 Introduction to Impact Assessment Methodology 33
5.2 Assessment of Biophysical Cumulative Impacts 34
5.3 Assessment Criteria 35
5.4 Mitigation 36
6. Public Participation 38
6.1 Introduction 38
6.2 Proposed Public Participation Process 39
7. EIA Milestones and Project Programme 40
8. Conclusion 41

Glossary

CA	**Competent Authority**
EAP	**Environmental Assessment Practitioner**
EIA	**Environmental Impact Assessment**
EMP	**Environmental Management Programme**
GNR	**Government Notice Regulation**
I&APs	**Interested and Affected Parties**
MDEDET	**Mpumalanga Department of Economic Development, Environment and Tourism**
NEMA	**National Environmental Management Act, 1998 (Act 107 of 1998)**
POS	**Plan of Study**
PPP	**Public Participation Process**
SAHRA	**South African Heritage Resources Agency**

1. Introduction

1.1 Project Background

Eco Elementum (Pty) Ltd has been appointed by Eyethu on behalf of the applicant Kebrafield (Pty) Ltd to undertake the Scoping Environmental Impact Assessment and Water Use Licensing for all the relevant listed activities as discussed further on in this report. The mining right which has been awarded to Kebrafield (Pty) Ltd, MP30/5/1/2/2/479 MR, includes various farms and associated farm portions although for this specific project only the farm Roodepoort 151 IS portion 17 in the vicinity of the town of Pullenshope in Mpumalanga is being applied for. The project falls within the district municipality of the Nkangala District while the local authority is the Steve Tshwete Local Municipality. This report entails an application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010, and falls within the jurisdiction of the Department: Economic Development, Environment and Tourism, Mpumalanga Provincial Government.

The proposed project relate to the opencast mining of approximately 800 000tons of high grade coal over a period of approximately three years. When coal seams are near the surface, it may be economical to extract the coal using open cut (also referred to as open cast, open pit, or strip) mining methods. Open cast coal mining recovers a greater proportion of the coal deposit than underground methods, as more of the coal seams in the strata may be exploited. The activity will cover approximately 50 hectares and is situated next to the town of Pullenshope downstream of the Eskom Hendrina Power Station.

The Environmental Impact Assessment (EIA) process followed is in compliance with the National Environmental Management Act, 1998 (Act 107 of 1998), as amended and the Environmental Impact Assessment Regulations of 2010 (Government Notice No's R544, 545 and 546 in Government Gazette No. 33306 of 18 June 2010). The proposed opencast coal mining operations constitutes various listed activities which have been listed within the scheduled activities in Government Notice Regulation No 544, 545 and 546 and therefore require a full Scoping and EIA process to be followed. Prior to such a listed activity being approved, it is required that an environmental process is undertaken and a report is submitted to the relevant environmental authority for consideration.

1.2 Legislative Context

National Environmental Management Act, 1998 (Act 108 of 1998) [as amended):

The proposed development requires compliance with the EIA Regulations of 2010, promulgated in terms of the National Environmental Management Act, Act 107 of 1998 (as amended). The proposed activity requires a Scoping and EIA process as listed activities 9, 11, 13, 18, and 22 under Government Notice No R. 544 as well as listed activities 10 and 15 of Government Notice No R. 545 and also activity 13 and 14a of Government Notice No R 546 of the EIA 2010 Regulations are triggered.

National Water Act, 1998 (Act 36 of 1998):

The project will require the submission of a Water Use License Application (WULA) in terms of Section 21 of the NWA which will include the following activities:

21.(a): taking water from a water resource;

21.(b): storing water;

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

21.(f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;

21.(g): disposing of waste in a manner which may detrimentally impact on a water resource;

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

21.(j): removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

Various legal references have been considered throughout the application while the following list serves as a summary;

- The Constitution of the Republic of South Africa, 1996;
- The National Environmental Management Act, 1998 (Act 107 of 1998) [NEMA];
- National Heritage Resource Act, 1999 (Act No. 25 of 1999) [NHRA];
- National Water Act, 1998 (Act No.36 of 1998) [NWA];
- Integrated Environmental Management [IEM] (DEAT Guideline Series);
- National Environmental Air Quality Act (Act No 39 of 2004) [NEMAQA];
- Mineral and Petroleum Resources Development Act (Act 28 of 2002) [MPRDA];
- National Environmental Management: Waste Act (Act 59 of 2008) [NEMWA];
- Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [MHSA];
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA];
- Conservation of Agricultural Resources Act (Act 43 of 1983) [CARA];
- Occupational Health and Safety Act (Act 85 of 1993)[OSHAct].

1.3 Purpose of the Plan of Study

The Plan of Study (PoS) is a document which is intended to provide a summary of the key findings of the Scoping Phase of the EIA process, to ultimately describe the activities to be undertaken in the Impact Assessment Phase of the EIA process.

This PoS has been completed in terms of the requirements of Regulation 28 *(n)(i-iv)* of the EIA Regulations (2010), which sets out the approach to the Environmental Impact Assessment (EIA) of the Application which includes *inter alia*:

(i) A description of the tasks that will be undertaken as part of the EIA process, including any specialised reports or specialised processes, and the manner in which such tasks will be undertaken;

(ii) An indication of the stages at which the competent authority will be consulted;

(iii) A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and

(iv) Particulars of the public participation process that will be conducted during the environmental impact assessment process.

1.4 Details of the Applicant

Table 1: Details of the applicant

Project applicant:	Kebrafield (Pty) Ltd		
Trading name (if any):	Kebrafield		
Contact person:	Wayne van der Burgh c/o Burgh Group Holdings (Pty) Ltd		
Physical address:	54 Guinea Fowl Str, Silver Lakes, Pretoria		
Postal address:	P.O. Box 71986, Die Wilgers		
Postal code:	0041	**Cell:**	
Telephone:	012 807 0229	**Fax:**	012 807 0339

1.5 Details of the Environmental Assessment Practitioner

Table 2: Details of the Environmental Assessment Practitioner

EAP:	Ilze Ueckermann for Eco Elementum (Pty) Ltd		
Contact person:	Henno Engelbrecht (Project Manager)		
Postal address:	26 Greenwood Crescent, Lynnwood Ridge, Pretoria		
Postal code:	0040	**Cell:**	082 690 9105
Telephone:	012 348 5214	**Fax:**	086 714 5399
E-mail:	henno@ecoelementum.co.za / info@ecoelementum.co.za		
Qualifications & relevant experience	Masters Degree specializing in Environmental Management 10 Years' experience in Environmental Consultancy		
Professional affiliation(s) (if any)	Chartered Environmental Assessment Practitioner South Africa (CEAPSA)		

2. Project Description

Section 39(3)(a) of the National Environmental Management Act (Act 107 of 1998) read together with Regulation 50(a) of the MPRDA further requires a description of the proposed activity including all infrastructure and associated activities.

The Kebrafield Roodepoort Colliery will be an opencast mine producing 800 000tons of high grade Bituminous Coal found in a single coal seam (2.5 -3.0m thick) of the Witbank Coal Field at depths varying from 6.5m to 28m deep. The colliery will be covering an extent of approximately 60ha of the 410ha Portion 17 of Roodepoort 151 IS farm (approximately 15% of the farm). The extent of the mining area is predetermined by the extent of the coal seam as has been determined during the prospecting phase of the project. The mining right with reference MP30/5/1/2/2/479 MR has already been awarded to Kebrafield (Pty) Ltd and the Mining Right EIA and EMPR has been approved and stamped on 2011-06-06. An application for the Water Use License is being made concurrently with this EIA to ensure authorisation can be granted at the same time (expected authorisation end 2014) to enable the project to commence.

The larger extent of the mining right entails a life of mine of 30 years and covers various farm portions, although for this particular EIA authorisation only the first phase of the project is being applied for with an estimated life of mine of approximately three years. Future applications for the remainder of the reserve as approved in the Mining Right will be lodged with the Department as separate applications due to the size and extent of the operation making it very difficult to apply for everything at once. The scope and extent of the Kebrafield Roodepoort Colliery therefore has been limited to 60ha on Portion 17 of the Farm Roodepoort 151 IS.

Mining methods vary widely and depend on the location, type and size of mineral resources. Surface mining methods are most economical in situations where mineral deposits occur close to the surface (e.g. coal, salts and other evaporite deposits or road quarry material) or form part of surface deposits (e.g. alluvial gold and diamonds, and heavy mineral sands). For this specific project the mining of coal by means of surface mining methods are viable due to the fact that the resource is situated close enough to the surface to make it economically mineable. Typical surface mining methods include: strip mining and open pit mining, as well as dredge, placer and hydraulic mining in riverbeds, terraces and beaches. The Kebrafield Roodepoort Colliery will be mined by means of open pit or also known as opencast mining methods following a roll over rehabilitation sequence. These activities always disrupt the surface and this, in turn, affect soils, surface water and near-surface ground water, fauna, flora and all alternative types of land-use (Fuggle & Rabie, 1996; Ashton, 1999).

Besides the rate and method of mining, the location, variety and scale of mine infrastructure also influences the nature and extent of impacts. The Kebrafield Roodepoort Colliery will be mined relatively quickly in a period of one year compared to other mining operations that could last for several years and/or even decades. The fast

mining sequence will ensure impact duration during mining is short. Typical mine infrastructure includes: haul roads and spoil dumps; surface facilities (e.g. offices, workshops, car parks and warehouses); tailings and waste rock disposal areas; transport and service corridors (e.g. railway lines, roads, pipelines, conveyers, power and water corridors); product stockpiles; chemicals and fuel storage and housing facilities (Australian Environmental Protection Agency, 1995-1996; Fuggle & Rabie, 1996; Ashton, 1999; Weaver & Caldwell, 1999).

The figures below give an overview of the mine planning as is currently anticipated. This layout will change as specialist investigations and studies are completed and also according to the requirements of the final Record of Decision for both the NEMA and WULA processes. The images below is one technical design drawing which was created based merely on exploration drilling results, while the second image includes an initial high level wetland study and aerial image overlay. Which can be noted already is that a section of opencast has been indicated within the wetland area to the east, although this was initial planning and will be examined by a wetland specialist team to determine the viability of this section of mining. The anticipated result is that the section of boxcut indicated to the east of the main mining layout will not be included in the mine plan as this is too close to the sensitive receptor. The wetland specialist team and ecologists will make their recommendations regarding the required buffer distances which must be adhered to when mining in proximity of sensitive receptors and therefore has been acknowledged in this Draft Scoping report as an element to be studied further during the Environmental Impact Assessment phase.

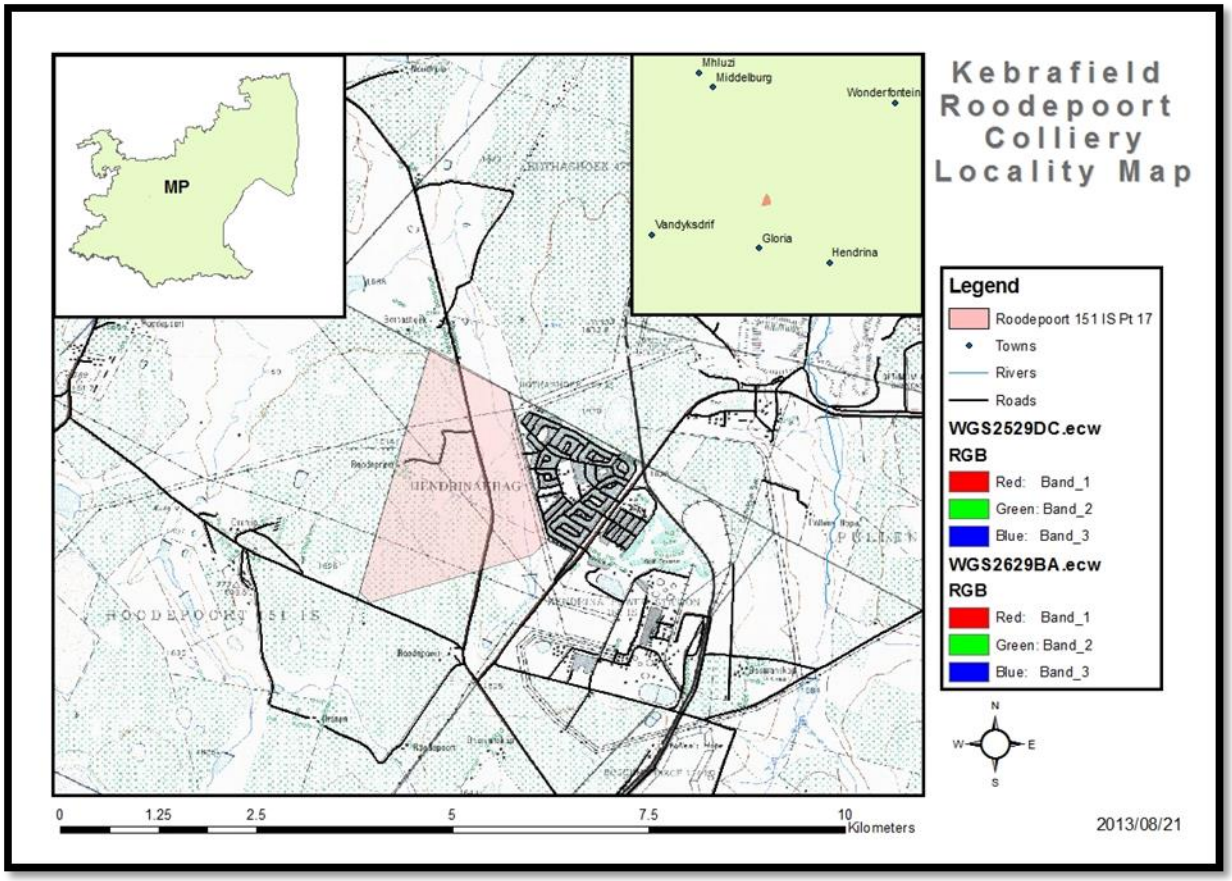


Figure 1: Locality map

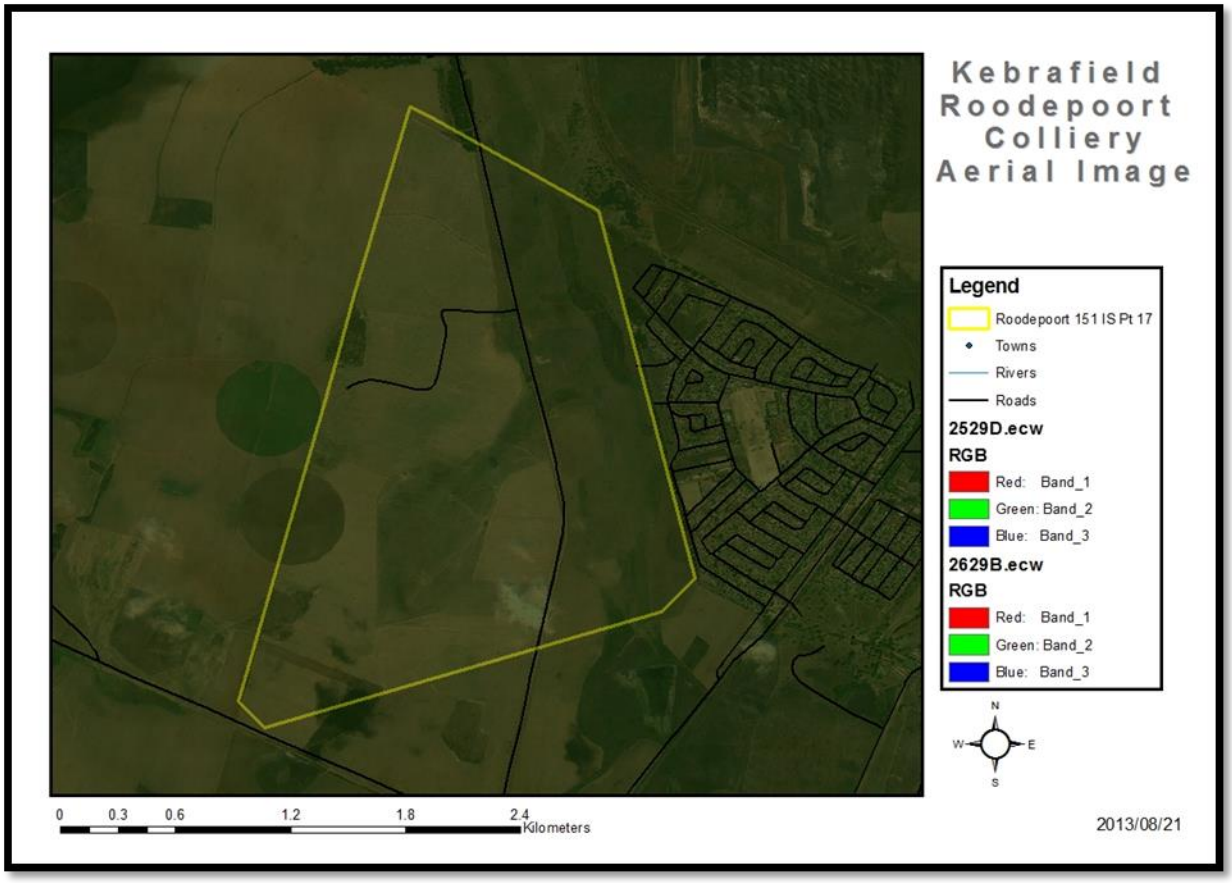


Figure 2: Aerial photograph indicating Roodepoort 151IS Pt 17

Figure 3: Proposed site layout

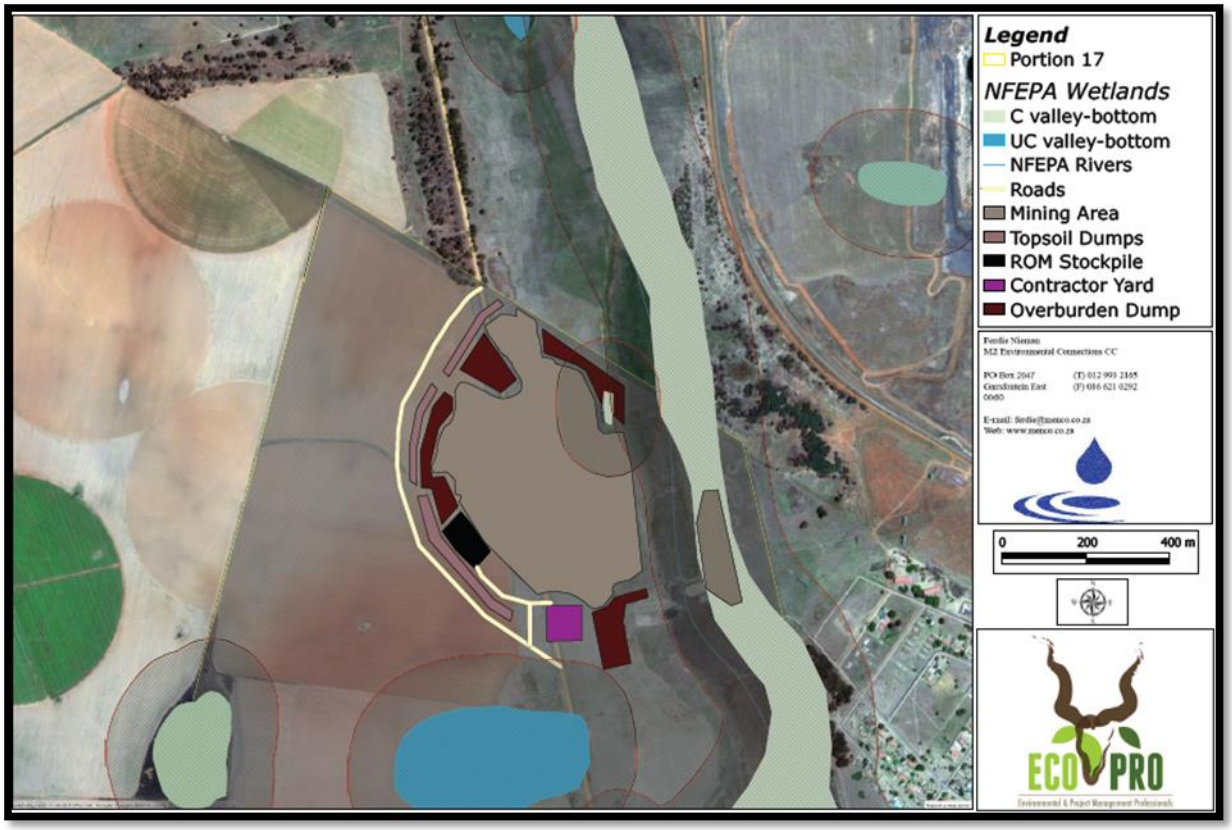


Figure 4: Proposed site layout indicating identified wetlands

3. Process to Assess Alternatives

The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. The various alternatives are assessed in terms of both environmental acceptability as well as economical feasibility. The preferred option is to be highlighted and presented to the authorities.

Alternatives are defined in the NEMA EIA Regulations (2010) as *"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; and (e) the operational aspects of the activity and (f) the option of not implementing the activity*".

3.1 Property or Location Alternatives

For the purpose of this EIA farm portion 17 of the farm Roodepoort 151IS was considered due to the positive results obtained during prospecting with regards to the underlying mineral reserve; high grade coal. An initial desktop survey indicating the NFEPA wetlands were conducted as a pre-feasibility study and it was indicate that

various wetland areas do transect this particular farm portion. The only position that was left for the proposed opencast mine was at the furthest northern edge on the farm. This area covers a mere 60ha of the total approximately 410ha farm portion. If viable the proponent would have wanted to mine the entire farm portion indicated in the image below, but as can be observed the wetlands do not allow for alternative layouts and this is the optimal layout for opencast operations. The hatched yellow polygon indicates the proposed opencast area as Alternative A while the orange polygon feature indicate alternative B. Both alternative A and B have been indicated in the figure below with 'text boxes'. A NFEPA wetland transects the area marked as alternative B and therefore it is not viable to mine this section unless a serious offset strategy is in place. The cost associated with off-set strategies will not be viable given the size of the reserve at 800 000ton mineable reserve. Given both the fact that there is sensitive wetland habitat and the cost involved with offset strategies, alternative A is better than alternative B.

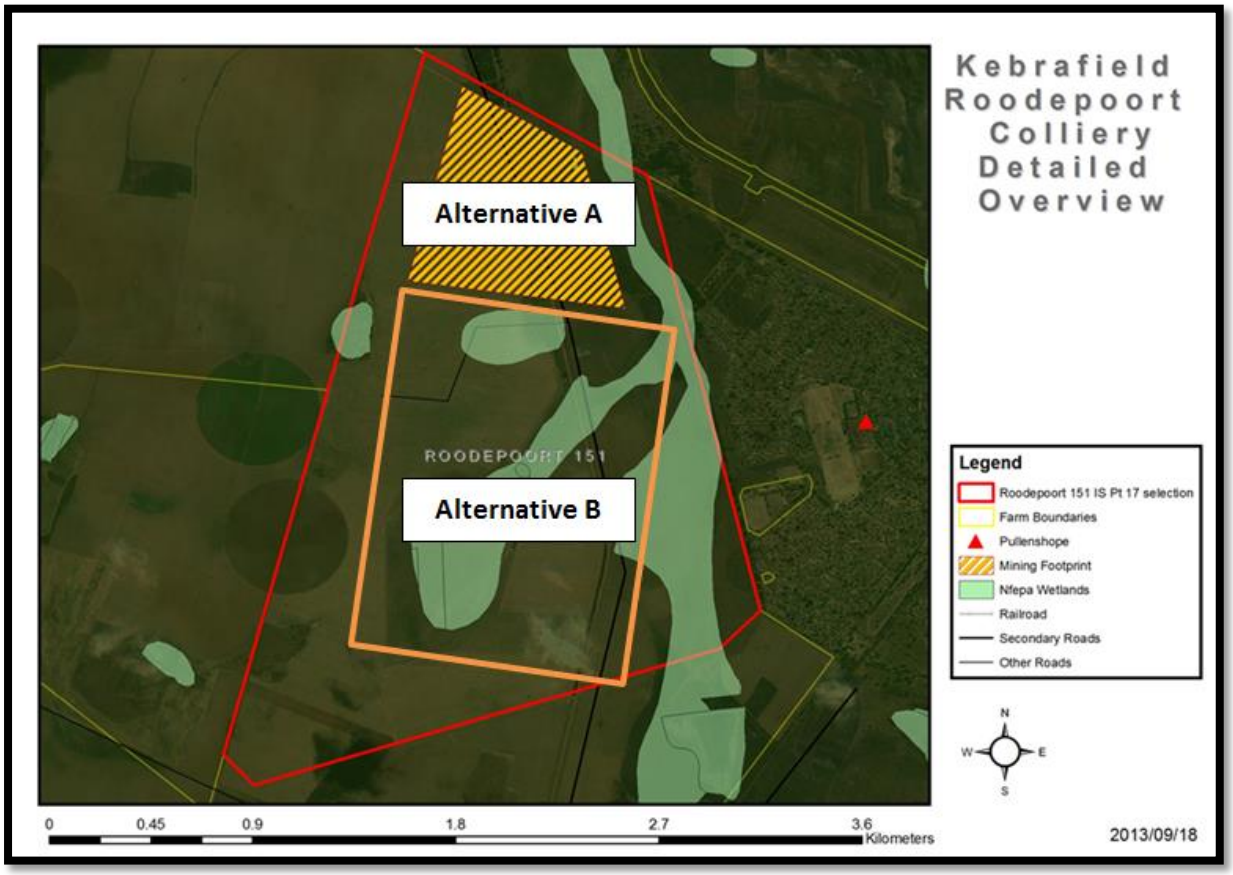


Figure 5: Aerial image indicating alternative locations on Roodepoort 151IS pt 17

3.2 Type of Activity to be Undertaken Alternatives

Alternative A which is suggested is mining of coal due to the results obtained during the prospecting phase, while alternative B would be to use the area for its agricultural potential. Based on the land cover map the area to the east of the proposed mining area is already being mined by various other mines. It might be beneficial to develop this new mine in an area where mining is already taking place and all the auxiliary mining services are

readily available. The coal is also of a very high grade and job creation will be more than for alternative B if agriculture continued. The area is currently being used for grazing land while Alternative A of mining the area will only disturb the grazing land for a period of three years where after it will be rehabilitated back to its original state, which will be grazing once again. The impact on the type of activity which could be undertaken alternatively if Alternative A was decided upon would be temporary and Alternative B would also have the potential to be undertaken after the three year life of mine period. Other alternatives for types of activities to be undertaken could be Alternative C as a residential development. Pullenshope is already to the east of the project area and creating a residential development on portion 17 of the farm Roodepoort 151IS will require its own infrastructure, services and clearance of vegetation. There is a great possibility that wetland crossings will be required to reach the existing Pullenshope town and this will impact upon the wetland system. Alternative A and B do not require any wetland crossings at the moment and propose to protect the wetland areas. Alternative C will have longer term impacts on the environment than alternative A and B from a general and sewage waste generation perspective.

3.3 Design or Layout Alternatives for the Activity

Overburden placement

The first design Alternative A is the current layout as it is depicted in the mine planning reports throughout this report. Alternative B would be to change the placement of overburden towards the eastern edge of the mine instead. This however would pose a risk to the water quality in the receiving wetland area as leachate might occur. The best would be to keep the overburden dumps as far away as possible from the wetland receptors.

Roads

Alternative A is to divert the current road around the opencast mining area to ensure the vehicles do not have to travel through the mining area. Alternative B would be to keep the road in its current position and mine on both sides of the road. Alternative B poses a great safety concern and at the same time will sterilise a lot of the reserve. Alternative A would be preferred as traffic could then be diverted safely around the mine and a greater proportion of the reserve can be mined, ensuring better economic benefits to the local community and the country's economy as a whole.

Boxcut mining methods

Alternative A proposes to use a method of roll-over rehabilitation concurrently as mining progress. This way a minimum area is exposed at one point in time, the overburden dumps are kept to a minimum, the sandbank in the topsoil stay preserved as it is used quickly for rehabilitation and the overall mine closure liability is significantly reduced. Alternative B would be to open the entire reserve at once and close everything only at end of life of mine. This would ensure much better cash flow for the mine as concurrent rehabilitation costs would not

exist during the mining phase, however, the footprint will be much greater, there's a risk that the seedbank will become sterile, there's a risk that the mine closure liability become to great and insufficient provision is in place to close everything at once and the leachate from the overburden dumps and coal footprint areas will be much greater than for Alternative A. Alternative A would be recommended in this regard.

3.4 Technology Alternatives

Alternative A would use technology associated with opencast mining, while alternative B would be to use deep mining/underground methods. Deep coal mining or underground mining is the extraction of resources (coal in this case) below the ground surface. Underground mining takes place where it is uneconomical to remove the overburden from the seam. Deep coal mining is very expensive both to set up (initial costs) and also to run the mine (extraction of water and air regulation). Deep coal mining however has very little effect on any natural habitats and has little surface disruption other than a pit shaft and works (assuming there is no subsidence.) Alternative A however can be considered as the coal is at a depth where it can be mined economically without the requirement to go underground. The coal seam depth varies between 6m to 28m and at a depth of 6m underground mining in accordance with alternative B would not even be viable due to the safety associated with the roof thickness.

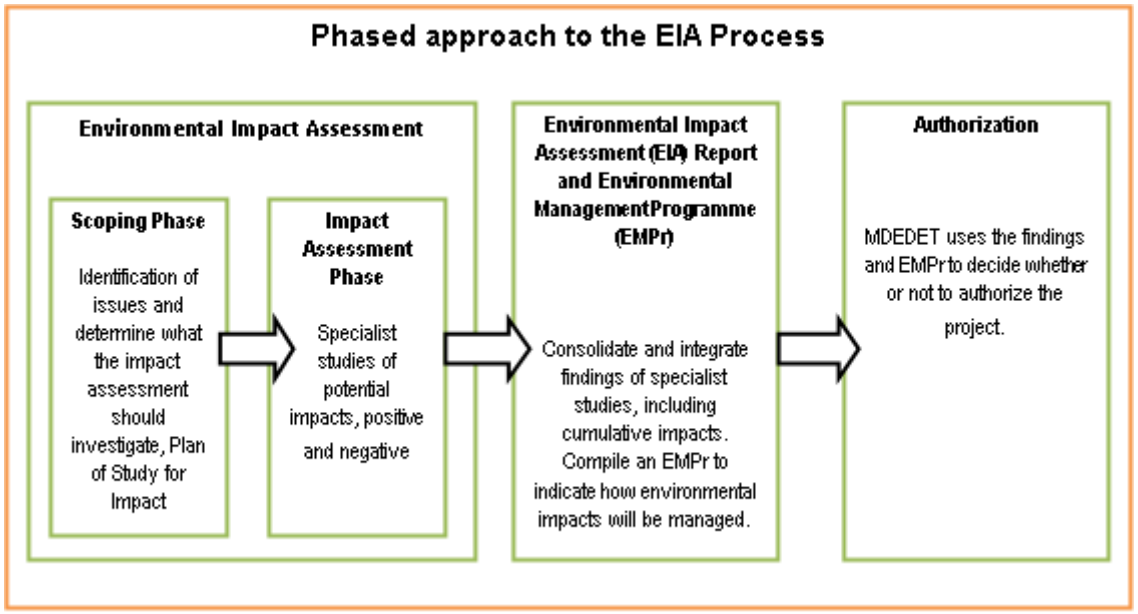
Alternative A is open cast mining where the coal seam is relatively close to the surface, thus it is cost effective to remove overlying rocks to access the coal. The coal is then extracted. Open cast mining often has higher tonnage as for alternative B pillars would have been left underground sterilising a proportion of the resource. Open cast (surface mining) affects habitats greatly (either by direct destruction, or indirectly such as blasting). In this case alternative A is preferred as the coal is very close to the surface at sections and due to the fact that it is economically much more viable than underground methods for this particular reserve.

3.5 No-go Alternative

The no-go alternative would entail no mining of the reserve and leaving the area as grazing land. Coal is currently becoming a very strategic resource in South Africa and as has also been highlighted in the project motivation coal resources are essential to ensure economic growth in South Africa. By not implementing this project in excess of 100 jobs will not be created and 800 000tons of coal which could potentially have benefitted the economy would become sterilised. The negative impacts on the environment however would not exist should the project not be implemented, although it must also be considered that the present ecological status of the wetland is very low and ecological importance of the proposed mining area is not very significant as the case is currently. This EIA will include an EMP to consider management options to mitigate and in some instances even

better environmental conditions as it currently is for eg. the wetland management plan as part of the wetland specialist study which will form part of the overall EMP.

4. Environmental Impact Assessment Approach and Methodology



4.1 Scoping Phase Process

A scoping study is conducted as the first phase in the EIA process during which:

- Project and baseline environmental information is collated. Baseline information for the scoping report is gathered through visual inspections during field visits of the proposed project area and surroundings, desktop studies and review of existing reports available to the EAP.
- Landowners, adjacent landowners, local authorities, environmental authorities, as well as other stakeholders which may be affected by the project, or that may have an interest in the environmental impacts of the project are identified.
- Interested and affected parties (I&APs) are informed about the proposed project.
- Public meetings are arranged and I&AP issues and concerns are identified.
- Environmental authorities are consulted to confirm legal and administrative requirements.
- Environmental issues and impacts are identified and described.
- Development alternatives are identified and evaluated, and non-feasible development alternatives are eliminated.
- The nature and extent for further investigations and specialist input required in the EIA phase is identified.

- The draft and final scoping reports are submitted for review by authorities, relevant organs of state and I&APs.
- Key I&AP issues and concerns are collated into an issues and response report for consideration in the EIA phase.

4.2 EIA Phase Process

After the initial scoping phase, the EIA phase of the application includes:

- Specialist investigations are undertaken in accordance with the terms of reference established in the scoping assessment (plan of study for EIA appended to the scoping report). The scope for specialist work is determined accordingly to the nature and scale of the project impacts.
- An evaluation of development alternatives and identification of a proposed option.
- An assessment of existing impacts (no-go development option), environmental impacts that may be associated with the proposed project option, and cumulative impacts using the impact assessment methodology.
- Identification of mitigation measures to address the environmental impacts and development of actions required to achieve the mitigation required.
- Consultation with I&APs.
- Incorporation of public comment received during scoping and the draft EIA into the final EIA report.
- Issuing of the final EIA report for review.
- After the draft EIA report was reviewed, comments received are incorporated in the final EIA report and final EMP.

4.3 EIA Programme and Opportunities for I&AP and Authority Involvement

Project Schedule for Scoping-EIR

Tasks to be performed	Number of days	Sep-13				Oct-13				Nov-13				Dec-13				Jan-14				Feb-14				Mar-14				Apr-14				May-14				Jun-14				Jul-14				Aug-14				Sep-14				Oct-14			
		Week				Week				Week				Week				Week				Week				Week				Week				Week				Week				Week				Week				Week				Week			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EAP to complete Application Form and submit to Department.	7																																																						
If in order, the Department to acknowledge the application.	14																																																						
EAP to compile the draft Scoping Report (SR) (incl. the Plan of Study for EIA).	21																																																					
EAP to notify I&APs (incl. the State departments) (incl. placing notice(s) in the media) of the application as well as the availability of the draft SR.	7																																																					
Department to request comments from the State departments.	7																																																					
Commenting period of 40 days for I&APs and State departments to comment.	40																																																					
EAP to consider the comments received and complete the final SR.	14																																																					
EAP to make the final SR available to the registered I&APs for a 21-day commenting period.	21																																																					
Following the commenting period the EAP to submit the final SR together with any comments received on the final SR to the Department.	14																																																				
Department to acknowledge SR & Plan of Study for EIA.	14																																																				
If in order, the Department to accept the SR & Plan of Study for EIA.	30																																																				
EAP to undertake the EIA and compile the draft EIA Report ("EIAR") (including the draft EMP)	40																																																				
EAP to notify registered I&APs (incl. the State departments) of the availability of the draft EIAR for comment.	7																																																				
Department to request comments from the State Departments.	7																																																				
Commenting period of 40 days for I&APs and State departments.	40																																																				
EAP to consider the comments received and complete the final EIAR.	14																																																				
EAP to make the final EIAR available to the registered I&APs for a 21-day commenting period.	21																																																				
Following the commenting period the EAP to submit the final EIR together with any comments received on the final EIR to the Department.	14																																																				
Department to acknowledge EIR.	14																																																				
If in order, the Department to accept the EIR.	60																																																				
After having accepted the EIR, the Department to decide whether or not to grant or refuse Environmental Authorisation.	45																																																				
The Department to inform the applicant of its decision.	2																																																				
Applicant/EAP to notify I&APs of outcome and if authorised may only commence 20 days after the date of the authorisation.	20																																																				

4.4 Information Gathering

Early in the EIA process, the EAP identified the information that would be required for the impact assessment and the relevant data were obtained. In addition, available information about the receiving environment was gathered from reliable sources, interested and affected parties, previous documented studies in the area and previous EIA Reports. The project team then visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

4.5 Identified Impacts during the Scoping Phase

Potential impacts resulting from the proposed Kebrafield Roodepoort Colliery were identified using input from the following sectors:

- Views of interested and affected parties;
- Existing information;
- Site visit with the project team;
- Guidelines; and
- Legislation.

The following potential impacts were identified:

- Ground and Surface Water contamination;
- Geology, Soil and Land Capability;
- Socio-Economic Issues;
- Waste Products;
- Floral and Faunal Displacement;
- Impacts on the wetland and drainage patterns;
- Dust and Noise Impacts
- Visual Impacts
- Blast and Vibration Impacts;
- Identified heritage sites and
- Paleontological Impacts.

Table 3: Detailed breakdown of potential environmental impacts

Detailed Breakdown of Potential Environmental Impacts	
Ground Water Contamination	• During mining ground water can seep through the high walls and become contaminated in the pit when in contact with carbonaceous material • Based on the Acid Base Accounting score for the material that will be mined including the material used for backfill rehabilitation potential water

	contamination can occur • The drawdown effect can cause water sources in the vicinity of the opencast pit to potentially flow into the pit
Surface Water Contamination	• Open pit mining is associated with surface water contamination due to the leaching of stockpiles - also dependant on the characteristics of the stockpiled material • The quality of the water used for dust suppression has the potential to contaminate surface water sources • The clean and dirty water separation system could potentially contaminate surface water sources • Erosion of denuded soil surfaces could potentially increase the total dissolved solids and cause sedimentation of surface water sources
Geology, soil and land capability	• Opencast mining will impact the geology, soil and land capability and must be addressed during the backfill rollover rehabilitation
Socio-economic issues	• A potential positive impact could occur as the mine will create in excess of direct 100 jobs while many more indirect jobs will be created • The mining of the coal resource will positively impact on the economy of the country
Waste products	• General waste will be generated on site • Small amounts of hydrocarbon waste associated with maintenance activities will be generated on site • No washing of coal will take place on site therefore no negative impact from slurry dams
Flora and faunal displacement	• During opencast mining total displacement of flora and fauna will take place within the footprint of the opencast pit
Impacts on the wetlands and drainage patterns	• Potential impacts could arise due to mining in the vicinity of a wetland and therefore a 100m buffer must be adhered to according to specialist investigations. A WULA will however be applied for to

	authorise mining within the 500m radius from a wetland up and to the 100m buffer line. • Surface water drainage patterns will be altered according to the storm water management plan to ensure clean and dirty water separation.
Dust and noise impacts	• Mining is associated with dust and noise impacts as a result of blasting, excavation, stockpiling, crushing & screening and general vehicle movement on gravel roads.
Visual impacts	• Opencast mining is associated with potential visual impacts as a result of the stockpiles and waste rock dumps that is higher than the initial topography before mining
Blast & vibration impacts	• Blasting will be required during the opencast mining operation and potential blast and vibration impacts exist
Identified heritage sites	• Various graves have been identified during the initial site visits on the edge of the mining footprint (not within) that might be impacted due to mining activities
Paleontological impacts	• Based on the findings from the Paleontological investigation can we further determine possible impacts

Further details associated with the construction and operation of the various activities as listed in the Project Description will be discussed in the EIA Report. The EIA Report will assess the impacts of each of the activities as well as ascertain the cumulative impacts of the development in totality. The EIA Report will outline the necessary mitigation measures and define any issues/areas which could be the cause for concern.

4.6 Specialist Assessments

Based on the impacts identified during the Scoping Phase, the following specialist studies have been identified to be completed and form part of the EIA. The main objective of the specialist studies is to provide independent scientifically sound information on issues of concern relating to the project proposal. The following specialist studies and investigations are proposed to be undertaken in order to quantify and qualify the potential environmental impacts while also developing appropriate mitigation measures, management plans and monitoring schedules;

Table 4: Proposed specialist studies

Specialist Impact Studies
Geohydrological Investigation, Impact Assessment and Modelling;
Hydrological/Surface Water Impact Assessment;
Wetland Delineation, Assessment and Impact Assessment (PES and EIS);
River Health Assessment (SASS5);
Floodline Determination;
Civil Engineering Pollution Control Dam Designs and Storm-water Management Plan,
Baseline Ambient Air Quality Assessment;
Baseline Noise Assessment;
Soils and Land Capability assessment;
Visual Impact Assessment;
Traffic Impact Assessment;
Heritage, Cultural and Archaeological Impact Assessment;
Social Impact Assessment;
Blast and Vibration Risk Assessment;
Wetland Management and Rehabilitation Plan;
Ecological, Fauna & Flora Impact Assessment; and
Paleontological Impact Assessment.

The current proposed project team to conduct the aforementioned specialist studies include;

Table 5: Proposed EIA project team

Team Member	Qualification	Role
Mr. Henno Engelbrecht	B.Sc Hons Env Mgmt & Anlysis, M.Sc Project Management (final thesis)	Project Manager
Me. Ilze Ueckermann	MA Environmental Management, Registered CEAPSA	Environmental Assessment Practitioner
Mr. Morne Burger	M.Sc Hydrogeology, Pr.Sci.Nat	Geohydrology and Modelling
Dr. Giep du Toit	D.Sc, Pr.Sci.Nat	Geohydrology and Modelling
Mr. Johan Mare	M.Sc, Pr.Sci.Nat	Microbiologist, Surface Water Specialist
Dr. Petro Erasmus	Ph.D	Management Plans
Me. Nicola Gouws	M.Env.Sc	Ecology, Fauna & Flora
Mr. Ferdie Nieman	B.Sc Hons	GIS, Mapping & Field Technician
Mr. Tobias Coetzee	BA Hons	Archaeologist & Heritage Specislist

Me. Leanne George	MA	Archaeologist & Heritage Specialist
Mr. A J Smith	PrEng	Civil Engineering Works, Stormwater Management Planning, Dam Designs and Floodlines
Mr. Kas van der Merwe	B.ing (Agriculture)	Land Capability Assessment
Mr. Cobus Havenga	PrEng	Traffic Impact Assessment
Me. Phyllis Kalele	MA	Social Impact Assessment
Mr. Morne Pretorius	B Tech (Nature Conservation) COMCSC, ASANIRE	Blast Risk Assessment
Dr. Barry Millsteed	PhD Geology; Pr.Sci.Nat; MGSSA	Paleontological Impact Assessment

The findings of the various specialist studies undertaken will be incorporated into the Draft and Final EIA Report. The Terms of Reference (ToR) for the various specialist assessments are as follows:

4.6.1 Geohydrological / Groundwater Study

- A geohydrological assessment must be undertaken and this study will aim to contain and relate to the following objectives:
    - Description of the pre-mining geohydrological environment.
    - Prediction of the environmental impact of the proposed mining activity on the geohydrological regime of the area. This includes the description of possible negative impacts during mining, construction, decommissioning and after closure.
    - Design and implementation of rehabilitation measures based on physical, hydraulic and hydro-geochemical information as gathered and predicted in the preceding phase.
    - Compilation of all the relevant data and recommendations in a geohydrological report, structured in such a way that it can be incorporated into the final Environmental Management Program document.

- The methodology of the geohydrological assessment will include the following:

- Detailed site inspection, mapping of relevant geohydrological features and gathering of existing information from topographical maps, ortho-photos, geological maps, hydrological information,

meteorological information, previous groundwater studies in the area, discussions with relevant mine personnel, etc.

- Execution of a borehole/spring census in the area to assess groundwater utilisation by neighbours (this part of the study will be crucial). Based on the information, gathered during the hydrocensus, the groundwater potential (quality & quantity) of the area will be evaluated. The data gathered during this phase will assist in the development of a groundwater-monitoring program. If suitable boreholes exist in the study area they will be incorporated into the monitoring program.
- Groundwater flow and transport modelling to predict the long term impacts on the receiving environment. The impacts, associated with mining activities, can normally be subdivided into two aspects, namely the de-watering of the surrounding aquifer system and the deterioration of the water quality in the receiving aquifer system. Both these aspects will be addressed.
- Inflow into the mining areas from groundwater will be calculated. This underground water balance will also address possible decanting over time.
- Acid base accounting of material associated with the coal seams and overburden will also be undertaken in this study, if exploration drilling cores can be supplied by the mining company.
- Available data will be interpretation and collation for the prediction of the possible environmental impact and to conceptualise mitigation measures.
- Recommendation of a groundwater monitoring network will be made and standard operational procedures for groundwater monitoring and management supplied.

4.6.2 Hydrology/Surface Water Study

A hydrological and surface water assessment (including water and salt balances) will be required. This assessment shall include:

- Describe all the surface water impacts and then propose mitigation measures as normally required for and EIA/EMP. This should be done for the construction, operational, decommissioning and post closure phases;
- A Storm Water Management Plan (SWMP) as prescribed by the Best Practice Guideline G1: Storm Water Management by DWAF, 2006. All recommendations must be in line with Regulation 704 of the NWA, 1998 and must include the following:
- Catchments' characteristics i.e. catchments' boundaries (clean and dirty water), rainfall, water bodies (pans, dams, etc.), slope and drainage directions;
- Determination of the impact of all water retention infrastructure (pit, dirty water areas, etc.) on the Mean Annual Runoff (MAR);

- Determine the storm water flows and volumes (1:50 & 1:100 year recurrence intervals) for both the dirty and clean water areas together with the infrastructure engineer.
- For storm water containment purposes the volumes for longer storm durations (24 hours) should also be determined;
- Identify and delineate the clean and dirty water areas on a map. The mine to supply a mining plan and infrastructure map as compiled by the infrastructure engineer;
- Confirm the indicated placement of berms, channels and pollution control dams to divert clean water around the dirty water area as well as infrastructure needed for the dirty water system;
- All water diversion berms and conveyances for the open cast area must be developed to coincide with the mining plan to ensure the movement of these infrastructures as mining progresses (A map showing the berms and conveyances on a yearly time step will suffice);
- Conceptual storm water designs by an approved civil engineer would be required for the mining area and overburden dumps;
- Identify suitable lining options for the potential ROM stockpiles; and
- Investigate the placement of a dirty water containment facility (pollution control dam) by taking into account post closure water decant from the rehabilitated open cast area.

➢ Develop operational and post closure water balances as prescribed by the Best Practice Guideline G2: Water and Salt Balances by DWAF, 2007. This must include the following:

- The operational and post closure water balances should be done for summer, winter, dry and wet seasons;
- Recommend pumping rates required to ensure that the water reticulation system is effective;
- Determine the saturation index for the process water reticulation system;
- The decant water in a post closure scenario should also be included in the post closure water balance; and
- Identify possible water treatment options operational as well as post closure to enable the mine to successfully implement water reclamation in the operational phase and to treat water post closure.

➢ Develop a surface and groundwater monitoring programme as prescribed by the Best Practice Guideline G3: Monitoring by DWAF, 2007.

➢ Background water quality information on both upstream and downstream water bodies (both groundwater and surface water). The following parameters must be sampled for:

_ pH, EC and TDS;

_ anions NO3, SO4, F and Cl;

_ cations Na, Ca and K;

_ suspended solids;

_ ICP scan for heavy metals;

_ COD;

- Evaluate the required parameters to be monitored as well as the frequency of monitoring and the logical placement of such monitoring points to identify any impacts caused by this project.
- Provide a clear map that can assist the mine in sampling the required monitoring points.

4.6.3 Wetlands Study

The wetlands and wethealth assessment to be undertaken shall include the following:

- A desktop biodiversity assessment of the study area. This will cover the development footprint in relation to available ecological information related to wetland and riverine ecosystems functioning within the region;

- A map demarcating the relevant local drainage area of the respective wetland/s, i.e. the wetland, its respective catchment and other wetland areas within a 500m radius of the study area. This will demonstrate, from a holistic point of view the connectivity between the site and the surrounding regions, i.e. the zone of influence;

- Maps depicting demarcated wetland areas delineated to a scale of 1:10 000, following the methodology described by the DWAF (2005), together with a classification of delineated wetland areas, according to the methods contained in the Level 1 WET-Health methodology and the latest National Wetland Classification System (2010);

- The determination of the ecological state of any wetland areas, estimating their biodiversity, conservation and ecosystem function importance with regard ecosystem services. (Note that this determination will not include avifaunal, herpetological or invertebrate studies; however possible habitat for species of special concern would be commented on);

- Recommend buffer zones and No-go areas around any delineated wetland areas based on the relevant legislation or best practice; and

- Assess the potential impacts, based on a supplied methodology.

4.6.3 Ecology – Terrestrial and Aquatic

The Terrestrial and Aquatic Ecology Assessment will provide specialist advice on the issues relating to the potential biodiversity and ecological impacts. This will be achieved by means of detailed assessments on the floral and faunal components of the terrestrial and aquatic study areas. The final report shall have the relevant maps and data analysis which will cover following:

- Habitat assessments and their associated levels of biodiversity importance;
- Species lists for each habitat and the identification of "species of significance";
- Identification of potential risks to biodiversity as a result of the plan development;

- The identification of potential mitigating or offset actions which may prevent/ reduce the loss of biodiversity;
- A suggested monitoring program to determine long term impacts of development and biodiversity; and
- All findings would be assessed in their relation to the relevant Provincial Biodiversity Assessment and the South African National Biodiversity Institute (SANBI) Guidelines.

A: Scope of work for the terrestrial component:

- Faunal diversity assessment (including mammalian, reptilian, amphibian, avian and invertebrate diversities);
    - Characterization of the faunal environment and habitat, related biota and the extent of site related effects; and
    - Determination of the current status of the faunal environment and an evaluation of the extent of site-related effects in terms of certain ecological indicators, as well as identification of specific important ecological attributes such as rare and endangered species, protected species, sensitive species and endemic species.

- Plant diversity assessment:

- The assessment of the current status of the habitat components and its conservation status; and
- Identification the floral species on site and to recommend steps to be taken should a Red list or protected species be found.

B: Scope of work for the aquatic component:

- Wetland and riparian zone delineation and classification;
- Vegetation survey of delineated aquatic ecosystems;
- Determine present ecological state and ecological importance, as well as a sensitivity analyses;
- Complete a SASS5 assessment on the aquatic invertebrates;
- Determine potential mitigations or offsets; and
- Compile monitoring plan.

4.6.4 Baseline Noise Assessment

The Noise Assessment shall include the following:

- Estimation of existing ambient noise levels;
- Representative noise measurement samples will be taken in accordance with the procedures specified in SANS 10103:2008 'The measurement and rating of environmental noise with respect to annoyance and to speech communication'. The results will be processed to estimate the present ambient noise levels during the day and night in the environment of the project;
- Over and above the noise parameters specified in SANS 10103 additional measurements will be used to characterise the ambient noise levels
- Proposed mitigation and management measures
- Monitoring schedule

4.6.5 Baseline Air Quality Assessment

The Air Quality Assessment will include a description of the methodology, the receiving environment, the emission estimates, predicted ambient concentrations, and the impact assessment using the standard EIA approach for impact significance.

This particular study shall include the monitoring and measurement of the ambient air quality at the proposed site. Passive and active sampling will be undertaken. The ambient air quality monitoring, measurement, analyses and reporting will include once off active indicative as well as passive sampling in the 8 main compass point directions for:

- Gravimetric Dust Fallout
- PM10 dust particulate (active sampling)
- SO2, NO2 and HF (passive sampling)

4.6.6 Archaeology (Phase 1 Heritage Assessment)

Phase 1 Heritage Assessment must be undertaken in order to assess the impacts and significance in terms of cultural and heritage and the proposed mitigation measures. The assessment shall be undertaken in accordance with the requirements of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999), including:

- Conducting a detailed desktop level investigation to identify all known archaeological, cultural and historical facilities on the property;
- Undertake fieldwork to verify results of desktop investigation;
- Undertake an assessment of the Aesthetic / Architectural compatibility of the proposed mine;
- Document using GPS co-ordinates and maps all sites, objects and structures identified on the proposed site;
- Undertake any required consultation with the relevant Department; and
- Compile a report which would include:

- Identification of all possible archaeological, cultural and historic sites on the property;
- Evaluation of the potential impacts of construction, operation and decommissioning of the proposed mining activities on archaeological, cultural and historical resources, in terms of the scale of the impact (local, regional, national), magnitude of impact (low, medium, high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction); and
- Recommendations for mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

4.6.7 Socio-economic Study

A Socio-economic assessment must be undertaken. The study will distinguish between objective and subjective impacts, and shall include:

1. Social profile: A basic social profile of these stakeholders will consist of the following elements:
- Social structure (gender, ethnic, age, main religions)
- History (age of community, e.g.)
- Demography;
- Social services (health, education, infrastructure, e.g.);
- Community power structures (traditional council, e.g.);
- Health and welfare;
- Available natural resources and ownership;
- Livelihood: standard of living, economic sectors, average income level, main businesses in the area;
- Skills: available skills, level of education, unemployment rates, employment rates and which areas. These should be matched with skills needed for the construction phase and operational phase of the project and gaps should be identified;
- Potential issues and possible causes created by the proposed project, raised by the stakeholders during consultation and how they suggest solving these; and

- Needs indicated by different stakeholders which could be addressed as part of the Social and Labour Plan (IDP, existing projects within the community).

2. Assessment of possible social impacts through the prediction how the proposed project will have an impact on key stakeholders mentioned in the social profile.

The following issues must be assessed:

- ✓ Employment
- ✓ Taxes and Royalties
- ✓ Natural resources / assets / environment
- ✓ Capacity and quality of existing infrastructure and services
- ✓ Safety
- ✓ In and out migration
- ✓ Community relations, social structures
- ✓ Health awareness
- ✓ Crime
- ✓ Labour relations
- ✓ Education and skills
- ✓ Social investment
- ✓ Economic growth

4.6.8 Visual Impact Assessment

The visual impact assessment to be undertaken shall comprise off:

A. Viewshed Analysis:

The viewshed analysis that will be undertaken in context of information with regard to the project design. The viewshed analysis determines the areas of possible visibility.

B. Viewer incidence and viewer perception

Areas of high viewer incidence (i.e. main roads, towns, tourism areas, etc) are identified, captured into GIS and classified, to quantify the perceived perception of the observers in these identified areas. This is done in order to focus attention on areas were the perceived visual impact of the proposed project will be the highest and the perception of affected observers will be negative. Related to this data set, is a land use character map, that further aids in identifying sensitive areas and possible critical features

C. Observer Proximity

The observer's proximity to the facility also plays a role in determining the visual impact. Buffer radii are created in order to model the reduced impact over distance and to identify the point where the impact becomes negligible.

D. Visual Absorption Capacity

The visual absorption capacity of the environment surrounding the proposed development will be determined in terms of existing landscape features, which includes natural as well as transformed landscapes. This will, together with the slope elevation of the topography, be incorporated with the previously mentioned facets of the visual assessment and will aid in the evaluation of the visual impact.

E. Visual Impact Index

The above datasets, both spatial and alphanumeric entities, are merged in order to calculate the weighted totals of the visual impact indexes. The visual impact index identifies the areas where the likely impact would occur and where the viewer perception would be negative.

F. Severity of impact

Once the areas of likely impact have been identified, the severity of impact for each area will be determined by adding non-spatial criteria to the equation. An example of non-spatial criteria, that would influence the severity of the visual impact, for instance, could be the potential to mitigate or reduce the impact through the utilisation of vegetation screening. Each area of visual impact would have to be evaluated according to its own opportunities and constraints for mitigation. Special circumstances that might further aggravate or mitigate the impact of the proposed development would also be identified during this phase of the visual impact assessment.

4.6.9 Land Capability and Soils Assessment

Comparative land use assessment must be undertaken. This study will involve the classification of the land capability using either the Chamber of Mines (2007) or the Department of Agriculture systems:

- Pre-mining land capability surveys; and
- Recommendations towards post-mining land uses.

The potential of the land will be determined according to the “CRITERIA FOR HIGH POTENTIAL AGRICULTURAL LAND IN SOUTH AFRICA” Report nr. GW/A/2002/21. This involves:

- Determine effective soil depth, texture and soil structure as well as soil type.
- Chemical analysis of the soil was also used to determine agricultural potential.

- Identify and assess all potential impacts (direct, indirect and cumulative) and economic consequences of the proposed development on soils and agricultural potential.
- Describe and map soil types (soil forms) and characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers.
- Describe the slope of the site.
- Determine the agricultural potential of the site.
- Describe current land use as well as possible alternative land use options.
- Nominate a preferred alternative for consideration in the EIA phase.
- Provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines.

4.6.10 Traffic Study (Including Representation to the relevant Roads Agency)

The traffic impact assessment must be undertaken in accordance with the South African Guidelines for Traffic Impact Studies. The objective and scope of study for the traffic impact investigation shall entail the following:

- Collection of traffic information to determine the status quo;
- Determination of the trip generation resulting from the activities of the mine, including capacity evaluation of existing routes (number of lanes and type of intersection control);
- Assessing the impact of transportation aspects related to the mining activities;
- The capacity analysis of the major routes, including the intersection analysis;
- Safety Statement: an assessment relevant Geometrical standards in terms of the vertical and horizontal alignment to accommodate more trucks; and a further investigation and determination if additional climbing lanes may be needed for the major access roads;
- Investigation of the public transport and pedestrian activities that might be impacted by the mine traffic or activities; and
- A detailed proposal of site specific mitigations which include any road network upgrading and specifications on preferred routes.

4.6.11 Blast & Vibration Risk Assessment Study

- The blasting impact assessment to be undertaken must involves the determination of the impact of blasting activities during the strip mining operations (overburden, interburden and coaling) during the operations phase of mining activities. These are divided into the following blasting impacts:
    - Vibration;
    - Air blast and fly rock;
    - Dust and fumes; and

- Water contamination.

- The receptors to be considered during the assessment are the existing infrastructure, houses and the people living in the area, graves and water sources in the area.
- Mitigation measures regarding blasting practice, monitoring and controls required to limit the impact of blasting on the surrounding areas must be provided provided.

4.6.12 Paleontological Impact Assessment

The proposed document will incorporate a desktop study and the results of a site investigation of the area in which the following observations will be made:

- Notes on any fossil material identified,
- Photographs of the site and any fossil material identified,
- Geological strata present,
- GPS trackway of the investigation of the area,
- GPS waypoints of any fossils, other observation points or photographs

Following the site visit report will be compiled which will incorporate the following:

- A desktop study of the geological environment of the project area,
- The results of the field observations,
- A summary of the relevant legislation,
- A summary of the potential for negative impact on the palaeontological heritage impact resulting from the proposed development,
- Recommendations for any future work that may be required.

5. EIA Impact Assessment Methodology

5.1 Introduction to Impact Assessment Methodology

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989). Although the ECA EIA Regulations have been repealed, the Guideline Document still provides good guidance for significance determination.

The level of detail as depicted in the EIA regulations were fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

The impact assessment criteria used to determine the impact of the proposed development are as follows:

- ***Nature*** of the impact;
- The ***Source*** of the Impact;
- Affected Stakeholders;
- ***Extent*** - The physical and spatial scale of the impact;
- ***Duration*** - The lifetime of the impact, that is measured in relation to the lifetime of the proposed development;
- ***Intensity*** - The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself;
- ***Probability*** - This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time;

- ***Mitigation*:** The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

- ***Determination of Significance – Without Mitigation**:* Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required.

- ***Determination of Significance – With Mitigation***: Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the identified mitigation measures.

Previous experience has shown that it is often not feasible or practical to only identify and address possible impacts. The rating and ranking of impacts is often a controversial aspect because of the subjectivity involved in attaching values to impacts. Therefore, the assessment will concentrate on addressing key issues.

The methodology employed will involve a circular route, which will allow for the evaluation of the efficiency of the process itself. The project will be divided into three phases in order to assess impacts related to the Pre-construction, Construction and Operational phases. The assessment of actions in each phase will be conducted in the following order:

a) Identification of key issues;
b) Analysis of the activities relating to the proposed development;
c) Assessment of the potential impacts arising from the activities, without mitigation; and
d) Investigation of the relevant mitigation measures, as well as an assessment of their effectiveness in alleviating impacts.

5.2 Assessment of Biophysical Cumulative Impacts

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines and in terms of the Environmental Conservation Act, 1989 (Act No 73 of 1989) [ECA]. Although the ECA EIA Regulations have been repealed the Guideline Document still provides good guidance for significance determination.

Activities within the framework of the proposed development and their respective construction and operational phases, give raise to certain impacts. For the purpose of assessing these impacts, the project has been divided into two phases from which impacting activities can be identified, namely:

a) Construction phase: All the construction related activities on site, until the contractor leaves the site.

b) Operational phase: All activities, including the operation and maintenance of the proposed development.

The activities arising from each of these phases have been included in the tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

5.3 Assessment Criteria

EXTENT: GEOGRAPHICAL	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring properties, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extent beyond the boundaries of South Africa.
DURATION	
Short term	The impact would either disappear with mitigation or will be mitigated through natural processes in a period shorter than that of the construction phase.
Short – Medium term	The impact will be relevant through to the end of the construction phase.
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be

	considered transient.
INTENSITY	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	
Impossible	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.
Highly likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.
Definite	The impacts will take place regardless of any provisional plans, and or mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

5.4 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

Determination of Significance – Without Mitigation

Significance is determined through a synthesis of impacts as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". Significance is rated on the following scale:

a) **No significance**: The impact is not substantial and does not require any mitigation action.

b) **Low:** The impact is of little importance, but may require limited mitigation.

c) **Medium:** The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

d) **High:** The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Determination of Significance – With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

a) **No significance:** The impact will be mitigated to the point where it is regarded as insubstantial.

b) **Low:** The impact will be mitigated to the point where it is of limited importance.

c) **Low to Medium**: The impact is of importance however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

d) **Medium:** Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

e) **Medium to High:** The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.

f) **High:** The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Assessment Weighting

Each aspect within the impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it is necessary to weigh and rank all criteria.

Ranking, Weighting and Scaling

For each impact under scrutiny, a scale weighting factor is attached to each respective impact (refer to the figure below). The purposes of assigning such weights serve to highlight those aspects considered most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspects criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 6:Description of the biophysical assessment paramaters with its respective weighting

Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

6. Public Participation

6.1 Introduction

The section provides details about the proposed Public Participation Process (PPP) activities to be undertaken during the EIA phase. The PPP undertaken to date is summarized in the Scoping Report.

Public Participation is an integral part of the EIA and must be undertaken in accordance with the requirements stipulated in Regulation 54 of the EIA Regulations (2010). Furthermore, in terms of Section 24(4)(a) of NEMA, procedures for the investigation, assessment and communication of the potential consequences or impacts of

activities on the environment must, *inter alia*, ensure with respect to every application for environmental authorisations:

- *Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than on organ of state;*

- *That the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in Section 2 of NEMA are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, plan or projects; consequences or impacts; and*

- *Public information and participation procedures which provide all interested and affected parties (I&AP's), including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.*

6.2 Proposed Public Participation Process

The specific objects associated with the PPP for the EIA phase are to:

- *Provide all relevant stakeholders (organs of state and I&AP's) with appropriate opportunities to raise potential issues, concerns and queries relating to the proposed project and EIA process;*

- *Facilitate the distribution of information through suitable means to ensure that all relevant stakeholders and I&AP's are informed about the progress of the project and to give feedback and responses regarding queries and issues raised;*

- *Provide all relevant stakeholders and I&AP's the opportunity to be part of the decision-making process by means of providing them with an opportunity to comment on the findings of the specialist assessments and other relevant information contained in the EIA Reports; and*

- *Gather the relevant skills and local knowledge to inform and improve the EIA process and impact assessment.*

Steps to be completed for the PPP during the EIA phase:

A) Identification of Stakeholders and I&AP's

Various I&AP's and stakeholders have been identified to date. All have been notified of the proposed project (please refer to Scoping Report). However, additional I&AP and stakeholder identification will be ongoing throughout the EIA process. All stakeholders will be kept informed on the progress of the EIA process and will be provided with an opportunity to comment on the Draft and Final EIA Reports.

B) Advertising and distribution of Draft and Final EIA Reports availability for comment

The Draft and Final EIA Reports will be distributed to all stakeholders and I&AP's for review and comment. The Draft EIA Report will be made available for comment for a period of 40 calendar days and the Final EIA Report for 21 calendar days.

The availability of these reports will be communicated and advertised to relevant stakeholders by means of:

- Personal letters, fax and emails to all the registered I&AP's and on the distribution list.

The EIA reports will be made available for review and comment by the public at the Pullemshope Public Library. The reports can also be obtained from the Eco Elementum by emailing a request through to info@ecoelementum.co.za. All relevant authorities will receive hardcopies and CD's of the EIA reports.

C) Public Meeting / Open Day

Public meetings will occur throughout the EIA process and scheduled in advance. Significant issues identified during each phase of the EIA will be addressed accordingly at the following public meeting. The purpose of these public meetings is to present the findings and potential impact identified in the various reports after which key issues and concerns can be discussed and debated by stakeholders and I&AP's. Additional issues raised will then be further assessed and addressed in the consecutive phase of the EIA.

D) Feedback to stakeholders and I&AP's on comments and issues raised

The EIA Report shall contain a Comments and Responses Report where all comments and issues raised by stakeholders and I&AP's as well as the responses issued by EAP will be formally recorded. Proof of all correspondence will also be included in the EIA Report.

E) Recordkeeping of PPP completed

Proof of all correspondence (comments and responses) and additional activities undertaken during the PPP will also be included in the EIA Report documentation.

7. EIA Milestones and Project Programme

The following key milestones and timeframes for the EIA phase have been identified:

- Distribution of the Final Scoping Report for public comment – January 2014
- Distribution of the Draft EIR and EMPr for public comment – March 2014
- Distribution of the Final EIR and EMPr for public comment – April 2014
- Submission of the Final EIR and EMPr to CA (MDEDET) for authorisation – June 2014

Note: The proposed programme detailed above are provided as guidance only and are subject to change depending on the various components and external factors that informs and influences the EIA process.

8. Conclusion

This PoS developed for the EIA Phase for the development has been compiled to meet the requirements contained in Regulation 28 *(n)(i-iv)* of the EIA Regulations (2010). The proposed specialist assessments and PPP methodologies considered for the EIA is deemed to be adequate to inform the EIA Report and environmental process. The CA will therefore receive appropriate integrated information required to allow for informed decision making on the application for authorisation.