

**DRAFT SCOPING REPORT**  
*FOR THE PROPOSED*  
**VLAKFONTEIN MINE - EAST BLOCK**

**Prepared for:**

**African Exploration Mining and Finance Corporation (SOC) Ltd**

CEF Building, SIMBA Complex  
152 Ann Crescent  
Strathavon  
Johannesburg



African Exploration  
Mining and Finance  
Corporation SOC Ltd

**Submitted to:**

**The Department of Environmental Affairs**

315 cnr Pretorius & Lilian Ngoyi Street  
Fedsure Forum Building  
North Tower, 2nd Floor  
Pretoria  
0001

**Prepared by:**

**Strategic Environmental Focus (Pty) Ltd**

CSIR Campus  
Building 4, 2nd Floor  
Meiring Naude Street  
Brummeria, Pretoria  
Tel. No.: +27 12 349 1307  
Fax No.: +27 12 349 1229  
Website: [www.sefsa.co.za](http://www.sefsa.co.za)  
E-mail: [sef@sefsa.co.za](mailto:sef@sefsa.co.za)



**S · E · F**

STRATEGIC ENVIRONMENTAL FOCUS

**OCTOBER 2013**

**DEA Ref No: 14/12/16/3/3/2/602**  
**DMR Ref No: MP30/5/1/2/3/2/1(436) MR**  
**SEF Project Code: 505380**

## PURPOSE OF DOCUMENT

A period of 40 calendar days (**31 October 2013 to 10 December 2013**) has been provided for the review and commenting phase of the Draft Scoping Report (DSR). All Interested and Affected Parties (I&APs) as well as State Departments have been notified of this review period.

The DSR contains the following information:

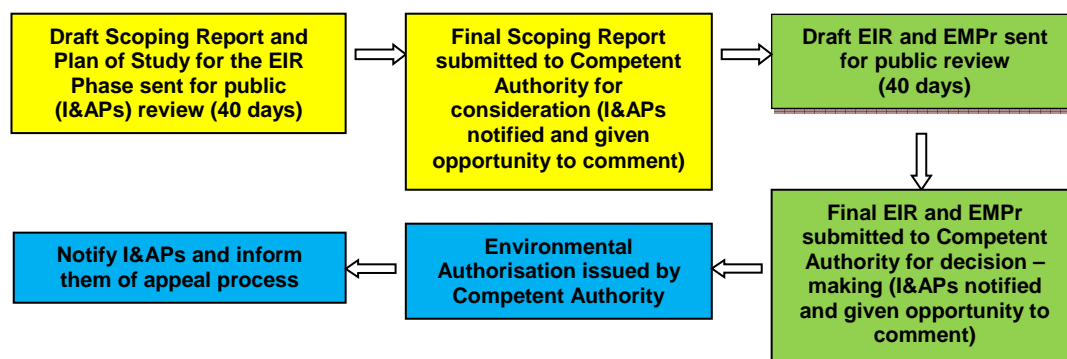
- A description of the proposed project, including project motivation;
- Discussion of applicable alternatives;
- A description of the environment affected by the proposed project;
- The outlined public participation process; and
- The plan of study for the Environmental Impact Reporting (EIR) phase.

The DSR can be viewed at the following venue:

| Name of public venue  | Name of Contact Person | Contact Number(s)  | Viewing Times           |
|---|------------------------|--------------------|-------------------------|
| Ogies Public Library<br>Old School Building,<br>No. 1 Main<br>Street, Ogies | Ms Ntombikayise Jele   | Tel.: 013 643 1024 | 8:00 – 16:30 (Weekdays) |

Should you wish to participate in the S&EIR process by contributing issues of concerns/comments, please register as an I&AP by completing the enclosed Registration and Comment Sheet or alternatively you can visit SEF’s website at <http://www.sefsa.co.za>. To register as an I&AP or comment on the project, click on “Stakeholder Engagement”. Click on the “register” button and complete the compulsory fields to register as an I&AP. On completion of these fields, you will receive an email titled “**Stakeholder Engagement – New Registration**”. Click on client login and use the emailed details to login in and view the DSR for the proposed **505380 Vlakfontein Mine – East Block** and associated appendices. Should you have any problems in obtaining the information from the Internet, please feel free to contact SEF for assistance.

Following the commenting period, the Scoping Report will be updated and submitted to the **Department of Environmental Affairs** for consideration. After the acceptance of the Scoping Report, the EIR phase will be initiated. The flow diagram below highlights the phases in the project where I&APs have the opportunity to participate within the process.



| <b>PROJECT SUMMARY</b>                             |  |
|--|--|
| Project Name                                       | Vlakfontein Mine – East Block  |
| Preferred Site                                     | Farm Name: Vlakfontein<br>Parcel No: 569<br>Portion No: 3  |
| Surveyor-General 21 Digit Code                     | T0JR00000000056900003  |
| Development Footprint                              | Approximately 23 ha  |
| Significant Developments/<br>Infrastructure Height | <ul style="list-style-type: none"> <li>• Overburden and interburden stockpiledump: Approx. 20 meters high</li> <li>• Extension of the southern berm (next to the N12): Approximately 15 meters high</li> </ul> |
| Site Photographs                                   | Refer to Appendix 2  |
| <b>Confirmation of Supply:</b>                     |  |
| Potable water                                      | Existing mine supply will be utilised (increase will be negligible)  |
| Raw water  | Groundwater ingress into the pit and stormwater run-off from new infrastructure, once treated, will be largely utilised for dust suppression   |
| Sewage   | Existing chemical toilets will be utilised (increase will be negligible)   |
| Electricity  | N.A  |
| Solid Waste  | N.A  |

## ENVIRONMENTAL ASSESSMENT PRACTITIONER

Strategic Environmental Focus (Pty) Ltd (SEF) is a privately owned company and was formed in 1997 with the objective of providing **expert solutions to pressing environmental issues. SEF is one of Africa’s largest multi-disciplinary consultancies**, offering innovative sustainable environmental solutions to private and public sector clients. With our integrated services approach in the management of natural, built and social environments, and with over a decade of experience, we bring a wealth of knowledge and expertise to each project.

### SEF’s Mission

*SEF is a national sustainability consultancy which provides integrated and innovative Social, Biophysical & Economic solutions while fostering strategic stakeholder relationships, underpinned by SEF’s core values.*

### SEF’s Vision

*SEF offers holistic and innovative sustainable solutions in response to global challenges.*

SEF has assembled a team of professionals, consisting of a core of environmental experts with extensive experience in dealing with Environmental Impact Assessments (EIAs), Public Participation Processes, Architectural and Landscape Architecture, Mining and Environmental Management. SEF also has a team of specialist practitioners such as specialists in Heritage Impact Assessments (HIA), Wetland Delineation and Functional Assessments; Wetland/ Riparian Rehabilitation, Aquatic Assessments; Ecological (Fauna, Avifauna and Flora) Assessment, Visual Impact Assessments (VIAs), Soils and Agricultural Potential Assessments, Socio-Economic Assessments, etc.

SEF is a Qualifying Small Enterprise and a **Level 2 contributor in terms of the Broad Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003)** and has a procurement recognition level of 135%.

SEF commits itself to comply with the requirements and the implementation of a Quality Management System. The Quality Management System will be reviewed and implemented to continually improve efficiency and effectiveness of the organisation. SEF uses a “green” approach to anything we embark on. We believe in using technology to our and the environment’s best advantage. We encourage the use of green alternatives such as telephone and video conferencing instead of travelling for workshops and meetings and CDs instead of printed material, where possible.

The following project team members are involved in this S&EIR application process.

**Table 1: Project Team Members**

| Name                  | Organization                   | Project Role                                  |
|-----------------------|--------------------------------|---|
| Mr Craig Allen        | SEF                            | Executive Director: Mining and Environment    |
| Mr Carene Kruger      | SEF                            | Project Manager                               |
| Ms Hanlie van Greunen | SEF                            | Environmental Manager                         |
| Ms Poogendri Reddy    | SEF                            | Public Participation/ Environmental Assistant |
| Ms Sinethemba Mchunu  | SEF                            | Soil Scientist                                |
| Ms Karin van der Walt | SEF                            | Terrestrial Ecologist                         |
| Mr Willem Lubbe       | SEF                            | Wetland Specialist                            |
| To be confirmed (TBC) | TBC                            | Surface Hydrology Specialist                  |
| Dr Lucian Burger      | Airshed Planning Professionals | Air Quality Specialist                        |
| Mr John Sibanyoni     | SEF                            | Geohydrologist                                |
| To Be Confirmed       | TBC                            | Heritage Specialist                           |

|                      |                         |   |
|----------------------|-------------------------|---|
| Mr Byron Grant       | SEF                     | Senior Natural Scientist/ Aquatic Ecologist |
| Mr Derek Cosijn      | Jongens Keet Associates | Noise Specialist                            |
| Ms Kelly Alexander   | SEF                     | Social Scientist                            |
| Ms Lizelle Wolmarans | SEF                     | Landscape Architect/ Rehabilitation Design  |

### Mr Craig Allen

Craig has been an Environmental Assessment Practitioner (EAP) for 7 years during which he has managed projects ranging in size and scope from small BAs to large-scale mining related EIAs throughout Southern Africa. Craig has excellent working knowledge of the NEMA and MPRDA Regulations and is the Executive Director of the Mining and Environment division within SEF. As such he provides technical supervision for projects, project leadership on large-scale environmental assessments and quality assurance on EIAs, EMPs, EMPRs and Basic Assessments (BAs).

### Ms Carene Kruger

Carene holds a BSc (Honours) Degree in Environmental Management (University of Johannesburg) and has been an EAP for over 6 years. She is employed as a Project Manager at SEF and has been with the company for 4 years. Her working experience varies from small to large scale projects pertaining to master planning, commercial, residential, mining and municipal infrastructure projects. Carene has excellent knowledge of the NEMA and has dealt with legal processes such as the Gautrain Variant Assessment High Court Interdict and other appeal processes. She also worked in the United Kingdom as a commercial recycling advisor and has extensive experience in community upliftment projects obtained in Mozambique. Key projects include: Lonmin Platinum EMPR amendment applications, Wonderboom Airport expansion, Gautrain Variant Assessment EIA, SKA- Meerkat infrastructure and Hazeldean Node Master Plan.

### Ms Hanlie van Greunen

Hanlie has 8 years of professional experience as a Landscape Technologist and holds a BSc LArch degree. She also completed a BSc Hons degree in Environmental Monitoring and Modeling in 2010. Hanlie spent 5 years in the UK working as a Landscape Architect at a charitable environmental regeneration organisation where she gained skills in community consultation along with the design and implementation of community led landscape projects. Hanlie is currently an Environmental Manager at SEF and has 3 years' experience in environmental management. She is involved in the compilation of Basic Assessments, Scoping Reports, EIA's and EMPr's in terms of NEMA and the MPRDA. Hanlie also conducts visual impact assessment studies (VIA's) for various types of development.

### Ms Poogendri Reddy

Poogendri has obtained a BSc Honours in Zoology from Rhodes University. She is currently registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions. She has worked for the South African Institute for Aquatic Biodiversity undertaking research in freshwater and marine ichthyology and has worked on numerous local and international research projects in the fields of molecular systematics and estuarine ecology. She has been with SEF for almost a year as an environmental assistant and public participation practitioner. She has a broad working knowledge and experience in basic assessments, scoping and environmental impact assessments and mine closure assessments for a range of development and mining projects.

**Table 2: Contact Details of Environmental Assessment Practitioner**

| Name             | Contact Details  |
|------------------|--|
| Ms Carene Kruger | Strategic Environmental Focus (Pty) Ltd<br>Postal Address: PO Box 74785, Lynnwood Ridge, PRETORIA, 0040<br>Tel: +27 12 349 1307<br>Fax: +27 12 349 1229<br>Email: carene@sefsa.co.za |

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## EXECUTIVE SUMMARY

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### 1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) has been appointed by African Exploration Mining and Finance Corporation (Pty) Ltd (AEMFC) to undertake an environmental application process for the proposed East Block of the currently operational Vlakfontein opencast coal mine.

A Scoping and Environmental Impact Reporting (S&EIR) process will be conducted for this project based on triggered listed activities within the Environmental Impact Assessment (EIA) Regulations of 2010 (Government Notice (GN) No's 543; 544; 545 and 546) promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as well as the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA).

The purpose of this, the Draft Scoping Report (DSR), is to provide all interested and affected parties (I&APs) with an opportunity to comment and provide input into the process going forward. All comments received during the 40 day review period will be incorporated into the Final Scoping Report (FSR) for consideration by the approving authorities, i.e. the Department of Environmental Affairs (DEA) and the Mpumalanga Department of Mineral Resources (DMR).

### 2 BRIEF PROJECT DESCRIPTION

Vlakfontein Mine is located approximately 100km east of Johannesburg, 10km north-west of the town of Ogies, and is situated north of the N12 highway at the R545 off-ramp to Kendal/ Balmoral in the Nkangala Magisterial District, Mpumalanga Province. Please refer to Figure 1 for the Locality Plan of the existing Vlakfontein Mine and the proposed Eastern Block study area (A3 size map provided in Appendix 1).

AEMFC was awarded a Mining Right in August 2010 to mine for coal on the remaining extent of Portions 3 and 10, Portions 20, 21 and 24 of the Farm Vlakfontein 569 JR in the Emalahleni Magisterial District. Vlakfontein Mine is currently mining coal by means of open cast mining methods on the block known as the Central Block. The Phase 1 (Central Block) operation was approved in terms of the existing EMPr authorisation number MP30/5/1/2/3/2/1(436) MR. The EMPr for the Phase 1 authorisation was compiled by SRK Consulting in 2009/2010. The proposed East Block expansion area was excluded from this assessment and is now being addressed in this S&EIA and EMPr Amendment Process.

The proposed East Block covers a total area of approximately 23 hectares, this being referred to as the study area. The No.2 Seam is well developed across the study area with an average thickness of approximately 6.63m. This seam has been further split into No.2 Lower and No.2 Upper Seams due to the presence of a thin intra-seam mudstone and/or siltstone parting (also known as inter-burden). The No.4 Seam is also well developed in the area with an average thickness of approximately 5.11m. These two seams (No. 2 and No. 4) are the target seams and contains a combined estimated resource of approximately 3.3 Million tonne (Mt) in-situ coal.

All coal to be mined at the proposed East Block will be trucked to Eskom's Kendal power station (including Kusile – once operational) and subsequently none will be exported. There is thus no need for a wash plant as coal will only be crushed and screened on site. The existing crushing and screening plant at the Vlakfontein Mine (Central Block) has the required capacity and will be utilised for these activities. Other existing infrastructure that will be utilised includes the mine access road and pollution control dams.

### 3 KEY IMPACTS

The following key impacts were initially identified and, amongst others, will be carried forward into the EIR phase for further investigation and assessment.

#### Biophysical Impacts:

- Potential impacts on surface water resources that occur in close proximity to the proposed surface footprint;
- Potential impacts of increased surface water run-off (viz. increased soil erosion) associated with the establishment of hard surfaces and vegetation clearing (mainly during the construction phase);
- Potential impacts on ground and surface water quality due to hydrocarbon spillages during the construction and operational phase of the development;
- Destruction of flora within the proposed area, stemming from activities such as vegetation clearing and topsoil stripping within the identified site; and
- Faunal displacement due to increased level of activity and associated noise.

#### Socio-Economic Impacts:

- Increased dust and noise generation as a result of the enlarged mine footprint;
- Change in the visual character of the area;
- Potential impacts on existing cultural and heritage resources;
- Potential loss of viable and high potential agricultural land; and
- Job creation during the construction and operational phases of the proposed project

#### Cumulative Impacts:

- Increased loss of potential agricultural/ grazing land; and
- Increased visual impacts associated opencast coal mining in the area

### 4 PROJECT ALTERNATIVES

To give effect to the principles of NEMA and Integrated Environmental Management (IEM), an EIA should assess a number of reasonable and feasible alternatives that may achieve the same end result as that of the preferred project alternative. The following alternatives have been identified as part of this Scoping exercise.

#### **Alternative 1 (Preferred site and method)**

AEMFC was awarded a Mining Right in August 2010 to mine for coal on the remaining extent of Portions 3 and 10, Portions 20, 21 and 24 of the Farm Vlakfontein 569 JR in the Emalahleni Magisterial District. Vlakfontein Mine is currently mining coal by means of open cast mining methods on the block known as Central Block. AEMFC now wishes to extend the mine footprint in an easterly direction (this application).

Prior to the commencement of the environmental process for the proposed Vlakfontein Mine – East Block, the Applicant undertook a feasibility assessment in order to identify the area for the preferred extension. The proposed area (as outlined on the layout plan in Appendix 3) was selected based on a number of criteria (amongst others) such as the topography of the land and the depth of the coal seam. No other site location alternatives for the surface infrastructure have been considered to be viable.

Opencast Strip Mining is currently being successfully utilised at the existing Central Block (adjacent to the proposed East Block). Due to the shallow depth of the coal seam, underground mining would be less safe, more difficult and significantly more expensive compared to an opencast mining method. Opencast mining will therefore also be the preferred mining method for the proposed East Block.

## **Alternative 2: No Development Alternative**

This option assumes that a conservative approach would ensure that the environment is not impacted upon as would currently be the case and the land would remain used for the purposes of maize production. It is important to state that this assessment is informed by the current condition of the area. Should the DEA and/ or DMR decline the application, the 'No-Go' option will be followed and the status quo of the site will remain (i.e. the site will remain as agricultural use).

## **5 CONCLUSIONS AND RECOMMENDATIONS**

In accordance with GN No. 543, the DSR is aimed at describing the proposed activity as well as the receiving environment that may be affected by the proposed project. In accordance with the EIA Regulations, an identification of relevant legislation and guidelines is also given as well as a description of the public participation process that will be followed.

Comments and/ or concerns identified by Interested and Affected Parties (I&APs) during the review period of the DSR will be incorporated into the FSR for further investigation during the EIR Phase to follow. The FSR will then be submitted to the DEA and DMR for consideration, together with the Plan of Study for the EIR phase of the project and other relevant supporting information.

The ability to mitigate any of the potential impacts identified in this DSR will also be investigated during the EIR phase and summarised into a working/ dynamic Environmental Management Programme (EMPr) for consideration by I&APs and ultimately by the DEA and the DMR.



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## LIST OF ABBREVIATIONS AND ACRONYMS

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|                         |   |
|-------------------------|---|
| <b>DEA</b>              | Department of Environmental Affairs   |
| <b>DMR</b>              | Department of Mineral Resources   |
| <b>DSR</b>              | Draft Scoping Report  |
| <b>DWA</b>              | Department of Water Affairs   |
| <b>EAP</b>              | Environmental Assessment Practitioner                                       |
| <b>EIA</b>              | Environmental Impact Assessment   |
| <b>EIR</b>              | Environmental Impact Reporting  |
| <b>EMPr</b>             | Environmental Management Programme  |
| <b>FSR</b>              | Final Scoping Report  |
| <b>GN</b>               | Government Notice   |
| <b>ha</b>               | Hectares  |
| <b>I&amp;APs</b>        | Interested and Affected Parties   |
| <b>IEM</b>              | Integrated Environmental Management   |
| <b>MAP</b>              | Mean Annual Precipitation   |
| <b>µg/m<sup>3</sup></b> | Micrograms per cubic meter air  |
| <b>ME</b>               | Mitigation Efficiency   |
| <b>MPRDA</b>            | Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) |
| <b>MW</b>               | Mega Watt   |
| <b>NEMA</b>             | National Environmental Management Act, 1998 (Act No. 107 of 1998)           |
| <b>NHRA</b>             | National Heritage Resources Act, 1999 (Act No. 25 of 1999)                  |
| <b>NWA</b>              | National Water Act, 1998 (Act No. 36 of 1998)                               |
| <b>PM<sup>10</sup></b>  | Particulate Matter of less than 10 microns                                  |
| <b>SANBI</b>            | South African National Biodiversity Institute's Interim                     |

|                  |  |
|------------------|--|
| <b>SAHRA</b>     | South African Heritage Resources Agency    |
| <b>SEF</b>       | Strategic Environmental Focus (Pty) Ltd    |
| <b>SFM</b>       | Significance Following Mitigation          |
| <b>S&amp;EIR</b> | Scoping and Environmental Impact Reporting |
| <b>WOM</b>       | Without Mitigation Measures                |
| <b>WM</b>        | With Mitigation Measures                   |

## GLOSSARY OF TERMS

|                                    |   |
|------------------------------------|---|
| Applicant                          | Any person who applies for an authorisation to undertake an activity or to cause such activity to be undertaken as contemplated in sections 24(5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).   |
| Ecology                            | The study of the interrelationships between organisms and their environments.   |
| Environment                        | The surroundings within which humans exist and that are made up of – (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing. |
| Environmental Impact Assessment    | Systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and S&EIR.   |
| Environmental Management Programme | A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.   |
| Interested and Affected Party      | Any person or groups of persons who may express interest in a project or be affected by the project, positively or negatively.  |
| Key Stakeholder                    | Any person who acts as a spokesperson for his/ her constituency and/ or community/ organisation, has specialised knowledge about the project and/ or area, is directly or indirectly affected by the project or who considers himself/ herself a key stakeholder.   |
| Opencast Mining                    | Opencast mining is a surface mining technique of extracting rock or minerals from the earth by their removal from an open pit or borrow.  |
| Stakeholder                        | Any person or group of persons whose live(s) may be affected by a project.  |
| Study Area                         | Refers to the entire study area encompassing all the alternatives as indicated on the study area or locality map.   |
| Succession                         | The natural restoration process of vegetation after disturbance.  |
| State Department                   | Any department or administration in the national or provincial sphere of government exercising functions that involve the management of the environment.  |

## SECTION A: INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) has been appointed by African Exploration Mining and Finance Corporation (SOC) Ltd (AEMFC) to undertake an environmental application process for the proposed Eastern Block of the currently operational Vlakfontein opencast coal mine.

Please refer to details of the Applicant: Mr Sizwe Excellent Madondo, on behalf of AEMFC below:

| Name of Applicant          | Postal Address                                    | Relevant Numbers   |
|----------------------------|---|--|
| Mr Sizwe Excellent Madondo | AEMFC SOC Ltd<br>P.O. Box 786141<br>Sandton, 2146 | Tel: 010 201 4777<br>Fax: 010 201 4927<br>E-mail: sizwem@aemfc.co.za |

### A-1 DESCRIPTION OF PROPOSED ACTIVITY

#### A-1.1 Locality

Vlakfontein Mine is located approximately 100km east of Johannesburg, 10km north-west of the town of Ogies, and is situated north of the N12 highway at the R545 off-ramp to Kendal/ Balmoral in the Nkangala Magisterial District, Mpumalanga Province. Please refer to **Error! Reference source not found.** for the Locality Plan of the existing Vlakfontein Mine and the proposed Eastern Block study area (A3 size map provided in Appendix 1).

AEMFC was awarded a Mining Right in August 2010 to mine for coal in the remaining extent of Portions 3 and 10, Portions 20, 21 and 24 of the Farm Vlakfontein 569 JR in the Emalahleni Magisterial District. Vlakfontein Mine is currently mining coal by means of open cast mining methods on the block known as the Central Block. The Phase 1 (Central Block) operation was approved in terms of the existing EMPr authorisation number MP30/5/1/2/3/2/1(436) MR. The EMPr for the Phase 1 authorisation was compiled by SRK Consulting in 2009/2010. The proposed East Block expansion area was excluded from this assessment and is now addressed in this S&EIA and EMPr Amendment Process.

The proposed East Block covers a total area of approximately 23 hectares, this being referred to as the study area.

#### A-1.2 Surrounding Land Use

To further place the site in context, the land uses within all four major compass directions are described in the table below. Refer to **Error! Reference source not found.** for an aerial photo of the proposed site and surrounding land.

**Table 3: Surrounding Land Use Table**

| Direction | Land Use                            | Distance (m)      |
|-----------|-------------------------------------|-------------------|
| North     | Existing Vlakfontein Mine           | Directly adjacent |
| West      | Existing Vlakfontein Mine           | Directly adjacent |
| South     | The N12 highway                     | Directly adjacent |
|           | Truter Boerdery Trust - Agriculture | South of the N12  |
| East      | Truter Boerdery Trust - Agriculture | Directly adjacent |

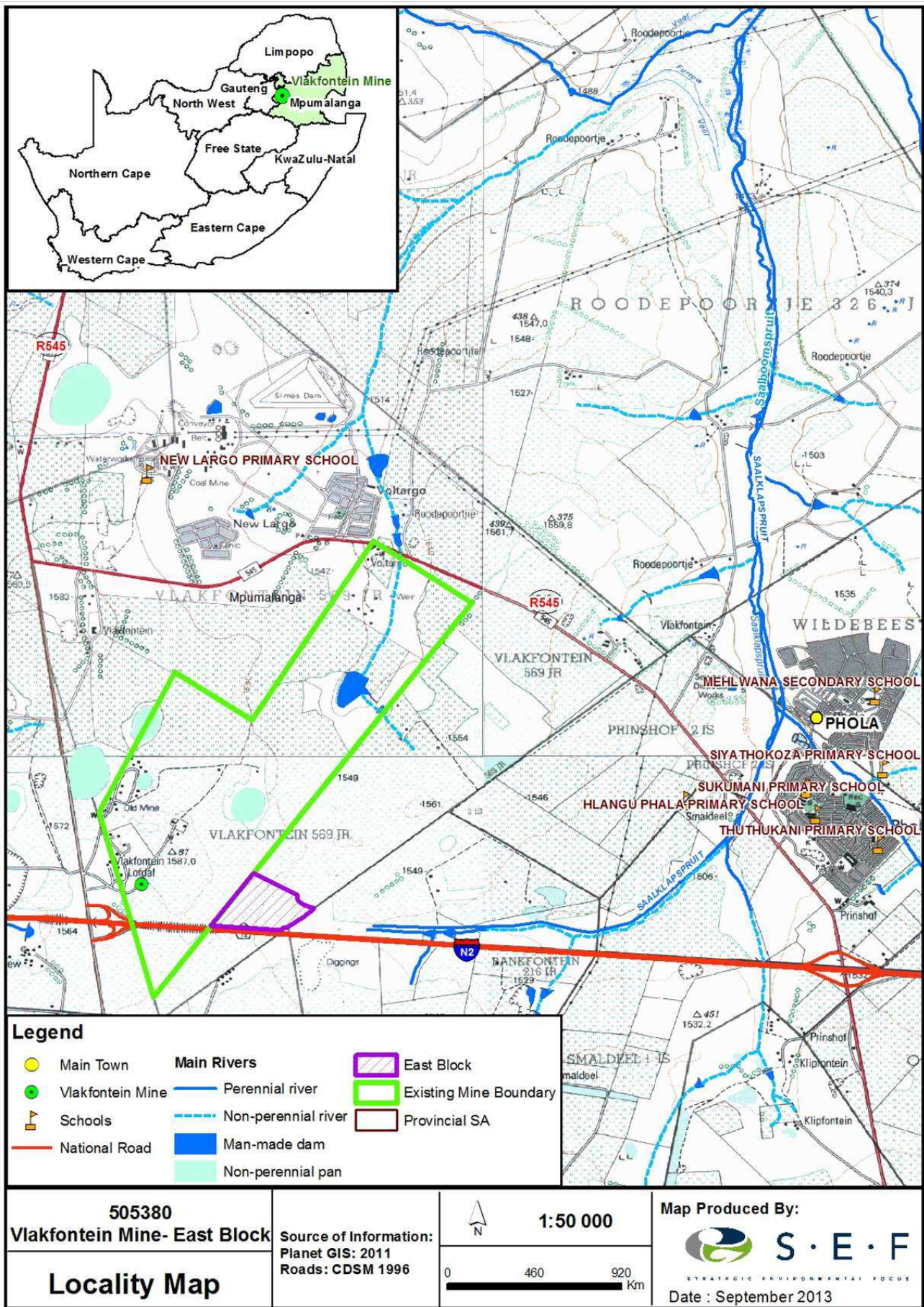


Figure 1: Vlakfontein Mine Locality Map – including the proposed East Block





**Figure 2: Proposed site and surrounding land (source: Google Earth)**

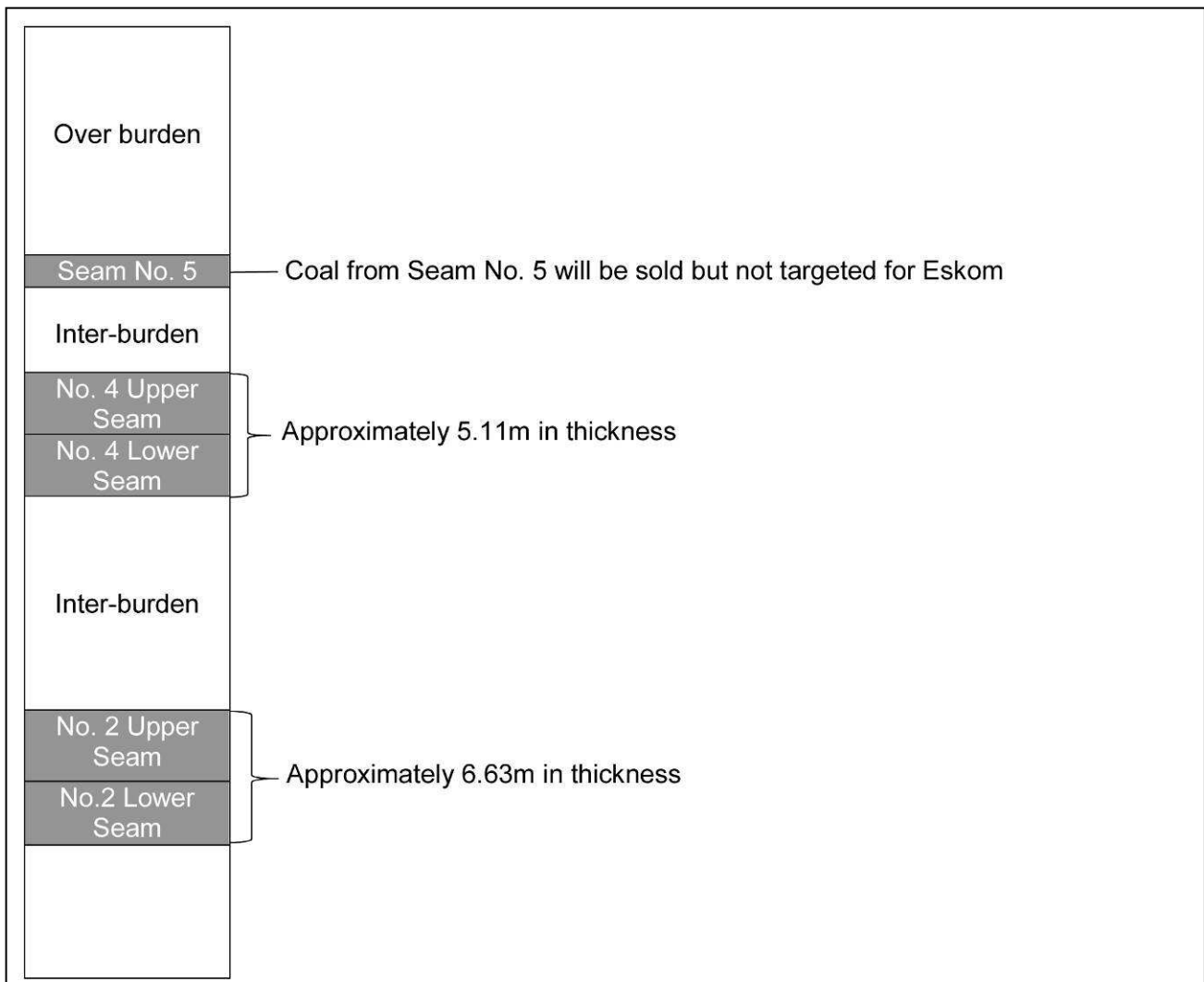
**A-1.3 Details of Coal Resource**

The geological investigation (conducted by AEMFC) has indicated that the sequence contains coal seams that are typical of the Witbank and Highveld coalfields. Drilling results from the study area indicated that there are three (3) coal seams. These are, from bottom up, the No.2, No.4 and the No.5 Seams.

The proposed East Block covers a total area of approximately 23 hectares, this being referred to as the study area. The No.2 Seam is well developed across the study area with an average thickness of approximately 6.63m. This seam has been further split into No.2 Lower and No.2 Upper Seams due to the presence of a thin intra-seam mudstone and/ or siltstone parting (also known as inter-burden). The No.4 Seam is also well developed in the area with an average thickness of approximately 5.11m. These two seams (No. 2 and No. 4) are the target seams and contain a combined estimated resource of approximately 3.3 Million tonne (Mt) *in-situ* coal. Refer to Figure 3 for an illustration of a typical section through of the target coal seams. AEMFC projections indicate that that this resource could be successfully mined (opencast) over a four year period at the rates indicated below:

| 1 <sup>st</sup> year | 2 <sup>nd</sup> year | 3 <sup>rd</sup> year | 4 <sup>th</sup> year |
|----------------------|----------------------|----------------------|----------------------|
| 332 779.81Mtpa       | 994 371.37Mtpa       | 1 100 457.82Mtpa     | 898 755.38Mtpa       |

All coal to be produced at the proposed East Block will be trucked to Eskom’s Kendal power station (including Kusile – once operational) and subsequently none will be exported. There is thus no need for a wash plant as coal will only be crushed and screened on site. The existing crushing and screening plant at the Vlakfontein Mine (Central Block) has the required capacity and will be utilised for these activities. Other existing infrastructure that will be utilised includes the mine access road and pollution control dams.



**Figure 3: Section of targeted coal seams at the proposed Vlakfontein Mine – East Block (not to scale)**

#### A-1.4 Proposed Mining Method

The proposed East Block will be operated on a Hybrid system, with the contractor being responsible for waste mining and AEMFC being responsible for coal mining. A standard conventional opencast strip mining method will be employed where the weathered overburden above the No.5 Seam will be ripped and dozed while the hard overburden will be drilled and blasted, all of which will be rolled over into the adjacent void left by the extracted material (Refer to Figure 4 and Appendix 2 – Photograph Plate).

The No. 5 seam will be ripped and loaded by Hydraulic Excavators into Articulated Dump Trucks (ADT's) and dumped onto the No 5. seam ROM stockpile for selling to the market. The No. 5 seam does not form part of the sales to Eskom. The No.4 seam coal will be drilled, blasted and loaded by Hydraulic Excavator into ADT's and dumped on a ROM stockpile adjacent to the proposed crushing and screening plant.

The inter-burden will be drilled to the top of the No.2 Upper Seam and blasted; the blasted material will then be dozed into the adjacent void or loaded by Hydraulic Excavators into ADT's for stockpiling onto a strategically placed stockpile for rehabilitation at a later stage during the mining operations. Due to the fact that the inter-burden parting, separating the No.2 Upper and the No.2 Lower coal seams, is very thin (average 0.15m thick), the No.2 Upper and No.2 Lower coal seams will be mined simultaneously, as a single bench. It must be noted, however, that this practice will add, on average, 2.5% contamination to the coal being mined. Unfortunately, due to the fact that the parting is a relatively thin band, to effectively control a separate parting

mining operation, using conventional opencast mining methods, would not be possible without potential losses of coal.

This mining method, including the mining of the parting simultaneously with the two coal seams, is currently applicable to the Central Block where the parting band is also relatively thin. Rehabilitation of the voids forms an integral part of the mining operation and follows in sequence concurrently with the mining operations. This entails the replacing of any stockpiled blasted over-burden, inter-burden and parting material into the voids which are then dressed with the sub-soil, then the top-soil and finally contoured and seeded if necessary.

### **A-1.5 The Proposed Mine Layout**

The following parameters were identified and taken into cognisance during the feasibility study pertinent to the proposed layout. Refer to Figure 5 (A3 plan attached in Appendix 3):

#### Transnet Pipelines:

A 100m buffer is used to protect the Transnet pipelines. The relevant Transnet officials shall be contacted when blasting is carried out within 500m of the pipeline servitude.

#### N12 Highway:

A safety pillar of 100m (inclusive of the road servitude of 20m as per National Road Agency communication) has been left to protect the N12 highway, and a portion of the surface overlying the pillar will be available for the spoils stockpile. **Error! Reference source not found.** below shows the proposed design layout for the East Block taking into account the above mentioned restrictions and parameters.



Figure 4: Opencast Coal Mining Process (Vlakfontein Central Block)



Figure 5: Vlakfontein Mine Layout Plan (including the East Block)

## A-2 LEGAL REQUIREMENTS APPLICABLE TO THIS APPLICATION

SEF registered the proposed Vlakfontein Mine – East Block with the DEA and the DMR and the project has been assigned the reference numbers: DEA Ref No: 14/12/16/3/3/2/602 and DMR Ref No: MP30/5/1/2/3/2/1(436) MR. The legislation, guidelines and policies applicable to this project are as follows:

### A-2.1 NEMA and the Environmental Impact Assessment Regulations

The EIA Regulations, promulgated under NEMA, focus primarily on creating a framework for co-operative environmental governance. NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

In terms of the EIA Regulations of 2010 and activities listed in GN No. 544 and 546 (requiring a Basic Assessment process) and GN No. 545 (requiring a S&EIR process), the following listed activities are deemed by the EAP to be applicable to the proposed mine based on the information provided by AEMFC.

| Number and date of the relevant notice: | Activity No's (in terms of the relevant notice):   | Listed activity as per the detailed project description:   |
|---|--|--|
| GN R 544 of 18 June 2010                | <p style="text-align: center;"><b>11</b></p> <p>The construction of:</p> <ul style="list-style-type: none"> <li>(i) canals;</li> <li>(ii) channels;</li> <li>(iii) bridges;</li> <li>(iv) dams;</li> <li>(v) weirs;</li> <li>(vi) bulk storm water outlet structures;</li> <li>(vii) marinas;</li> <li>(viii) jetties exceeding 50 square metres in size;</li> <li>(ix) slipways exceeding 50 square metres in size;</li> <li>(x) buildings exceeding 50 square metres in size; or</li> <li>(xi) infrastructure or structures covering 50 square metres or more</li> </ul> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> | The construction of channels within 32 meters from a watercourse.  |
| GN R 544 of 18 June 2010                | <p style="text-align: center;"><b>22</b></p> <p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> <li>(i) with a reserve wider than 13,5 meters or</li> <li>(ii) where no reserve exists where the road is wider than 8 metres, or</li> </ul> <p>for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</p>   | The construction of mine access and haul roads where the road will be wider than 8m with a reserve wider than 13.5 meters (the position of the haul roads will shift during the operation phase as needed, but within the East Block footprint). |

| Number and date of the relevant notice: | Activity No's (in terms of the relevant notice):   | Listed activity as per the detailed project description:  |
|---|--|---|
| <b>GN R 545 of 18 June 2010</b>         | <b>3</b><br>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.   | The storage of dangerous goods such as oil, fuel and surfactants with a combined capacity of more than 500 cubic meters (i.e. diesel).  |
| <b>GN R 545 of 18 June 2010</b>         | <b>15</b><br>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;<br><br>except where such physical alteration takes place for:<br>(i) linear development activities; or<br>agriculture or afforestation where activity 16 in this Schedule will apply.<br>(ii) | The mine's surface footprint will alter vacant land and cover an area of approximately 23 hectares.   |
| <b>GN R 545 of 18 June 2010</b>         | <b>20</b><br>Any activity which requires a mining right or renewal thereof as contemplated in sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).   | The proposed extension of the mine will require a mining right in terms of Sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). |

It must be noted that activities requiring a Basic Assessment process, as well as activities requiring an S&EIR process are triggered by the proposed development. Therefore, according to the above listed activities, a situation arises, whereby the legal requirements of the activity listed in terms of GN No. 545 of 2010 supersede those of the activities listed in terms of GN No. 544 of 2010, and as such **this application shall undergo an S&EIR process.**

The aforementioned listed activities are deemed to include activities that could potentially have a detrimental impact on the social and biophysical state of an area and as such, are required to undergo an environmental impact assessment process.

## **A-2.2 Mineral and Petroleum Resources Development Act, 2000 (Act No. 28 of 2000) and MPRDA Regulations**

The MPRDA provides that the environmental management principles set out in the NEMA shall apply to all prospecting and mining operations and serve as a guideline for the interpretation, administration and implementation of the environmental requirements of the MPRDA. Any prospecting or mining operations must be conducted in accordance with generally accepted principals of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that the exploitation of mineral resources serves both present and future generations.

The Phase 1 (Central Block) of the Vlakfontein Mine was approved in terms of the existing EMPr authorisation number MP30/5/1/2/3/2/1(436) MR. This reference number will also be used for the proposed East Block EMPr Amendment Process.

Section 102 of the MPRDA indicates that inter alia a mining right or environmental management programme, and Environmental Management Plan (EMP) may not be amended or varied without the written consent of the

Minister. Hence, as part of this process, the Minister will be notified of AEMFC's intent, and written consent will be sought with the submission of the final updated EMP. Further, Regulation 527, promulgated in terms of the MPRDA, outline the requirements for the assessment of an amendment for mining rights and permits, and this guideline is being followed.

### **A-2.3 National Water Act, 1998 (Act No. 36 of 1998)**

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in responsible ways.

Of specific importance to this application is Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

Due to the various processes involved in opencast coal mining, as well as a water body in the study area, the proposed mine may trigger the following water uses listed in Section 21 of the NWA:

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

The Integrated Water Use License (IWUL) for the existing Vlakfontein Mine was approved in May 2012. The IWUL will therefore have to be amended in order to incorporate listed activities triggered by the proposed East Block operation. As part of this amendment the Integrated Water and Waste Management Plan (IWWMP) will also be updated and submitted to the Department of Water Affairs (DWA) for consideration.

### **A-2.4 Other Legal Requirements**

#### ***A-2.4.1 Acts***

##### ***Constitution of the Republic of South Africa***

The Constitution of the Republic of South Africa has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the locus standi of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of the NEMA. Section 24 in the Bill of Rights of the Constitution specifically states that:

Everyone has the right -

- To an environment that is not harmful to their health or well-being; and
- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
  - Prevent pollution and ecological degradation;
  - Promote conservation; and



- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

***National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)***

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

This Act is applicable to this application for environmental authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.

***National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)***

To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

***National Heritage Resources Act, 1999 (Act No. 25 of 1999)***

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

***National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)***

The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.

***Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)***

The purpose of the Act is to control the subdivision and, in connection therewith, the use of agricultural land. The Minister of Agriculture, Forestry and Fisheries ("Minister of Agriculture") must consent to the proposed subdivision.

***Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)***

To provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

***Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)***

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

***Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)***

The Act recognises that everyone has a Constitutional right of access to any information held by the state and

by another person when that information is required to exercise or protect any rights. The purpose of the Act is to foster a culture of transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their rights

#### ***A-2.4.2 Provincial Policies and/or Guidelines***

##### ***Integrated Environmental Management (IEM)***

IEM is a philosophy for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels.

The DEA Integrated Environmental Management Information Series guidelines are also considered during this S&EIR application process.

##### ***National Spatial Biodiversity Assessment***

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

##### ***Protected species – Provincial Ordinances***

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the Provincial Departments of Environmental Affairs.

#### ***A-2.4.3 Provincial and Municipal By-laws***

The Emalahleni Local Municipality and Nkangala District municipalities have developed local bylaws and various policies relating to waste disposal, water, economic development, etc. AEMFC will ensure that such policies and bylaws, as far as possible, will be adhered to.

#### ***A-2.4.4 Development Strategies***

According to the Municipal Systems Act (MSA) of 2000, all municipalities have to undertake an Integrated Development Plan (IDP) process to produce IDP's. As the IDP is a legislative requirement it has a legal status and supersedes all other plans that guide development at local government level. In terms of Section 26(e) of the Municipal Systems Act (Act 32 of 2000), every municipality is also required to formulate a Spatial Development Framework (SDF) as a part of its IDP.

The following Development Strategies will be applicable to the proposed project:

| <b>Government Sphere</b> | <b>Applicable Development Strategy</b>   |
|--------------------------|--|
| District                 | Nkangala District Municipality reviewed Integrated Development Plan 2013 - 2014  |
| District                 | Nkangala District Municipality Spatial Development Framework 2012 - 2013   |
| Local                    | Emalahleni Local Municipality Integrated Development Plan 2012/13 – 2016/17, including the Spatial Development Framework (Section E) |

### **A-3 NEED AND DESIRABILITY OF THE PROJECT**

African Exploration Mining Finance Corporation (SOC) Ltd (AEMFC) is a subsidiary of the State-owned Central Energy Fund (CEF) and was formed with the objective of consolidating all mining and mineral rights and interests within the CEF group to enable optimal and effective exploitation of such minerals and mining rights. The AEMFC is thus a 100% owned subsidiary of the CEF.

Despite the slow economic recovery from the 2008 economic recession, there is still a high demand for coal in South Africa and internationally. Kusile Power Station will also be commissioned within the next few years and Vlakfontein has been identified as a supplier to the Power Station as a result of being situated in close proximity of the station. This means that should any one of the suppliers, such as the Vlakfontein, reduce their production and deliver less coal, alternative sources would have to be found to maintain required supplies. This could result in the establishment of a new coal mine, with additional environmental impacts associated with the location of the new mine.

The Vlakfontein East Block operation will extend the profitability and life of the AEMFC by an additional four (4) years.

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## **SECTION B: THE RECEIVING ENVIRONMENT**

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In order to assess the potential impacts of the proposed Vlakfontein Mine – East Block on the receiving environment, one needs to first assess the baseline conditions found over the study area. Using this *Status Quo* one can then, broadly speaking, determine the likely impacts that will emanate from a specific development typology on a well-defined receiving environment.

### **B-1 BIOPHYSICAL ENVIRONMENT**

#### **B-1.1 Soil, Land Use and Land Capability**

##### ***B-1.1.1 Soil Classification***

In 2009 SRK identified eleven (11) soil types in the Vlakfontein Mine Area (Central Block). These included Katspruit, Hutton, Acardia, Mispah, Glenrosa, Swartlands, Avalon, Kroonstad, Estcourt, Shortlands, Valsrivier, Avalons and Wesleights which are typically associated with hillslope seepage areas on the Central Block site. The Avalons and Wesleights that were found are not unique to either the Mpumalanga Province or to South Africa. The Katspruit soils that were found are often associated with pans and water bodies in the province.

##### ***B-1.1.2 Land Use***

Three land uses have been identified during previous studies. These include Agricultural (maize production and grazing), Industrial (Transnet infrastructure and mining) and Residential (Valley View and the Venter Community). The western and central portions of Portion 3 and Portion 10 of Vlakfontein 569 JR have historically been mined using underground mining methods. The underground void was used in the 1980's for the strategic storage of heavy fuel oil. At present these mined out underground oil storage bunkers are managed by Oil Pollution Control South Africa (OPCSA) on behalf of the Strategic Fuel Fund (SFF). In the central and south western parts of the site is a Transnet substation (Portion 21 and 24 of Vlakfontein 569JR), pipelines and a pump station for the underground oil storage facility. There are also relatively small areas on site where sand mining activities appear to have taken place.

##### ***B-1.1.3 Land Capability***

Results of soil fertility testing indicate that the soils pH irrespective of soil type, depth or whether the soil is a topsoil or subsoil are generally in the neutral range with pH ranging from 6.2 to 7.3. These pH levels are generally within the range which is considered ideal for plant growth.

In conclusion SRK found that there is nothing unique about the land capability of the project area (Central Block), relative to other areas in the region. Therefore, there was no requirement to preserve the land capability during mining activities. The only requirement was that land capability should be re-established at the end of the mining activities.

A detailed soil, land use and land capability assessment of the proposed East Block study area will be conducted in the EIR phase.

#### **B-1.2 Terrestrial fauna and flora (biodiversity)**

##### ***B-1.2.1 Flora***

According to a study conducted by EcoInfo for the Vlakfontein mine in 2010, the area is located in an endangered regional vegetation unit, namely Eastern Highveld Grassland. EcoInfo also stated in this report that the main driver of transformation/ loss of habitat in the area is cultivation. Large areas had been transformed (cultivated) with the majority of remaining grassland being associated with wetlands.

According to South African National Biodiversity Institute's Interim (SANBI) Red Data list for February 2009, 94 species within Mpumalanga Province are considered threatened (Vulnerable, Endangered, Critical Endangered). Eleven of the 94 species (12%) are considered to be Critical Endangered, 20 species (21%) are considered to be Endangered and 63 species (67%) are considered to be Vulnerable.

The 94 species represent 59 plant genera of which the following 13 genera contain 50% of the threatened species: *Encephalartos*, *Aloe*, *Disa*, *Streptocarpus*, *Brachystelma*, *Gladiolus*, *Protea*, *Asclepias*, *Asparagus*, *Erica*, *Helichrysum*, *Ocotea* and *Zantedeschia*. The majority of the threatened species (65 or 69%) is associated with the herbaceous layer, in the form of forbs, while 27 species (29%) represent woody species (trees and shrubs).

According to EcolInfo it is highly likely that the remaining grassland in association with the wetlands will be potential habitat for the threatened orchids.

#### ***B-1.2.2 Mammals***

Of the 164 mammal species recorded from Mpumalanga (according to Emery et al., 2002), 38 species could occur in the area of which 16 species were confirmed field surveys in 2010.

It was anticipated, by EcolInfo, that based on the predominance of wetland-associated habitat types, that most of the expected taxa will be partial towards wetland conditions. Typical species that occur on these wetland areas include *Rhodomys pumilio* (Four-striped Grass Mouse), *Otomys irroratus* (Vlei Rat) and taxa pertaining to the genus *Crocidura* (Musk Shrews). Typical taxa associated with the sandy soils adjacent to the wetland features will include burrowing (or pertaining to den structures) species such as *Cynictis penicillata* (Yellow Mongoose), *Tatera brantsii* (Highveld Gerbil), *Hystrix africaeaustralis* (Cape Porcupine), *Vulpes chama* (Cape Fox) and *Cryptomys hottentotus* (Common Mole-rat). It was also found that the dense *Arundinella*-*Paspalum* grassland bordering the south-eastern pan supports a small, isolated population of Common Reedbuck (*Redunca arundinum*), a species atypical from the western Mpumalanga highveld.

#### ***B-1.2.3 Amphibians***

Of the 51 species of amphibians occurring in Mpumalanga (Jacobson, 1989; Minter et al., 2004), 14 taxa could occur on the study site of which *Amietia angolensis* (Common River Frog), *Cacosternum boettgeri* (Boettger's Caco), *Strongylopus fasciatus* (Striped Stream Frog) and *Semnodactylus wealii* (Rattling Frog). According to EcolInfo these frogs are likely to be abundant from the various wetland features.

#### ***B-1.2.4 Reptiles***

Of the 154 reptile species recorded by Jacobsen (1989) in Mpumalanga, 20 snake species, 8 lizard species and one chelonian (i.e. turtle) species could occur in the area.

#### ***B-1.2.5 Avifauna***

According to the South African Bird Atlas Project (SABAP1) (Harrison et al., 1997), a total of 201 bird species have been recorded for the quarter degree grid cell (QDGC) 2628BB. According to EcolInfo the habitat types prevalent on the study site (Central Block) are more likely to sustain approximately 188 bird species of which approximately 77 were confirmed during field studies by EcolInfo in 2010. These included species such as Zitting Cisticola (*Cisticola juncidis*), *Streptopelia* (doves) and *Ploceid weavers* (weavers and bishops).

A detailed flora and fauna assessment (including avi-faunal) of the proposed East Block study area will be conducted in the EIR phase.

### B-1.3 Wetlands

According to a wetland assessment conducted by Wetland Consulting Services (WCS) in 2009 the site (Central Block Area) is dominated by hillslope seepage wetlands, which make up more than 85 % of the wetland area on site. This was no surprise to WCS since it was found that the study area is underlain by sandstone of the Vryheid Formation (Karoo Supergroup) that are prone to sub-seepage of water. WCS found that the hillslope seepage wetlands within the study area are typically seasonal wetland systems and seldom have areas of surface water, with flows taking place within the soil profile (interflow). As such, it was found that these wetlands are often classed as moist grasslands.

WCS also found that as with most areas located on the Mpumalanga Highveld, the proposed Vlakfontein mining area is located within an area of intense agricultural activity, while an oil pump and storage facility (managed by the Central Energy Fund) is also located on site and the N12 highway traverses the southern portion of the proposed mining area. According to WCS all of these activities, especially the extensive cultivation and the groundwater discharged into the pans from the underground oil storage facility have led to numerous impacts to the wetlands on site, with resultant degradation of the wetland habitat. WCS observed the following impacts in 2009:

- Extensive cultivation along and within the wetland boundaries on site;
- Erosion along farm tracks and within the cultivated fields leading to increased sedimentation within the wetlands;
- Old sand mining area within and adjacent to the wetlands;
- Two small impoundments in the wetlands;
- Discharge of clean groundwater from the oil storage facility into two of the pans;
- Pollutants entering the pans through leaking pipes associated with the oil storage facility;
- Old railway line through some of the wetlands on site; and
- Presence of alien invasive vegetation.

According to WCS these impacts have resulted in a much lower present ecological state (PES) of the wetlands than the reference condition or un-impacted state of the wetlands.

A detailed wetland delineation and functional assessment of the proposed East Block study area will be conducted in the EIR phase.

### B-1.4 Surface water (hydrology)

The proposed Vlakfontein mine – East Block study area covers an area of 23 ha, with the land use consisting of natural grassland and maize farming. There are several pans and wetlands in the wider area as described in the wetlands specialist report (WCS, 2009). Drainage lines occur on the north eastern, south eastern and south western area of the project area. The study area for the proposed East Block falls within the B20G catchment which drains into the Saalboomspruit towards the East.

According to SRK the nearest most reliable rainfall station is station 0478093\_W (Ogies), and is located 9 km south east of the Vlakfontein mine. Rainfall station 478093\_W (Ogies) has a rainfall record of 96 years beginning in 1907 and ending in 2003, only 8.3 % of the record has been patched and the station has a reliability of 91%. The calculated Mean Annual Precipitation (MAP) in millimetres for this rainfall station is 705 mm.

SRK also calculated the mean annual runoff (MAR) of the B20G quaternary catchment, based on the catchments hydrological characteristics such as: slope, length of longest watercourse, catchment land use and the rainfall. The results were as follows:

| Catchment      | Area (km <sup>2</sup> ) | MAR (Million m <sup>3</sup> ) | Peak Flow (1:50 Year) (m <sup>3</sup> /s) | Drainage density (km/km <sup>2</sup> ) |
|----------------|-------------------------|-------------------------------|---|--|
| Saalboomspruit | 522                     | 23.0                          | 735                                       | 0.5                                    |

### B-1.5 Groundwater (geohydrology)

According to studies conducted by SRK in 2009 the coal seams underlying the Vlakfontein mine are hosted by the lower part of the Vryheid Formation of the Ecca Group which overlies the glacially derived sediments of the Dwyka Group at the base of the Karoo Supergroup. Five coal seams are typically developed in the 70m thick Vryheid Formation of the Witbank coal field, but on the Vlakfontein property only the lower part of the Vryheid formation is preserved.

Studies conducted by SRK in 2009 indicated that the western and central portions of Portion 3 and Portion 10 of Vlakfontein 569 JR have historically been mined using underground mining methods and that the underground void was used in the 1980's for the strategic storage of heavy fuel oil. At present these mined out underground oil storage bunkers are managed by Oil Pollution Control South Africa (OPCSA) on behalf of the Strategic Fuel Fund (SFF). These underground workings were excluded from the proposed Vlakfontein Coal Mine Project in 2009 and will also be excluded from the Terms of Reference for the proposed East Block extension. This above scenario is run by the Central Energy Fund.

A detailed geo-hydrological assessment of the proposed East Block study area will be conducted in the EIR phase.

### B-1.6 Air quality

Airshed Planning Professionals (APP) identified the following receptors / contributors in the greater area in 2010:

- Witbank approximately 28 km to the northeast;
- Ogies approximately 10km to the southeast;
- Phola Residence on the eastern perimeter of Vlakfontein Mine;
- Kendal Power Station 5km to the south;
- Various other mines such as Klipspruit and Beesting;
- The Venter Community to the east; and
- Van den Heever Farm to the north.

The baseline study produced by APP included the analysis of meteorological data recorded at the closest meteorological monitoring station (Kendal 2). The predominant wind field for the period 2004 to 2007 was from the west-northwest with frequent moderate wind speeds of 5-10 m/s. During daytime conditions, the frequency of winds from the west-northwestern sector increases (>15%) winds from the east and east-northeast increase in occurrence with an increase in calm conditions (12.4%) as is typical of more stable conditions. During winter months (July to August), the enhanced influence of westerly wave disturbances is evident in the increased frequency of northwesterly and west-northwesterly winds at Kendal 2. An increase in the frequency of easterly winds during summer months (December to February) reflects the influence of easterly wave systems at Kendal 2. Autumn and winter months are associated with a greater frequency of calm wind conditions, with the smallest number of calms occurring during spring and summer months. Air quality estimates was made by APP through extrapolations from the Klipspruit Colliery dust fallout monitoring and Eskom's PM<sup>10</sup> (Particulate Matter of less than 10 microns) air concentration data. It was estimated that the current annual average background PM<sup>10</sup> concentration at the site is approximately 20 µg/m<sup>3</sup>, with a maximum

daily average of about 40 µg/m<sup>3</sup>. It was also estimated that the current fallout levels range between SLIGHT (i.e. less than 250 mg/m<sup>2</sup>/day and MODERATE (i.e. 250 to 500 mg/m<sup>2</sup>/day). frequency of occurrence) with calm conditions of 3.7%.

A detailed air quality assessment of the proposed East Block study area will be conducted in the EIR phase.

### **B-1.7 Heritage**

During a study conducted in 2009 for the Vlakfontein Mine area (Central Block) the following heritage resources were documented by J van Schalkwyk:

- Three different informal cemeteries were identified. They range in size from containing five (5) graves to probably as many as 100.
- A number of houses that were apparently built for the earlier mining activities on the site are still inhabited. They probably date to the late 1940s, early 1950s and are still sound in structure. They form a small village which include connecting roads and some elements of landscaping, e.g. planted vegetation.
- An old railway line that served the New Largo mine used to occur on the western edge of the study area. It was decommissioned, probably when the Wilge power station (1954 - 1987) and its staff quarters known as Voltargo and the New Largo mine were closed down. Only the embankment remains.

It was found that in terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a Grade III significance:

- The three different informal cemeteries are viewed to have a high significance on a local level.
- The old mine houses (known as the Venter houses) are viewed to have a medium significance on a regional level.
- The old railway line that served the New Largo mine is viewed to have a low significance on a regional level.

A detailed heritage assessment of the proposed East Block study area will be conducted in the EIR phase.

### **B-1.8 Noise**

Mr F. Malherbe conducted a noise assessment for the Vlakfontein Mine (Central Block) in 2009 and found that the present ambient noise levels are largely determined by the noise emissions from road traffic on the N12, R545 and Kendal Road. All these roads carry significant amounts of traffic and a large percentage of heavy vehicles.

Under conditions when there is no wind the ambient noise level was found to be approximately 50 dBA (Decibels), which is in excess of the 45 dBA recommended by the WHO for residential areas and SANS 10103 for 'urban districts' during the night. According to Malherbe the increase in ambient noise level, caused by mining activities, was found to be 10 dB which would have caused a 'medium' community/group response with 'widespread complaints'.

A detailed noise assessment of the proposed East Block study area will be conducted in the EIR phase.



## **B-1.9 Socio-economic**

### ***B-1.9.1 Socio-economic indicators: Mpumalanga Province***

The following socio-economic information and profile for Mpumalanga province has been sourced from the 2001 Census and the 2007 Community Surveys from Statistics South Africa (Stats SA) and was documented by Itekeng Development Consulting (IDC) in 2009 for the Vlakfontein Mine (Central Block).

A substantial population of just above three million (3 122 990) was recorded for the Mpumalanga Province, and this number has increased by 8.2% to 3 643 435 in 2007. Of the total population, forty seven percent (47%) were under the age of nineteen (19), whilst forty nine percent (49%) were of working age, i.e. between the ages of twenty (20) and sixty four (64) years, with only four percent (4%) of the population being above the age of sixty five (65), and therefore classified as pensioners. The ratio of males to females in the province was forty eight (48) males to fifty two (52) females.

The results of the 2001 Census indicated that approximately forty seven percent (47%) of the Mpumalanga Province population was economically active.

People who are economically active are those between the ages of nineteen (19) and sixty-four (64), and who are physically and mentally fit to perform their employment duties. Of the economically active population, fifty nine percent (59%) were employed, whereas the remaining forty one percent (41%) were unemployed and did not have access to secure gainful employment at this time. These figures, however, do not incorporate income from informal employment or remittances to households by employed family members from elsewhere. According to IDC Household income is one of the determinants of welfare in a region. The ability to meet basic needs, such as for adequate food, shelter and basic amenities, is largely determined by the level of income earned by the households. Given the high unemployment statistics for the province, the individual income profile is very low.

A detailed socio-economic assessment of the proposed East Block study area (including updated census statistics) will be conducted in the EIR phase.

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## SECTION C: ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

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### C-1 APPROACH TO THE EIA

An Environmental Impact Assessment (EIA) is an effective environmental planning tool. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The EIA for this project complies with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) (in accordance with the NEMA EIA Regulations of June 2010) as well as the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (in accordance with the MPRDA Regulations of April 2004).

#### Definition of the term “environment”

The term “environment” is used in the broadest sense in an environmental impact assessment. It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

The guiding principles of an EIA are listed below.

### C-2 GUIDING PRINCIPLES FOR AN EIA

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with Interested and Affected Parties (I&APs) representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should finally be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

The eight guiding principles that govern the entire process of EIA are as follows (see Figure 6 below):

- **Participation:** An appropriate and timely access to the process for all interested parties.
- **Transparency:** All assessment decisions and their basis should be open and accessible.
- **Certainty:** The process and timing of the assessment should be agreed in advance and followed by all participants.
- **Accountability:** The decision-makers are responsible to all parties for their action and decisions under the assessment process.
- **Credibility:** Assessment is undertaken with professionalism and objectivity.
- **Cost-effectiveness:** The assessment process and its outcomes will ensure environmental protection at the least cost to the society.
- **Flexibility:** The assessment process should be able to adapt to deal efficiently with any proposal and decision making situation.
- **Practicality:** The information and outputs provided by the assessment process are readily usable in decision making and planning.

An S&EIR process is considered as a project management tool for collecting and analysing information on the environmental effects of a project. As such, it is used to:

- Identify potential environmental impacts;
- Examine the significance of environmental implications;
- Assess whether impacts can be mitigated;
- Recommend preventive and corrective mitigating measures;
- Inform decision makers and concerned parties about the environmental implications; and
- Advise whether development should go ahead.



**Figure 6: The Eight Guiding Principles for the EIA Process**

An S&EIR process typically has four phases, as illustrated in Figure 7 below. The Public Participation process forms an integral part of all four phases and is discussed in greater detail in Section C – 4 of this Scoping Report.

## C-3 S&EIR TECHNICAL PROCESS

This section provides a summary of the technical process to be followed for this S&EIR process.

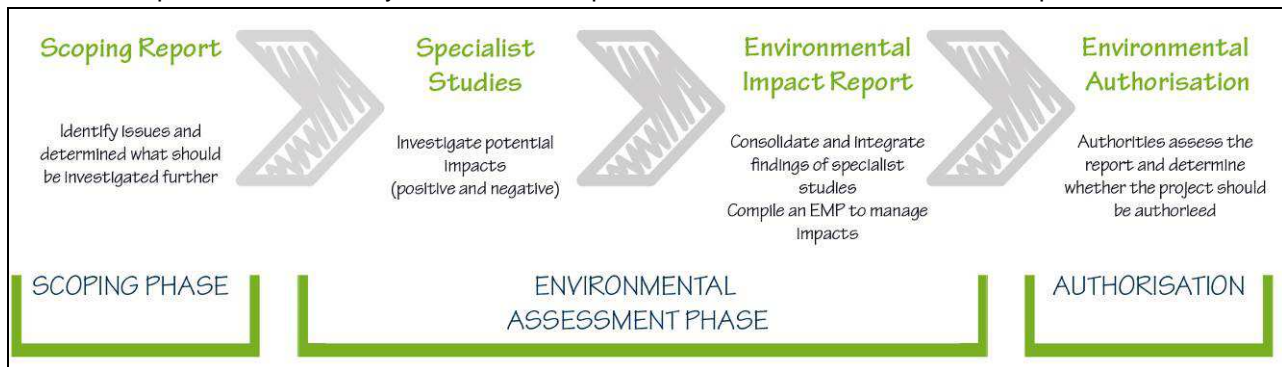


Figure 7: Flow Diagram of the Scoping and EIR Process

### C-3.1 Pre-application Consultation with the Competent Authorities

A pre-consultation meeting was held between SEF and the DMR in order to confirm the process to be followed in terms of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The process to be followed in terms of the NEMA was confirmed in writing with the DEA. The EAP conducting the S&EIR process for the applicant, in support of their application for an environmental authorisation, is deemed to have a good understanding of the information requirements of both Departments for the proposed mine, such that the Department's specific information requirements are deemed to have been met for the scoping phase of this project.

### C-3.2 Application for Authorisation

The application form informing the Department of intent to obtain an environmental authorisation was submitted to the DEA on 10 October 2013. The project was subsequently registered and assigned the reference number: DEA Ref No.: 14/12/16/3/3/2/602. The DMR requested that the existing Vlakfontein Mine reference number (MP30/5/1/2/3/2/1(436) MR) is being used for the proposed East Block.

### C-3.3 Information Gathering

Early in the EIA process, the technical specialists will identify the information that would be required for the impact assessment and the relevant data will subsequently be obtained. In addition, the specialists will source available information about the receiving environment from reliable sources, I&APs, previous documented studies in the area and previous Scoping and EIA Reports.

### C-3.4 Specialist Studies

The following specialist studies, originally conducted for the Vlakfontein Mine (Central Block), will be updated for the proposed East Block.

- Soil, land use and land capability assessment;
- Terrestrial fauna and flora (biodiversity) assessment;
- Wetland delineation and aquatic assessment;
- Surface water (hydrology) assessment;
- Groundwater (geohydrology) assessment (excluding drilling);
- Air quality assessment;
- Heritage and archaeological assessment;

- Noise assessment;
- Socio-economic assessment; and
- Rehabilitation and Land Use Planning.

## **C-4 PUBLIC PARTICIPATION PROCESS**

The principles of NEMA govern many aspects of the S&EIR process, including consultation with I&APs. These principles include the provision of sufficient and transparent information to I&APs on an ongoing basis, to allow them to comment and ensure the participation of historically disadvantaged individuals, including women, the disabled and the youth.

The principal objective of public participation is thus to inform and enrich decision-making. This is also the key role in the scoping phase of the process.

### **C-4.1 Identification of Interested and Affected Parties**

I&AP's representing the following sectors of society have been identified in terms of Regulation 55 of the EIA Regulations R543 of 2010 (see Appendix 5 for a complete preliminary I&AP distribution list):

- Provincial Authorities;
- Local Authorities;
- Ward Councillors;
- Parastatal/ Service Providers;
- Non-governmental Organisations;
- Local forums/ unions; and
- Adjacent Landowners.

### **C-4.2 Public Announcement of the Project**

The project was announced on **31 October 2013** in the following manner (see Appendix 5 for public announcement documentation):

- Publication of media advertisements (in English) in a regional newspaper;
- On-site notices (in English) advertising the S&EIR process were placed on and around the site, as well as in the public venue where reports were made available for review and comment; and
- Distribution of letters by fax/ by hand/ post/ email to I&APs including Registration and Comment Sheets.

### **C-4.3 Public Review of the Draft Scoping Report**

I&APs and relevant State Departments have the opportunity to raise issues either in writing, by telephone or email on the Draft Scoping Report (DSR) for a period of 40 days (**31 October 2013 to 10 December 2013**). The availability of the DSR was announced by means of personal letters to all the registered I&APs on the distribution list, as well as by the media advertisement in a regional newspaper.

In addition, the DSR was distributed for comment as follows:

- Left in the Ogies Public Library;
- Hand-delivered/ couriered to the relevant authorities; and
- Posted on SEF's website at <http://www.sefsa.co.za>

#### **C-4.4 Final Scoping Report**

The Final Scoping Report (FSR) will be updated with comments and/or concerns raised by I&APs during the commenting period of the DSR. The FSR will be submitted to the Department of Environmental Affairs (DEA) and registered I&APs simultaneously for review and comment for a period of 30 days. Registered I&AP's will be advised to submit any comments on the FSR directly to the DEA prior to the lapsing of the 30 day review period.

#### **C-4.5 Public Review of the Draft Environmental Impact Report**

A period of 40 calendar days will be provided to the General Public and State Departments for the review and commenting phase of the Draft Environmental Impact Report (EIR) including the Draft Environmental Management Programme (EMP) and all specialist studies.

The availability of the Draft EIR and supporting documents will be announced by the following means:

- Distribution of letters by fax/ by hand/ post/ email to all registered I&AP's.

In addition, the Draft EIR will be distributed for comment as follows:

- Left in the Ogies Public Library;
- Hand-delivered/ couriered to the relevant authorities; and
- Posted on SEF's website at <http://www.sefsa.co.za>

#### **C-4.6 Final Environmental Impact Report and Environmental Management Programme (EMPr)**

The Final EIR and Section 102 EMPr will be updated with comments and/ or concerns as raised by I&APs during the commenting period of the Draft EIR. The Final EIR will be submitted to the DEA and DMR and registered I&APs simultaneously for review and comment for a period of 30 days. Registered I&AP's will be advised to submit any comments on the Final EIR directly to the DEA and DMR prior to the lapsing of the 30 day review period.

The availability of the Final EIR and EMPr and supporting documents will be announced by the following means:

- Distribution of letters by fax/ by hand/ post/ email to all registered I&AP's.

In addition, the Final EIR will be distributed for comment as follows:

- Left in the Ogies Public Library;
- Hand-delivered/ couriered to the relevant authorities; and
- Posted on SEF's website at <http://www.sefsa.co.za>

#### **C-4.7 Meetings**

Public and/ or Stakeholder meetings will be arranged as and when required.

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## **SECTION D: IDENTIFICATION OF IMPACTS**

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### **D-1 IDENTIFICATION OF IMPORTANT ENVIRONMENTAL IMPACTS**

The key environmental impacts listed in the following section have been determined through:

- Legislation; and
- Experience of the Environmental Assessment Practitioner (EAP).

The following issues were initially identified and, amongst others, will be carried forward into the EIR phase for further investigation and assessment:

#### **D-1.1 Biophysical Impacts**

##### **Biophysical Impacts:**

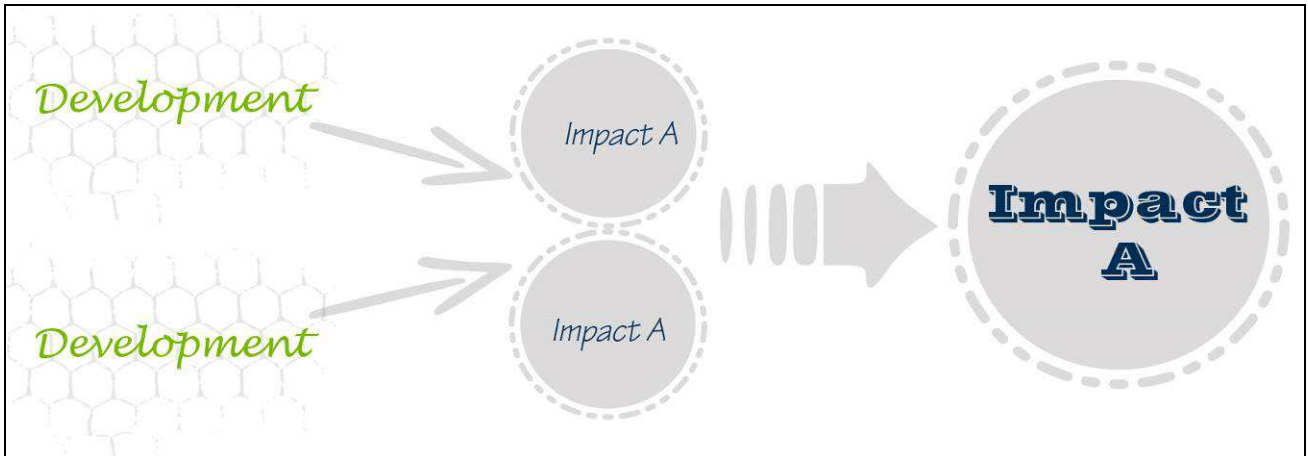
- Potential impacts on surface water resources that occur in close proximity to the proposed surface footprint;
- Potential impacts of increased surface water run-off (viz. increased soil erosion) associated with the establishment of hard surfaces and vegetation clearing (mainly during the construction phase);
- Potential impacts on ground and surface water quality due to hydrocarbon spillages during the construction and operational phase of the development;
- Destruction of flora within the proposed area, stemming from activities such as vegetation clearing and topsoil stripping within the identified site; and
- Faunal displacement due to increased level of activity and associated noise;

#### **D-1.2 Socio-Economic Impacts**

- Increased dust and noise generation as a result of the enlarged mine footprint;
- Change in the visual character of the area;
- Potential impacts on existing cultural and heritage resources;
- Potential loss of viable and high potential agricultural land; and
- Job creation during the construction and operational phases of the proposed project.

### **D-2 IDENTIFICATION OF CUMULATIVE IMPACTS**

Cumulative impacts, as illustrated below, occur as a result from the combined effect of incremental changes caused by other activities together with the proposed mine development. In other words, several developments with insignificant impacts individually may, when viewed together, have a significant cumulative adverse impact on the environment (see Figure 8 below).



**Figure 8: The Identification of Cumulative Impacts**

The following initial cumulative impacts have been identified in terms of the proposed mine development and warrant further investigation during the assessment phase:

- Increased loss of potential agricultural/ grazing land;
- Increase in surface water, storm water runoff when considered in association with the existing operations; and
- Increased visual impacts associated opencast coal mining in the area



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## SECTION E: ALTERNATIVES

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### E-1 IDENTIFICATION OF ALTERNATIVES

The EIA procedures and regulations stipulate 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. During the EIR phase of the project, the identified alternatives will be assessed, in terms of environmental acceptability as well as socio-economic feasibility. To define the term alternatives as per Government Notice No. 543 of the NEMA EIA Regulations 2010 means:

*“...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.”*

The alternatives below will be further investigated during the EIR phase of the project (Refer to figure 14 for the linear route alternatives):

#### **Alternative 1 (Preferred Alternative)**

AEMFC was awarded a Mining Right in August 2010 to mine for coal on the remaining extent of Portions 3 and 10, Portions 20, 21 and 24 of the Farm Vlakfontein 569 JR in the Emalaheni Magisterial District. Vlakfontein Mine is currently mining coal by means of open cast mining methods on the block known as Central Block. AEMFC now wishes to expand the mine footprint in an easterly direction (this application).

Prior to the commencement of the environmental process for the proposed Vlakfontein Mine – East Block, the Applicant undertook a feasibility assessment in order to identify the area for the preferred extension. The proposed area (as outlined on the layout plan in Appendix 3) was selected based on a number of criteria (amongst others) such as the topography of the land and the depth of the coal seam. No other site location alternatives for the surface infrastructure have been considered to be viable.

Opencast Strip Mining is currently being successfully undertaken at the existing Central Block (adjacent to the proposed East Block). Due to the shallow depth of the coal seam, underground mining would be less safe, more difficult and significantly more expensive when compared to the opencast mining method. Opencast mining will therefore also be the preferred mining method for the proposed East Block.

#### **Alternative 2: No Development Alternative**

This option assumes that a conservative approach would ensure that the environment is not impacted upon as would currently be the case and the land would remain used for the purposes of maize production. It is important to state that this assessment is informed by the current condition of the area. Should the DEA and/or DMR decline the application, the ‘No-Go’ option will be followed and the status quo of the site will remain (i.e. the site will remain as agricultural use).

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## **SECTION F: PLAN OF STUDY FOR EIR PHASE**

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### **F-1 SCOPE AND PURPOSE OF THE EIR PHASE**

The EIR phase will focus on the proposed Vlakfontein Mine – East Block and the associated impacts thereof. The next step of the S&EIR process is the development of guidelines for the execution of the impact assessment and the compilation of an Environmental Impact Report, as well as an Environmental Management Programme (EMPr). The compilation of these documents will take into account all comments and concerns raised by I&APs which are captured within the Comments and Responses Report (CRR) as well as the findings of various specialist studies.

The Final EIR and amended EMPr will be submitted to the DEA and the DMR for consideration towards Environmental Authorisation and the granting of a Mining Right.

### **F-2 METHODOLOGY OF THE EIR PHASE**

#### **F-2.1 Specialist Investigations and Terms of Reference**

A team of specialists were identified to provide technical and scientific input in assessing the impacts of the proposed Vlakfontein Mine – East Block. The following specialist studies will be incorporated into the Draft EIR:

- Soil, land use and land capability assessment;
- Terrestrial fauna and flora (biodiversity) assessment;
- Wetland delineation and aquatic assessment;
- Surface water (hydrology) assessment;
- Groundwater (geohydrology) assessment (excluding drilling);
- Air quality assessment;
- Heritage and archaeological assessment;
- Noise assessment;
- Socio-economic assessment; and
- Rehabilitation and Land Use Planning

The Environmental and Technical Investigation Team of Specialists will focus on discipline-specific problems and examine each significant issue in further detail through the relevant specialist studies.

As per the Environmental Management Guidelines, specialists' Terms of Reference (ToR) must be clearly defined and clarified. This is to ensure that the specialists have covered all the issues and topics in an appropriate manner and at an appropriate level of detail. The proposed studies will take into consideration the present state of the receiving environment and provide an assessment of the impacts likely to be associated with the proposed mine development, as well as mitigation measures to be used to minimise possible impacts. The ToR for each specialist study is explained in greater detail below.

##### ***F-2.1.1 Soil, Land Use and Land Capability Assessment***

The Soil, Land Use and Land Capability assessment will include the following:

- Reviewing of all existing information;
- The identification of the soil forms present on site;
- The size of the area where a particular soil form is found;

- GPS readings of the soil survey points;
- The depth of the soil at each survey point;
- Soil colour;
- Limiting factors;
- Clay content;
- Slope of the site;
- A detailed map indicating the locality of the soil forms within the specified area;
- Size of the site;
- Exact locality of the site;
- Current activities on the site, developments, buildings, etc;
- Surrounding developments/ land uses and activities in a radius of 500 m of the site;
- Access routes and the condition thereof;
- Current status of the land (including erosion, vegetation and a degradation assessment);
- Possible land use options for the site;
- Water availability, source and quality (if available);
- Detailed descriptions of why agriculture should or should not be the land use of choice;
- Impact of the change of land use on the surrounding area; and
- A shape file containing the soil forms and relevant attribute data as depicted on the map.

#### ***F-2.1.2 Terrestrial fauna and flora (biodiversity) assessment;***

The Terrestrial Faunal and Flora (biodiversity) Assessment will aim to:

- Describe the relevant baseline conditions relating to the natural vegetation communities and faunal species in the area of investigation;
- Describe the anticipated environmental impacts on the natural vegetation and fauna during the proposed project;
- Describe how the negative environmental impacts, as described above, will be managed;
- Provide a description of the dominant and typical species occurring on site; and
- Provide a description of threatened, endemic or rare species to the Province, with an indication of the relative functionality and conservation importance of the specific community in the area under investigation.

#### ***F-2.1.3 Wetland Delineation and Aquatic Assessment***

A wetland delineation and functional assessment of the wetland(s)/ drainage line(s) on site will be conducted during the EIR phase of the project. It will identify the current condition of the wetland and identify the potential impacts of the proposed development on the wetland/ drainage line and recommend mitigation measures accordingly.

The terms of reference for the Wetland Delineation and Functional Assessment Study are therefore to:

- Identify the footprint of the wetland areas;
- Determine the Present Ecological Status (PES) of the relevant wetlands;
- Indicate possible impacts on the wetland areas; and
- Recommend mitigation measures in order to limit the impacts of the proposed development on the wetland area.

#### ***F-2.1.4 Surface Water (hydrology) Assessment***

The terms of reference for the hydrological specialist study are related to assessing the impact of establishment of an open cast coal mining facility on the surface water and vice versa:

- Reviewing of all existing information;
- Surface water / drainage lines occurrence;
- Surface water characteristics (e.g. perennial – ephemeral, effluent – influent – disconnected);
- Springs occurrence and characteristics;
- Rainfall pattern, frequency, storm events;
- Risk of flooding;
- Water quality;
- Storm water run-off calculations;
- Flow direction;
- Sediment transport, potential for erosion;
- Importance of streams in regional context and as water supply source;
- Possible use of surface water for water supply during construction and operation;
- Risks of pollution;
- Stormwater catchment hydrology;
- Catchment areas;
- Slope categories;
- Average slope of rivers;
- Land use categories percentage distribution per sub catchment;
- Channel length and 10/85 slope;
- Representative cross sections for use in flood routing;
- Watercourse hydraulics and flood line determination;
- Flood peaks;
- Flood levels and flow velocity distributions at recognised watercourse cross sectional chainages;
- Flood hazard assessments;
- Contaminant transport;
- Watercourse sedimentation dynamics; and
- Site specific stormwater management.

#### ***F-2.1.5 Groundwater (geohydrology) Assessment (excluding drilling)***

The terms of reference for in this investigation is as follows:

- Reviewing of all existing information;
- Determine aquifer parameters;
- Using numerical groundwater models to determine viable options; and
- Performing risk assessments to determine the sustainability of the options.

#### ***F-2.1.6 Air Quality Assessment***

The Air Quality Assessment will consist of the following components:

- Air Quality Impact Assessment; and
- Air Quality Management Plan.

The Air Quality Impact Assessment will comprise of the following:

- Reviewing of all existing information;
- Emissions inventory compilation, including identification and quantification of point and fugitive

- sources of atmospheric emissions associated:
- Construction phase;
  - Operational phase; and
  - Closure and Decommissioning phase.
- Preparation of topographical, meteorological, land use, source and emissions data required for input to the air dispersion model.
  - Simulation of ambient air pollutant concentrations and dustfall rates occurring due to mine-related emissions during proposed operations. This will include predicted PM10 ground level concentrations and dust fall out levels.
  - Evaluation of predicted air pollutant concentrations and dustfall rates on the basis of SA standards (as stipulated by the DEA), with reference also made to other local limits (specifically SANS limits) and international “good practice” criteria (e.g. EC, WHO, WB).

The Air Quality Management Plan must include the following:

- Estimation of emission control efficiencies required for each significant source;
- Identification of suitable pollution abatement measures able to realise the required dust control efficiencies, and possible contingency measures;
- Specification of source-based performance indicators, targets, and monitoring methods applicable for each source;
- Recommendation of receptor-based performance indicators and targets;
- Recommendations pertaining to record keeping, environmental reporting and community liaison.

#### ***F-2.1.7 Heritage and Archaeological Assessment***

A Heritage Impact Assessment will be undertaken in order to assess the impacts and significance in terms of heritage and Archaeological aspects and propose mitigation measures.

The ToR includes *inter alia*:

- Reviewing of all existing information;
- A desk-top investigation of the area;
- A site visit to the proposed mine development study area;
- Identify possible archaeological, cultural and historic sites within the proposed mine development area;
- Evaluate the potential impacts of the proposed mine development on archaeological, cultural and historical resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

#### ***F-2.1.8 Noise Assessment***

The terms of reference for the Noise and Vibration Impact Assessment study are to:

- Create baseline noise levels for all adjacent farms and areas;
- Predict the noise levels to be caused by the mining activities during construction and operational phases;
- Identify mitigation measures to reduce noise levels and outline the effectiveness of these; and
- Rank linear alternatives on the basis of their potential noise impacts.

#### ***F-2.1.9 Socio-economic Assessment***

The Social and Economic Impact Assessment will include the following:

- Define and describe the receiving environment (footprint, local and regional) from a social perspective, and identify, analyse and in detail assess the opportunities and constraints arising from

- or potentially limiting the proposed new mining operation; and
- Investigate the potential benefits of the proposed new mining operation in order to ensure maximum benefit to the local community.

### ***F-2.1.10 Rehabilitation and Land Use Planning***

The overall goal for reclamation and closure of the proposed Vlakfontein Mine – East Block site is to re-instate a final land use which would match the surrounding environment as far as possible, and/or acceptable, predetermined land-use by the community, ensuring that the land is stable and safe in the long-term, taking into account the unavoidable remaining, but reclaimed mining residue.

The rehabilitation specialist must therefore determine the following:

- Identify existing land use of the proposed site, as well as other areas that may be affected by the proposed mine expansion;
- Determine to what extent the identified areas will be impacted on in terms of their existing and future land use; and
- Develop a rehabilitation strategy and closure plan for the proposed East Block site, which is in line with the existing closure plan of the Vlakfontein Mine.

## **F-2.2 Approach to Assessment of Impacts**

The EAP in association with the relevant specialists will provide an outline of the approach used in the study. Assumptions and sources of information will also be clearly identified.

### ***F-2.2.1 Impact Identification and Assessment***

The EAP must make a clear statement, identifying the environmental impacts of the various phases and management of the proposed mine development. As far as possible, the EAPs must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/ her professional expertise and experience.

### ***F-2.2.2 Assessment Procedure: Proposed Impact Assessment Methodology***

For the purpose of assessing impacts during the EIR phase of the project to follow, the project will be divided into three phases from which impacting activities can be identified, namely:

|                               |  |
|-------------------------------|--|
| <b>Construction Phase:</b>    | All the construction related activities on site, until the contractor leaves the site. |
| <b>Operational Phase:</b>     | All activities, including the operation and maintenance of the proposed mine.          |
| <b>Decommissioning Phase:</b> | All activities, including the decommissioning of the proposed mine development.        |

The activities arising from each of these phases will be included in the impact assessment tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure.

|   |                   |   |
|---|-------------------|---|
| <b>Extent</b><br>The physical and spatial scale of the impact.  | 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 farms, 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 extend beyond the boundaries of South Africa.   |
| <b>Duration</b><br>The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.  | Short Term        | The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.  |
|   | Short-Medium Term | The impact will be relevant through to the end of a 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.    |
| <b>Intensity</b><br>Is the impact destructive or benign, does it destroy the impacted environment, alters its functioning, or slightly alter the environment itself?                  | 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.  |
| <b>Probability</b><br>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. | Improbable        | 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 impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%. |

**Mitigation** – The impacts that are generated by the mine can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the mine 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. Where the impact is positive, significance is noted as “positive”. Significance will be rated on the following scale:

No significance: The impact is not substantial and does not require any mitigation action;

Low: The impact is of little importance, but may require limited mitigation;

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; and

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 will be rated on the following scale:

No significance: The impact will be mitigated to the point where it is regarded as insubstantial; Low: The impact will be mitigated to the point where it is of limited importance;

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;

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;

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; and

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 an 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 will be necessary to weigh and rank all the identified criteria.

***Ranking, Weighting and Scaling*** – For each impact under scrutiny, a scaled weighting factor will be attached to each respective impact. The purpose of assigning such weightings serve to highlight those aspects considered the 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 aspect 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 (See Figure 9 below):



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

**Figure 9: Description of Bio-Physical Assessment Parameters**

**Identifying the Potential Impacts Without Mitigation Measures (WOM)** – Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:      Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x  
Weighting Factor

**Identifying the Potential Impacts With Mitigation Measures (WM)** – In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it will be necessary to re-evaluate the impact.

**Mitigation Efficiency (ME)** – The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:      Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency  
Or  
WM = WOM x ME

**Significance Following Mitigation (SFM)** – The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact will, therefore, be seen in its entirety with all considerations taken into account.

### ***F-2.2.3 Integration of Specialist's Input***

In order to maintain consistency in the impact assessment, it is suggested that all potential impacts to the environment (or component of the environment under review) should be listed in a table similar to the example shown below (more than one table will be required if impacts require assessment at more than one scale). The assessment parameters used in the table should be applied to all of the impacts and a brief descriptive review of the impacts and their significance will then be provided in the text of the specialist reports and consequently in the EIR. The implications of applying mitigation are reviewed in Section C-2.4 below.

**Table 4: Example of an Impact Table**

|                       |                    |        |   |
|-----------------------|--------------------|--------|---|
| Nature                |                    | Status | - |
| Impact source(s)      |                    |        |   |
| Affected stakeholders |                    |        |   |
| Magnitude             | Extent             |        |   |
|                       | Intensity          |        |   |
|                       | Duration           |        |   |
|                       | Reversibility      |        |   |
|                       | Probability        |        |   |
| Significance          | Without mitigation |        | H |
|                       | With mitigation    |        | L |
| Confidence            |                    |        |   |

#### ***F-2.2.4 Mitigation Measures***

Mitigation measures will be recommended in order to enhance benefits and minimise negative impacts and they will address the following:

- Mitigation objectives: what level of mitigation must be aimed at: For each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in a measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make an “educated guess” based on his/ her professional experience;
- Recommended mitigation measures: For each impact the specialist must recommend practicable mitigation actions that can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided;
- Effectiveness of mitigation measures: The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible; and
- Recommended monitoring and evaluation programme: The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented. The management objectives, design standards, etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits. National standards or criteria are examples, which can be stated as mitigation objectives.

Once the above objectives have been stated, feasible management actions, which can be applied as mitigation, must be provided. A duplicate column on the impact assessment tables described above will indicate how the application of the proposed mitigation or management actions has reduced the impact. If the proposed mitigation is to be of any consequence, it should result in a measurable reduction in impacts (or, where relevant, a measurable benefit).

#### **F-2.3 Approach to the Assessment of Cumulative Impacts**

Cumulative impacts can arise from one or more activities. A cumulative impact may result in an additive impact i.e. where it adds to the impact which is caused by other similar impacts or an interactive impact i.e. where a cumulative impact is caused by different impacts that combine to form a new kind of impact. Interactive impacts may be either countervailing (the net adverse cumulative impact is less than the sum of the individual impacts) or synergistic (the net adverse cumulative impact is greater than the sum of the individual impacts). Possible cumulative impacts of the project will be evaluated in the EIR. In addition,

various other cumulative impacts e.g. other external impacts that could arise from the project will be further investigated in the EIR phase of the project.

The assessment of cumulative impacts on a study area is complex; especially if many of the impacts occur on a much wider scale than the site being assessed and evaluated. It is often difficult to determine at which point the accumulation of many small impacts reaches the point of an undesired or unintended cumulative impact that should be avoided or mitigated. There are often factors which are uncertain when potential cumulative impacts are identified.

### ***F-2.3.1 Steps in Assessing Cumulative Impacts***

The assessment of cumulative impacts will not be done separately from the assessment of other impacts. Cumulative impacts however, tend to have different time and space dimensions and therefore require specific steps. This may even mean that some of the actions in the assessment process, that preceded general impact identification, may have to be revisited after potential cumulative impacts have been identified. This will ensure that the scope of the EIR process is adequate to deal with the identified cumulative impacts. Three (3) general steps, which are discussed below, will be recommended to ensure the proper assessment of cumulative impacts.

### ***F-2.3.2 Determining the Extent of Cumulative Impacts***

To initiate the process of assessing cumulative impacts, it is necessary to determine what the extent of potential cumulative impacts will be. This will be done by adopting the following approach:

- Identify potentially significant cumulative impacts associated with the proposed activity;
- Establish the geographic scope of the assessment;
- Identify other activities affecting the environmental resources of the area; and
- Define the goals of the assessment.

### ***F-2.3.3 Describing the Affected Environment***

The following approach is suggested for the compilation of a description of the environment:

- Characterise the identified external environmental resources in terms of their response to change and capacity to withstand stress;
- Characterise the stresses affecting these environmental resources and their relation to regulatory thresholds; and
- Define a baseline condition that provides a measuring point for the environmental resources that will be impacted on.

### ***F-2.3.4 Assessment of Cumulative Impacts***

The general methodology which is used for the assessment of cumulative impacts should be coherent and should comprise of the following:

- An identification of the important cause-and-impact relationships between proposed activity and the environmental resources;
- A determination of the magnitude and significance of cumulative impacts; and
- The modification, or addition, of alternatives to avoid, minimize or mitigate significant cumulative impacts.

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## **SECTION G: CONCLUSION AND RECOMMENDATIONS**

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In accordance with GN No. 543, the DSR is aimed at describing the proposed activity as well as the receiving environment that may be affected by the proposed mine expansion. In accordance with the EIA Regulations, an identification of relevant legislation and guidelines is also given as well as a description of the public participation process that will be followed.

In conclusion, the DSR established the scope of the proposed project throughout its phases, as well as its key impacts on the receiving and surrounding environments. The project motivation has also been described. The DSR also sets out the proposed scope of the EIR phase that will be undertaken for the proposed project.

Comments and/ or concerns identified by Interested and Affected Parties (I&APs) during the review period of the DSR will be incorporated into the FSR for further investigation during the EIR Phase to follow. The FSR and Plan of Study for the EIR phase will be submitted to the DEA and the DMR for consideration. All comments received on the FSR will also be forwarded to the DEA and the DMR for consideration.

The ability to mitigate any of the potential impacts identified in this DSR will also be investigated during the EIR phase and summarised into a working/ dynamic Environmental Management Programme (EMPr) for consideration by I&APs and ultimately by the DEA and the DMR.

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## SECTION H: REFERENCES

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- Air Quality Impact Assessment for the proposed Vlakfontein Coal Mine in the Mpumalanga Province, by Airshed Planning Professionals, December 2009.
- EIA Level: Ecological Assessment on Vlakfontein Area Northwest of Ogies, Mpumalanga by EkoInfo CC & Pachnoda Consulting, February 2010.
- Final Scoping Report – Amendment of the Environmental Management Programme (EMP) for the Vlakfontein Coal Mine to include the Proposed Vlakfontein Coal Mine Phase 2.
- Noise Impact Study for the Proposed New Vlakfontein Coal Mine, F le R Malherbe, December 2009.  
  
Proposed Coal Mining Activities on the Farm Vlakfontein 569JR, Witbank Magisterial District, Mpumalanga Province, J A van Schalkwyk, October 2009.
- Proposed Vlakfontein Coal Mine Socio-Economic Impact Report, Itekeng Development Consulting, November 2009.
- Surface water specialist report for the Proposed Vlakfontein Coal Mine, SRK Consulting, January 2010.
- Vlakfontein Coal Mine Environmental Impact Assessment: Soil Classification and Land Capability Specialist Report, SRK Consulting November 2009.
- Wetland Delineation & Impact Assessment Report for the Proposed AEMFC Coal Mine near Ogies, Mpumalanga Province, Wetland Consulting Services, November 2009.

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## **SECTION I: APPENDICES**

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**Appendix 1:** Locality Map

**Appendix 2:** Photograph Plate

**Appendix 3:** Layout Plans

**Appendix 4:** Authority Correspondence

**Appendix 5:** Public Participation