



DEDET Ref: 17/2/3C NK31

Final Environmental Assessment Report Part 1: Introduction and Project Description

Proposed Eerstelingsfontein Mine, eMakhazeni (Belfast), Mpumalanga

Client: Exxaro Coal (Pty) Ltd

Date: November 2012

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| Remarks | Draft Report for comment | Final Report for comment | | |
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1 INTRODUCTION

Exxaro Coal (Pty) Ltd (Exxaro) is proposing to mine a coal resource at the Eerstelingsfontein site, south of eMakhazeni (formally Belfast), Mpumalanga. WSP Environment & Energy (WSP) was appointed by Exxaro to fulfil the role of independent Environmental Assessment Practitioner (EAP) in November 2010 to undertake the environmental assessment process.

The proposed Eerstelingsfontein Mine triggers a number of listed activities according to the Environmental Impact Assessment (EIA) Regulations of the National Environmental Management Act (107 of 1998) (NEMA). With the commencement of minor works on site, the project is the subject of a NEMA Section 24G application in order to obtain the necessary environmental authorisation from the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET).

An Environmental Assessment Report has been prepared to provide all the necessary information required by MDEDET to allow them to make a decision with regard to the proposed Eerstelingsfontein Mine. The report has been structured as follows:

- Part 1: Introduction and Project Description (**this document**)
- Part 2: Environmental Assessment
- Part 3: Environmental Management and Closure Plan

This report represents the **final** Environmental Assessment Report and includes all updates made in **red text** to the draft Environmental Assessment Report following the 40 day consultation period. Any comments received on this final Report will need to be submitted directly to the Competent Authority, MDEDET for consideration in the determination of this Section 24G application.

1.1 PROJECT BACKGROUND

Exxaro operates a coal mining complex in the province of Mpumalanga, situated outside of the town of eMakhazeni. This complex is referred to as the North Block Complex (NBC) and consists of the Glisa and Strathrae coal mines as well as the proposed Eerstelingsfontein and Belfast Block projects. The NBC utilises both underground and opencast mining methods, and the coal mined is sold to various Eskom power stations.

The current coal supply from NBC's opencast and underground sections is expected to be exhausted within the next 3 to 4 years (end 2014). All the coal mined at NBC is blended to meet Eskom's quality specifications. Exxaro NBC is liable for substantial penalties in the event of under supply to Eskom. As the current coal reserves near the end of their lifespan, the quality (calorific value) of the coal reserve is deteriorating. The mining of Eerstelingsfontein site is required to provide the high quality coal required to blend with the coal from NBC's current operations. Without good quality coal to blend, Exxaro NBC would not be able to meet the contract requirements with Eskom and the substantial penalties will force the closure of the entire NBC operation.

The Eerstelingsfontein site, with a total lifespan of 2 years, will provide a short term bridge supply of coal necessary to allow NBC to remain operational until the proposed Belfast Block project comes on line. The Belfast Block is a significant coal resource (mining right area of ± 5820ha) approximately 10km northwest of eMakhazeni (Belfast).

A detailed project background and motivation, outlining the overall need for the Eerstelingfontein Mine is provided in **Section 4**.

Investigations associated with the proposed Eerstelingsfontein Mine span in excess of 10 years. Submission of an Environmental Management Programme Report (EMPR) (GCS, 2004) resulted in the receipt of a mining right in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002) in June 2008. In addition, Exxaro received an integrated Water Use License in terms of the National Water Act (NWA) (No. 36 of 1998) in February 2010.

1.2 SITE LOCATION

The proposed Eerstelingsfontein Mine is located approximately 100km from Ermelo and 20km south of eMakhazeni on the farm Eerstelingsfontein 406 JT, Mpumalanga (**Figure 1**). The site lies within the eMakhazeni Local Municipality and the Nkangala District Municipality.

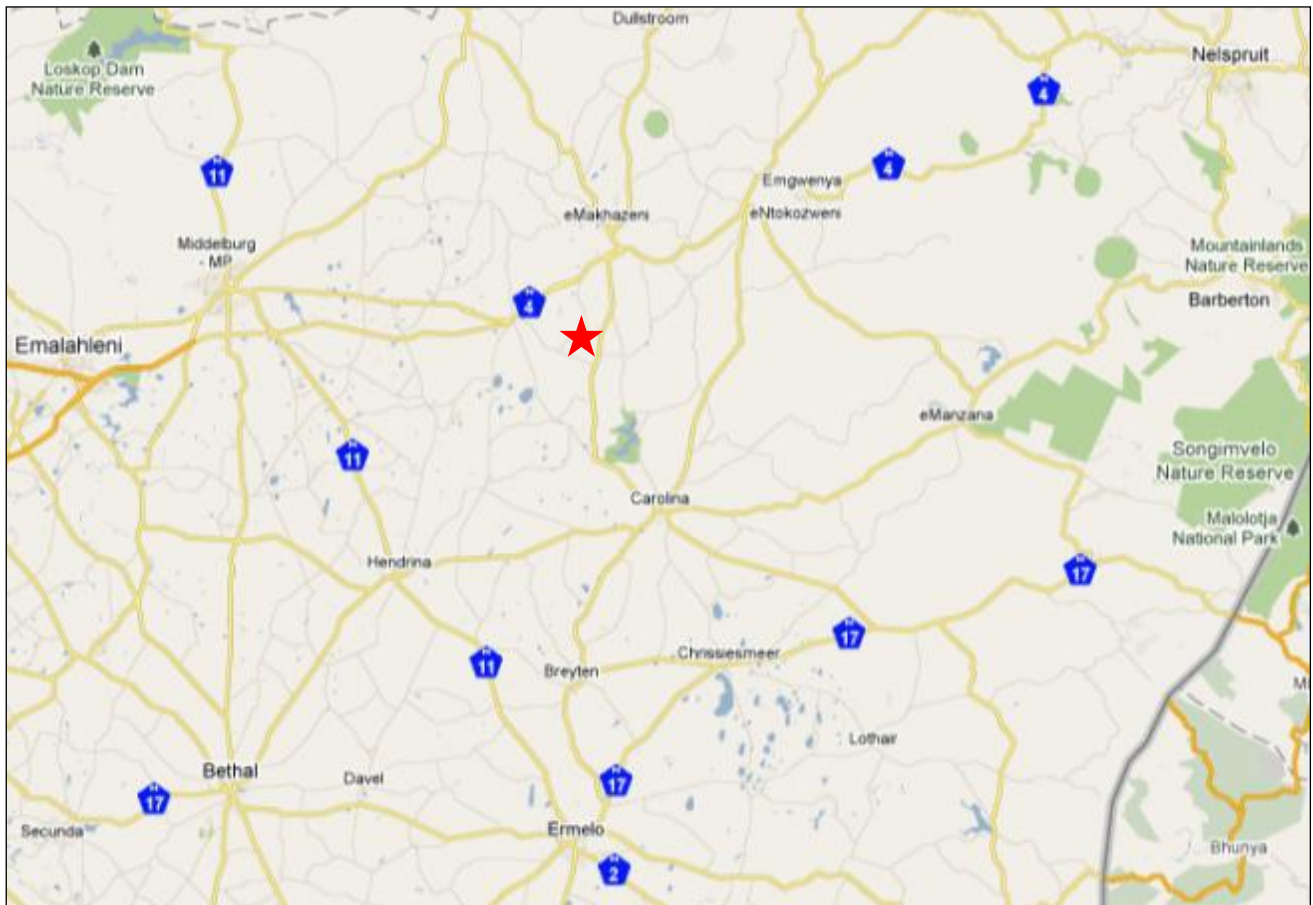


Figure 1 Site Location and Regional Context (Google Maps, 2010)

1.3 PROJECT OVERVIEW

The Eerstelingsfontein site will be an open cast mine, and will form part of Exxaro's NBC Glisa Colliery, located just outside eMakhazeni. The site is intended to be mined using the open cast strip mining method. The coal reserve on site is a high quality, low sulphur coal with a single seam at a depth between 5m and 19m. It is estimated that a total of 2.4 million tons of coal will be mined during a period of 2 years. Coal mined at Eerstelingsfontein will be transported to Glisa Colliery, where it will be processed.

The proposed site comprises 8 portions of the farm Eerstelingsfontein 406 JT (Mpumalanga), totalling 314 hectares (ha) in extent.

1.3.1 Project Scope

The proposed coal mine will consist of:

- A total development footprint of approximately 227 ha, consisting of:
 - Open cast pit: 110 ha
 - Buildings and plant equipment: 64 ha
 - Other (i.e. road infrastructure; stockpile areas, etc.): 53 ha
- 2 x coal stockpiles of approximately 15 000m³ each (30 000m³ total volume);

- 2 x overburden stockpiles for temporary stockpiling (<90 days, storage volume unknown) prior to returning material to the pit (roll over method);
- 1 x pollution control dam with an area of 6 050m², volume of 12 332m³, and height of 2.8m;
- Sewage septic tanks and associated treatment system with an estimated annual capacity of 2400 to 6000m³,
- 11 KV power line; and
- On site road infrastructure.

A detailed project description is included in **Section 4**.

1.3.2 Commencement of Activities

Site establishment activities occurred on the Eerstelingfontein site during the period March and June 2010. Commencement of activity on site was in the form of construction of the main haul road to service mining activities on site. The activity is characterised by an excavation across the site (on a north-west transect). The overall footprint of the excavation represents approximately 1 ha of disturbance. A more detailed description of the on-site activities undertaken is provided in **Section 4**.

The Section 24G application (for which this report has been compiled as supporting documentation) is seeking approval for the activities which commenced in 2010, as well as overall approval of the proposed project as a whole.

1.4 PROJECT APPLICANT

The applicant for the proposed Eerstelingsfontein Mine is Exxaro Coal (Pty) Ltd (**Table 1**).

Table 1 Applicants Details

| Project Applicant: Exxaro Coal (Pty) Ltd | |
|--|----------------------------|
| Contact Person: | Simon Mkhonza |
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| Fax: | 013 253 7360 |
| E-mail: | simon.mkhonza@exxaro.com |

1.5 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

WSP was appointed by Exxaro Coal (Pty) Ltd to fulfil the role of independent EAP to facilitate the environmental authorisation process (**Table 2**). WSP is a leading international environmental consultancy with a broad range of expertise in the environmental industry. WSP is a subsidiary of WSP Group plc, a global consultancy which is listed on the London Stock Exchange. WSP has successfully project managed a number of high profile environmental projects in South Africa over the past 20 years.

Table 2 EAP Details

| Environmental Assessment Practitioner: WSP Environmental (Pty) Ltd | |
|--|--|
| Contact Person: | Hilary Konigkramer |
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| | |
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2 LEGAL FRAMEWORK

It is essential to develop an understanding of the legal framework applicable to the project at the outset to avoid future process delays and the incurring of unnecessary expenses. WSP have undertaken a comprehensive legal review and the legislation which has a bearing on the proposed Eerstelingsfontein Mine is summarised below.

2.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002)

The Mineral and Petroleum Resources Development Act (MPRDA) makes provision for the equitable access to, and sustainable use of, South Africa's mineral and petroleum resources. The Act provides a framework for the environmentally sustainable exploitation and management of mineral resources. The submission of an Environmental Management Programme Report (EMPR) resulted in a mining right being issued to the former Eyesizwe Coal (Pty) Ltd, now known as Mpumalanga Coal (Pty) Ltd (a subsidiary of Exxaro Coal Limited) for the proposed Eerstelingsfontein Mine (**Appendix A**):

- Mining Right No 680/2008 (Ref: F2004/10/08/01, issued to Eyesizwe Coal (Pty) Ltd on 12.06.2008 for Remainder of Portions 2, 3, 4, 5, 6, 7, 8 and 9 of the Farm Eerstelingsfontein 406 JT.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107 OF 1998)

The National Environmental Management Act (107 of 1998) (NEMA) provides for an environmental legislative framework for South Africa. Activities associated with the proposed Eerstelingsfontein Mine fall within the ambit of NEMA due to the potential for the project to impact on the environment.

EIA Regulations containing listed activities which require environmental authorisation prior to commencement have been promulgated under NEMA. Since the inception of NEMA, two sets of EIA regulations have been promulgated:

- (1) 2006 EIA Regulations (GN: R385) and associated listed activities (GN: R386 and 387), effective 21 April 2006 to 1 August 2010; and
- (2) 2010 EIA Regulations (GN: R543) and associated Listing Notices (GN: R544, 545, and 546), effective 2 August 2010 onward.

The EIA Regulations (2006 and 2010) contain listed activities which require either a basic assessment process, or a more onerous Scoping and EIA process in order to obtain environmental authorisation from the competent authority.

2.2.1 Legal Framework for Activities Already Commenced

According to Section 24G of NEMA, a listed activity cannot commence unless the competent authority has granted environmental authorisation for the activity. Unauthorised commencement of activities identified in terms of the EIA regulations can be rectified by means of an application for the Minister (or relevant MEC, in this case MDEDET).

As the site establishment activities were undertaken prior to 2 August 2010 (date on which new 2010 EIA regulations came into effect), the 2006 EIA regulations for the rectification of potential non-compliance is applicable legal framework for the authorisation of this project.

The 2006 EIA Regulations applicable to the site establishment activities, and the project as a whole, are presented below (**Table 3**).

Table 3 **Applicable 2006 EIA Regulations**

| GN: R386 requiring a Basic Assessment procedure | | |
|---|--|--|
| No | Description of activity | Applicability |
| 15 | The construction of a road that is wider than 4m or that has a reserve wider than 6m, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30m long. | Applicable: Construction of the main haul road, exceeding the thresholds provided, commenced on site in 2010. |
| GN: R387 requiring a Scoping and EIA procedure | | |
| No. | Description of activity | Applicability |
| 2 | Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more | Applicable: Excavations on site have been observed and can be considered as the commencement of strip mining. While the excavation itself has a footprint of ± 1 hectare, it represents the commencement an activity which is intended to be ± 227 hectares |

The activities listed (Table 3) required a Scoping and EIA process to be undertaken, and environmental authorisation issued, prior to commencement. A Section 24G application has been prepared and submitted to MDEDET in order to facilitate approval for these activities. This report has been prepared in support of this application.

2.2.2 Legal Framework for Proposed Activities

The scope of the Section 24G application (Section 2.2.1) covers construction of roads, and the entire development of the site (227 ha footprint) in the context that these activities commenced prior to receipt of an environmental authorisation. In addition to this, WSP has reviewed the 2010 EIA Regulations to identify whether any additional activities, which do not fall within the scope of the Section 24G application, apply to the proposed development.

The 2010 EIA Regulations applicable to the proposed Eerstelingsfontein Mine are presented below (Table 4).

Table 4 Applicable 2010 EIA Regulations

| Listing Notice 3 - GN: R546 requiring a Basic Assessment procedure | | |
|--|---|---|
| No | Description of activity | Applicability |
| 4 | The construction of a road wider than 4 metres with a reserve less than 13.5 metres (a) In Mpumalanga, (ii) outside urban areas in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. | Applicable: Road infrastructure is proposed within areas of the site which are defined as both sensitive areas and critical biodiversity areas in terms of the Mpumalanga Biodiversity Conservation Plan (which is considered to be an environmental management framework and systematic biodiversity plan). |
| 12 | The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation. (b) Within critical biodiversity areas identified in bioregional plans. | Applicable: mining infrastructure within critical biodiversity areas will require the clearance of more than 300m ² of vegetation where 75% of vegetation cover is indigenous. |
| 13 | The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, (a) In Mpumalanga, outside urban areas in (cc) Sensitive areas as identified in an environmental management | Applicable: mining infrastructure, within sensitive and critical biodiversity areas, will require the clearance of more than 1ha of vegetation, where 75% of the vegetation cover is indigenous. |

| | | |
|--|--|--|
| | framework as contemplated in chapter 5 of the Act and as adopted by the competent authority | |
| | (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans | |

The activities listed (**Table 4**) require a Basic Assessment process, and environmental authorisation issued, prior to commencement.

As the Section 24G application is seeking approval for the entire development, which includes development of sensitive areas, it is WSP's opinion that there is no merit for the submission of a separate 2010 EIA application form for approval of the Listing Notice 3 activities. WSP has discussed the issue with MDEDET and no further instruction was received in this regard.

2.3 NATIONAL WATER ACT (36 OF 1998)

The National Water Act (NWA) aims to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. Section 21 of the NWA identifies water uses which require a license. The Section 21 listed activities applicable to the proposed Eerstelingsfontein Mine are outlined below (**Table 5**).

Table 5 Listed activities according to the National Water Act

| Section 21: Water uses requiring licensing | |
|--|--|
| No | Description of activity |
| (a) | Taking water from a water resource |
| (c) | Impeding or diverting the flow of water in a watercourse |
| (g) | Disposing of waste in a manner which may detrimentally impact on a water resource |
| (i) | altering the bed, banks, course or characteristics of a watercourse |
| (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 Department of Water Affairs (DWA) issued Exxaro Coal (Pty) Ltd – North Block Complex with a license for the above mentioned water uses on 28 January 2010 (**Appendix B**). Each water use has been authorised, with stipulated thresholds and is subject to specific conditions. The license is valid for a period of 5 years.

2.4 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (59 OF 2008)

The National Environmental Management: Waste Act (NEM:WA) serves to reform the law regulating waste management in order to protect human health and the environment. The NEM:WA protects the health, well-being and the environment by providing reasonable measures for minimisation of consumption of a natural resource, minimising general waste, reducing, re-using, recycling and recovering waste, safely treating or disposing waste as a last resort, preventing pollution and ecological degradation, securing ecological sustainable development. The Act also promotes economic and sustainable development, promotes and ensures effective delivery of waste services, remediating land where contamination is or could be present, and achieving integrated waste management.

Regulated under NEM:WA is GNR: 718 which comprises a list of waste management activities that have or are likely to have a detrimental effect on the environment. Activities included in GNR: 718 require a Waste Management License and in turn require a Basic Assessment (Category A activities) or Scoping and Environmental Impact Assessment (EIA) (Category B activities) in terms of the NEMA EIA Regulations.

Following a thorough review of GNR: 718, it is concluded that a Waste Management License is not required for the infrastructure associated with the Eerstelingsfontein Mine. The proposed pollution control dam does not trigger the

GN R:718 listed activities and has been permitted as part of the Integrated Water Use License (dated January 2010) issued under the National Water Act (see Section 2.1.3).

2.5 NATIONAL HERITAGE RESOURCES ACT (55 OF 1999)

The National Heritage Resources Act (NHRA) established the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. Section 38(1) provides a list of activities which require a Heritage Impact Assessment to be undertaken by a heritage specialist approved by SAHRA (Table 6).

Table 6 Listed activities in terms of the National Resources Heritage Act

| Section 38(1) listed activities requiring a Heritage Impact Assessment | | |
|--|---|--|
| No. | Description of activity | Applicability |
| (a) | the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; | Road infrastructure exceeds 300m in length. |
| (c) | any development or other activity which will change the character of a site: (i) exceeding 5 000 m ² in extent; or (ii) involving three or more existing erven or subdivisions thereof | The site is 310ha (3 100 000m ²) in extent, and the development footprint proposed is 227ha (2 270 000m ²). The character of the site will be changed and proposed property to be affected consists of 8 erven (portions). |
| (d) | the re-zoning of a site exceeding 10 000 m ² in extent | The site (3 100 000m ²) is currently zoned "agriculture" and will be re-zoned. |

3 APPROACH AND METHODOLOGY

3.1 OVERALL PROCESS AND METHODOLOGY

The environmental authorisation application process was initiated in February 2011 as a Basic Assessment Procedure in terms of the 2010 EIA Regulations. Authority consultations and initiation of the stakeholder engagement process were undertaken in terms of the requirements of the 2010 EIA Regulations.

Following confirmation from MDEDET (**Appendix C**) that the project should seek authorisation under the Section 24G rectification process, the original application for authorisation was withdrawn and a Section 24G application submitted.

Subsequently, following a thorough review of the 2010 EIA regulations and guidance from the biodiversity project specialists, it was determined that Listing Notice 3 (GN: R546) activities apply to the project, which require an application for environmental authorisation (**Section 2.2**).

The Section 24G process (**Figure 2**) requires submission of an application, following which the competent authority advises the applicant of the administrative fine payable with respect to the activities which have commenced unlawfully. The authority considers the application and supportive documentation submitted to issue a decision as to whether the activity should be authorised or not.



Figure 2 Diagram illustrating the Section 24G process

MDEDET have confirmed that correspondence with regard to the administrative fine will occur after the application and final report have been reviewed and considered. The administrative fine will need to be paid prior to the issue of the decision on the project.

Initial activities in terms of the original and subsequent 2010 EIA applications, as well as activities undertaken under the framework of the Section 24G application all collectively contribute to the overall fulfilment of the NEMA requirements. The methodology associated with the project is outlined below.

3.2 AUTHORITY CONSULTATION

3.2.1 Lead Authority Pre-Consultation

A meeting was held with the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), lead authority for the application, on 10 December 2010 at the DEDET offices in Witbank. Project information was provided to the authority, in the form of a presentation. The objectives of the meeting were to provide an overview of the proposed project, confirm acceptance of WSP's approach to the EIA process and to receive initial comments on particular issues required to be addressed during the process. The outcomes of the meeting were recorded and meeting notes circulated to all those who attended (**Appendix C**).

3.2.2 Application for Authorisation

- Application for Environmental Authorisation (in terms of 2010 EIA listed activities)

The initial "Application for Authorisation" form was submitted to MDEDET on 14 February 2011, which was acknowledged on 8 March 2011. Following a site inspection by officials on 4 April 2011 the application was withdrawn by MDEDET. Exxaro was instructed to commence with a Section 24G application for rectification of the unlawful commencement of a listed activity without authorisation (Section 2.2.2) (**Appendix C**).

- Section 24G Application (to approve 2006 EIA listed activities)

Subsequently, a Section 24G application form was submitted to MDEDET (in the form of an interim submission) on 2 June 2011. MDEDET acknowledged receipt of the application on 8 June 2011, providing the official reference number: **17/2/3/C NK31**.

Following the completion of specialist studies and the undertaking of a comprehensive environmental impact assessment exercise, the Section 24G application form has been finalised for MDEDET consideration (**Appendix C**). This report has been prepared in support of the Section 24G application.

3.2.3 Authority Consultation

Project information, in the form of a Background Information Document (BID) (**Section 3.3.2**), was circulated to all relevant authorities. No comments were submitted in response to the distribution of initial project information.

3.2.4 Continued Authority Involvement

The Draft Environmental Assessment Report **has been** circulated to all relevant authorities for comment. Relevant authorities **have been** invited to attend a meeting where the Draft Report **was** presented and discussed. All formal comments received on the Draft Report **have been** included in the issues trail, and incorporated into **this** Final Report for submission to MDEDET for approval.

3.3 STAKEHOLDER ENGAGEMENT

The NEMA EIA Regulations (Section 54 to 57) require an inclusive, transparent process of engagement to allow participation of all stakeholders and members of the public who may be affected by, or have an interest in, the proposed project.

3.3.1 Stakeholder Database

An electronic stakeholder database was developed at the outset of the EIA process. The database has expanded to include new stakeholders registering during the process in response to media advertisements, notices and circulation of documents (**Appendix D**). WSP has maintained and updated the electronic database throughout the EIA process.

3.3.2 Legal and Written Notices

■ Advertisements

A 'Notice of Environmental Impact Assessment Process' was placed in the regional newspaper, the *Lowvelder*, on 25 February 2011, in accordance with the EIA Regulations (**Appendix D**). The distribution of the *Lowvelder* includes the following areas:

- Nelspruit; White River; Lydenburg; Malalane; Barberton; Belfast; Shongwe; KNP; Bushbuckridge; Sabie; Kanyamazane; Dwarsoop; Machadorp; Badplaas; Burgersfort; Carolina

The contact details of stakeholders who responded to these notices were added to the database.

■ Site Posters

The NEMA EIA Regulations require that site notice boards be erected, at a place conspicuous to the public, at the boundary or on the fence of the site where the proposed activity is to be undertaken, and at any alternative sites. The purpose of the site notices is to notify surrounding landowners of the proposed project and to facilitate their registration as stakeholders for inclusion in the stakeholder engagement process.

On 1 March 2011, a total of 12 English and Afrikaans site notices (**Appendix D**) were placed at the following locations in and around the proposed site:

- At the intersection of the R33 to Carolina and the N4;
- At the intersection of the N4 and the Eerstelingsfontein Road;
- At the Municipal offices located in eMakhazeni (Belfast);
- At the entrance to the site located off the R33 from eMakhazeni to Carolina; and
- At the intersection of the R33 and the road to Dalmanutha.

■ Written Notices

During the initiation of the original EIA process, written notice (**Appendix D**) was delivered (by hand or registered post) to the following relevant stakeholders during March 2011:

- Owners and occupiers of neighbouring farms;
- The municipal ward councillor of the area;
- The eMakhazeni Local Municipality and Nkangala District Municipality; and

- Organs of state which have jurisdiction in respect to the activity: Departments of Mineral Resources; Water Affairs; and Agriculture.

3.3.3 Background Information Document

A Background Information Document (BID) was prepared and distributed to stakeholders in early March 2011. The BID provided a brief description of need for the proposed project, location and project description and provided details on stakeholder involvement in the EIA process. The BID include a comment form to allow stakeholders the opportunity to submit initial comments on the proposed project. All comments received in response to this document have been included in the Scoping Phase issues trail and appropriate response provided (**Section 3.3.5**)

3.3.4 Draft Report Availability

The Draft Environmental Assessment Reports were circulated 17/18 May 2012. A cover letter went with each report advising the recipient of the comment period (18 May to 25 June) and the public meeting details. In addition, a notification was distributed to all stakeholders on our database advising them of the availability of the report and the comment period (provided in Appendix D). WSP provided a copy of the report at the Highlands Library in Belfast, and on our website.

All comments received on the draft report **have been** included in the issues trail, responded to, and incorporated into this Final Environmental Assessment Report as **red text**.

Attached, in Appendix D is a list of all those who received hard copies of the report. WSP followed up with all recipients to confirm their receipt of the draft report.

3.3.5 Public Meeting

Following the release of the draft Environmental Assessment Report a public meeting was scheduled. The public meeting was held on the 12th June 2012 at the Belfast Golf Club at 4pm. All registered I&APs were invited to attend the meeting and follow-up phone calls were made in advance of the meeting to ensure all I&APs were afforded a fair opportunity to attend the meeting.

Representatives from the neighbouring farms, Zenzeleni community and Exxaro attended the meeting. The signed attendance registers are included within Appendix D. A total of 30 people attended the meeting. Minutes were taken of the meeting, there were distributed for comment prior to them be finalised and translated into Zulu. The Zulu minutes were distributed to the community by Ernst Van Der Berg. The English and Zulu minutes are included in Appendix D.

3.3.6 Issues Trail

An issues trail has been developed providing an overview of the outcomes of stakeholder engagement and consultation (**Appendix D**). The issues trail documents potential issues and impacts, and includes responses where appropriate.

No comments have been received from any State Departments despite efforts being made to obtain formal comments. These efforts included Exxaro meeting with the Departments and a formal request from WSP to the Department of Environmental Affairs in July 2012 to write to all the State Departments formally requesting comments on the draft Report within 40 days. In total, approximately 4 months have been afforded to the public including the State Departments to comment on the draft Environmental Assessment Report. To date, the only comments received on this application are those raised at the public meeting which have been captured within the minutes of the meeting and formal comments received within a letter and a supporting document from Ms J Doyer, a neighbouring land owner. As such, the issues trail includes comments captured at the meeting and the comments raised in the single formal comment received. Any further comments received on the final Environmental Assessment Report will be sent directly to the Department of Environmental Affairs in their determination of this Section 24G application.

3.4 SPECIALIST INPUTS

Due to the nature of the proposed activity, a wide range of specialist investigations have been undertaken (**Table 7**), the findings of which are described and assessed in **Part 2: Environmental Assessment**.

Table 7 Specialist inputs

| Specialist Studies | Specialist Consultant |
|--|---|
| Terrestrial and Aquatic Ecology | Natural Scientific Services CC |
| Water and Salt Balance | WSP Environment & Energy |
| Surface Water Assessment | WSP Environment & Energy |
| Groundwater Assessment | WSP Environment & Energy; in collaboration with the Institute of Groundwater Studies, University of Free State. |
| Air Quality Assessment | WSP Environment & Energy |
| Noise Assessment | WSP Environment & Energy |
| Heritage Impact Assessment | Archaetnos CC |
| Visual Impact Assessment | B Gebhardt |
| Socio-Economic Assessment | WSP Environment & Energy; in collaboration with Nomad Socio-Economic Consulting CC |
| Blast and Vibration Assessment | Blast Management & Consulting |
| Traffic Impact Assessment | WSP Environment & Energy |
| Agricultural Land Use Assessment | WSP Environment & Energy |
| Rehabilitation and Closure Assessment | WSP Environment & Energy |

3.5 ASSESSMENT REPORTING

The reporting has been compiled, taking into consideration the NEMA 2010 EIA Regulations reporting requirements, with the primary objective of providing all the information necessary for the competent authority to consider and reach a decision on the Section 24G application (which is seeking approval of the entire development). The Environmental Assessment Report is structured as follows:

- Part 1: Introduction and Project Description (**this document**); consisting of:
 - Introduction
 - Legal Framework
 - Approach and Methodology
 - Project Description
 - Project Alternatives
 - Description of the Receiving Environment
- Part 2: Environmental Assessment
 - Introduction
 - Assessment Methodology
 - Specialist Chapters
 - Impact Assessment Matrix
 - Discussion
 - Conclusion
- Part 3: Environmental Management Programme and Closure Plan
 - Environmental Management Programme (EMPr)
 - Closure and Rehabilitation Plan

4 PROJECT DESCRIPTION

4.1 PROJECT CONTEXT

Exxaro operates the North Block Complex (NBC) in the province of Mpumalanga, situated outside of the town of eMakhazeni. The NBC consists of the Glisa Colliery as well as the proposed Eerstelingsfontein and Belfast Block projects (Figure 3).

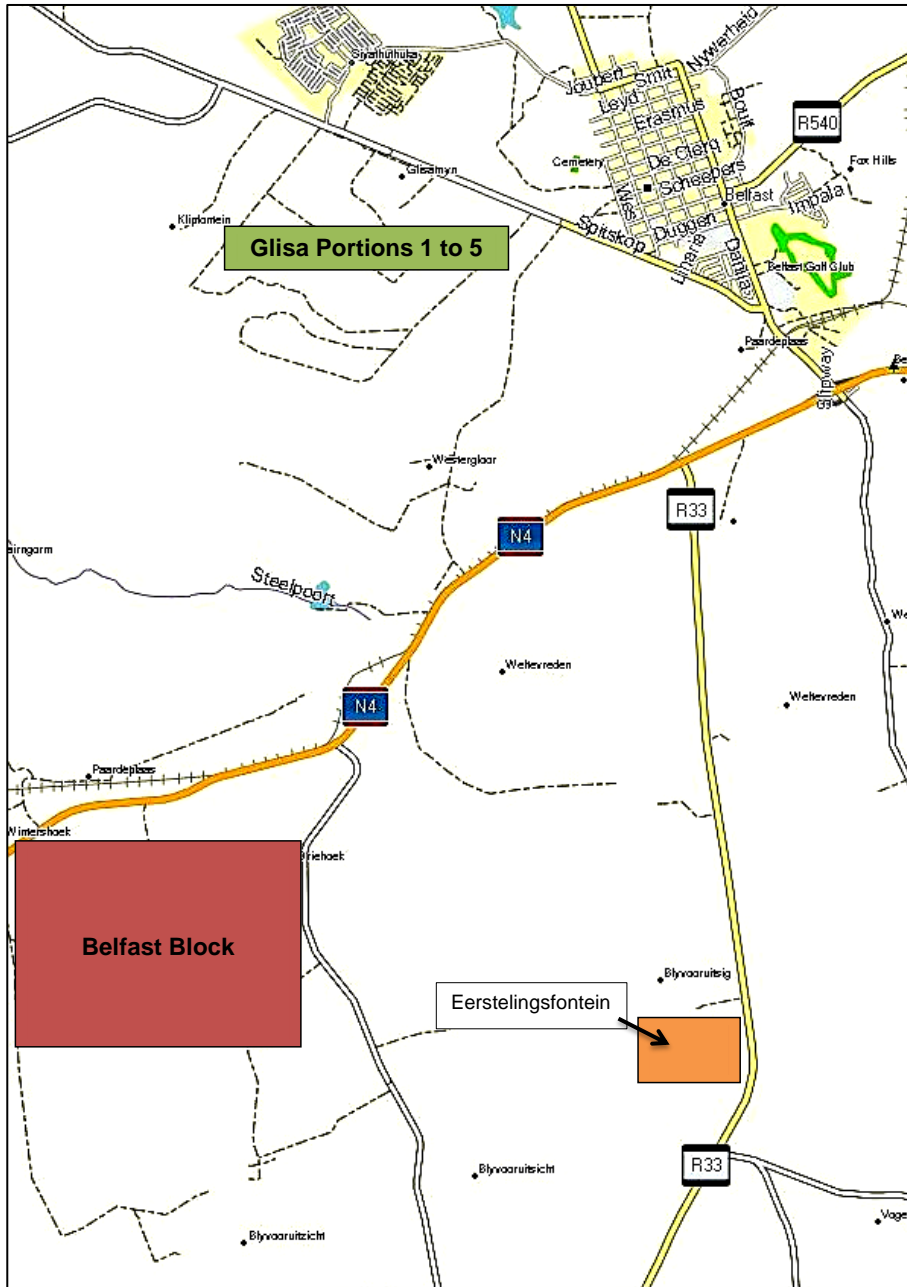


Figure 3 Exxaro NBC's Current and Prospective Operations, Mpumalanga (Source: Exxaro)

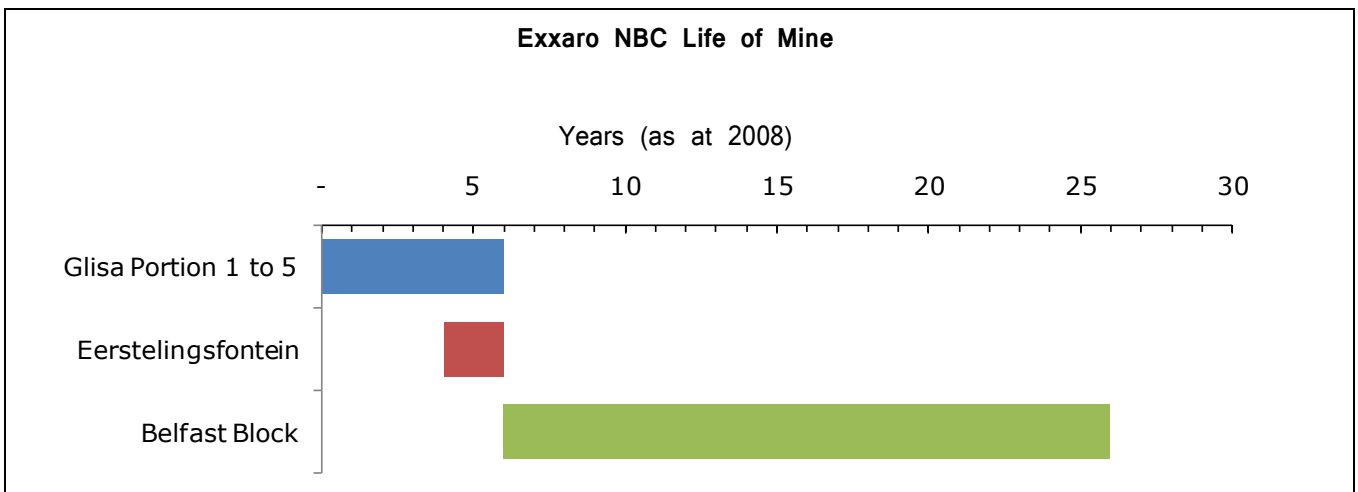


Figure 4 Exxaro NBC Life of Mine – as at 2008 (Source: Exxaro)

Exxaro NBC is currently mining the reserves on portion 4 of the farm Paardeplaas 380JT. This reserve is expected to be exhausted within the next 3 to 4 years (end 2014) (Figure 4).

Current operations comprise the opencast mining of 2 pits, Blesbok on the eastern side and Block A on northern side of the reserve respectively. Blesbok is mined by a contractor, Megacube Mining. Annual production totals approximately 3.5 million tons of run of mine coal. Run of mine coal is beneficiated on site by means of four crush and screen plants. Two of the crush and screen plants are owned and operated by B & E International. Once crushed and screened, coal is fed into the washing plant operated by Fraser Alexander. The washing plant has the capacity to wash approximately 160 000 ton per month, with the average actual yield being approximately 40%.

NBC sells in the region of 2.5 million tons a year of coal product to Eskom's Arnot, Komati, Camden and Tutuka power stations. This is based on a supply agreement signed with Eskom which commits Exxaro to supplying approximately 200 000 tons per month for the duration of the mining at portion 1 to 5 of Glisa. All Exxaro's NBC coal is blended with washed product or with 2 seam coal from Blesbok to meet Eskom's quality specifications.

Exxaro's NBC currently employs a workforce of 159 staff, and Exxaro has budgeted for this to increase to 199 staff by 2014. In addition, there are approximately 14 contractors, who rely significantly (if not solely) on Exxaro's mining and processing activities within the NBC. These contractors currently employ 776 people.

4.2 PROJECT MOTIVATION

4.2.1 Exxaro NBC Challenge

The inherent calorific value (quality) of the Glisa coal reserve is deteriorating. This has triggered the need to obtain a source of high quality coal that can be blended with the deteriorating reserves at NBC. The result being that there is an increased demand for good quality blending coal to obtain the necessary energy value required for sale to Eskom. Exxaro NBC is already under pressure to meet Eskom's quality specifications. Presently, all Exxaro's NBC coal is blended with washed product or with 2 seam coal from Blesbok to meet Eskom's quality specifications. The current situation will worsen significantly, reaching a critical point during the period 2012 and 2014, as a result of dwindling 2 seam reserves and limited washing capacity.

The coal seam on the site has an average thickness of 2.40m and extends over an area is approximately 1.2 square km. The total reserve area covers a surface area of 104 hectares and comprises approximately 2.98 million tons of low Sulphur coal. With increasingly stringent environmental legislation, coal sulphur content has become one of the most important factors for fuel choice. Therefore, the supply of low-sulphur coal has increased considerably in recent years. In addition, the coal seam found on the Eerstelingsfontein site has a high calorific value and with limited supplies of high quality low sulphur coal being available this coal deposit is of very high value to Exxaro. The calorific value of this coal seam is better than that which remains within the NBC reserves. Furthermore, Exxaro has no similar

deposit within their portfolio that can replace the need for the Eerstelingsfontein resources. Therefore no alternative sites have been assessed.

Based on the Eskom supply agreement Exxaro NBC face substantial penalties in the event of under supply of coal product. Exxaro require good quality coal for blending in order to meet their contractual obligations. The penalties which under supply would carry will render the NBC unprofitable and result in the closure of this operation.

Exxaro's challenge, therefore, is to secure a short term supply of good quality coal to blend with the coal remaining within the Glisa reserve. The need for supplementary source of good quality coal is a short term requirement (2 years), until such time as the Belfast Block (a significant coal resource with an expected mine lifespan of 20 years) receives the necessary authorisations and can begin being mined.

4.2.2 Need for the Project

Exxaro NBC has the mining right on the Eerstelingsfontein reserve, located approximately 20km from the current NBC operations. The Eerstelingsfontein site is characterised with high grade, low sulphur coal of significant economic importance. The expect yield is approximately 2.4 million tons of opencastable reserve proposed to be mined over a 2 year period. The Eerstelingsfontein resource has a measured calorific value of 24.3 CV. It is proposed that the coal mined at Eerstelingsfontein site will be transported back to Glisa for beneficiation and blending.

The mining of the Eerstelingsfontein site will ensure continued supply of coal from Exxaro's Glisa operations to Eskom. The Eerstelingsfontein Mine will ensure continued job security for the current labour force employed by Exxaro within the NBC and sustaining the local economic growth generated from Exxaro's mining operations, until such time as the Belfast Block project is implemented.

4.3 PROJECT DESCRIPTION

4.3.1 Site Location and Description

The proposed site is located on the farm Eerstelingsfontein 406 JT (Mpumalanga), approximately 100 km north of Ermelo and 20 km south of eMakhazeni (**Figure 1**). The site lies within the eMakhazeni Local Municipality and the Nkangala District Municipality, Mpumalanga. The geographic co-ordinates for centre of the site are 25° 51' 34" S and 30° 01' 00" E (**Figure 5**).

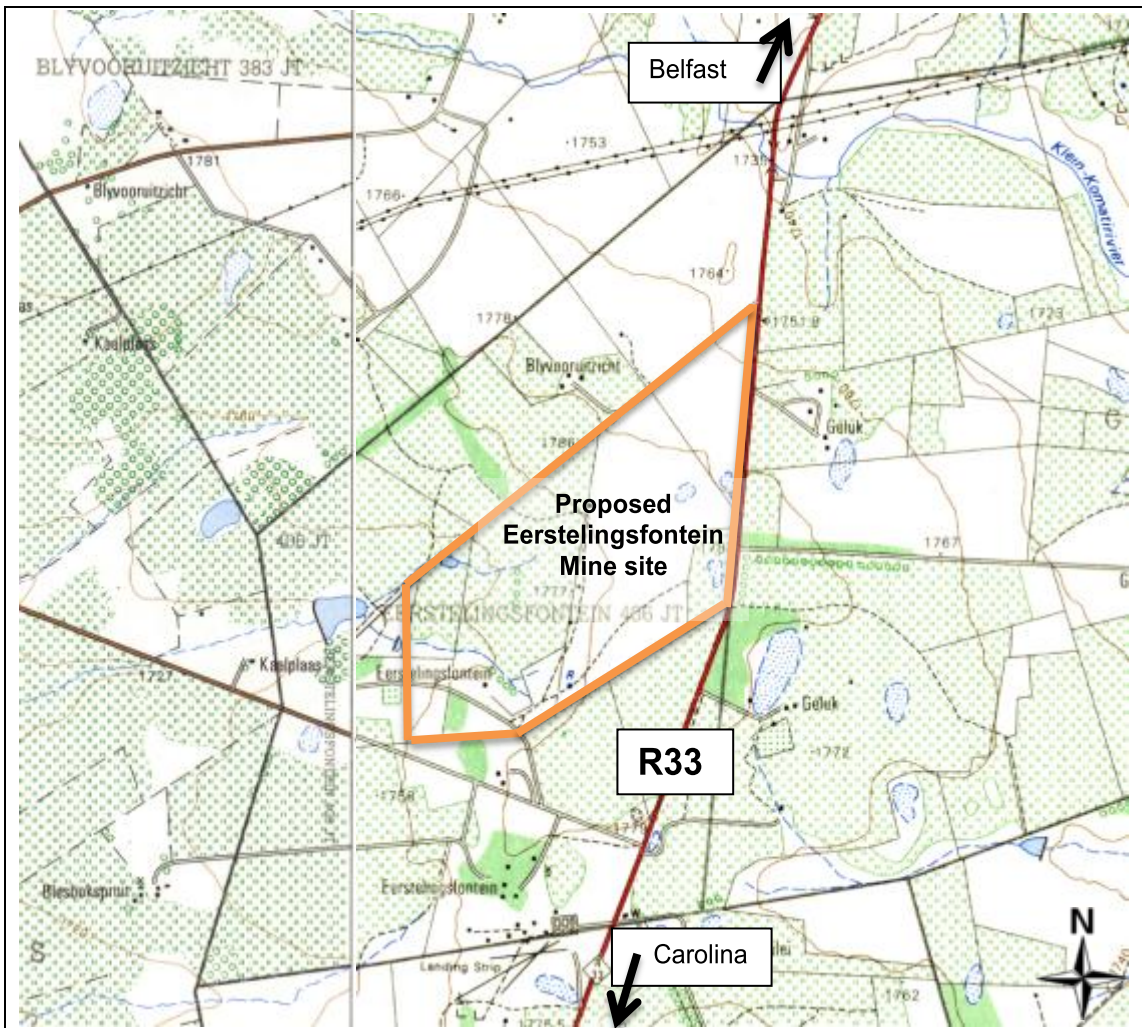


Figure 5 Site Location (portion of 1:50 000 Topocadastral Map: 2530CC Moedig and 2529DD Arnot)

The site, which totals 314 ha, is comprised of the following 8 portions of the farm Eerstelingsfontein 406 JT (Mpumalanga) (**Figure 6**):

- Remaining extent of Portion 2 (39,3 ha)
- Portion 3a portion of Portion 2 (39,3 ha);
- Portion 4a portion of Portion 2 (39,3 ha);
- Portion 5a portion of Portion 2 (39,3 ha);
- Portion 6a portion of Portion 2 (39,3 ha);
- Portion 7a portion of Portion 2 (39,3 ha);
- Portion 8a portion of Portion 2 (39,3 ha); and
- Portion 9a portion of Portion 2 (39,3 ha).

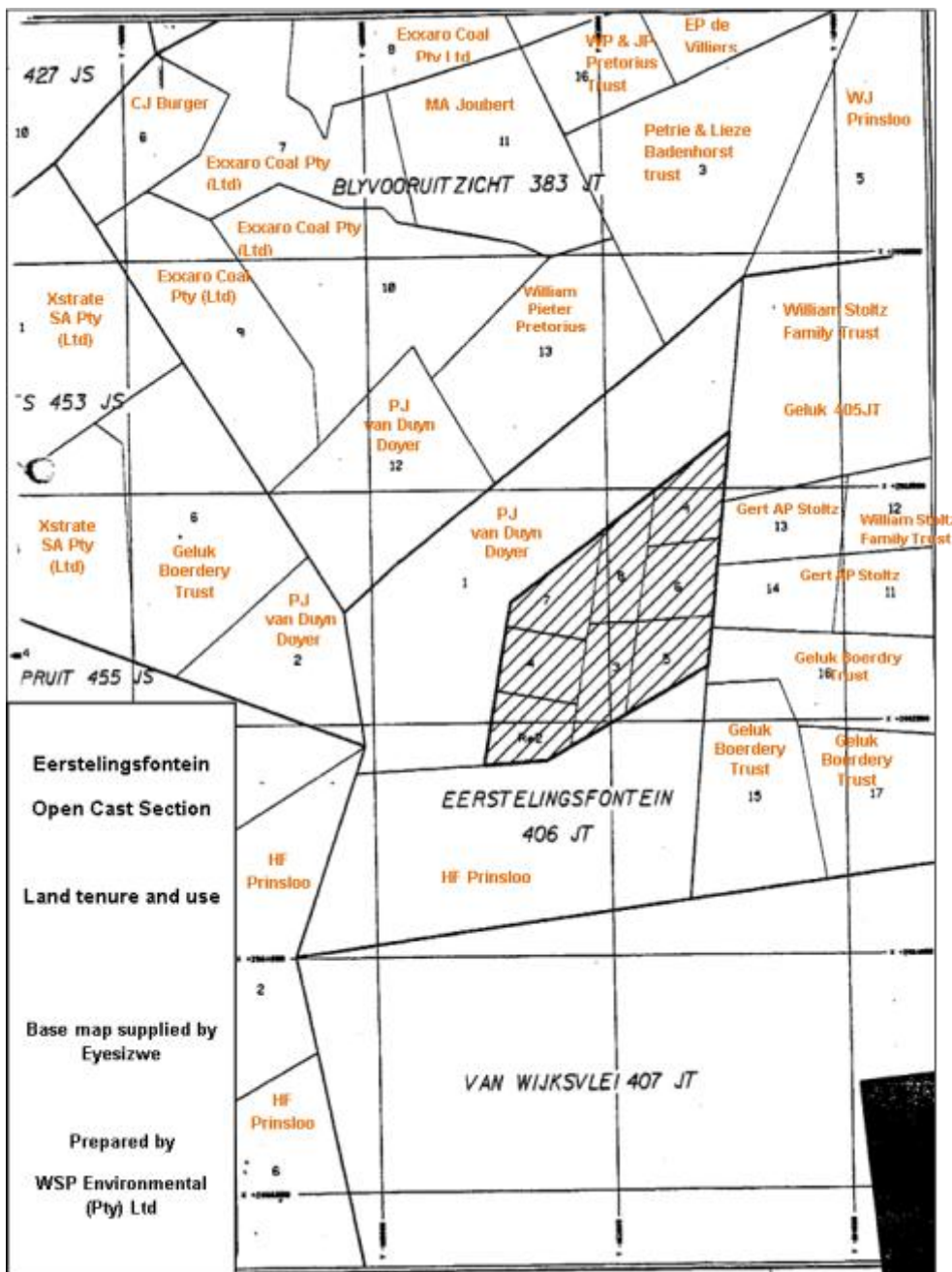


Figure 6 Portions of the farm Eerstelingsfontein 406 JT (Mpumalanga) comprising the site, as well as surrounding land tenure

The proposed site, and associated surface rights, is owned by Exxaro Coal (Pty) Ltd. The site is zoned 'agriculture' and portions of the site are currently utilised for agricultural activities, previously cultivation and more recently grazing (Figure 7).

The Zenzeleni Settlement (9 homesteads) is located within the southern extent of the property boundary, and covers an area of approximately 10 ha. The community's water supply is from a borehole located within the community area. There are a number of graves and historical structures present on and in the vicinity of the site.

The neighbouring farms cultivate a variety of agricultural products, including maize, lucerne, soy, fruit (e.g. cherries), cattle (meat and dairy), sheep and horse breeding.

Beyond the northern boundary of the site is the decommissioned open cast coal mine which was operated by Sumo Coal (Figure 7). The site is bounded on the east by the R33 which runs between the towns of eMakhazeni and Carolina.

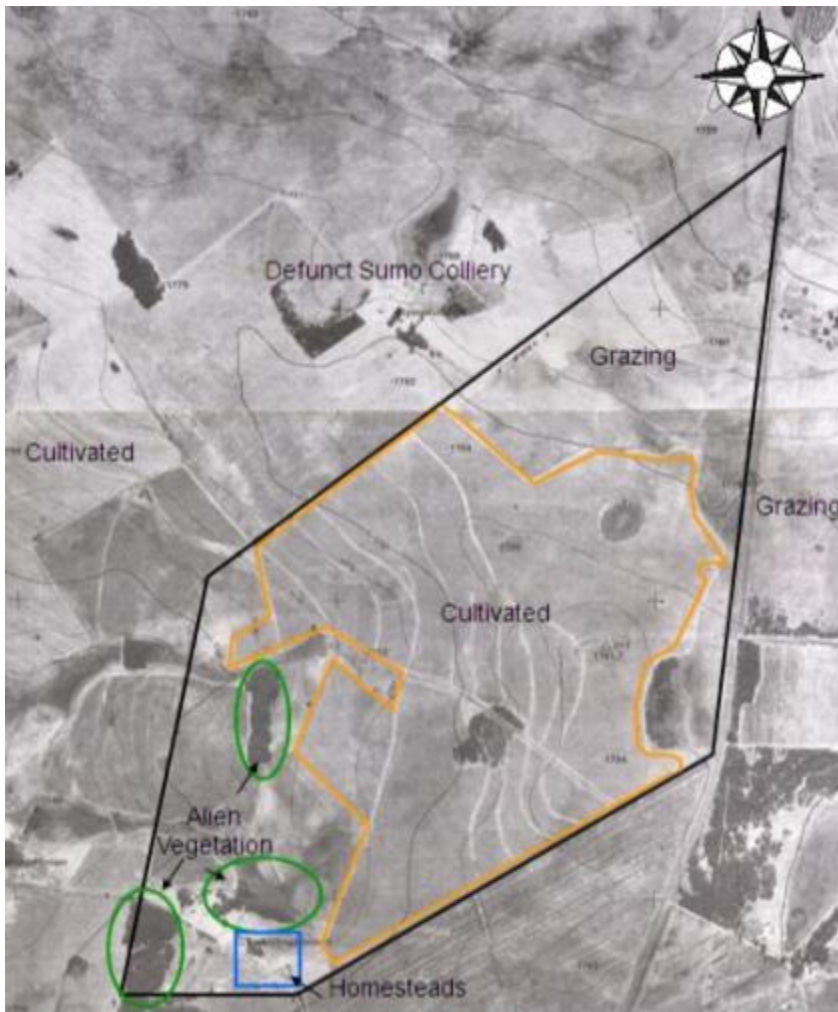


Figure 7 Pre-mining Land Use (GCS, 2004)

4.3.2 Coal Reserve

The proposed Eerstelingsfontein Mine is characterised by a mineral reserve consisting of low sulphur coal in a single seam. The coal seam is located at a depth of between 5 and 19 metres, with an average thickness of 2.5 metres.

The total reserve area covers a surface area of approximately 343.3 ha, with the Eerstelingsfontein Mine proposed to utilise 227 ha of the mineral area, resulting in approximately 2.4 million tons of coal (75% of the total reserve) being mined over a period of approximately 2 years.

With a measured calorific value of 24.3 CV (Figure 8), the Eerstelingsfontein resource is a high grade coal of significant economic importance.

Exxaro NBC has signed a supply agreement to provide 200 000 tons per month (2.3 million tons per annum) of coal product to Eskom’s Arnot, Komati, Camden and Tutuka power stations. This agreement requires Exxaro NBC to supply the required volume and quality of coal. Exxaro is liable for substantial penalties in the event of under supply to Eskom. Due to the declining quality of coal within the remaining Glisa reserves, there is a high demand for the good quality coal present on the Eerstelingsfontein. Exxaro propose to use the coal within the Eerstelingsfontein reserve to blend with current coal supplies at Glisa in order to meet Eskom’s quality specifications.

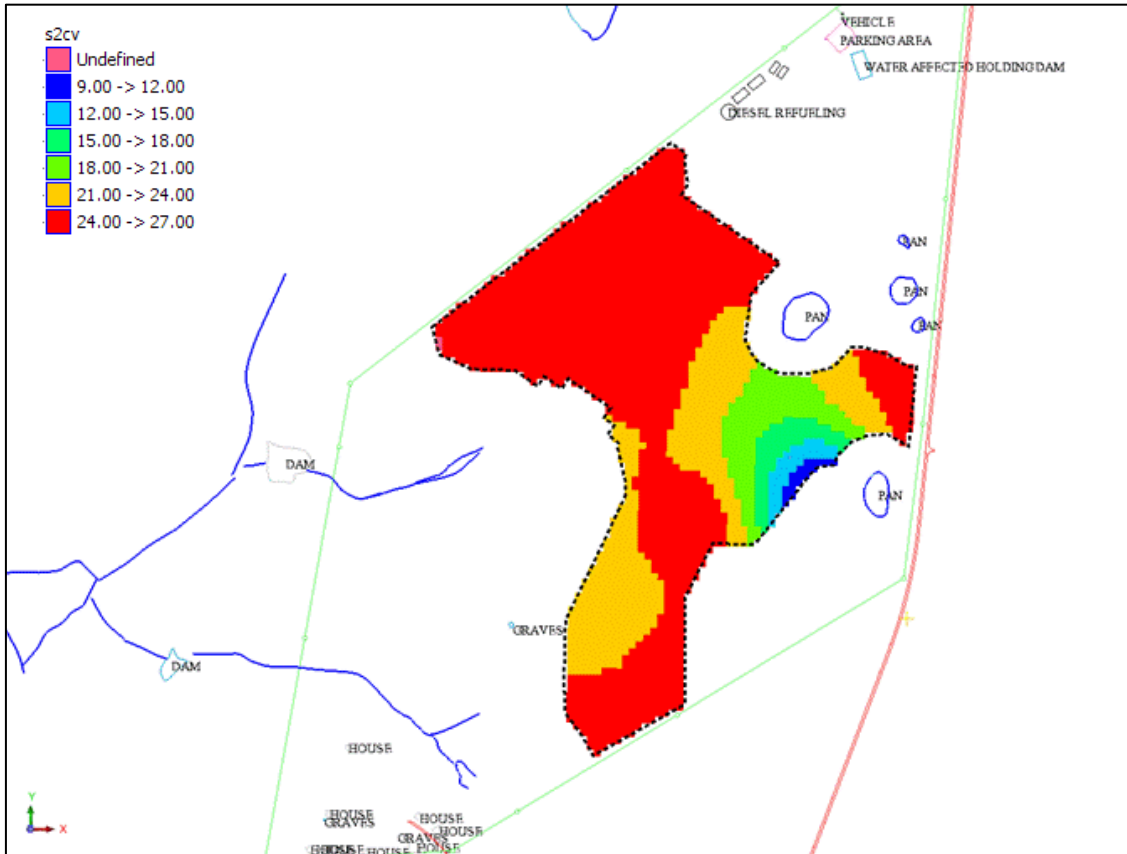


Figure 8 Quality of Coal Reserve (Calorific Value: CV) on the Eerstelingsfontein Site (Exxaro, 2011)

4.3.3 Mining Method

The proposed mining method will be opencast mining, using the “roll-over” and “truck-and-shovel” system (**Figure 9**).

The method of opencast mining is used when the coal seam is near to the surface, and is also called surface mining. Two types of surface mining are strip and contour mining, and are chosen based on the topography of the land and the geometry of the coal deposit. Since the terrain of the proposed site is relatively flat, the method of opencast mining will be strip mining, whereby a seam of the mineral is mined by removing a long strip of overburden (overlying soil and rock). This process is appropriate for extracting thin deposits which lie close to the surface, have a relatively flat geometry, and where the material is unsuitable for underground tunnelling.

The proposed technique is described below in the following 5 stages:

(1) Vegetation and soil removal:

All vegetation and topsoil within the mining area is cleared with bulldozers and stockpiled.

(2) Blasting of overburden:

Holes are drilled into the overburden (soil and rock overlying the deposit) and loaded with explosives. The blasting loosens the overburden for removal and stockpiling.

(3) Stripping of the overburden:

Trucks remove the loosened overburden in long, parallel strips. As each strip is excavated, the overburden is placed in the previously excavated strip, beginning the rehabilitation process. This is central to the roll-over method, and has the advantage of preventing the problems associated with large stockpiles of overburden. The stability of the site is controlled, and only one portion of land is being worked at a time.

(4) Mineral removal:

Once the coal is exposed in each strip, mechanical shovels are used to collect the minerals. Drilling and blasting may be necessary here to loosen the coal seam. Once the coal has been removed from a strip, a new strip is formed adjacent to it. The coal is transported from the mining area via trucks or conveyors, and taken to the processing plant.

(5) Rehabilitation:

Rehabilitation is a vital part of surface-mining operations. In the past, mines were abandoned after exhausted of the resource, leaving large stockpiles of overburden and barren ground. Excavated areas are now reclaimed by returning all overburden to the empty pits, replacing the topsoil, and planting permanent vegetation. With the roll-over method, excavated strips are continuously rehabilitated, strip by strip.

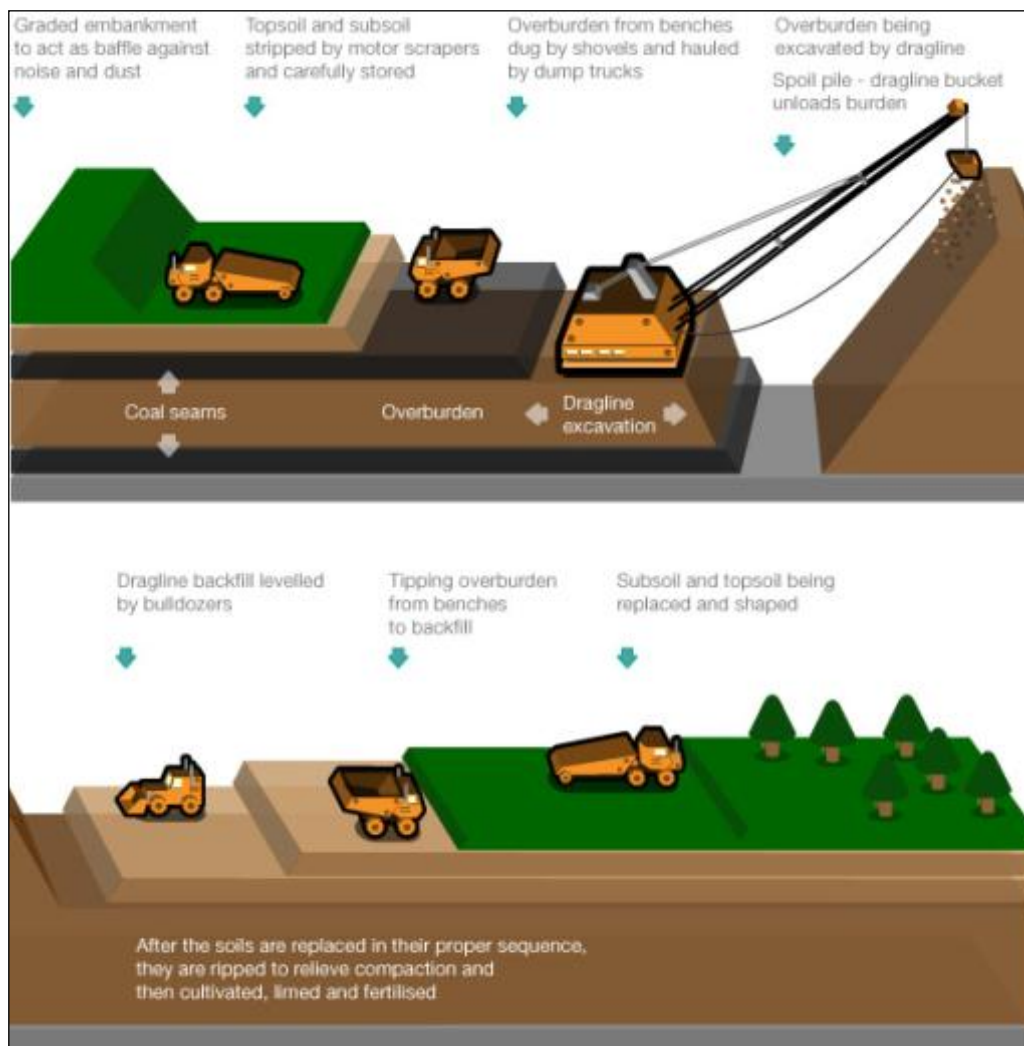


Figure 9 Diagram of the opencast mining method (<http://www.worldcoal.org>)

4.4 PROPOSED SITE INFRASTRUCTURE

A description of the surface infrastructure associated with the proposed Eerstelingsfontein Mine is provided below, with reference to **Figure 10** and **11**.

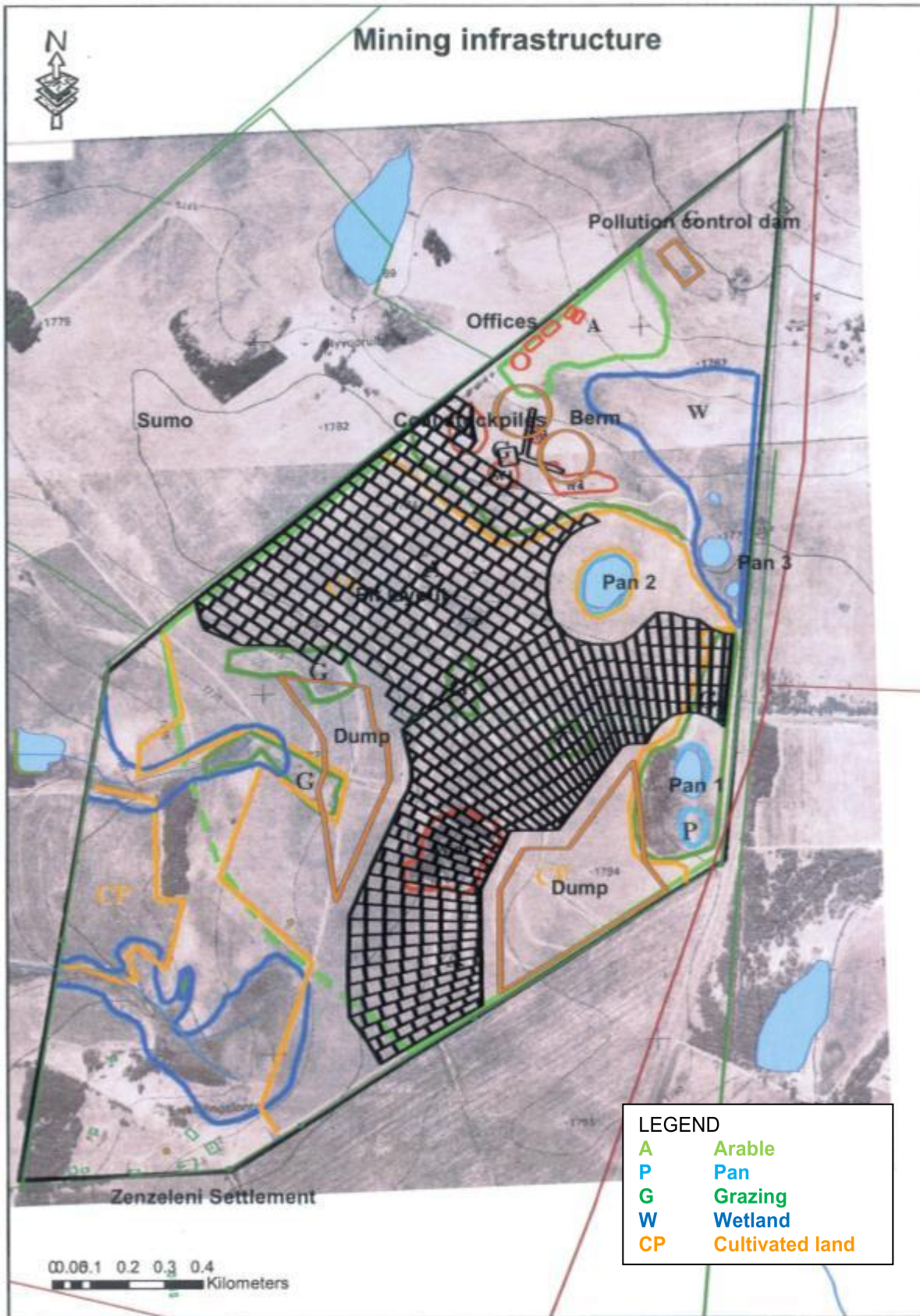


Figure 10 Conceptual Layout Plan for Proposed Eerstelingsfontein Mine (Exxaro, 2009)

4.4.2 Stockpiles

■ Coal Stockpiles

Coal product mined at Eerstelingsfontein will be stored temporarily in two stockpiles of approximately 15 000m³ each (total volume of 30 000m³), prior to being transported to Glisa Colliery for processing. Coal stockpiles are proposed to be located near the northern boundary of the site, adjacent to the site access road to facilitate the transportation of product off site (**Figure 10** and **11**).

■ Overburden Stockpiles (Dumps)

Large overburden stockpiles will result from mining operations. Two overburden stockpiles are proposed for the temporary (< 90 days) stockpiling of material prior to returning the material to the pit as per the roll over method of mining. The two areas identified for overburden stockpiling (dumps) are located to the south-east and south-west of the mine area (**Figure 10** and **11**) respectively. Topsoil and subsoil will be stored in the form of a berm not exceeding 1.5m in height. Soils will be stockpiled in separately to facilitate proper good site rehabilitation.

Berms will be created around the stockpiles to contain water and any erosion sediment. Containment berms will be constructed to ensure that “dirty” water coffered are created. The area between the berms and stockpile will be vegetated to promote rapid evapotranspiration, to reduce ponding within these areas. A 15m wide densely vegetated “buffer” will be constructed around the outside of the berms to contain sediment.

Separate overburden stockpiles will be created for carbonaceous waste and inert material. The surface water management approach will differ for each of these stockpiles:

- Carbonaceous stockpiles: Surface water will be contained within the stockpile and berms. Groundwater contamination will be prevented by placing a 125mm clay liner at the bottom of the stockpile. Capture water will be lost through evapotranspiration.
- Inert stockpiles: “Dirty” waste will be contained within the stockpile and berms. As the water runoff from this area is expected to be contained only by suspended solids, surface water seepage through the containment berms can be accommodated if sufficient sedimentation is allowed to occur within the berm.

4.4.3 Water Pollution Management Facilities

■ Pollution Control Dam

A single pollution control dam, located to the north of the mine pit (**Figure 10** and **11**), is proposed. All surface water runoff within the main operational area of the mine (northern portion of the site where crushing plant, product stockpiles, roads, stores and office infrastructure is located) will be directed, through the use of berms, to the pollution control dam. To limit the impact water bodies it is proposed that “dirty” water flow from this area be directed through earth channels, berms and culverts towards a silt trap just upslope of the proposed pollution control dam. The silt trap will removed suspended solids, while the lined pollution control dam will contain all polluted water.

The footprint of the pollution control dam is approximately 6000m², with a dam wall height of 2.8m and an overall capacity of the approximately 12 332m³. The proposed dam will be lined with a 2mm thick HDPE liner. A sub-surface drainage system will be installed to ensure that all seepage water within the dam area is also collected. The design of the dam was approved by Department of Water Affairs (DWA) in terms of the Integrated Water Use License approved for the Eerstelingsfontein mine.

The water collected and stored in the pollution control dam will be used for dust suppression during mining operations. Any excess of water generated will be pumped into the opencast pit to ensure that the pollution control dam is kept empty at all times.

■ Storage of water in the mine pit

Dirty water storage in the pit will be localised in various storage depressions, in order to facilitate on-going rehabilitation during the operational phase.

■ Dewatering Dam

Decant from the mine may occur post closure. A passive treatment system has been proposed, consisting of an anaerobic contact bed, anoxic limestone drain, sulphate reduction unit and polishing wetland. The specific

requirements of the system are largely dependent on the characteristics of the decant, as such, it has been proposed that design of the treatment process will be conducted after mining operations and rehabilitation have been completed.

4.4.4 Dry Screening and Crushing Plant

A dry screening and crushing plant is included in the proposed site infrastructure to beneficiate the run-of-mine coal. The run-of-mine coal will be crushed and screened by means of a dry process, together with a dense medium (wet) separation to classify qualities. The portion of screened coal which is discarded is returned to the working pit.

The dry screening and crushing plant site has been identified and is located in close proximity to the coal stockpile areas in the northern extent of the property (**Figure 10** and **11**).

4.4.5 Water Supply

- Current water supply associated with the site

Currently, the Eerstelingsfontein site has a number of existing lawful waste uses in terms of Section 21 of the National Water Act, no 36 of 1998. These uses include:

- Section 21(a) Abstracting water from a spring
- Section 21(a) Abstracting groundwater

The Zenzeleni Settlement, located in the southern boundary of the site utilise this water supply for domestic and livestock purposes (in terms of Schedule 1 of the NWA).

- Water for Mine Operations

During mine operations, water will be required primarily for dust suppression. The Water Use License (Appendix B) authorises a volume of 109 440 m³ of underground water to be stored in a pollution control dam for dust suppression. The mine-affected process water will be reused i.e. contained and circulated in a closed system.

- Water for Domestic Use

Groundwater with potable quality will be extracted from boreholes and used for domestic consumption (drinking water) only. The Water Use License issued by Department of Water Affairs (Appendix B) allows for 7116 m³ per annum to be abstracted for domestic purposes. Borehole water will be used for the ablutions at the site office complex. Water extracted for boreholes will be monitored according to the qualities as per the South African drinking water standards.

Potable water requirements were assumed to be 0.2m³/person/day. Water requirements (and associated water balance calculations) have been based on 130 staff members working 5 days a week. It is likely that water will be piped from the borehole source, stored in tanks (2 x 5m³) for supply to ablution facilities.

There will be no change-house on site, as employees will use the existing facilities at Glisa Colliery.

4.4.6 Wastewater Management

Ablution facilities will be positioned near the mine office complex. Disposal will be made by utilising septic tanks and associated treatment system with an estimated annual capacity of 2400 to 6000m³.

4.4.7 Solid Waste Management

- Industrial and domestic waste

Domestic waste will be transported to the eMakhazeni municipal landfill. Industrial waste will be contained in closed drums for collection and correct disposal by a registered company.

- Mine residue disposal

There will be no mine residue disposal sites at Eerstelingsfontein opencast section, as the run-of-mine coal will be beneficiated only at a dry screening and crushing plant. All unwanted material from the overburden will be returned to the mine pit to be placed in the voids below the water table, as part of the rehabilitation process.

4.4.8 Transportation

Transportation of coal to Glisa Mine by means of conveyor belt or utilising railway lines is not feasible due to the short lifespan of the mine (approximately 2 years). The most feasible method of transporting coal from the Eerstelingsfontein site is via the existing local road infrastructure (See Section 6.5.9).

Once crushed, screened and classified, the coal products will be transported by haulage trucks to the existing Glisa mine for further processing.

Approximately 2.4 million tons of coal will be transported in 30 ton truck loads to Glisa over the 2 year mine lifespan. Transportation of coal from Eerstelingsfontein to Glisa will occur 7 days a week.

Other sources of traffic will include daily transport of labour from Glisa to the Eerstelingsfontein mine.

4.4.9 Road Infrastructure

■ Site Access

The tarred R33 (provincial road) linking the towns of eMakhazeni and Carolina is located along the eastern boundary of the Eerstelingsfontein Mine site (**Figure 11**). The proposed access is from the R33 via a formal intersection that will be upgraded to meet the mine requirements.

■ Internal Roads

Road infrastructure will be developed on the Eerstelingsfontein site for mining operations. Internal road infrastructure consists of a main haul road providing access to and from product stockpile and crushing plant area, and smaller roads developed to provide access to the operational area (workshops, stores, offices, etc) as well as various parts of the mine work area (**Figure 11**). The internal roads, designed to accommodate mining equipment and vehicles, will range from approximately 15 and 65m in width.

4.4.10 Electricity Provision (Powerline)

There is no electricity to the site currently. There is an existing overhead powerline to the north of the site, which previously serviced the Sumo Colliery (now decommissioned).

Eskom has confirmed that they can supply a maximum demand of 100kVA at a supply voltage of 415V/22kV to the proposed Eerstelingsfontein site. Eskom will be responsible for the installation of the necessary infrastructure for the electricity supply to the site. It is most likely that the power will be supplied from the existing overhead powerline located on the adjacent property.

4.4.11 Administration and Employee Facilities

The coal mined from the Eerstelingsfontein Mine is proposed to replace the supply of coal from the current Glisa operations. The administration of the Eerstelingsfontein site will be managed from Glisa Colliery, situated outside eMakhazeni, approximately 20 km from the site.

Employee facilities currently utilised at the Glisa Colliery will continue to be used by the employees. The mine will provide transport from Glisa Colliery to the proposed Eerstelingsfontein opencast section.

4.4.12 Buildings, Workshops and Storage Facilities

Site offices and a weighbridge will be constructed on the Eerstelingsfontein site. Workshops, for minor services, are proposed. Workshop facilities at Glisa Colliery will be utilised for major repairs and maintenance.

A storage facility is proposed for oils and lubricants. Diesel storage of 46m³ will be provided on site for operational purposes.

Offices, workshops and storage facilities are proposed for the north-eastern portion of the site, adjacent to road which forms the northern site boundary (**Figure 11**).

4.5 DEVELOPMENT PHASES

4.5.1 Site Establishment (Construction) Phase

Site establishment phase, estimated to occur over a 2 to 3 month period, will include the following:

- Construction of the pollution control dam;
- Construction of berms and stormwater control system
- Construction of the 27m x 2m weigh bridge;
- Upgrading of the existing access (ingress/egress) point at the R33;
- Development of internal road infrastructure;
- Establishment of the office and workshop complex (no permanent buildings to be constructed);
- Establishment of crushing and screening plant;
- Stripping of topsoil and preparation of stockpile areas; and
- Construction of the box cut.

4.5.2 Operational Phase

The operational phase involves the mining of coal from a single seam. The reserve will be mined by the roll-over method for opencast mining integrated with continuous rehabilitation. Mining operations will occur in stages, over a period of 2 years and will include:

- Creation of the mining pit and progressive development of mining section;
- Creation of inert and carbonaceous rock stockpiles
- Crushing and screening of run-of-mine coal;
- Transportation of coal to Glisa by haul truck;
- Water management i.e. storm water runoff captured and diverted to pollution control dam for use in dust suppression, excess water redirected to mine pit area; and
- Progressive rehabilitation of pit area.

4.5.3 Decommissioning Phase

The decommissioning phase will include:

- Rehabilitation of pollution control dam;
- Landscaping of remaining backfilled voids;
- Re-vegetation of remaining disturbed areas
- Dismantling of all infrastructure;
- Removal and rehabilitation of stockpile areas, haul and internal roads and operations areas;
- Construction of berms across the mining area to slow surface water flow and prevent erosion from taking place

Decant from the mine is expected to occur within 5 years after closure. The post closure phase will be characterised by on-going surface and groundwater monitoring.

5 PROJECT ALTERNATIVES

5.1 NO PROJECT OPTION

The no project option refers to the option that the proposed Eerstelingsfontein open cast coal mine does not go ahead. Currently, portions of the site are used for agricultural activities, primarily for the grazing of livestock. The no project option would result in the continuation of the status quo, that being the limited agricultural use of the site. A brief overview of the potential implications of the no project option is provided below:

5.1.1 Exxaro Financial Implications

With the decrease in viable quality coal supply from the Glisa mine, Exxaro will not be able to meet the requirements of their supply agreement with Eskom. The terms of the agreement state that there is a significant financial penalty if Exxaro continuously supplies less than the required volume and / or quality of coal product per month. This amount is currently approximately R271 per ton, which amounts to R650 million over a year.

5.1.2 Employment losses

The closure of Exxaro's NBC operations would result in the retrenchment of 159 employees. In addition, there are approximately 14 separate contractors, who rely significantly (if not solely) on Exxaro's mining and processing activities within NBC (Table 5). These contractors currently employ 776 people, which are likely to be directly or indirectly affected by the closure of Exxaro NBC, potentially affecting R 774 million in turnover over the period 2012 to 2014.

5.1.3 Social Upliftment

Exxaro NBC is currently committed to social upliftment and education projects. These are related to their mining license for Eerstelingsfontein and involvement in other community initiatives. The Social and Labour Plan developed for the mining license application for the proposed site incorporates a number of community upliftment projects, including using, electricity to existing houses, agricultural cooperative and an alien plant eradication. The total value of these projects will be approximately R3 million, and will generate approximately 30 jobs in the construction, agriculture and manufacturing industries within the area. Social upliftment and community initiatives will not be implemented in the event of the closure of NBC's operations.

5.1.4 National Income Loss

There are potential implications for state income should the Eerstelingsfontein mine not commence. The Exxaro NBC business plan (2010) estimates that an amount of R392.9 million would be paid in corporate tax and mining royalties to the South African Revenue Services over the 2012 to 2014 period.

5.1.5 Protection of Wetlands and Biodiversity

Should the Eerstelingsfontein project not be implemented, the wetlands and vegetation, and associated biodiversity, would not be disrupted by opencast mining activities.

5.2 SITE ALTERNATIVES

Exxaro owns the right to mine the Eerstelingsfontein site therefore the alternatives considered in this investigation are associated with this particular site. **Alternative site assessment is not part of a Section 24G process because the site in question has already been impacted upon and is subject to rectification. Therefore no alternative sites were considered in this application for environmental authorisation. Consideration and investigation of the mining of other sites would be the subject of a separate application. With regards to alternative coal supply, Exxaro is investigating alternative coal resources to be used in the future as additional rather than alternative supply source. Currently within Exxaro's NBC portfolio there is no other site that can supply the same high value coal as is present on the Eerstelingsfontein site.**

5.3 TECHNOLOGY / DESIGN ALTERNATIVES

A variety of alternative technologies are available for the mining of coal. Exxaro are proposing to apply the method of open cast strip mining to the proposed Eerstelingsfontein site. A brief overview of the surface and underground mining alternatives, including their suitability to the Eerstelingsfontein site, is provided below.

5.3.1 Surface Mining Methods

Apart from opencast strip mining (preferred method for this site), other forms of surface mining include contour, auger and mountaintop removal mining:

- Contour mining is applied in hilly or mountainous terrain. A section of overburden is removed from the coal outcrop on the side of the mountain or hill. This forms a bench at the level of coal to be mined. The removal of this overburden follows the contours of the ridge, hill or mountain. Once the coal has been removed, the overburden is placed back on the bench, in an effort to restore the original topography of the landscape. The problems associated with this method involve potential erosion or landslides, and the formation of a terraced landscape.
- Auger mining is associated with contour mining. Auger mines run on the benches of contour mines before the overburden is replaced. The coal which cannot be reached by contour mining is augered (drilled) out.
- Mountaintop removal mining is used when a number of thick mineral seams occur near the top of a mountain. Large amounts of overburden are removed from the top of the mountain. Once coal seams are exposed, the overburden is used to fill valleys adjacent to the mine. This form of mining combines the methods of strip and contour mining.

The above methods are used when mineral deposits are located near to the surface, but where the topography of the landscape is not flat enough for strip mining. These alternative surface mining methods are **not appropriate** for this project, as the topography of the Eerstelingsfontein site is relatively flat.

5.3.2 Underground Mining Methods

Underground mining is used when the mineral is deep beneath the ground surface or when the mineral occurs as seams within hard rock. The overburden is not removed, and the mineral is extracted via shafts or tunnels. The main types of underground mining are room-and-pillar, longwall, and blast mining:

- Room-and-pillar (or retreat) mining involves a network of 'rooms' being cut into the coal seam, with 'pillars' or coal ribs left behind to support the roof. This method of mining is one of the most dangerous, due to the possibility of the roof collapsing and trapping miners underground.
- Longwall mining comprises extraction of coal from a part of the seam (or 'face'), using mechanical shearers. Before development begins, it is important to ensure that favourable geology is present throughout the longwall face. The roof is temporarily held with self-advancing, hydraulically-powered supports. Once coal has been extracted from the face, the roof is collapsed.
- Blast mining is the seldom used, older practice of using explosives to break up the coal seam. The broken coal is collected and transported out of the mine on shuttle cars or conveyors.

None of the above underground mining methods are appropriate for this project, due to the shallow depth of the coal seam (5 to 19m below the surface).

6 SITE CHARACTERISTICS

6.1 CLIMATE

A brief overview of the baseline meteorological conditions, based on meteorological data was sourced from the South African Weather Service's (SAWS) weather station located in Belfast, is provided below.

eMakhazeni (formerly Belfast) has a mild climate. Average daily maximum temperatures range from 29.4°C in October to 18.4°C in July (Table 8). The mean annual precipitation (MAP) is 325.6 mm and most (98.34%) of the rainfall occurs during summer months from October to December with the highest rainfall in November (Table 8) (SAWS, 2010).

Winters in Belfast are dry and cold with large variations between day and night temperatures, followed with wet and hot summer months (SAWS, 2010). Particulate matter (PM10) and dust fallout in the Belfast region will be expected to be highest during the dry winter months (WSP, 2011).

Table 8 Summary of the Temperature and Rainfall at eMakhazeni for 2010 (Source: SAWS)

| Parameter | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----------|------|------|------|------|------|------|------|------|------|------|-------|------|
| Max Temp | 26.7 | 28.7 | 28.1 | 24.1 | 21.6 | 25.0 | 18.4 | 24.5 | 27.4 | 29.4 | 28.2 | 25.1 |
| Min Temp | 10.8 | 10.3 | 9.9 | 6.1 | 1.7 | -5.0 | -3.8 | -3.4 | 4.5 | 4.1 | 9.4 | 11.6 |
| Avg. Temp | 22.7 | 13.1 | 12.2 | 9.1 | 18.6 | 16.0 | 15.7 | 10.7 | 23.9 | 24.6 | 22.8 | 14.6 |
| Rainfall | 0 | 0 | 0 | 2.8 | 2.6 | 0 | 0 | 0 | 0 | 84.6 | 182.2 | 53.4 |

The most frequent wind that occurred at eMakhazeni was between 2.1 – 3.6 m/s from the direction North East (45°). The average wind direction at eMakhazeni is from the North East (42°) (Figure 12) with the average wind speed being 2.2 m/s (WSP, 2011).

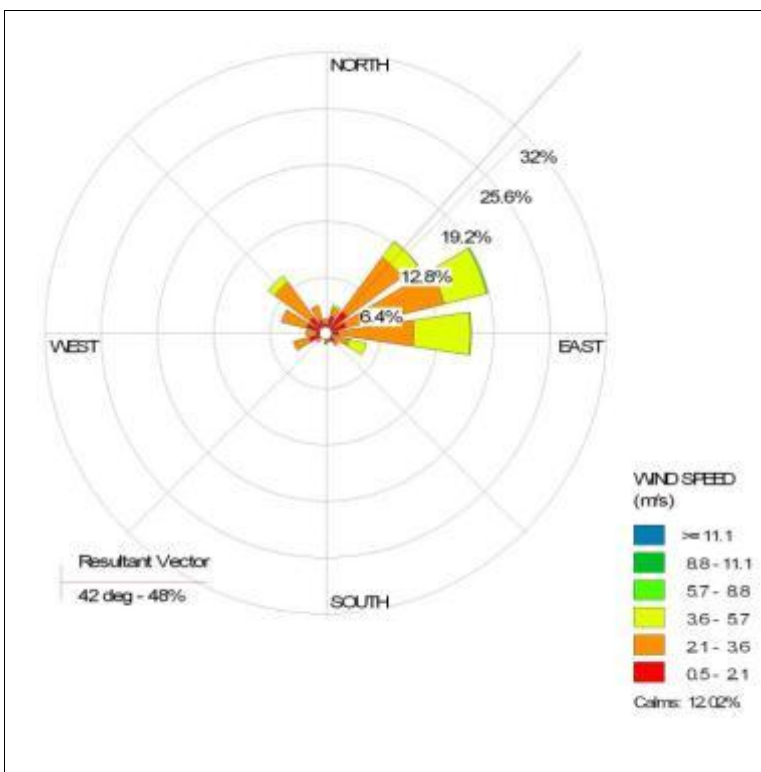


Figure 12 Windrose indicating wind direction and speed for 2010 at eMakhazeni (SA Weather Service)

6.2 AIR QUALITY

During WSP’s Air Quality Specialist Investigation (2011) baseline air quality data was sourced for the region surrounding the proposed mining activities. The dust fallout monitoring data obtained was collected from locations in the vicinity of Eerstelingsfontein Mine site (Table 9).

Table 9 Dust fallout monitoring data (mg/m²/day) surrounding the proposed site (Exxaro, 2010)

| Date | No. 1 | No. 2 | No. 3 | No. 4 North | No. 4 South | No. 4 East | No. 4 West |
|----------|-------|-------|-------|-------------|-------------|------------|------------|
| Jan-2010 | 397 | N/A | N/A | 119 | 120 | 142 | 37 |
| Feb-2010 | N/A | 70 | N/A | 142 | 152 | 153 | 106 |
| Mar-2010 | 357 | 151 | 214 | 282 | 182 | 120 | 120 |
| Apr-2010 | 64 | 88 | 50 | 48 | 10 | 54 | 49 |
| May-2010 | 1060 | 138 | 188 | 472 | 309 | 254 | 307 |
| Jun-2010 | 347 | 319 | 339 | 129 | 159 | 172 | 110 |
| Jul-2010 | 347 | 319 | 339 | 129 | 159 | 172 | 110 |
| Aug-2010 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Sep-2010 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Oct-2010 | 1000 | 285 | 255 | 267 | 197 | 274 | 133 |
| Nov-2010 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Dec-2010 | 266 | 176 | 217 | 179 | 248 | 250 | 133 |
| Average | 480 | 193 | 229 | 196 | 171 | 176 | 123 |

The data suggests that dust fallout levels have historically been in the moderate range for the area, with values averaging at approximately 200 mg/m²/day, with one monitoring station consistently averaging in the four hundreds mg/m²/day (**Table 9**). These are well within the SANS residential threshold value of 600 mg/m²/day, with the exception of a few isolated instances that are in excess of this threshold value (WSP, 2011).

6.3 GEOLOGY AND SOILS

6.3.1 Geology

The Eerstelingsfontein Opencast mine is entirely underlain by Vryheid formation sediments of the Ecca Group, which forms part of the Karoo sequence. The coal seam is overlain by the fractured Karoo sandstones and shales, which become more weathered near the surface. The relatively impermeable coal layer leads to a perched water table resulting in springs where the coal seam intersects the surface. A fault crosses the mining area and strikes in a north-west to south-west direction. Exploration borehole logs indicate a dolerite intrusion in the central part of the mine, running in an east-west orientation, which also leads to the creation of springs. There are numerous fractures within the study area, which can form conduits for groundwater flow.

6.3.2 Geohydrology

The current available information indicates that the aquifer displays fractured rock characteristics. Based on data from monitoring boreholes (within and close to the mining area) and privately owned boreholes within the sub-catchment, the water level in the aquifer ranges from 1.08 to 3.33 meters below ground level (mbgl) (GCS, 2004). One exception to this occurs in borehole GCS4 where the water level is 13.96 mbgl. The transmissivity values of the aquifer are therefore expected to be smaller than 1 m²/day. The average recharge is approximately 6% of the mean annual precipitation. Analysis of the major cations and anions in the sampled groundwater are well below the SANS 241:2005 drinking water guideline.

6.3.3 Soils

Two soils investigations covering the entire study area have been conducted in the past; by KSE Environmentalists (1998) and Viljoen and Associates (2011).

The soils investigation by KSE Environmentalist was described in the mine EMPR (2004). The soils were classified according to the South African binomial soil classification system (soil classification working group, 1991). Five soil forms were encountered:

- Avalon (Av)
- Glencoe (Gc)
- Dresden (Dr)
- Constantia (Ct)
- Longlands (Lo)

The 2011 Viljoen and Associates assessment comprised in excess of 200 soil sampling locations taken across the site, particularly focussed on the boundary of the planned mine boundary, in order to generate a soil map of the site (**Figure 13**). The soil mapping indicates a dominance of the Avalon soil form across the study area, and the Constantia soil form present to the north-east of the site. Towards the central portion of the study area, the Glencoe's soil form is present, with the Dresden soil form present in the northern portion of the property.

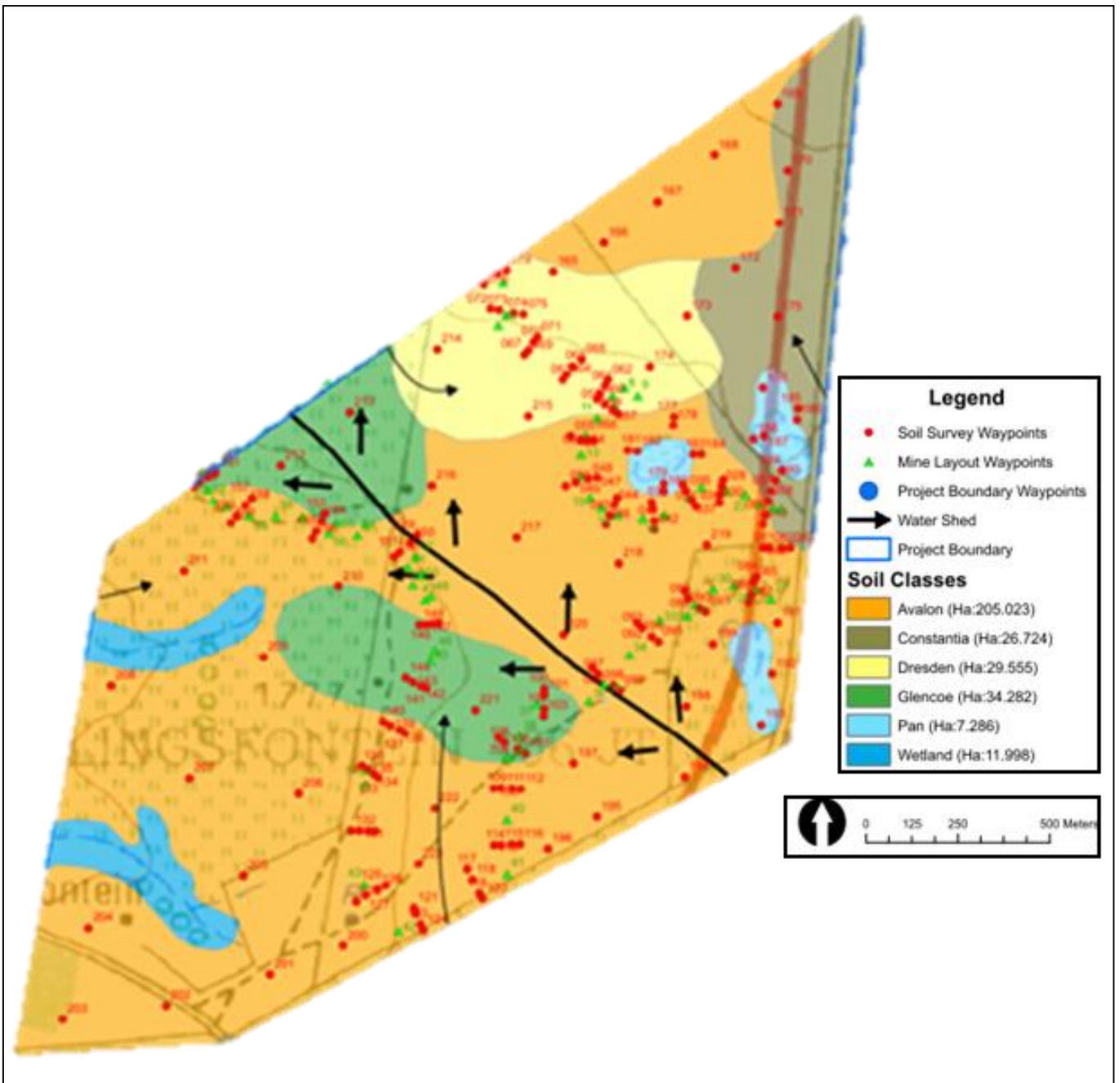


Figure 13 Soil map of the property (Viljoen, 2011)

6.4 HYDROLOGY

6.4.1 Regional Hydrology

The Eerstelingfontein mine site is situated in the upper reaches of the Komati River catchment, and straddles the quaternary catchments X11C and X11D (WSP, 2011).

Two unnamed non-perennial streams drain the western portion of the site, hereafter referred to as Tributary 1 and 2 respectively (**Figure 14**). The catchments for Tributary 1 and 2 account for 1% of the contributing area of the X11C quaternary catchment. These 2 watercourses converge 500m west of the site, and later join the Witkloofspruit approximately 6km south-west of the site. The Witkloofspruit flows into the Nooitgedacht Dam (associated with the Komati River) located 12km south of the site (WSP, 2011).

Surface water on the eastern portion of the site drains towards a non-perennial tributary of the Klein-Komati River (**Figure 14**). This tributary accounts for 0.5% of the contributing catchment of the X11D quaternary catchment. The Klein Komati River joins the Komati River 15km east of the site (WSP, 2011).

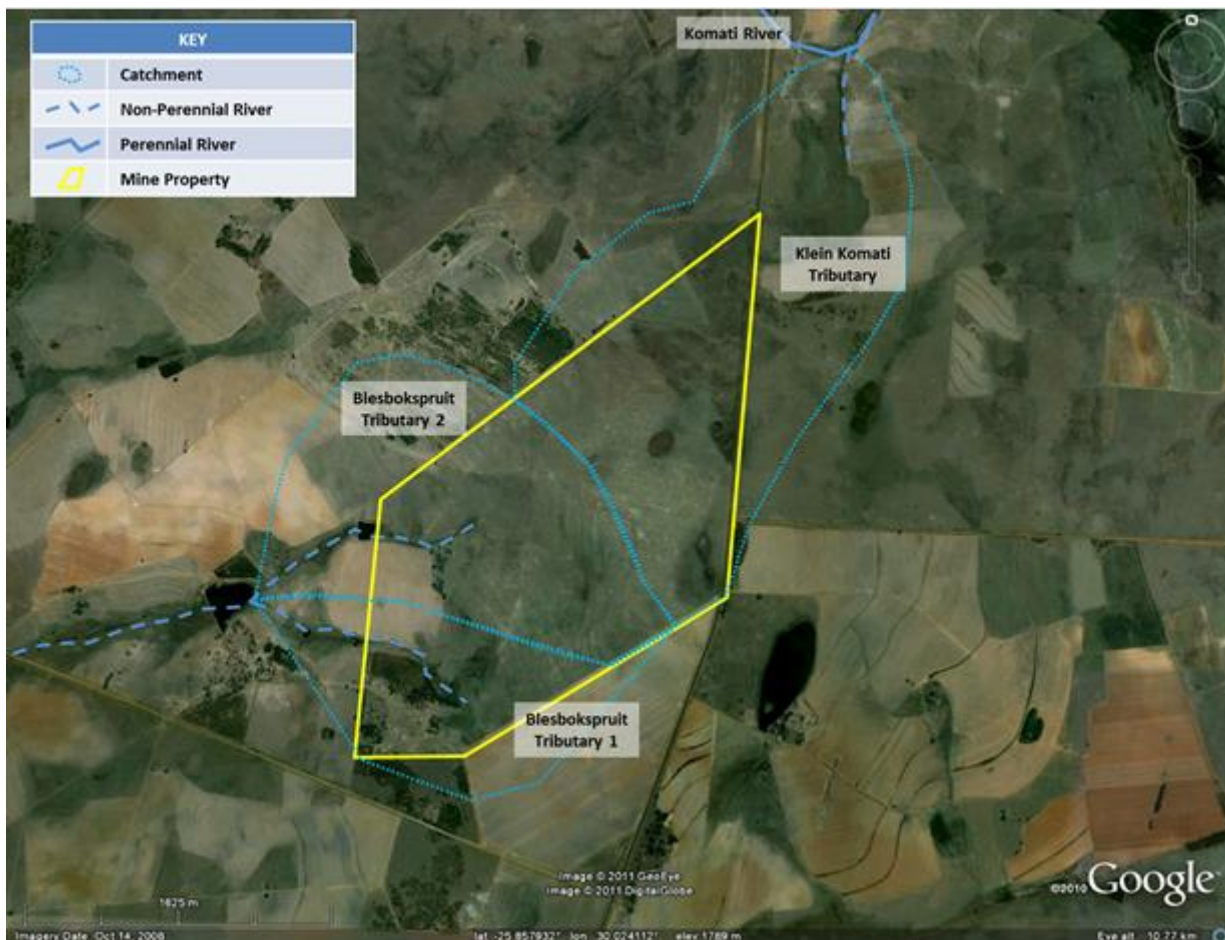


Figure 14 Surface water within the study area (WSP, 2011)

6.4.2 Surface Water Features

Wetlands and pans have been identified to be present within the study area. Various studies have been undertaken between the period 2004 and 2011 in order to identify and determine the extent of wetland features on the Eerstelingfontein site. A study by KSE Environmentalists (2004) identified wetlands to the east and west of the site. The location of the pans to the south-east of the study area was verified by Rehab Green in 2007 (WSP, 2011).

Golder Associates Africa (Pty) Ltd undertook a watercourse attributes assessment in 2009, in support of the Integrated Water Use License Application (in terms of Section 21 of the National Water Act (1998)). The watercourse attributes assessment included wetland/pan delineation, classification and functional assessment.

Natural Scientific Services (NSS) (2011) undertook a comprehensive wetland delineation, which identified a broader extent of wetlands than originally defined by previous studies. The findings of the NSS investigation are documented in **Part 2: Environmental Assessment** of the Environmental Assessment Report.

6.5 REGIONAL VEGETATION

According to Mucina and Rutherford (2006) the regional vegetation of the study area is classified as the *Eastern Highveld Grassland* (Gm12). This vegetation type is located between eMakhazeni (Belfast) and extends westward to the eastern edge of Johannesburg and southwards to Bethal, Ermelo and west of Piet Retief (NSS, 2011). *Eastern Highveld Grassland* comprises predominately short dense grassland dominated by *Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* grass species interspersed by small rock outcrops containin some woody species such as *Acacia caffra*, *Celtis Africana*, *Diospyros lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Searsia magalismontanum*. Generally, this regional vegetation is poorly conserved and under pressure from anthropogenic activities (NSS, 2011)

With almost 50% of the *Eastern Highveld Grassland* having been transformed, this vegetation type has a national conservation status of Endangered (Mucina and Rutherford, 2006). Transformation has been primarily the result of cultivation, with plantations, mines, urbanisation and dams being additional contributing factors (NSS, 2011).

WSP contracted NSS conduct a detailed biodiversity assessment including terrestrial flora and fauna, aquatic and wetland components. The findings of the NSS investigation are documented in **Part 2: Environmental Assessment** of the Environmental Assessment Report.

6.6 ROAD NETWORK AND EXISTING TRAFFIC

The proposed Eerstelingsfontein Mine is situated on the western side of the R33 (P81-2) provincial road between eMakhazeni and Carolina, to the south of the N4 freeway (**Figure 15**). The existing Glisa mine is situated south of the R33 (P2-8), north of the N4 freeway (**Figure 15**) (WSP, 2011).



FIGURE 1: Locality Plan

Figure 15 Existing traffic network in the study area (WSP, 2011)

The access to the site will be via the existing intersection with the R33. The R33 between the Eerstelingfontein site and Glisa is a tarred, single carriageway road with one lane in each direction. The speed limit along the R33 in the vicinity of the proposed access to the Eerstelingsfontein mine is 120km/hr. The speed limit in and around eMakhazeni varies between 60 and 80km/hr (WSP, 2011).

As part of WSP's 2011 traffic assessment traffic counts were undertaken in March 2011. Electronic traffic counts, comprising 24hour, classified (light and heavy) vehicle counts, in each direction were carried out at the following locations on the R33 (**Figure 15**):

- E-1: on the R33 (P2-8) between Glisa access and Intersection 1; and
- E-2: on the R33 (P81-2) between Eerstelingsfontein and Intersection 2.

Table 10 Average Traffic Volumes (7 day, 24 hour) (WSP, 2011)

| Station | Vehicle Classification | Eastbound | Westbound | Both Directions |
|---------|------------------------|-----------|-----------|-----------------|
| E-1 | Light | 298 | 314 | 609 |
| | Heavy | 200 | 192 | 390 |
| | All | 497 | 506 | 1003 |
| E-2 | Light | 199 | 322 | 521 |
| | Heavy | 261 | 152 | 414 |
| | All | 462 | 471 | 935 |

Average daily traffic volumes are considered to be relatively low (**Table 10**) (WSP, 2011).

6.7 SOCIAL CONTEXT

The primary stakeholders, located on or within the immediate vicinity of the proposed site, are described briefly below.

6.7.1 Zenzeleni Community

This community is comprised of 9 low-income, rural homesteads located within the site boundary. There are 61 residents (both permanent and intermittent) who speak a range of African languages, including isiZulu, SeSotho and Xhosa. The footprint of the settlement is approximately 10 ha. The houses are either individual or multi-roomed, "wattle and daub" type structure (WSP, 2011).

The Zenzeleni community is well established, as it has reportedly existed for almost a century. Despite this long history, provision of municipal services is still limited. Water is sourced from a borehole on the property (in the south-east corner of the community). Waste is managed internally, mainly through recycling and reusing products, and for animal feed. Wood (sourced from the surrounding area) and coal are the main sources of heat for households (WSP, 2011).

6.7.2 Surrounding Farmers

The neighbouring farms cultivate a variety of agricultural products, including maize, lucerne, soy, fruit (e.g. cherries), cattle (meat and dairy), sheep and horse breeding. A number of these farmers are long-term residents within the area and multiple generation farmers. Two of the farmers have purchased their farms more recently and have only farmed in the area for past ten to thirty years (WSP, 2011).

There appears to be a strong sense of community, as farmers are familiar with each other, and rely on each other for support, especially in times of emergency or crisis. There appears to be a number of family owned farms (under trusts), however a number of individuals have acquired land over the past few decades, and become an integral part of the community, including doctors and similar -skilled service providers within the area (WSP, 2011).

7 REFERENCES

- Ground Water Consulting Services cc (2004) Environmental Management Programme Report (EMPR) for the proposed Eerstelingsfontein Opencast, a Section of the Glisa Colliery, Belfast Magisterial District, Eastern Mpumalanga.
- National Environmental Management Act (107 of 1998) including:
 - 2006 EIA Regulations (GN: R385) and associated listed activities (GN: R386 and 387); and
 - 2010 EIA Regulations (GN: R543) and associated Listing Notices (GN: R544, 545, and 546).
- National Environmental Management: Waste Act (59 of 2008) and associated GNR: 718.
- National Heritage Resources Act (55 of 1999)
- National Water Act (36 of 1998)
- Natural Scientific Services (2011) Biodiversity Baseline and Impact Assessment, Eerstelingsfontein Project.
- Viljoen and Associates (2011)
- WSP Environment & Energy (2011) Air Quality Impact Assessment, Eerstelingsfontein
- WSP Environment & Energy (2011) Surface Water Assessment, Eerstelingsfontein Mine
- WSP Environment & Energy (2011) Social Impact Assessment, Eerstelingsfontein Coal Mine, Emakhazeni
- WSP SA Civil and Structural Engineers (2011) Traffic Impact Assessment, Proposed New Eerstelingsfontein Opencast Coal Mine in Belfast, Mpumalanga

Appendix A Mining Right (June 2008)

Appendix B Water Use License (January 2010)

Appendix C MDEDET Correspondence

- MDEDET confirmation that Section 24G process is to be followed (date: 4 May 2011)
- Minutes of pre-application consultation meeting with MDEDET, 10 December 2010
- MDEDET acknowledgement of S24G form submission (date: 8 June 2010)
- Final S24G Application Form

Appendix D Stakeholder Engagement

- Stakeholder database
- Newspaper advertisements
- Site posters
- Written notices
- Background Information Document
- Stakeholder Notification Letter, May 2012
- Minutes of Public Meeting (English and Zulu)
- Comments Received
 - Comment 1: Letter from PJvD DOYER on 20 June 2012
 - Comment 2: The impact of the proposed mine on the farming enterprises of PJvD Doyer and JM Doyer
- Issues trail
 - Matters Arising at the Public Meeting held on the 12th June 2012
 - Issues raised in the Comments Received