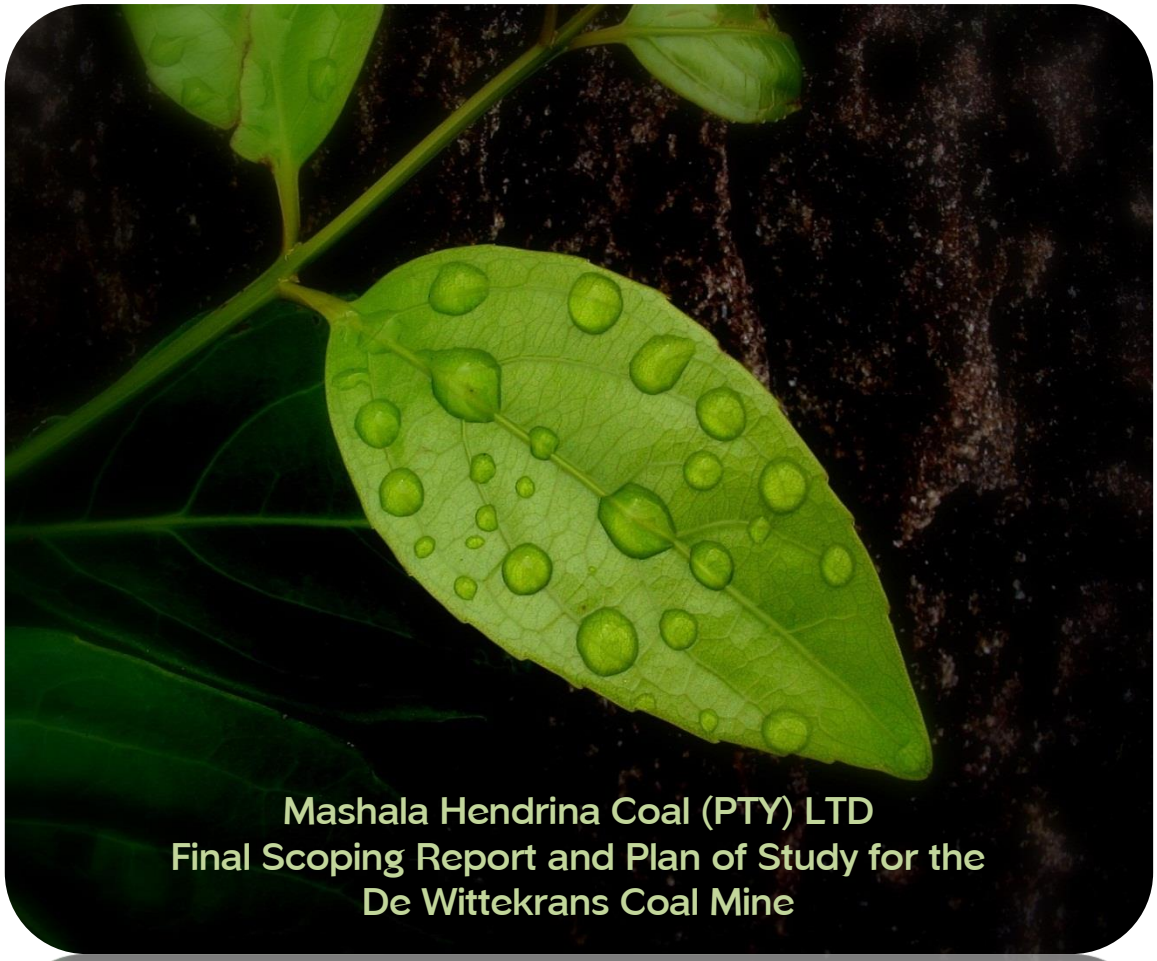

Mashala Hendrina Coal (PTY) LTD
Final Scoping Report and Plan of Study for the De Wittekrans Coal Mine

Reference No
NEMA: MDEDET 17/2/3 GS-200
NEMWA: DEA 12/9/11/L1053/6

26 September 2013

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Submitted to:
Mpumalanga Department of Economic Development, Environmental and Tourism; &
Department of Environmental Affairs

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DOCUMENT CONTROL

Project Name:	Mashala Hendrina Coal (Pty) Ltd: Environmental Impact Assessment for the De Wittekrans Coal Mine	
Report Title:	De Wittekrans Coal Mine - Final Scoping Report and Plan of Study	
Report Status:	Final	
Date:	26 September 2013	
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Project Team:	Author:	Mariante Herbst
	Reviewer:	Khalid Patel

The original document is signed and stored in the offices of Geo Soil and Water, Plot 78C, Leander Street, Olympus, South Africa

PURPOSE OF THIS DOCUMENT

Mashala Hendrina Coal (Pty) Ltd (Mashala) has applied for a mining right in respect of coal reserves on Portions 5, 7, 10, 11 and the remaining extents of Portions 1 and 2 of the farm De Wittekrans 218 IS, the remaining extent of Portion 1 of the farm Tweefontein 203 IS, the remaining extent of the farm Groblershoek 191 IS and all portions on the farm Groblershoop 192 IS and Israel 207 IS. The Environmental Management Program (EMPR) was compiled and submitted as per the requirements of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) by GSC Consultants during 2010. The mining right application was issued with reference number **MP 30/5/1/1/2/3006**.

The project area is situated between the towns of Ermelo and Hendrina in the Mpumalanga Province, on the western side of the N11. It is the intention of Mashala to develop both an opencast and underground coal mine on the above-mentioned properties.

In addition to the mining right application, Mashala must conduct an Environmental Impact Assessment (EIA) for the proposed De Wittekrans Coal Mine, as required by the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the National Environmental Waste Act, 2008 (Act 59 of 2008) (NEMWA). In terms of the National Water Act, 1998 (Act 36 of 1998) (NWA), an Integrated Water Use Licence (IWULA) is also required.

EIA applications for Environmental Authorisation and a Waste Licence have been submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) and the Department of Environmental Affairs (DEA) respectively. The EIA applications were made in terms of Regulations 544 and 545 published under the NEMA and Government Notice 718 published under the NEMWA. The reference number **17/2/3 GS-200** has been issued for this EIA by the MDEDET and reference number **12/9/11/L1053/6** has been issued by the DEA. An Environmental Management Programme (EMP) based on the findings of the EIA and a Water Use Licence Application in terms of the NWA will also form part of this process.

De Wittekrans Coal mine was granted exemption in terms of the provisions of Section 50 of the Environmental Impact Assessment Regulations (EIA), 2010. The original reference number issued by MDEDET: **17/2/3 GS – 126** dated 01 August 2012.

Mashala has appointed Geo Soil and Water CC (GSW) to conduct the EIA/EMP, public participation process and the integrated water use licence application (IWULA). The public participation process provides stakeholders with information about the proposed project, and several opportunities to comment throughout the EIA/EMP/IWULA process.

The first phase of an EIA is the Scoping Phase. In terms of the MPRDA and the NEMA, interested and affected parties (I&APs) must be given the opportunity to comment on the proposed project. The proposed project, the environment in which the project is located and the specialist studies that will be/have been undertaken are described in this Final Scoping Report.

This final document is being made available for public comment from **26th September 2013 to 9th November 2013** (a period of 45 days). During the process to apply for a mining right, a complete public participation process was undertaken. The comments received from interested and affected parties (I&APs) thus far as well as those captured during the previous mining right application process have been captured in an Issue and Responses Report accompanying this Final Scoping Report (Annexure O).

Mashala has appointed EIMS to facilitate the public participation process required for the EIA applications as well as the IWULA.

An EIA Report, including an EMPR, will be compiled and presented for public comment as the next step of this EIA process.

SUMMARY OF WHAT THIS SCOPING REPORT CONTAINS

This report contains:

- Background and a description of the proposed project;
- An overview of the EIA process, including the public participation process followed to date;
- A description of the existing environment within the project area;
- The potential environmental issues and impacts which have been identified;
- The specialist studies proposed to be undertaken as part of this EIA and those that has been undertaken as part of the application for a mining right; and
- A list of I&APs involved to date and their comments.

REVIEW OF THE FINAL SCOPING REPORT

This Final Scoping Report will be available for comment for a period of 45-days from **26th September 2013 to 9th November 2013**. Copies of the Report will be made available at the following places:

- Geo Soil and Water offices, Pretoria – Adri Joubert on 082 926 8460;
- EIMS offices, Randburg – Ms Nobuhle Hughes on 011 789 7170;

The draft and final reports are also available on the EIMS website: www.eims.co.za.

OPPORTUNITIES TO COMMENT

Stakeholders can comment on the Final Scoping Report by:

- Submitting comments by e-mail, fax or telephone to the **Mpumalanga Department of Economic Development, Environmental and Tourism; & Department of Environmental Affairs.**

DUE DATE FOR COMMENT ON THIS Final SCOPING REPORT

On or before the 9th November 2013

ABBREVIATIONS

AMD	– Acid Mine Drainage
COD	– Chemical Oxygen Demand
DMR	– Department of Mineral Resources
DWA	– Department of Water Affairs
EIA	– Environmental Impact Assessment
EIS	– Ecological Importance and Sensitivity
EMP	– Environmental Management Programme
GDP	– Gross Domestic Product
GSW	– Geo Soil and Water cc
ha	– Hectare
HDPE	– High-Density Polyethylene
HDSA	– Historically Disadvantaged South Africans
HQI	– Habitat Quality Index
IHAS	– Integrated Habitat Assessment System
I&APs	– Interested and Affected Parties
IDP	– Local Integration Development Plan
IHAS v.2	– Integrated Habitat Assessment Index version 2
IWULA	– Integrated Water Use License Application
LED	– Local Economic Development
MPRDA	– Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
NEMA	– National Environmental Management Act, 1998 (Act 107 of 1998)
NEMWA	– National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NWA	– National Water Act, 1998 (Act 36 of 1998)
PCD	– Pollution Control Dam
PDI	– Previously Disadvantage Individuals
PES	– Present Ecological State
PLC	– Programmable Logic Controller
pt	– Portion
ROM	– Run of Mine
SASS	– South African Scoring System
SLP	– Social and Labour Plan
TDS	– Total Dissolved Solids
TWQR	– Target Water Quality Requirement
WMA	– Water Management Area
IWULA	– Integrated Water Use License Application

CONTENTS

List of Figures

List of Tables

1. INTRODUCTION

1.1 BACKGROUND

Mashala Hendrina Coal (Pty) Ltd (hereafter Mashala) has applied for a mining right in respect of coal reserves on Portions 5, 7, 10, 11 and the remaining extents of Portions 1 and 2 of the farm De Wittekrans 218 IS, the remaining extent of Portion 1 of the farm Tweefontein 203 IS, the remaining extent of the farm Groblershoek 191 IS and all portions on the farm Groblershoop 192 IS and Israel 207 IS. The Environmental Management Program (EMPR) was compiled and submitted as per the requirements of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) by Groundwater Consulting Services (GCS) during 2010. The mining right application was issued with reference number **MP 30/5/1/1/2/3006**.

The project area is situated between the towns of Ermelo and Hendrina in the Mpumalanga Province, on the western side of the N11 (Figure 1-1). It is the intention of Mashala to develop both an opencast and underground coal mine on the above-mentioned properties.

Please note that full size maps and figures are provided in Annexure B.

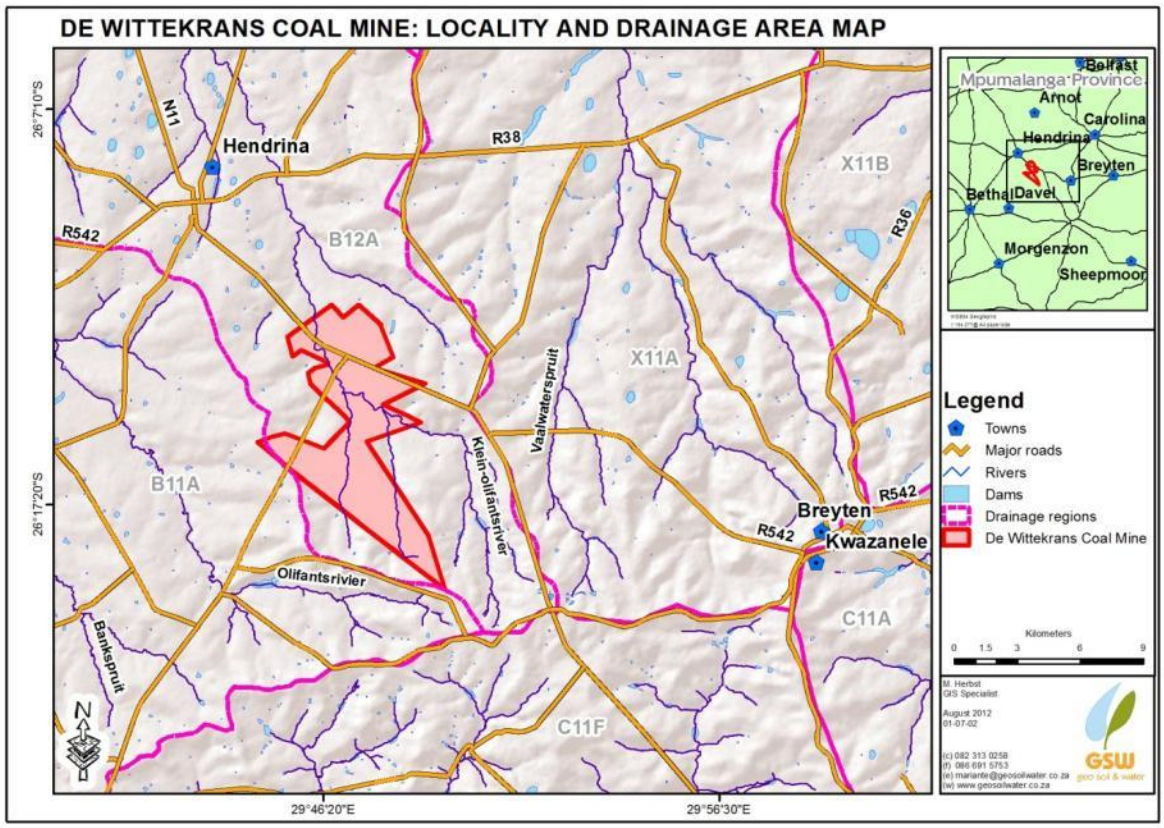


Figure 1-1 Locality map of the proposed De Wittekrans Coal Mine.

In addition to the mining right application, Mashala must conduct an Environmental Impact Assessment (EIA) for the proposed De Wittekrans Coal Mine, as required by the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the National Environmental Waste Act, 2008 (Act 59 of 2008) (NEMWA). In terms of

the National Water Act, 1998 (Act 36 of 1998) (NWA), an Integrated Water Use Licence (IWULA) is also required.

EIA applications for Environmental Authorisation and a Waste Licence have been submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) and the Department of Environmental Affairs (DEA) respectively. The EIA applications were made in terms of Regulations 544 and 545 published under the NEMA (Table 6-1) and Government Notice 718 published under the NEMWA (Table 6-2). The reference number **17/2/3 GS-200** has been issued for this EIA by the MDEDET and reference number **12/9/11/L1053/6** has been issued by the DEA. An Environmental Management Programme (EMP) based on the findings of the EIA and a Water Use Licence Application in terms of the NWA (Table 6-3) will also form part of this process.

Mashala has appointed Geo Soil and Water CC (hereafter GSW) to conduct the EIA/EMP, public participation process and the integrated water use licence application (IWULA). The public participation process provides stakeholders with information about the proposed project, and several opportunities to comment throughout the EIA/EMP/IWULA process.

1.2 DETAILS OF THE PROPONENT

Mashala Hendrina Coal (Pty) Ltd is the project applicant and will fulfill the role of project developers and project managers for the proposed De Wittekrans Coal Mine.

Mashala Hendrina Coal was established in mid-2003 with four shareholder groups as part of their group and is ranked as a BEE shareholders company.

The main business of the De Wittekrans Coal Mine (as well as Mashala Hendrina Coal) will be to explore, mine, beneficiate and market coal.

Mashala Hendrina Coal's vision is to be become a significant BEE coal producer in South Africa and their mission is to secure further strategic reserves in order to grow and develop the business and to secure increased export entitlement and grow markets.

The applicant's details are summarized in Table 1-1.

Table 1-1 Applicant's contact details.

Name of Applicant:	Mashala Hendrina Coal (Pty) Ltd
Name of Mine:	De Wittekrans Coal Mine
Delegated responsible person:	Me Yolandie Du Randt
Physical Address:	Level 9 Fredman Towers Fredman Drive Sandton
Postal Address:	PO Box 413800 Craighall 2024
Tel:	+27 82 214 1268
Fax:	+27 11 881 1423
Email:	yolandie@conticoal.com

1.3 DETAILS OF THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

In terms of the NEMA the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake EIA of any activities regulated in terms of NEMA.

Mashala has appointed GSW, an independent consultancy, to undertake the environmental authorisation process for the proposed project in accordance with the EIA Regulations in terms of the NEMA. The IWULA pertaining to the proposed project will also be undertaken by GSW. Refer to Section 6 for a description of the legal framework.

GSW has no vested interest in Mashala or the proposed project and hereby declares its independence as required by the EIA Regulations.

The environmental consultant's details are summarized in Table 1-2.

Table 1-2 Environmental consultant's contact details.

Name of EAP:	Geo Soil and Water cc
Delegated responsible person:	Adri Joubert
Physical Address:	Plot 78C Leander street Olympus 0040
Postal Address:	Postnet Suite C319 Private Bag X18 Lynnwood Ridge 0040
Tel:	+27 82 926 8460
Fax:	+27 86 691 5753
Email:	adri@geosoilwater.co.za

1.4 PROJECT OVERVIEW

The proposed mining area is approximately 3 193 ha in extent. The proposed mining method is comprised of conventional opencast mining, making use of the roll-over method, while the standard bord and pillar mining method will be used for the underground sections. Opencast rehabilitation will take place on an ongoing basis.

Opencast mining is expected to commence within twelve months of the granting of the Mining Right. The areas will commence to the north of the Klein Olifants River and will be developed to allow access to the underground mining areas to the north east (Northern Underground section) and an adit will be developed to allow access to the south west (Southern Underground Section) of the property (Figure 1-2).

Approximately three (3) opencast sections (consisting of 118 ha of the total area) will be mined during the life of mine. Box-cut excavations will be constructed in the opencast areas to allow mining to continue and to facilitate the exposure of the highwall at an appropriate time to allow access to the southern underground reserves (Figure 1-2).

Two Underground sections (approximately 1900 ha) will be developed. One section will be located north of the N11 and the other sections will be located to the south of the N11 (Figure 1-2).

The forecast of annual production rates have been based on approximately 340 000 t/m. This consists of approximately 63 000 t/m from each opencast operation and approximately 120 000 and 200 000 t/m respectively from each underground operation when in full production (with both B seam and C seam having at least two mechanized continuous miner sections).

The A, B, and C Seams are targeted for opencast mining and the B and C Seams are targeted for the underground mining areas. The A Seam has not been targeted as a primary seam, but will be recovered from the opencast operations where mining permits.

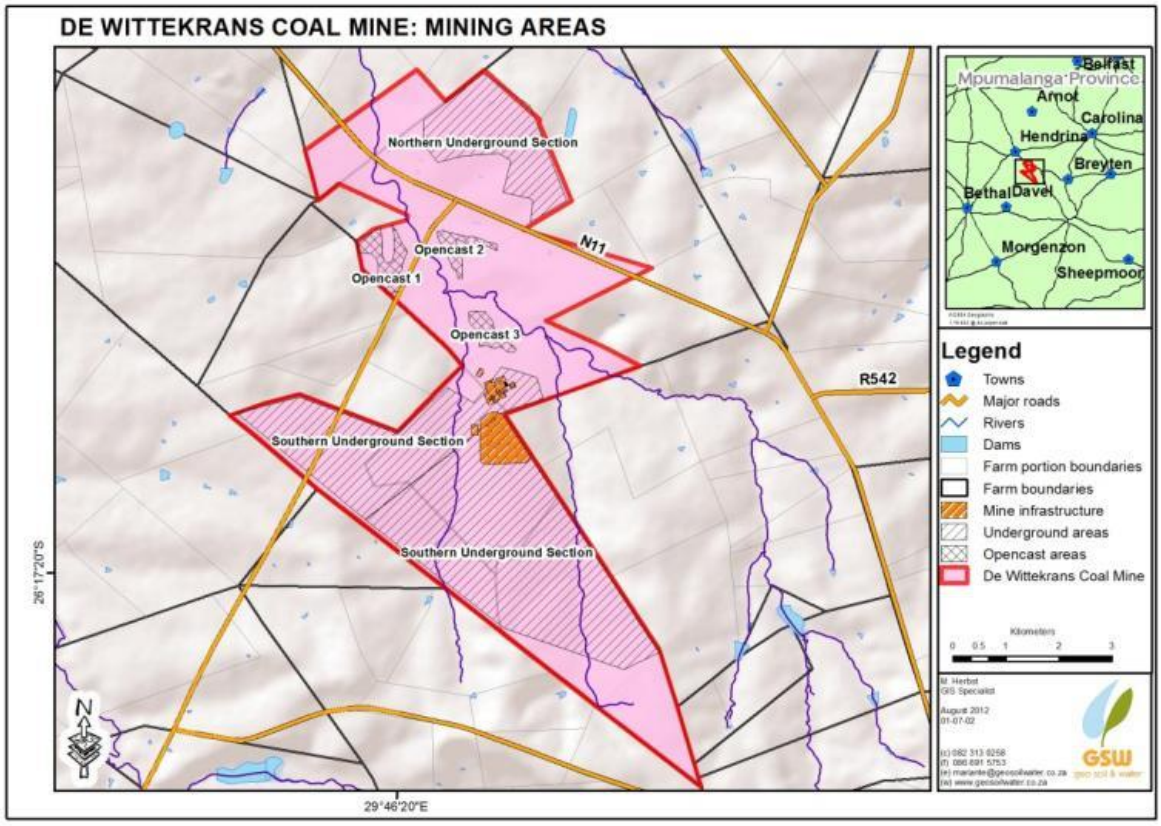


Figure 1-2 Opencast and underground mining area locations.

1.5 LOCATION OF THE PROJECT

The project area is situated on the south western side of the N11 between the towns of Ermelo (approximately 34 km south-southeast) and Hendrina (approximately 15 km north-northwest) within the Msukaligwa Local Municipality, which falls under the Gert Sibande District Municipality of the Mpumalanga Province. It is situated approximately equal distances from the Klein-Olifants and Olifants Rivers. The relative information of the project area is indicated in Figure 1-1.

The predominant land uses in the immediate surroundings are agriculture and mining. The agricultural activities are mostly maize farming with a lesser extent of potato and cattle farming activities. Wetlands, graves, dams and pans occur within

the project area. The mining activities that take place in the area are mostly coal mining, both opencast and underground mining. The project area is situated in the Ermelo Coalfield, of which the A, B and C coal seams occur on the project area.

Of the habitats found on the project area, almost 50% has been transformed through agricultural activities, either through maize (*Zea mays*), potato (*Solanum tuberosum*) or pasture grass (*Eragrostis spp, Digitaria spp*) farming. However, at least 27% of the project area is under natural grassland. These are often associated with the Klein Olifants River, its tributaries and the rocky outcrops.

The De Wittekrans Coal Mine project area falls within the B12A quaternary drainage region of the Upper Olifants sub-area within the Upper Olifants River catchment area of the Olifants WMA (Figure 1-1). It is situated within the Olifants River basin near the Southern catchment boundary of the Klein Olifants River (tributary of the Olifants River). The project area is approximately 3 193 ha in size and the effective catchment area is approximately 9770 ha in size.

The project area is situated within the Msukaligwa Local Municipality, which falls under the Gert Sibande District Municipality.

1.6 LAND TENURE

The project area covers various portions of the farms De Wittekrans 218 IS, Groblershoek 191 IS, Groblershoop 192 IS and Israel 207 IS (Figure 1-3).

Land tenure is indicated in Table 1-3.

Table 1-3 Title deed information.

Farm name and Registration division	Portion number	Title deed number	Owner details
De Wittekrans 218 IS	Portion 0 (RE)	T163331/2006	Anvin Beleggings Trust
De Wittekrans 218 IS	Portion 1 (RE)	T51496/1988	De Wittekrans CC
De Wittekrans 218 IS	Portion 5	T148343/2005	Marmic Trust
De Wittekrans 218 IS	Portion 10 (RE)	T168846/2005	Plaas De Wittekrans
De Wittekrans 218 IS	Portion 11	T34534/1987	Landman Samuel Jacobus
Groblershoek 191 IS	Portion 0 (RE)	T29181/1998	Riccor Boerdery Pty Ltd
Groblershoop 192 IS	Portion 0 (Entire farm)	T14631/1994	Voorsorg Plase Pty Ltd
Israel 207 IS	Portion 0 (Entire farm)	T29180/1998	Riccor Boerdery Pty Ltd

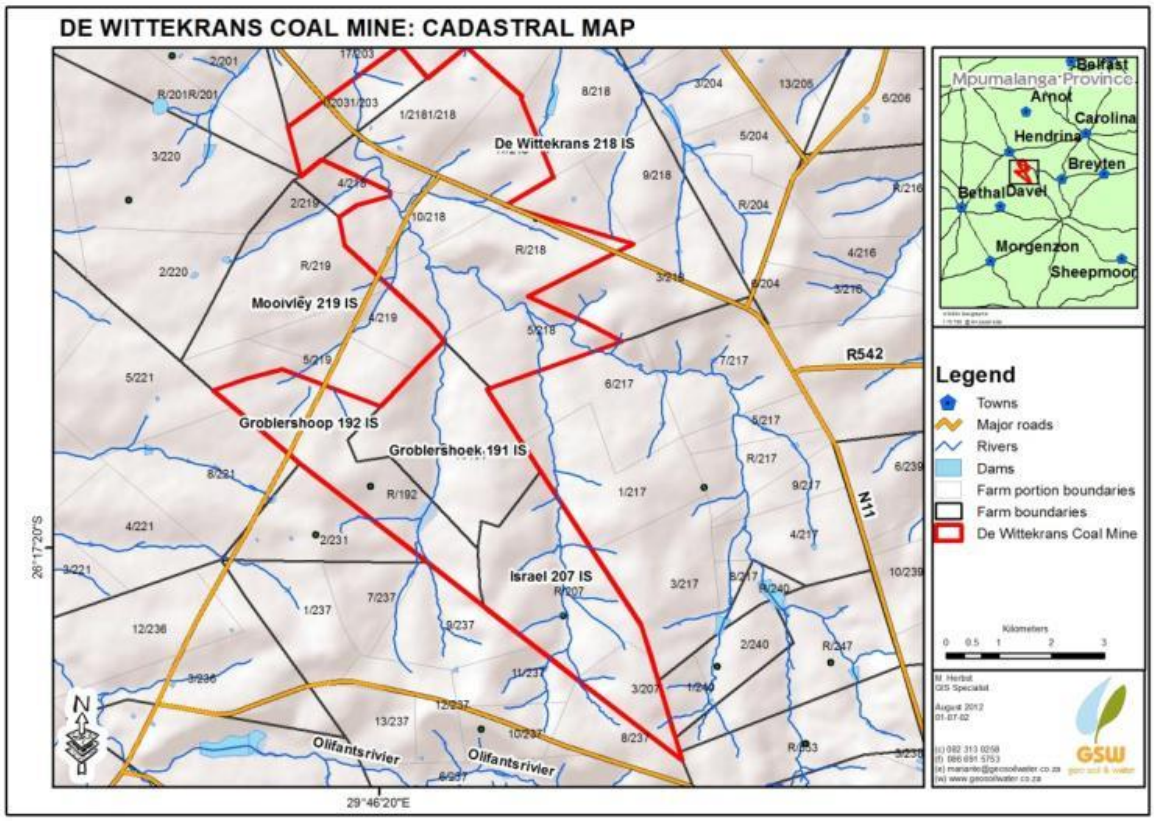


Figure 1-3 Cadastral information of the project area and surrounding area.

1.7 CURRENT AND PREVIOUS APPLICATIONS AND EMP REPORTS

An application for a mining right on the project area was submitted to the DMR during 2010 under the reference number **MP 30/5/1/1/2/3006**. A complete Scoping and EIA process was undertaken and the EMP Report submitted to the DMR. The EIA process included a public participation process whereof the comments and responses are provided in Section 8.3.3. The specialist studies that were undertaken and completed during the application for mining rights included:

- **Soil and Land Capability Assessment:** Earth Science Solutions dated August 2010;
- **Ecology (Fauna and Flora)** Assessment: Resource Management Services dated December 2008;
- **Hydrogeological (Groundwater) Assessment:** GCS dated August 2010;
- **Hydrological (Surface Water) Assessment:** GCS dated August 2010;
- **Wetland Delineation:** Resource Management Services dated December 2008;
- **Air Quality Assessment**: SDG Consulting CC dated August 2010;
- **Heritage Assessment:** PGS Heritage & Grave Relocation Consultants dated July 2010;
- **Noise and Vibration Impact Assessment:** dB Acoustics dated July 2010;
- **Traffic Impact Assessment:** Route2 – Transport Strategies dated August 2010;
- **Biomonitoring and Aquatic Assessment:** Econ@uj dated 2010;

- **Visual Impact Assessment:** Newtown Landscape Architects dated May 2009; and
- **Social Impact Assessment**: GCS dated June 2009.

This Scoping Report and EIA process are undertaken as part of the following processes:

- Application for Environmental Authorisation from MDEDET with reference number **17/2/3 GS-200;** and
- Application for a Waste Licence from DEA with reference number **12/9/11/L1053/6.**

An IWULA also forms part of the current processes.

2. DESCRIPTION OF THE PROPOSED PROJECT

The project area is approximately 3 193 ha in extent. The mining process to be employed is comprised initially of an opencast roll-over method, followed by underground mechanized bord-and-pillar operations at an appropriate time. Opencast rehabilitation will take place on an ongoing basis. Please refer to Figure 2-3 and Figure 2-4 for the infrastructure at the proposed De Wittekrans Coal Mine.

The A, B, and C Seams are targeted for opencast mining and the B and C Seams are targeted for the underground mining areas. The A Seam has not been targeted as a primary seam, but will be recovered from the opencast operations where mining permits.

The mine design parameters used in the mining operation are described below.

2.1 MINING METHODS

2.1.1 Topsoil management

Topsoil from the box-cuts will be stored along the open pit boundaries and at the final void strip. This will be used for the closure of the final strip. The roll over method of strip mining will be used, meaning that the topsoil stripped off one strip will be used to cover a previously mined strip.

2.1.2 Opencast mining

Mining will be carried out by contractors. Mining will be conducted in benches using appropriate equipment in current general use in South Africa. Highwalls are expected to be vertical. Appropriate geotechnical test work will be carried out during the next phase of exploration to determine the slope angels appropriate to the lithological types encountered.

Box-cut excavations will be constructed in the opencast areas to facilitate the exposure of the highwall at an appropriate time to allow access to the underground reserves.

Three opencast pits will be mined using the roll-over method (Figure 2-1)

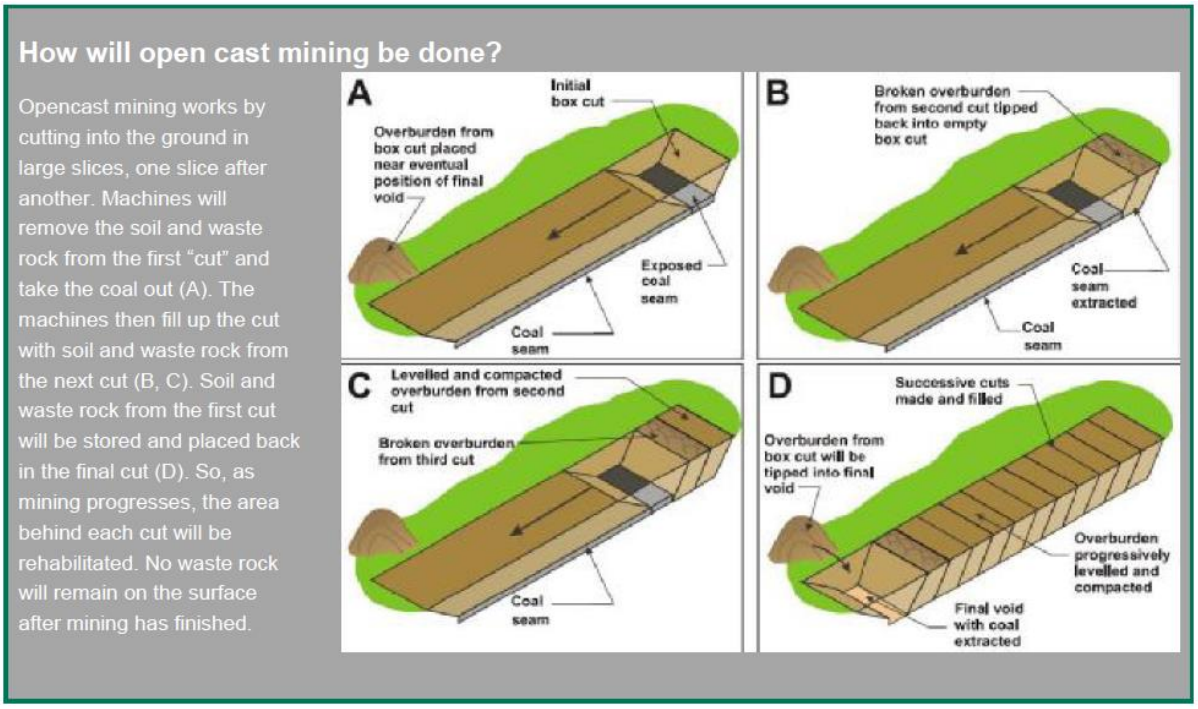


Figure 2-1 Opencast mining method.

2.1.3 Underground mining

The mining layout of the underground reserves to ensure optimal utilization includes the following considerations: Two underground sections will be developed. One section will be located north of the N11 and the other section will be located to the south of the N11.

The design parameters have taken cognizance of the Salamon & Munro formulae in determining pillar sizes. The full seam height of 2.0 m to 3.5 m for the full B Seam and the full C Seam will be mined. As the B Seam and the C Seam are mined, pillars will be superimposed where required to ensure maximum stability. Panel heights will be between 500 and 1000 m.

The seam floor is relatively flat and the power requirements for the trunk and section belts will not be abnormal for SA coal mining. Access to the underground areas will be from the highwall of the opencast areas.

Main dykes or discontinuities have already been identified and additional exploration will determine the effect of these structures on the estimation of coal resource and coal reserves. It is expected that the current coal resource estimate will be altered materially (Figure 2-2).

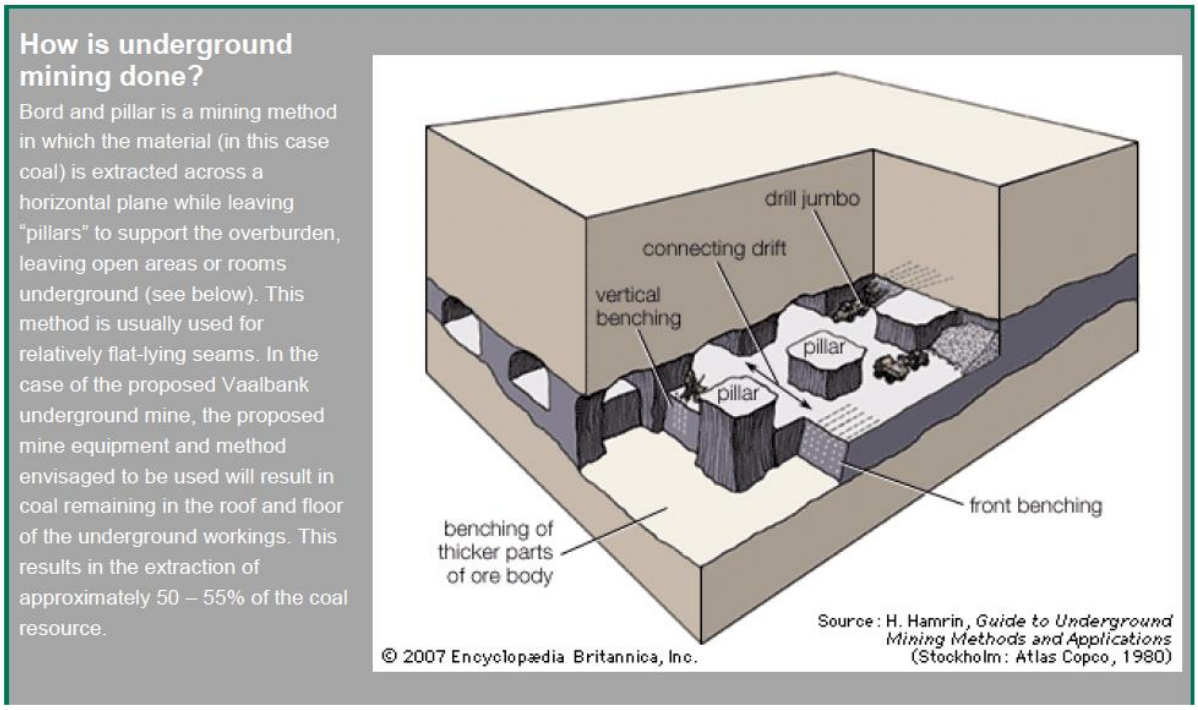


Figure 2-2 Underground mining method.

2.1.4 Coal processing

A processing plant will form part of the mine infrastructure and will be situated near the other mine infrastructure to the south of the entrance to the underground sections.

The processing plant is expected to be a two stage washing plant using an initial high density wash (RD = 1.8) to remove the high density material, and a secondary wash at an appropriate density will be used to separate the export and Eskom product.

A full description of the processing plant is provided in Section 2.2.4.

2.2 SURFACE LAYOUT, INFRASTRUCTURE AND ACTIVITIES UNDERTAKEN

Please refer to Figure 2-4 for the exact position of these structures.

General site infrastructure will include the following:

- Opencast workings;
- Underground workings;
- Process/benefication plant;
- Co-disposal facility;
- Pollution control dam;
- Mine water balancing dam;
- Product and topsoil stockpiles;
- Access and haul roads;
- Salvage yard/sorting area;
- Waste tyre storage area;

- Water management infrastructure;
- Water treatment plant;
- Wash bay, effluent separation and water recycling system facilities;
- Dewatering infrastructure;
- Conveyors and roads;
- Substation and power lines;
- Explosives storage;
- Fuel storage;
- Water storage;
- Sewerage treatment plant; and
- Plant offices, change rooms, store rooms and workshops, and other ancillary infrastructure.

See Figure 2-3 and Figure 2-4 for the conceptual mine plan.

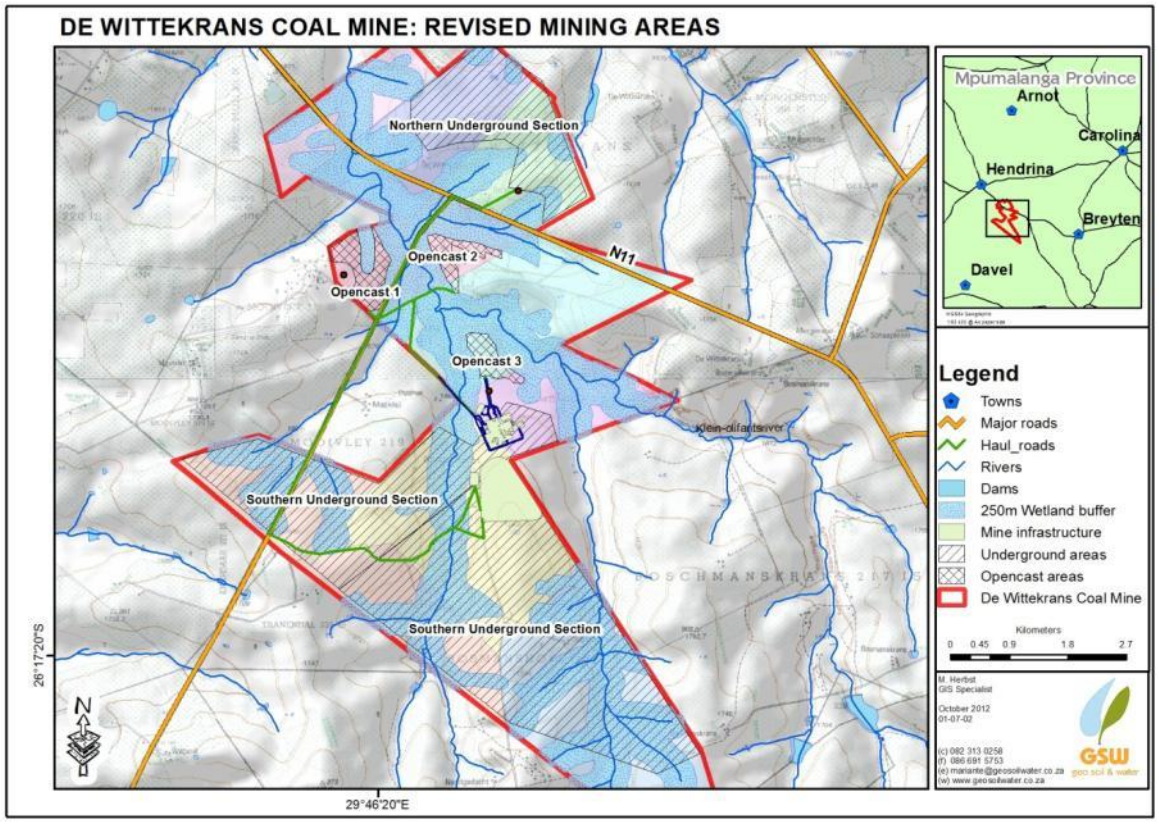


Figure 2-3 Conceptual mine layout including opencast and underground areas.

2.2.1 Access control and fencing

Access to the plant and mine site will be controlled through a single entrance/exit point onto the mine footprint. Most fencing has been specified as 1.8 m high razor diamond-mesh fencing. One variation is the containment fence around the dams where diamond mesh fencing is required (TWP Feasibility Study, 2011).

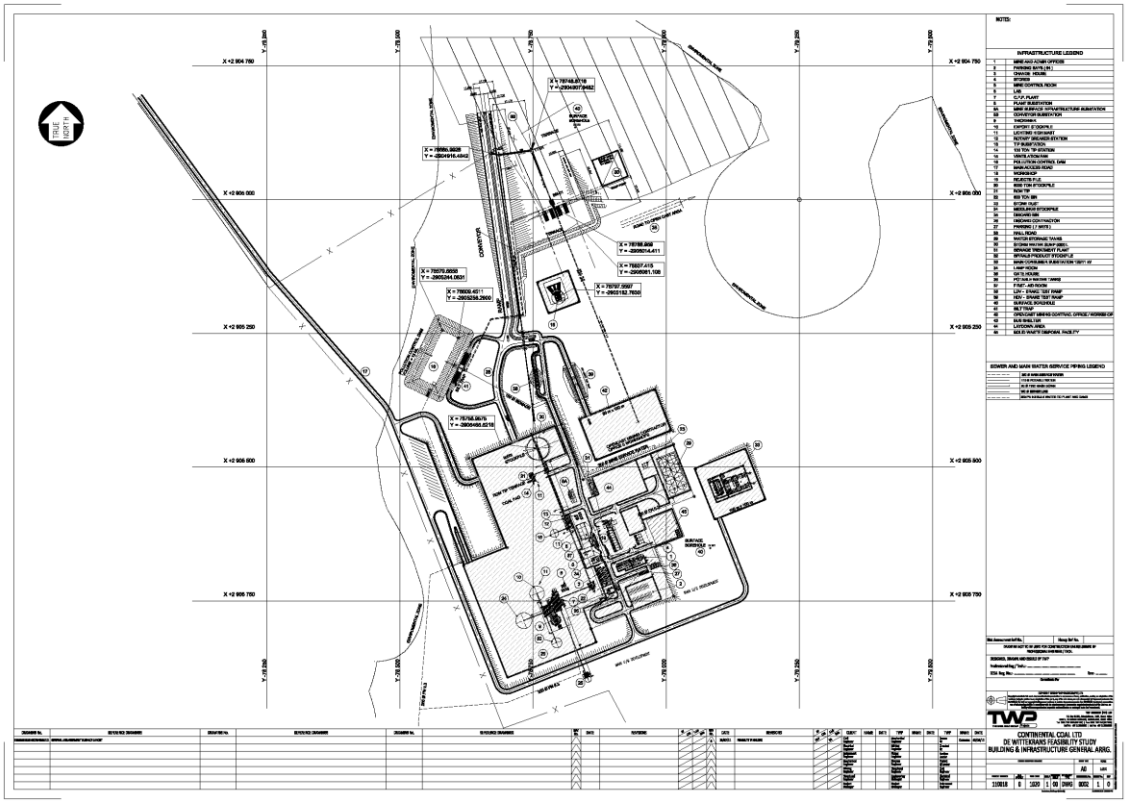


Figure 2-4 Conceptual mine layout depicting mine infrastructure.

2.2.2 Roads, railway lines and power lines

2.2.2.1 Roads

All new roads will be located outside the 1:50 year flood lines, except where they cross a stream. The causeway over the stream will be constructed to cater for the 1:50 year storm events.

Access to the mine and plant will be via the N11 between Hendrina and Ermelo, approximately 11 km south of Hendrina. The mine is located approximately 3.7 km from this road, however existing road access to the project area along farm roads is 22.5 km. The existing provincial gravel road from the N11, passing in close proximity to the proposed mining operations, will require upgrading to enable haulage of coal along this road either to the north or to the south to Davel. The existing intersection with the N11 has also to be upgraded to allow for the safe turning of vehicles. Additional lanes are to be added in the south and north direction allowing a passing lane to avoid vehicles waiting to turn across the road.

The first 2.6 km from the N11 will be used as the main access to the mine. All access and on-road haul roads will be 8m wide minimum, gravel surfaced roads (TWP Feasibility Study, 2011).

The road from the N11 to Davel will require similar upgrading and as the current surface does not allow for bi-directional traffic, it has been allowed for that the entire section will require a re-build (TWP Feasibility Study, 2011).

2.2.2.2 River crossings

Although existing roads will be used as haul roads, some sections will consist of newly constructed roads. Various non-perennial and perennial streams will thus be crossed by the haul roads. The existing roads contain various low-water bridges and these will have to be widened using conventional concrete construction methods, yet with extensive doweling to existing structures (TWP Feasibility Study, 2011). Where new or upgraded river crossings are needed, it will impede and divert flow during high flows.

2.2.2.3 Power lines

A temporary supply of 500 KVa will be provided by Eskom to be used in the interim and layer as a backup for the underground fans. The main supply of 10 MVa will be available in 2 years' time and this will be used for the washing plant and underground mining operations.

2.2.2.4 Railway lines

There are currently no operating railway lines currently on the mining area. Coal for export will be transported via road to one of the following siding options where it will be loaded onto railway trucks on the Richards Bay Railway line:

- Davel siding;
- An approved existing siding; or
- Delta siding for a provisional period until a decision can be made on one of the above options. Delta siding will become permanent option if the above mentioned options are deemed not viable.

2.2.3 Buildings and associated infrastructure

Various buildings and additional infrastructure will be constructed to the south of the entrance to the underground section.

These buildings and additional infrastructure include:

- Administrative and main office;
- Parking bays;
- Change house;
- Stores;
- Mine control room;
- Lab;
- Lamp room;
- First-aid room
- Workshops; and
- Contractor's offices and workshop.

2.2.4 Process plant

The process plant will be situated near the other mine infrastructure to the south of the entrance to the underground sections.

The processing plant is expected to be a two stage washing plant using an initial high density wash (RD = 1.8) to remove the high density material, and a secondary wash at an appropriate density will be used to separate the export and Eskom product.

It has been estimated that the plant capacity is expected to be 750 to 800 tph.

A schematic mass balance diagram developed for the plant is shown in Figure 2-5 and the process control and feedback system is indicated in Figure 2-6.

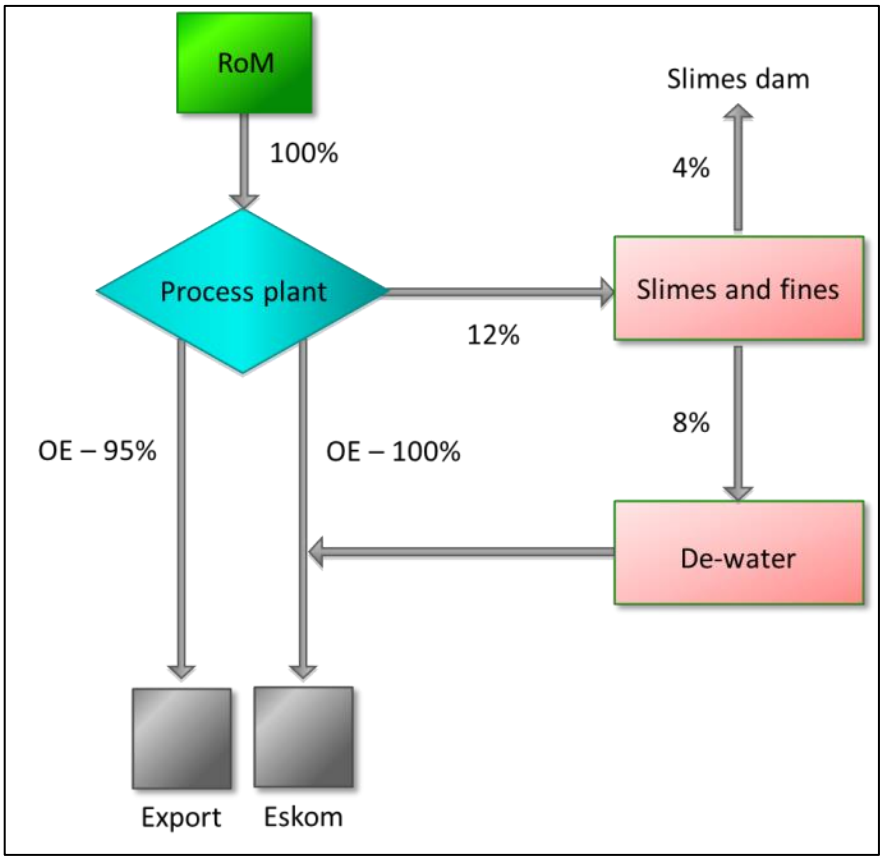


Figure 2-5 Schematic process flow diagram schematic for the plant.

The plant will operate in two phases:

- Phase 1 will operate without water. The plant will operate as a destoning plant. Crushing will take place on site and the coal transported to the Delta siding for processing;
- Phase 2 will be a fully operational plant requiring water.

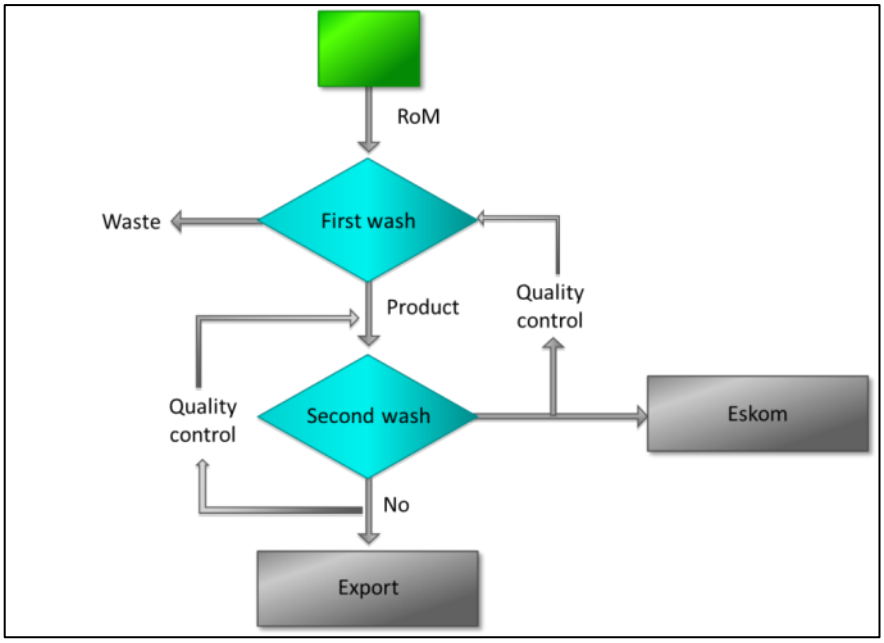


Figure 2-6 Schematic process and flow diagram for the process control and feedback system of the plant.

2.2.4.1 ROM feed section

ROM coal will be delivered from the opencast mine in trucks dumped onto a dedicated stockpile. Front-end loaders (FEL) will be used to reclaim material and discharges into a ROM Hopper.

A water wash-down system will be provided which will also provide dust suppression at the reception hopper. An overhead dust suppression spray gantry will be installed above the grizzly.

ROM coal from underground mine is conveyed to a surge stockpile by others. A reclaim tunnel equipped with vibrating feeders will be provided to reclaim coal onto a raw coal product conveyor.

The crushed opencast coal combines with the underground coal on the raw coal product prior to discharge onto the rotary breaker grizzly feeder.

2.2.4.2 Plant feed

The washing plant will consist of a primary washing stage, where discards are removed, and secondary washing stage, where product and middlings are produced. The CPP feed conveyor will discharge into the raw coal distribution box where the coal will be slurried with water prior to feeding onto a desliming fixed sieve.

2.2.4.3 Primary dense medium circuit

The -80 +0.63 mm raw coal overflow from the desliming screens will be flushed with medium in a chute to the DMC wing tanks. The wing tank will be designed with a constant sump level maintained through overflow of excess medium to the primary correct medium sump. In this way, the suction head above the coarse DMC feed pump remains constant regardless of fluctuations in the solids feed rate.

Slurry consisting of dense medium and coarse coal will be pumped into single high-capacity dense medium cyclones located on the top floor of the plant. Product coal and dense medium will collect in the DMC overflow box and, in turn, will discharge onto a fixed sieve where the majority of the medium will be removed. Product coal and adhering medium will then discharge onto a multi-slope product drain and rinse D&R screens.

Medium drained through the drain section of the D&R screen will be returned directly to the primary correct medium sump from where it will be re-circulated by means of the primary correct medium pump. Any adhering medium after the drain portion of the screen will be rinsed from the coal by water sprays as the coal travels across the rinse portion of the screen and transferred to the common dilute medium sump.

Drained product from the D&R screen will report to a double roll crusher where the particle size will be reduced to 50 mm prior to reporting to the secondary washing stage.

Discards and dense medium from the underflow of the DMC will collect in an underflow box prior to discharging onto a fixed sieve. Discard and adhering medium will then discharge onto a multi-slope discards drain and rinse screen. Medium drained through the drain section of the D&R screen will be returned directly to the primary correct medium sump from where it will be re-circulated by means of the primary correct medium pump. Any adhering medium after the drain portion of the screen will be rinsed from the discards and report to the common dilute medium sump. The drained solids from the discards screen will be sent to the discard conveyor.

2.2.4.4 Secondary dense medium circuit

The -50 +0.63 mm raw coal overflow from the primary product crusher will be flushed with medium in a chute to the DMC wing tanks. The wing tank will be designed with a constant sump level maintained through overflow of excess medium to the primary correct medium sump. In this way, the suction head above the coarse DMC feed pump remains constant regardless of fluctuations in the solids feed rate.

Slurry consisting of dense medium and coarse coal will be pumped into a single high-capacity dense medium cyclone located on the top floor of the plant. Product coal and dense medium will collect in the DMC overflow box and, in turn, will discharge onto a fixed sieve where the majority of the medium will be removed. Product coal and adhering medium will then discharge onto a multi-slope product D&R screens.

Medium drained through the drain section of the D&R screen will be returned directly to the secondary correct medium sump from where it will be re-circulated by means of the secondary correct medium pump. Any adhering medium after the drain portion of the screen will be rinsed from the coal by water sprays as the coal travels across the rinse portion of the screen and transferred to the common dilute medium sump. Drained product from the D&R screen will report to a coarse coal vibrating basket centrifuge prior to the export product conveyor.

Sinks and dense medium from the underflow of the secondary DMS cyclone will collect in an underflow box prior to discharging onto a fixed sieve. Sinks and adhering medium will then discharge onto a multi-slope sinks drain and rinse

screen. Medium drained through the drain section of the D&R screen will be returned directly to the secondary correct medium sump from where it will be re-circulated by means of the secondary correct medium pump. Any adhering medium after the drain portion of the screen will be rinsed from the sinks and report to the common dilute medium sump. The drained solids from the sinks screen will be sent to the middlings conveyor.

2.2.4.5 Magnetite recovery

A portion of the medium drained through the drain section of the product D&R screens from both the primary and secondary plants, will provide the bleed of medium via the correct medium bleed splitter boxes to the common dilute medium tank. The bleed is necessary to purge excess water and non-magnetic contaminants, principally -0.63 mm (w/w) material, from the correct medium circuit.

The rinse sections of the D&R screens will drain directly to the common dilute medium tank. Rinsed medium from the screens will be combined with the bleed from the drain section of the product D&R screen and pumped up to the primary magnetic separators. Concentrate from the separators will gravitate to either the primary or secondary correct medium tank. Effluent from the primary magnetic separators will be collected and report to the raw coal distribution box to assist in slurring of the raw coal prior to desliming. In this way, any fine coal within the DMS circuit is recovered for processing within the fines circuit.

2.2.4.6 Density control

The density control for the DMS circuits operates on the basis of maintaining the medium in the correct medium sump as a rising density which is generally higher than the desired DMC cut-point. The density of the correct medium in the discharge leg of the correct medium pump will be monitored by means of a fixed nucleonic density gauge.

Any positive offset between the measured process variable and the chosen set-point will be corrected by means of water injection into the correct medium sump.

In the event that the actual medium specific gravity is less than set-point (a negative off-set) in the DMS circuit, the water injection will cease and the inherent rising density of the correct medium circuit will over time increase the specific gravity of the correct medium to that of the set-point. In these situations it is almost inevitable that raw magnetite will need to be added to the respective correct medium circuit as the level in the correct medium sump will drop as water is bled from the correct medium circuit to increase the specific gravity of the circulating medium.

To maintain an over-dense medium in the correct medium tank, the water adhering to the coal entering the DMS circuit will be removed by the controlled bleed to the dilute medium sump. From the dilute medium tank, the excess water will be pumped to the magnetic separators and lost as effluent to the desliming screens whilst the recovered magnetite is returned to the correct medium sump as a magnetite concentrate thereby ensuring a rising density.

In order to raise the density of the high gravity section, correct medium is bled from the drain section of the secondary circuit product D&R screen to the densifying cyclone feed tank. The densifying cyclone underflow, at an estimated density of 2.1 t/m^3, gravitates to the secondary circuit correct medium tank. The densifying cyclone overflows gravitate to the dilute medium tank. When the secondary circuit

correct medium set-point has been achieved, the bleed medium is diverted to the secondary correct medium tank and the densifying circuit is switched off.

2.2.4.7 Magnetite addition

When the level in one of the correct medium sumps decreases to a pre-set level, magnetite will be added to the relevant sump until the sump level returns to normal. Magnetite losses will be made up from the bulk magnetite storage pit. The bulk magnetite will be slurried in the pit by a hose monitor and pumped by the raw magnetite pump to a magnetic separator. Over-dense from the magnetic separator will report to relevant correct medium sump. Magnetic separator underflow can either be proportioned between dilute medium sump and magnetite pit.

2.2.4.8 Fines washing circuit

The fine coal, -0.63 mm (w/w) reports as desliming screen underflow into the desliming cyclone feed sump and will be pumped to the desliming cyclone cluster. The desliming cyclones will classify feed at nominal 0.125 mm. The desliming cyclone underflow will gravitate to spiral concentrators. The desliming cyclone overflow will report to the tailings thickener.

Spiral product will report to the spiral product sump. Product is then pumped to a product dewatering cyclone cluster. Overflow from the cyclone cluster reports to a tailings thickener. Underflow from the cyclone cluster reports to high frequency dewatering screen. Overflow from the dewatering screen reports to a fine coal centrifuge before it discharges onto the spiral feed conveyor. Dewatering screen underflow gravitates to the spiral product sump.

Spiral discards drains to a high-frequency discards dewatering screen. Oversize from the discards screen is transferred directly onto the discards conveyor and the underflow gravitates to a dedicated tank and pumped to the tailings thickener.

2.2.4.9 Tailings circuit

The desliming cyclone overflow and spiral product dewatering cyclone overflow will flow to the tailings thickener. A smaller volumetric load will also come from the effluent draining from the high-frequency fines discards screen. Thickener underflow will be pumped to a tailings dam for deposition and recovery of return water after the solids have settled. Thickener underflow will be monitored by a density gauge to facilitate pumping slurry of an acceptable pulp density to conserve water. The thickener underflow pump will be fitted with a variable speed drive. The tailings line will also employ a flow meter to allow the mass flow of solids to be estimated. Clarified water will overflow the tailings thickener to the clarified water tank and will be re-circulated through the plant as process water.

2.2.4.10 Flocculent addition

A fully automated flocculent mixing / dosing system will be provided to serve the tailings thickener. The system should be designed to accept a powdered flocculent supply which will be manually charged into the flocculent bin regularly to ensure availability at all times. Flocculent will be withdrawn from the feed bin via screw feeder and mixed with potable water under high pressure prior to entering the flocculent mixing tank. Upon expiry of the hydration timer, the mixed flocculent will be available for transfer to the flocculent dosing tank. A transfer pump will transfer flocculent to the dosing tank. A variable speed dosing pump will transfer flocculent

from the dosing pump to the thickener feed launder. The pump speed is manually controlled a "percentage" pump speed setting on the PLC.

2.2.4.11 Raw, return and potable water system

The return water system is outside the scope of the CPP design. However, as much of the decanted water returning from the tailings dam will be re-used as process water to minimize the volume of raw water needed to sustain the CPP. Return water will be pumped to a raw water dam (by others). Raw water (by others) will be supplied to maintain level in the dam. Water from the dam will be pumped to the clarified water tank by others. A potable water tank will be supplied (potable water supply by others) complete with pump and reticulation pipelines to flocculent make up plant.

2.2.4.12 Process water circuit

All process water will be supplied from the clarified water tank which will collect the clarified thickener overflow and make-up water from the Ericson dam. The process water supply will be based on two circuits:

- A ring main to supply the screen sprays, the water for control of the density in the DMC circuits, flushing water for the tailings line, make-up water used for level control within the sumps and slurring water in head boxes.
- A ring main to supply to the ROM tip for dust suppression, wash down in the plant, flocculent and fire fighting.

The two ring mains will be supplied by independent suppliers.

2.2.4.13 Discards handling

Spiral discards and coarse discards will discharge from their respective discards screens onto the discards conveyor which in turn will transfer to a discards bin. The bin will be capable of loading rear dump trucks and has an overfill by-pass chute in case of an emergency, which will form a stockpile for removal by front-end loader. Before entering the bin, the material will be sampled by a cross-belt sampler fitted on the discards conveyor. A six idler electro-mechanical scale will be installed to weigh the discards conveyed to the discards bin. This scale will be used for accounting purposes

2.2.4.14 Product handling

Export product from the plant will be directed onto the product conveyor which will supply product coal to a stockpile. Before discharging onto the stockpile, the material will be sampled by a cross-belt sampler fitted on the product conveyor. Middlings from the plant will also be directed onto a stockpile and a cross-belt sampler will be provided. Six idler electro-mechanical scales will be installed to weigh the coal on both conveyors. This scale will be used for accounting purposes.

2.2.5 Storm water management

The management of storm water is important as it limits the effects of the plant on the environment, therefore contributing to a sustainable solution. Clean storm water will be diverted around the dirty water catchment in a controlled manner to tie in with existing surface drainage features and flow into the tributary of the Klein-Olifants (Figure 2-7).

Figure 2-7 Storm water drainage layout.

The principals on which the storm water management plans are based, and which are implemented in the conceptual design can be summarized as follows:

- The containment of contaminated water;
- A pollution control dams weres designed and located in such a way that polluted water from the site is contained;
- The monitoring of quality of water in the nearby rivers; 4 monitoring points are recommended;
- The re-use of containated dirty water; and
- No discharge of contaminated surface water to the environment is anticipated from this activity.

The storm water management facilities will consist of the following:

- Pollution control dam (PCD);
- Mine water balancing dam;
- Clean water cut off drains and berms;
- Polluted water drains;
- Pipe culverts and box culverts;
- V-drains and/or trapezoidal drains; and
- Silt traps.

The catchment area for the mine and plant infrastructure has been minimised though the use of clean water cut off drains and berms. These drains are used to intercept any water entering the mine dirty water area and diverting it to lower soak away points where the water will re-enter the environment. These drains will only be lined at locations where high velocities are expected. The remainder of the drain would be hydroseeded. Drains would be constructed using conventional excavations or can be grader-cut, depending on the application. Drain beds will be levelled and compacted using trench compactors. Side slopes are to be suitably topsoiled and hydroseeding is to be undertaken using the correct mixture for climate and season.

The water inside the polluted area would be collect through a series of polluted water drains. These drains are concrete lined to reduce energy losses and water infiltration. This would be either v-drains or trapezoidal drains depending on expected flow rates. Concrete drains will be constructed as described above with reinforced concrete cast in-situ using construction jointing as dictated by the construction drawings.

Pipe culverts would be used to transport water under roads or other services where necessary, larger box culverts will be supplied at locations where streams and drains need to pass under roads. This is applicable to both the clean and dirty water systems. All culverts will be constructed in accordance with SANS 1200 and headwalls will be constructed from reinforced concrete, in-situ.

The polluted water will drain toward the PCD. The water will need to pass through single bed silt traps. The area of these traps will be large to allow for effective settlement as well as sufficient volume to contain silt from the biggest rainfall events. Cast in steel rails have been placed to prevent damage to the concrete during the cleaning process.

Ramps allow heavy machines to assist in cleaning silt out the traps. The silt traps will be constructed using conventional in-situ reinforced concrete construction techniques. Care is to be taken with the provision of cast-in items and with the construction of sloped beds.

The PCD and water balancing dam has been positioned and sized to allow for the particular polluted footprint in two areas namely the plant area and the discard area, where the discard dam also serves as a balancing facility for the polluted water generated from the open pit and underground activities. All dirty water management structures will have 2000 micron HDPE liners.

The PCD and water balancing dam will be constructed using conventional earthmoving equipment and techniques. Liners will be placed and installed by a specialist supplier / installer (such as Aquatan) and will require anchoring to walls and toes in anchor trenches, and concrete structures using L-shaped stainless steel mounting strips with rubber gaskets. Concrete in and outlet structures to the PCD will be constructed using conventional in-situ reinforced concrete construction techniques (TWP Feasibility Study, 2011).

The dams are conceptually designed around the 1:50 year flood volume as in accordance with GN 704. There is also a freeboard added to act as a safety barrier, in case there are a few extreme events in a short period of time, to give some extra leeway. The dams are designed as a square for ease of conceptualization and are

designed with walls of less than 5 m to comply with the NWA and not need to apply for the construction.

2.2.6 Water treatment plant

A potable treatment plant will be constructed at the entrance to the underground section. The potable treatment plant will treat raw water that will be used for drinking purposes (i.e. potable water) on site.

2.2.7 Wash-bay, effluent separation and water recycling system

A wash bay complete with an effluent separation system and Oil/Water separator system will be implemented as part of the mine's water management activities. The following requirements will be incorporated into the design:

- Allowance must also be made to recover wash water that can be re-used during the washing operations.
- The effluent separation system must cater for all effluent generated in the Wash-Bay area.
- The system must be an environmentally sustainable system that is cost effective and easily maintainable, but also complies with all relevant legislation and regulations.

The effluent separation and water treatment plant will cover the following installations (Figure 2-8):

1. Wash-Bay Civil Implementation
2. Silt trap/Sediment Control
3. Gravity Effluent Separation
4. Oil/Water Separation System
5. Closed Circuit System

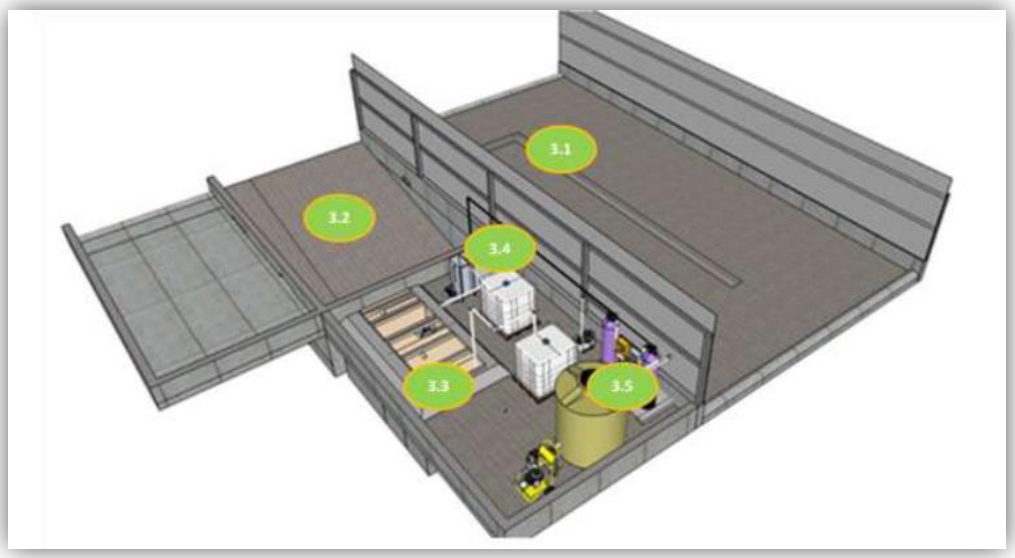


Figure 2-8 Illustration of the components of the wash-bay, effluent separation and water recycling system.

Design parameters:

- A Wash Bay System which will allow for the washing of Waste Skip Trucks.
- The Wash-Bay design is based on daily utilization to wash with the use of two High Pressure Washers per bay.
- Effluent from the Washing Apron will be directed to the effluent separation system.
- Effluent will be collected in a sediment trap and effluent separation system to allow for the collection of fines and solids and separation of hydrocarbon contaminants.
- Final effluent to be recovered into holding tanks for re-use in the Wash-Bay. Any excess water that cannot be recovered will be free of hydrocarbons and silt before being discharged into the storm water system.
- Piping and pumps will be supplied from the effluent separation system to the holding tank and from the holding tank to the booster pump.

1. Wash-bay:

The Civil Wash-Bay installation shall comprise of the following:

- A reinforced concrete pad that will be capable of handling HDV's within the enclosed area using 25 Mpa concrete.
- The entrance and exit to the concrete pad shall have a cast concrete sill included to prevent water runoff from the operational area.
- The concrete pad shall have a general fall towards the central drainage system which will convey fines and wash water to the sediment trap and effluent separation system.
- In the washing area containment walls will be constructed by using IBR sheeting. These walls will be erected on two sides of the washing apron. This is done to reduce water splash and protect personnel and equipment from flying debris. This will also eliminate soil contamination adjacent to the Wash-Bay.
- The central drainage system will be a self-cleaning V-Drain type drain that will be sloped towards the sediment trap.

2. Sediment trap:

The silt trap is designed to separate the silt and sludge from the effluent, as well as the initial hydrocarbon separation.

- The silt trap will allow the silt the sink to the bottom due to the density of the silt, and the hydrocarbons to rise to the surface.
- The silt trap is built at a decline angle to allow easy access by means of TLB.
- The over flow will only allow the top surface of the effluent to enter into the first sump chamber, and prevent the silt to enter into the first sump chamber.
- The regulated flow to the sump is 650 Lpm.

3. Effluent Separation System:

The first sump chamber is designed to give the effluent sufficient time to separate, due to the stagnant water in the chamber (Figure 2-9).

- The first sump chamber will contain most of the hydrocarbons (Oil, Diesel, Petrol, Turpentine, and oil based paints), because of under over system, only hydrocarbon free effluent will be forced into the second chamber.
- Stagnant water capacity is 20 000 L; with a regulated flow of 200 L per minute thus only 3.2 % of stagnant water will create turbulence due to the regulated flow. This means that 96.8 % of the capacity is contributing to the settling and segregation process.
- The Primary sump chamber will create a pressure of 200 KPA at the bottom of the sump, due to the pressure generated size 80+ micron hydrocarbons will not be able to pass into the second chamber.
- In case of flush water (storms, pipe burst's) the effluent will not have sufficient time to separate due to the emulation effect that turbulent water produce, and the fast flow of the rush water. The effluent will be pushed into the second sump chamber where a second stagnant process will force the effluent to separate.
- The worst case there is a third chamber with the same process as in second sump chamber.
- Under normal conditions, normal flow or regular flow, the first chamber will handle all the effluent.
- The last chamber of the sump may also serve as a pump chamber; creating a close circuit system. This water may be used for washing or general plant uses, but is not fit for drinking.

Figure 2-9 Photographs of an installed effluent seperation system.

4. Oil/Water Separator (600 l/hour)

It is proposed to the implementation a 600 L Oil/Water Separator, the separator will recover all hydrocarbons that may have settled on in the effluent separation plant (Figure 2-10).

Separators are gravity separation devices designed by using Stokes Law to define the rise velocity of oil droplets based on their density and size. The design of the separator is based on the specific gravity difference between the hydrocarbon and the waste water because the difference is much smaller than the specific gravity

difference between the suspended solids and water. Oil water separators purpose is to recover hydrocarbons that have segregated from emulsion in an effluent separation plant.

Figure 2-10 Photographs of an Oil/Water separator.

5. Water Purification and Return Water System:

The water purification system comprises of various stages to purify the effluent for reuse.

Purified Water Storage Tank - Purified water is stored in the holding tank for re-use in the wash bay. This water is pressure fed via a pressure pump to the High Pressure Cleaner.

Programmable Logic Controller (PLC) - A PLC is installed that will control all mechanical components such as pumps and levels in tanks to ensure that tanks do not over fill and that the complete system is perational with start-up. This control panel makes the equipment fully automatic and simple to operate.

A Closed Circuit System will be implemented for the recovery of outflow effluent that will be re-used in the washing process. The system will feed the High Pressure Washers.

The closed circuit system will comprise of the following (Figure 2-11):

- Holding tank with 5 000 litre Capacity
- Piping to tank and from tank to Booster Pump
- Booster Pump to supply water to Hp Washer with a delivery capacity of 3 Bar.

Figure 2-11 Photograph and illustration of a holding tank and closed circuit system.

2.2.8 Mine waste

Waste that will be generated during the planned life of mine will include domestic waste, industrial waste, sewage, hazardous industrial waste (hydrocarbon containing waste) and coal waste. In each of the categories there will be both solid and liquid waste.

- Salvage yard/Sorting area

  Removal of used material from a mine is vital and a facility where redundant equipment can be sold is essential. The operation of this facility is in line with the waste hierarchy, which promotes re-use and recycling of waste.

  Large volumes of waste will be generated on the mine annually. The availability of a facility where waste can be off-loaded, sorted, and temporarily stored before being recycled, resold or disposed of is therefore essential.

- Waste tyre storage area

  The waste tyre storage area will be part of the salvage yard. The storage area will comply with all legislative requirements as set out in Regulation 149 of 2009: Environmental Conservation Act (73/1989) - Waste Tyre Regulations of 2008.

2.2.8.1 Domestic waste

Domestic waste will be collected on site in clearly marked skip bins and transported off site by a contractor when full. Where possible, the domestic waste will be disposed of separately in clearly marked containers and recycled by contractors who will remove them off-site for commercial gain. A waste disposal certificate will be required from the contractors to ensure safe disposal.

2.2.8.2 Industrial waste

Industrial waste (metals, rubber, tyres, conveyor sheets etc.) will be stored separately in clearly marked containers within a salvage yard and bartered off to recycling companies once or twice a year, depending on the volumes. A waste disposal certificate will be required from the contractor to ensure safe disposal.

2.2.8.3 Sewerage facilities

A package sewage treatment plant will be provided to handle sewage water generated from the change house, offices, workshop and store buildings. Treated waste water will be fed back into the mine water system for re-use in the plant or underground.

The effluent will be disposed of into the PCD. The treated sewage water will be piped to the industrial water reservoir in order to reduce make up water requirements.

Portable toilets will be used at the opencast sections and the raw sewage will be disposed of at the dedicated sewerage plant or alternatively be collected by a licensed contractor for disposal at a licensed sewage treatment plant.

A package sewage treatment plant will be provided to handle sewage water generated from the change house, offices, workshop and store buildings. The sewage treatment plant will be sized to cater for a percentage of the total potable water demands for the operation. The treated sewage water will be piped from the sewage treatment plant to (and stored in) an industrial water reservoir in order to reduce make up water requirements. The sewage treatment plant will consist of a number of individual pre-manufactured fiberglass units (as per Figure 2-12) complete with inner pipe reticulation. The footprint of the STP in its entirety will be approximately 500 m^2 (0.05 ha).Treated waste water will be fed back into the mine water system for re-use in the plant or underground.

The package plant requires the construction of a number of rectangular concrete tanks and a conically shaped concrete digester with interconnecting pipework.

These will be constructed in-situ using conventional reinforced concrete construction.

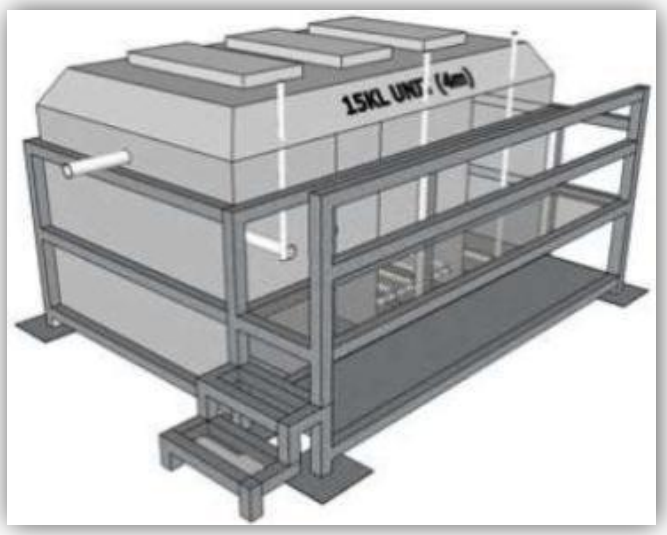


Figure 2-12 Individual pre-manufactured fiberglass unit.

Principle of the sewage treatment plant:

Sewage will be collected through a network of sewage pipes already in use and will be routed to the sewage treatment plant. The basic phases of the sewage treatment plant is described below and illustrated in Figure 2-13.

1. **First phase**
   - Screening takes place at the point of entrance in the STP (this can be done manually or automatically).
2. **Second phase**
   - Two anaerobic tanks are at work during the second phase: The first tank allows for digestion of sewage and the separation of solids i.e. those that settle and those that float. The middle cut of the effluent then flows through to the second tank.
   - The second tank breaks down the fine sewage particles and alters to carbon dioxide and water. This ideal effluent then passes into the aerobic chamber for polishing.
   - The de-nitrification cycle also takes place in this phase.
   - This function is responsible for the breaking down of nitrates to nitrogen gas.
3. **Third phase**
   - In this phase the digestion takes place in an aerated environment.
   - This phase is called aerobic digestion.
   - This phase takes the smaller solids and bio-degrade them further.
   - This phase is also called the "polishing phase".
   - The type of bacteria that operates in this environment is called aerobic bacteria.
   - It is very important to aerate this phase to enrich the liquid with oxygen.
   - The bacteria perform at their optimum in an oxygen enriched environment.
   - In the aerobic phase the nitrification takes place. This process breaks down the ammonia to nitrites and the nitrites to nitrates.
   - It is very difficult to establish this function. The bacterium needed to perform this function needs a very specific environment.
   - To provide these bacteria with their "homes" we have designed a very effective aerobic zone.
4. **Fourth phase**
   - Secondary settling takes place in the fourth phase.
   - The cell material and settle able solids settle in this phase and form the so-called "sludge blanket ".
   - The sludge blanket is very important for the process. When the blanket matures it is re-circulated to the primary settling tank in phase one to "seed" or inoculate the raw sewerage entering into the plant and to alter the nitrates to nitrogen gas.
   - This cycle is called the re-activated sludge cycle. This technology improves the efficiency of the process and the plant.
5. **Fifth phase**

- In the fifth and final phase the final effluent is prepared for final discharge.
- The effluent is disinfected or sterilized to prevent any dangerous or harmful bacteria from entering our environment.

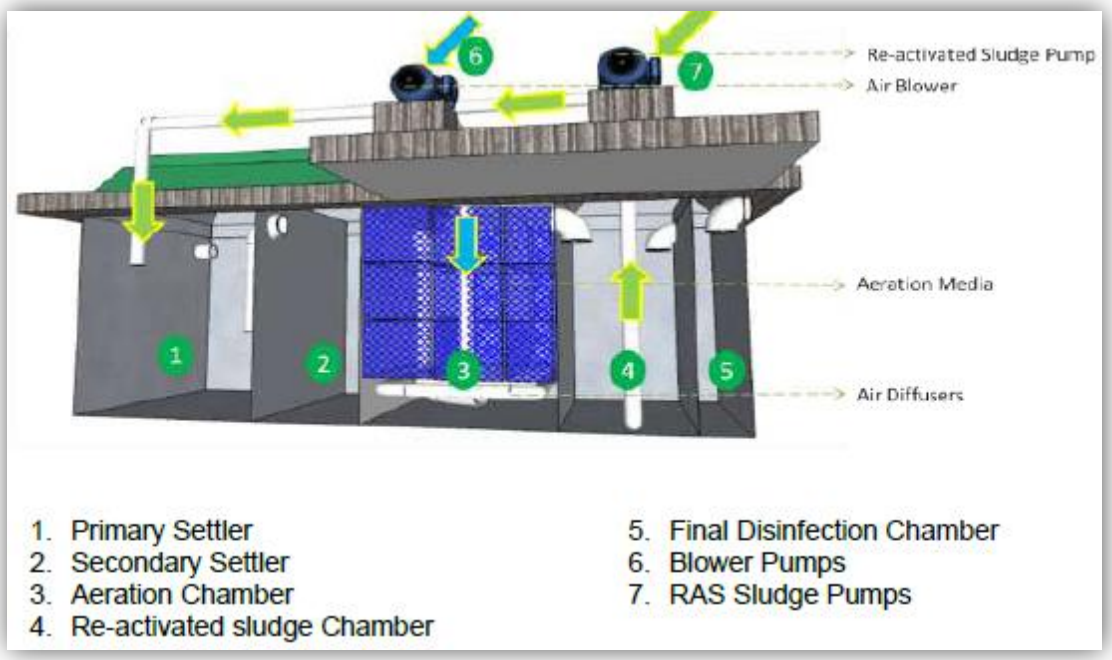


Figure 2-13 Basic functional design of sewage treatment plant.

It is proposed to install a Reverse Osmosis system with pre-filtration and Ozone at 3000 LT/day (Figure 2-14). The water purification unit will pump from the last chamber in the sewage system and purify it to drinking water status.

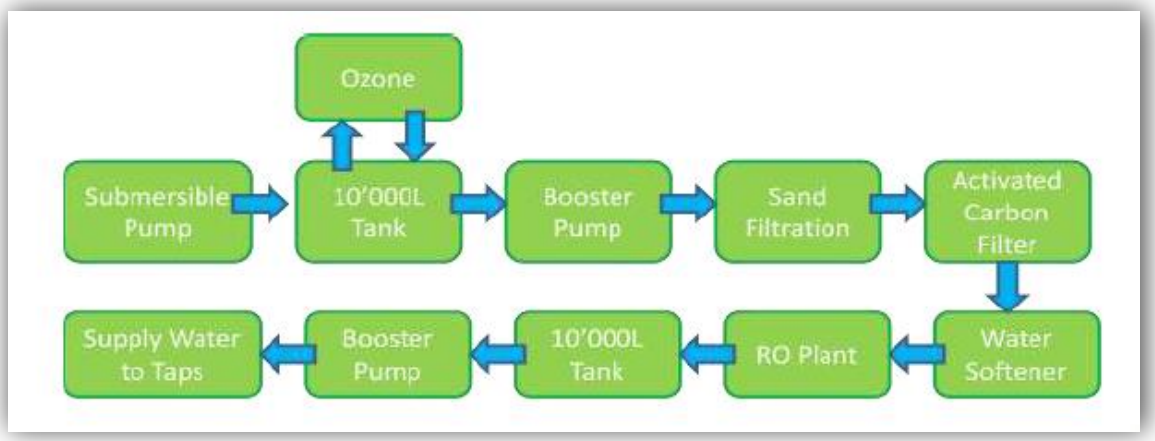


Figure 2-14 Flow diagram of the reverse osmosis system.

2.2.8.4 Hazardous industrial waste (Hydrocarbon waste)

Hydrocarbon containing waste (used oil, dirty diesel and grease) will be stored in clearly marked skip bins (solids) and containers (liquids). These will be placed in an isolated area on a hard park. When full the containers will be collected by a contractor for safe disposal or recycling companies will be appointed to collect

waste. A waste disposal certificate will be required from the contractor to ensure safe disposal.

2.2.8.5 Coal waste

The only coal waste anticipated is that falling off trucks at the RoM stockpile prior to transportation. This will be collected and transported off the site.

The dirty water associated with the RoM will be isolated from the clean catchment (includes groundwater seepage and direct rainfall) and channeled to the PCD where it will form part of the water recycled between the water treatment plant, underground areas and PCD which is also the source for dust suppression.

Coal fines will be cleared periodically from the PCD and disposed of at the co-disposal facility.

2.2.8.6 Co-disposal facility

A co-disposal facility will be constructed from discard to the south of the plant and will store the slurry (Figure 2-3).

The plant will produce coal discard from the cyclones and the spirals, as well as slurry from the thickener underflow. These mining waste streams will be pumped to co-disposal dams. Design of a co-disposal for discard and slurry will be completed by contractor.

2.3 BUSINESS PLAN

2.3.1 Nature of the business, production volumes and development cost

It is envisioned that an annual RoM production of approximately 4.7 Mt/a can be achieved.

This will require an average production of 389 240 t/m to be achieved and maintained. This requires a mining advance per month on the opencast operations of some 800 to 1000 m. If two mining faces are maintained for each seam, then an advance of 200 to 250 m is required.

Turnover is purely a function of the ROM and the sales price will be negotiated per ton. Initial production will be in the order of 389 240 t/m and the expected price is between R 600 per ton. The turnover will thus be in the range of R 233 million per month.

The De Wittekrans Coal Mine will be managed by Continental Coal (Pty) Ltd, whose philosophy is to run all operations on an outsourced basis with a small key management team at the site. The approximate development cost, in the form of a capital budget estimate, was developed by TWP (Pty) Ltd in July 2010 and are indicated in Table 2-1.

Table 2-1 Approximate development cost.

CONTINENTAL COAL LTD.
De Wittekrans Project
CAPITAL BUDGET ESTIMATE - Summary by WBS
Estimate Base Date: 01 July 2011
Updated Date: 01 July 2011

WBS Code	Description	CBE AMOUNT
	DE WITTEKRANS GRAND TOTAL	1 571 850 293
1000	CENTRAL MINE SURFACE INFRASTRUCTURE	352 814 418
1020	General and Site Development	12 217 023
1040	Fencing & Security	4 650 249
1060	Water Supply	16 957 251
1080	Power Supply	166 983 694
1100	Roads, Access and services	63 456 443
1180	Buildings	17 731 407
1200	Main Workshops and Stores	1 674 054
1220	Pumping	1 513 418
1240	Piping	11 905 814
1280	Sewage Treatment	2 376 000
1300	Discard and Slurry	53 349 065
1500	CENTRAL MINE UNDERGROUND INFRASTRUCTURE	714 445 094
1520	Mining Layout	334 845 421
1540	Roads, Access and Services	50 334 604
1620	Power Supply	95 920 662
1640	Piping	4 233 200
1740	Ventilation Shaft	74 788 516
1760	Pumping	7 390 657
1780	Section Conveyors CV-31-33 CV-41-43	44 234 627
1800	B-Seam N&S Trunk Conveyor CV-11 CV-12	24 937 638
1820	C-Seam N&S Trunk Conveyor CV-21 CV-22	24 967 719
1840	B-Seam Main Trunk Conveyor CV-05	10 809 719
1860	C-Seam Main Trunk Conveyor CV-04	9 755 563
1880	Transfer Conveyor CV-03	6 526 908
1900	Cross Conveyor CV-02	4 086 948
1920	Incline Conveyor CV-01	13 469 248
1940	Outbye Service Vehicles	8 143 663
5000	WASHPLANT	272 528 959
5100	Rom Handling and Crushing	125 575 824
5200	High Gravity DM Plant	50 242 569
5300	Low Gravity DM Plant	31 538 627
5400	Spiral Plant	17 818 484
5500	Thickener & Water Reticulation	16 808 425
5600	Services	7 415 757
5700	Product & Discard Handling	23 129 273
	CONTINGENCY	71 287 206
	ESCALATION	-
	EPCM COSTS	160 774 617
	SPECIALIST STUDIES	-
	CLIENT	-
	INSURANCE	-

2.3.2 Activity and implementation schedule

The activity and implementation schedule will only be developed once a mining contractor has been appointed.

There are sufficient coal reserves to sustain an operation for 20 years or more.

The activity and implementation schedule (Table 2-2) will be finalized once a mining contractor has been appointed.

Table 2-2 Project development schedule for De Wittekrans Coal Mine.

Project development schedule	Year 1		Year 2	
	6 months	6 months	6 months	6 months
Environmental studies and licensing				
Mine design, planning and scheduling				
Tender process				
Contractor mobilization and site establishment				
Box-cut establishment and haul road construction				
Build-up to full production				

3. PROJECT ALTERNATIVES

Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives help identify the most appropriate method of developing the project, taking into account location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives and the no-go alternative. Alternatives also help identify the activity and operational alternative with the least environmental impact.

3.1 ALTERNATIVE MEANS OF POWER GENERATION

Energy plays a pivotal role in economic growth and improving livelihoods. Although better supply of energy does not automatically guarantee an acceleration of human development, it is a prerequisite for it. Finding effective means of providing safe, affordable and reliable energy services is therefore of critical importance to governments and organisations endeavouring to promote sustainable development.

While coal remains one of the cheaper, most abundant resources in South Africa, there are a number of other alternatives for power generation. Among these are alternative fossil fuels (natural gas), renewable energy sources (solar, wind, etc.) and nuclear energy. Of these, the more feasible alternatives for national power generation are nuclear power and natural gas. A recent development is the extraction of coal bed methane and the conversion of gas to liquid fuels to provide a clean and long-term solution to the current energy crisis. There are thus a number of alternatives to provide power generation within South Africa. However, until the

necessary infrastructure and capital is available to develop these alternatives on a large scale, coal remains one of the more feasible options.

3.2 INFRASTRUCTURE LOCATION ALTERNATIVES

All possible alternative sites within the mining footprint area were considered. During the site selection process four candidate sites for the plant and co-disposal facility area were identified (Figure 3-1). The site selection process took into consideration the area available, distance from homesteads and distance from access routes (economical, environmental and social considerations). The sites have been narrowed down to two potential sites, Sites 1 and 4. The footprint of the co-disposal facility, plant area and main offices will cover an area of roughly 130 ha. With the co-disposal facility covering 80 ha and the plant site 30 ha within this area.

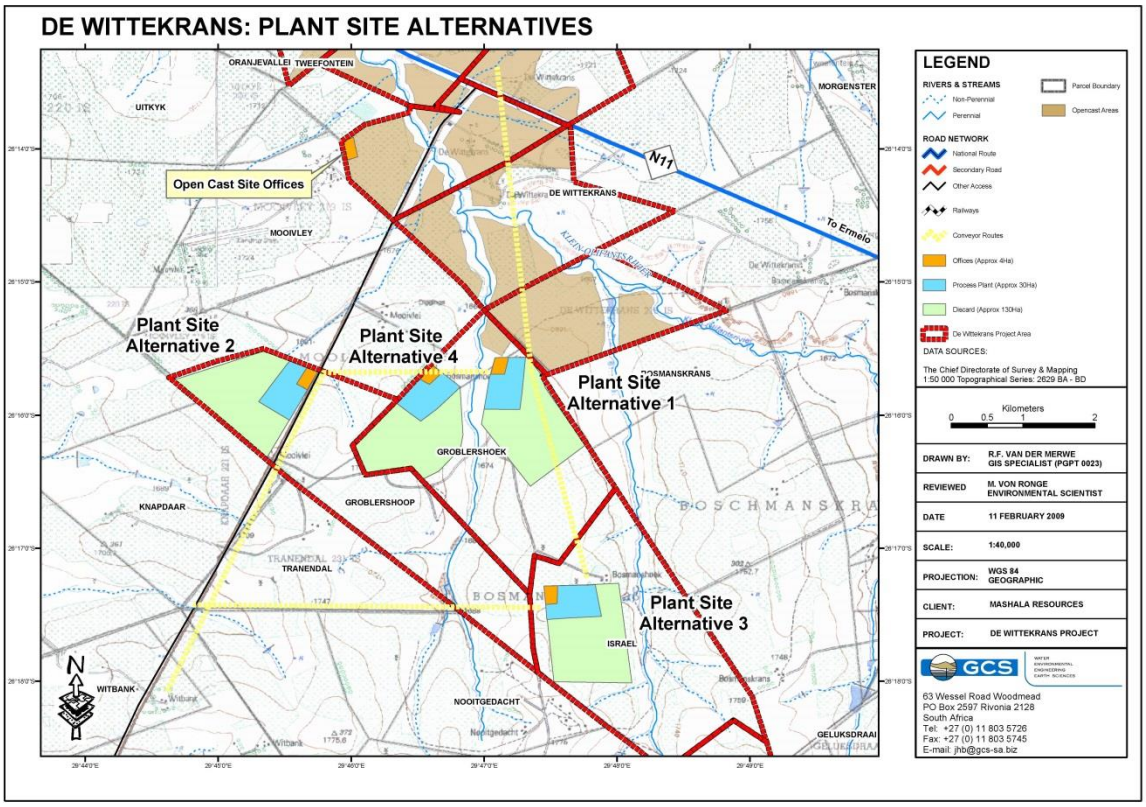


Figure 3-1 Plant and co-disposal alternative site locations.

The original four sites are located in the following areas (refer to Figure 3-1 for the alternative sites):

- Site 1 is located on the farm Groblershoek 191 IS next to the underground entrance from the box-cut. The proposed conveyor route will be the shortest of the four options.
- Site 2 is located next to the western border of the farm Groblershoop 192 IS next to an existing road. A conveyor will be constructed from the opencast site to the plant site.
- Site 3 is located on the farm Israel 107 IS. Site 3 is the furthest from the opencast section, as well as from the existing road. Roads and conveyors will have to be constructed from the opencast site to the plant.

- Site 4 is located next to the western border of the farm Groblershoek 191 IS close to the underground entrance of the box-cut. The planned conveyor route will be shorter than those of site 2 and 3 but longer that the conveyor route associated with Site 1.

Site 1 has been selected as the preferred site due to the proximity of the co-disposal facility and plant site to the opencast and underground adit, the area available, distance from homesteads, and distance from access routes (economical, environmental and social considerations). Refer to Figure 3-2 for the final site and conceptual mine plan.

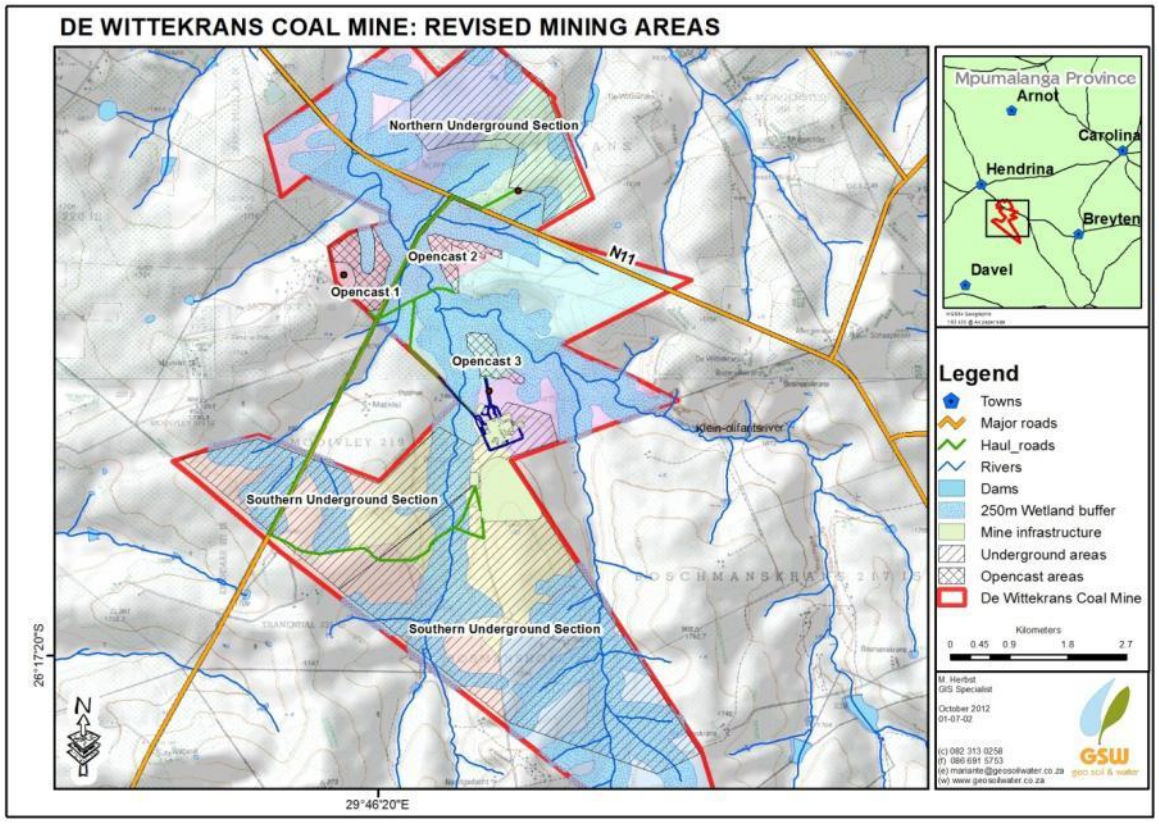


Figure 3-2 Conceptual mine plan with 250 m buffer and prefered infrastructure options.

3.3 MINE DESIGN ALTERNATIVES

3.3.1 Opencast mining areas

During the initial studies done it was determined that six opencast areas where available to be mined using the opencast mining method. After comments received from both the DMR and I&APs during the public participation process, further investigations where conducted and it was determined that only three opencast sections (consisting of 118 ha) would be mined. The individual sizes of the opencast pits where also reduced to ensure that no mining activities would occur within the enlarged buffer areas surrounding the water sources. Please refer to Figure 3-3 and Figure 3-4 for the maps indicating the different opencast mining areas.

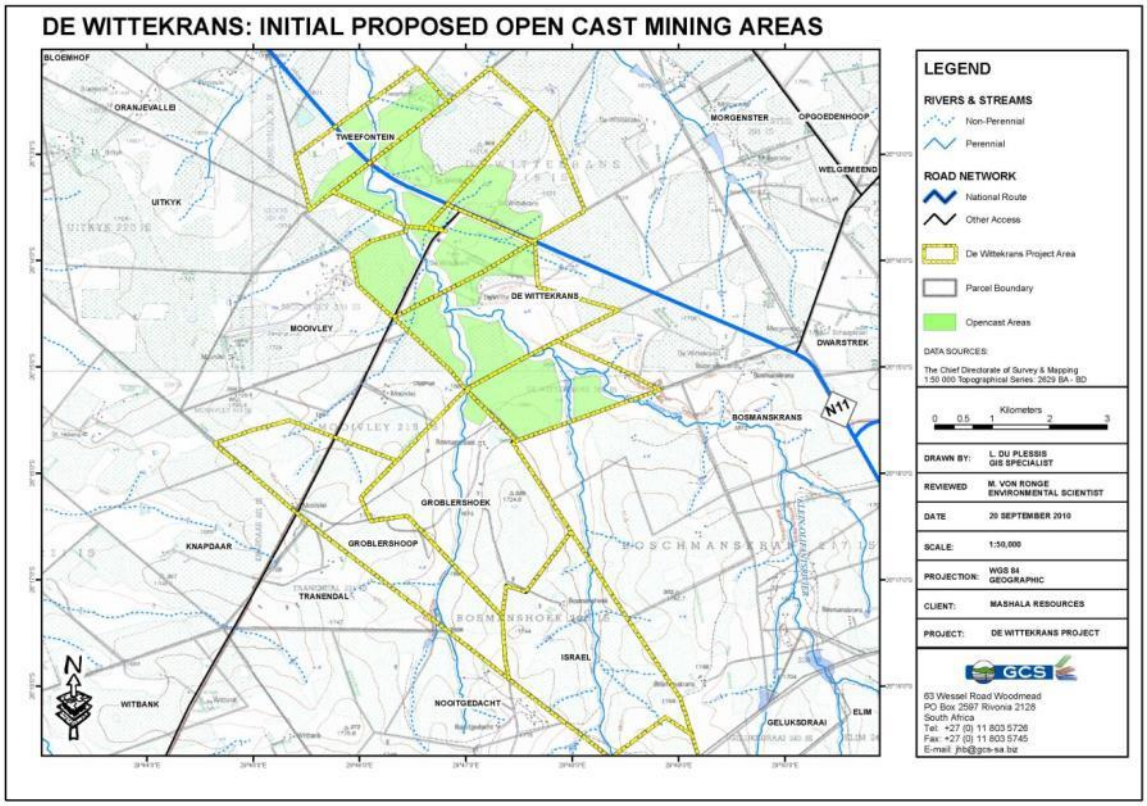


Figure 3-3 Initial opencast sections to be mined.

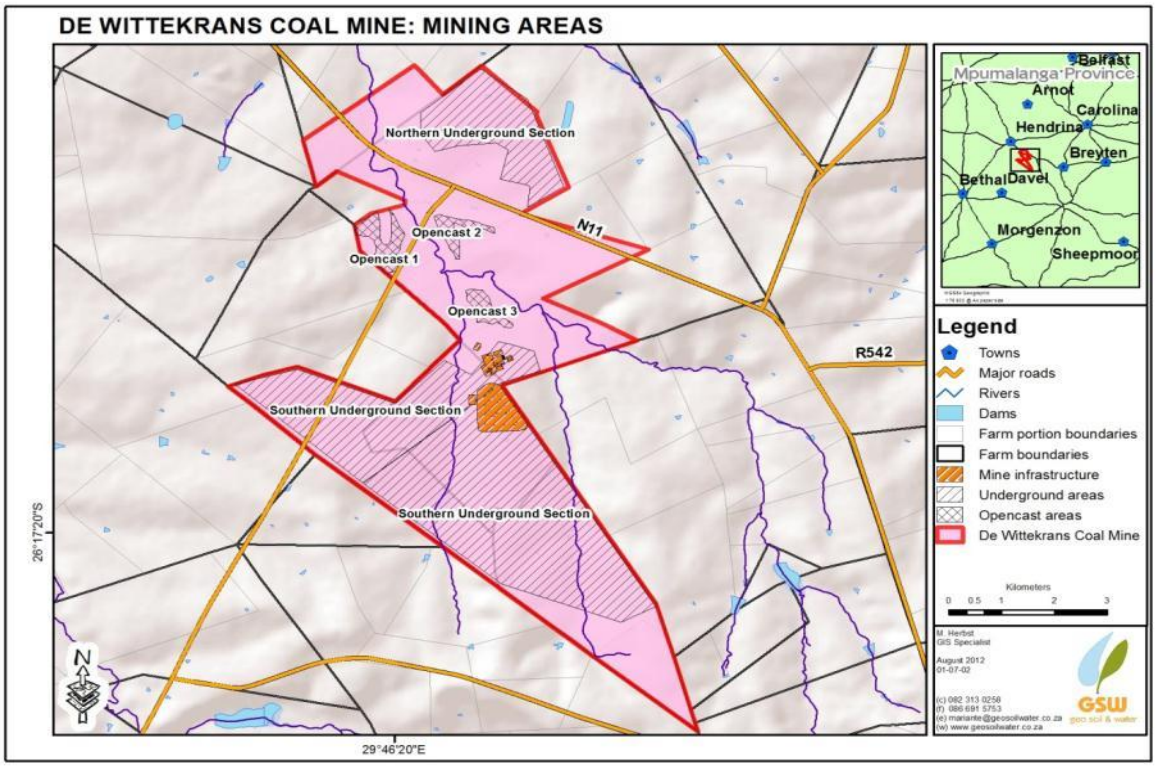


Figure 3-4 Conceptual opencast and underground mining areas.

The new buffer area combined the recommended 50 m from the wetlands and the recommended 250 m around the Klein Olifants River to create a new buffer system

that would ensure that no mining activities would occur within the sensitive areas (Figure 3-2).

3.3.2 Transportation

There are no operating railway lines currently on the mining area or in close proximity to the area and as a result no other alternatives but road transportation to the sidings were assessed.

Export product will be transported via road to one of the following siding options, where it will be loaded onto railway trucks on the Richards Bay Railway line:

- Davel siding;
- An approved existing siding (yet to be determined);
- Delta siding for a provisional period until a decision can been made on one of the above options. Delta siding will become a permanent option if the above mentioned options area deemed not viable.

These alternatives will be assessed by the mine, as no final siding has been chosen.

3.4 LAND USE ALTERNATIVES

3.4.1 Residential

The proposed site is characterised by a rural/pastoral environment and the site is surrounded by farms to the north, east, south and west of the site. The farmsteads are scattered throughout the area. The closest residential area is the town of Hendrina, which is located approximately 15 km to the northwest of the site.

The proposed De Wittekrans site is therefore not regarded as an area with the potential for residential development.

3.4.2 Tourism

The N11 national road is one of the tourist routes travelled towards Swaziland, Mozambique and the northern coast of Kwa-Zulu-Natal. However, the project has no specific tourism attractions and has therefore not been considered for tourism development.

3.4.3 Agriculture

Farming is the main activity currently occurring on the proposed mining site. These activities are taking place on a large scale and the surface rights to the proposed area are owned by the landowners.

It has been determined that there are high yielding coal reserves underlying the proposed area, and coal mining could be seen as an alternative to agriculture.

3.5 WATER USE ALTERNATIVES

The De Wittekrans Coal Mine is likely to have a surplus of water on site, arising mainly from the underground water seeping into the open pits and existing water (either from surface or groundwater sources) in the open voids. This water is to be contained in the PCDs, and used for dust suppression on site, in terms of Section

21 of the NWA. The final water use on site is the temporary stockpiling of potentially acid-generating material and the disposal of polluted water in the PCDs.

The water uses are limited to those described above, for the following reasons:

- The water from the voids must be pumped out in order to facilitate and ensure safe and effective mining.
- The water from the voids must be contained in the PCDs because it is considered polluted. The water can therefore not be discharged into the nearest river, nor be used as potable or irrigation water. As a result it can only be used on the dirty water areas of the mine, for dust suppression. The area has windy dry seasons and the mine will require dust suppression on site.
- The stockpiling of potentially acid-generating material (interburden material and ROM coal) is only a temporary measure. This material will be stockpiled on a compacted surface, with adequate surrounding drainage systems that will contain any polluted water arising off these stockpiles. This dirty water will be directed to the PCDs. There is no other option for the handling of this material other than stockpiling temporarily. The interburden material will be placed back into the progressively rehabilitated pits, and the ROM coal will be loaded and transported after it has been crushed.

3.6 NO-GO ALTERNATIVE

If any environmental impacts or long term liabilities are considered to be potentially detrimental to the natural environment, the 'no-go' option would be considered.

Currently the land is used for the cultivation of potatoes and grazing. If the 'no-go' option was to be considered, the existing agricultural activities will continue. Unfortunately this will also imply that the economic benefits associated with the mining activities would not take place.

If the mine was to go ahead, it would have favorable economic impacts on both the local and regional economies. The 'no-go' option would result in the loss of local and regional development opportunities.

The proposed project will ensure the following benefits for the surrounding communities:

- A mining operation with a sustainable life of mine of approximately 20 to 30 years;
- Provisions of sustainable employment;
- Ongoing economic inputs into the area;
- Provision of a regional socio-economic benefit; and
- Improved environmental management commitments.

Expenditure on the construction and operation of the mine will lead to positive economic impacts as they would constitute an injection of capital into the local and regional economy resulting in increased commercial activity.

Coal will be produced for the local (e.g. Eskom) and international markets. The production and sale of coal will ensure a constant inflow of foreign capital into South Africa and into the project region.

The proposed project would create job opportunities to approximately 500 people. It is the intention of the mine to give priority to the local community when recruiting people for the jobs associated with the mine activities.

4. THE EXISTING ENVIRONMENT

This section of the Scoping Report provides a description of the environment that may be affected by the proposed De Wittekrans Coal Mine. This information is provided in order to assist the reader in understanding the possible effects of the proposed project on the environment. Aspects of the biophysical, social and economic environment that could be affected by, or could affect, the proposed development have been described. This information has been sourced largely from existing information available for the area and specialist studies undertaken as part of the mining right EIA process, and aims to provide the overall context within which the EIA will be conducted. A more detailed description of each aspect of the affected environment is included within the specialist reports contained in Annexure C to Annexure N.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Climate

No long term weather dataset was available for the site in question so Ermelo was selected as an acceptable proxy.

4.1.1.1 Regional Climate

The project area is situated in a high altitude region characterized by regular summer rains but where the winters are cool, dry and windy, resulting in conditions ideal for the desiccation of the environment and the wind entrainment of any loose material. Areas most affected by dust from the mine will generally lie to the west and northwest of the mine when synoptic level flow dominates while local meteorological conditions appear to favour dispersion to the south.

4.1.1.2 Precipitation

The project area is set in the Mpumalanga Highveld, at an altitude of approximately 1650 m above sea level. It is in South Africa's summer rainfall region with an annual average rainfall of 711 mm per year (Figure 4-1). Rain peaks early in the season, in November, and then again in January while the winter months are characterised by a long and very dry period. Figure 4-2 indicates the average monthly rain days.

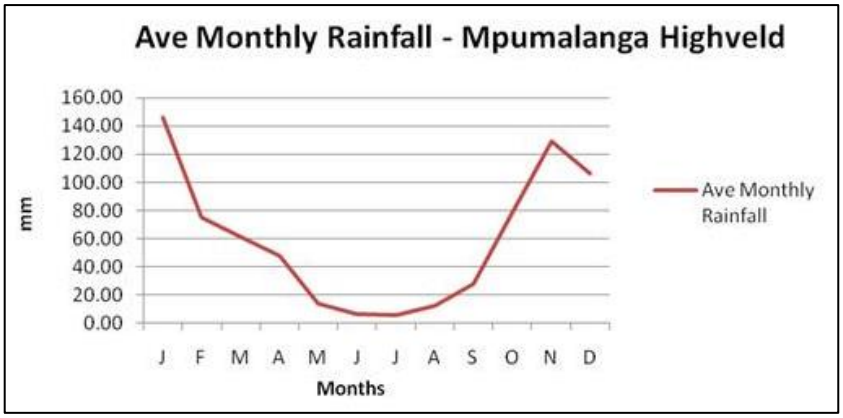


Figure 4-1 Average monthly rainfall for the Mpumalanga Highveld.

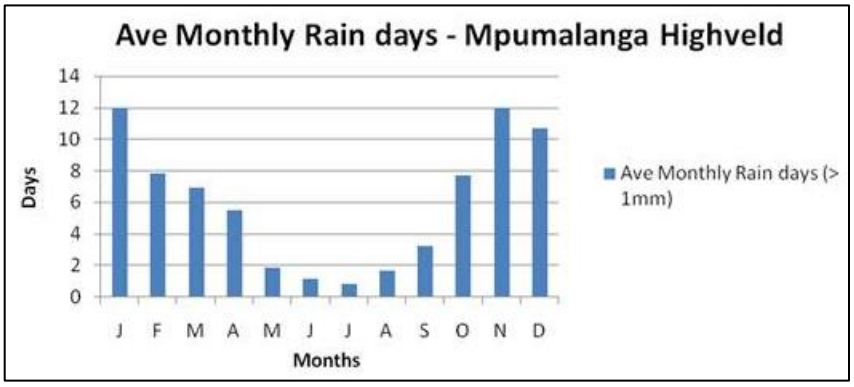


Figure 4-2 Average monthly rain days for the Mpumalanga Highveld.

4.1.1.3 Temperature and relative humidity

The warmest period is December/January, when maximum temperatures average above 25°C while June is the coldest with daytime temperatures averaging 16.5°C and overnight temperatures frequently dropping below freezing (Figure 4-3). The winter period is also very dry with little or no rainfall and relative humidity dropping below the 40% mark (Figure 4-4).

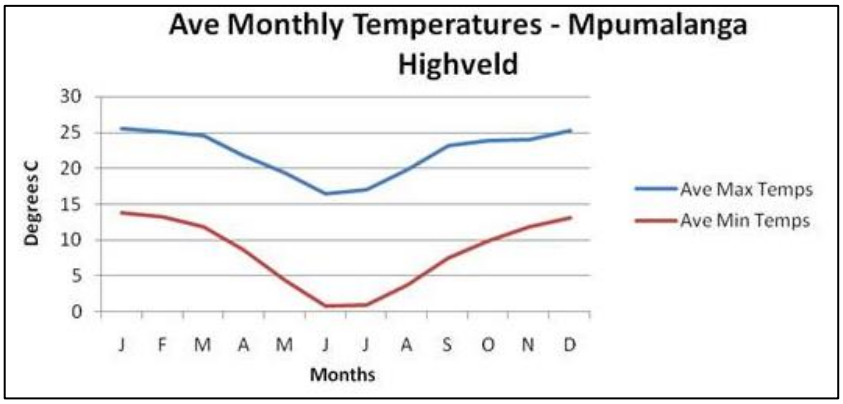


Figure 4-3 Average monthly temperatures for the Mpumalanga Highveld.

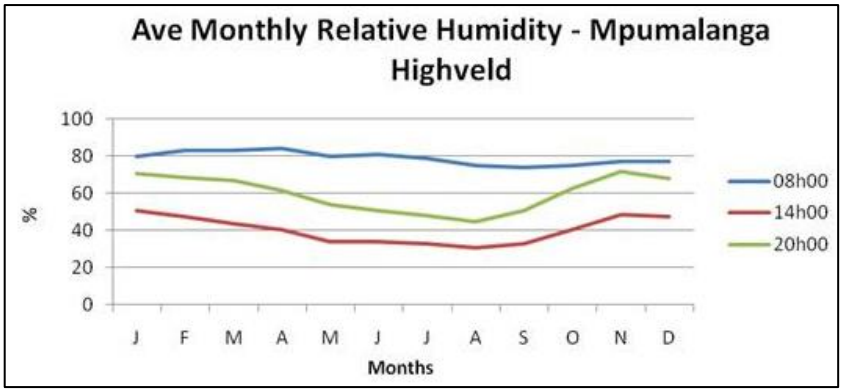


Figure 4-4 Average monthly relative humidity for the Mpumalanga Highveld.

4.1.1.4 Wind

Winds are predominantly easterly with a strengthening westerly component in the winter (Figure 4-5). Strongest wind speeds are recorded in late winter, during the period July/August (Figure 4-6). More than half the data shows periods of calm (wind <0.5 m.s^{-1}).

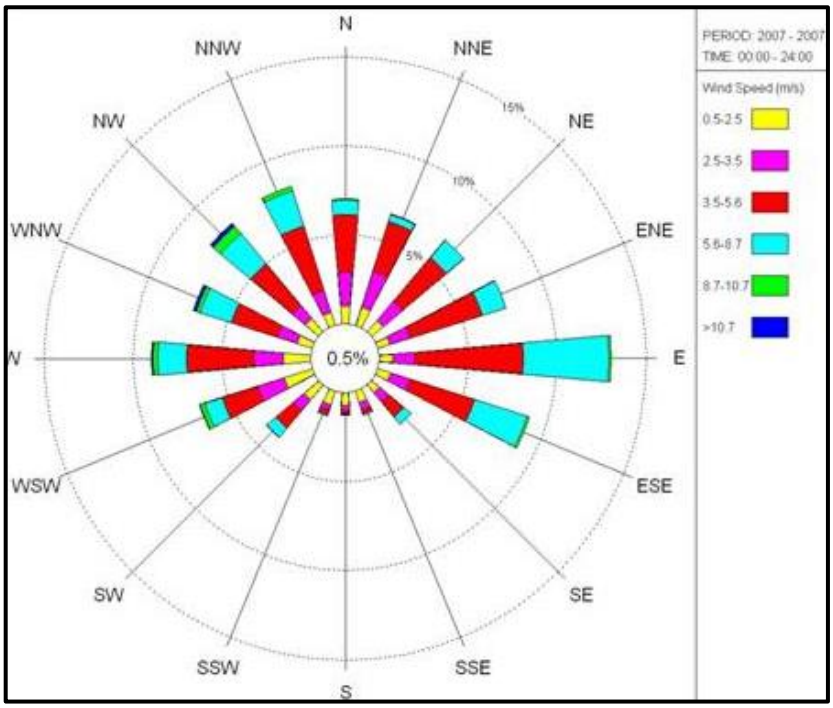


Figure 4-5 Annual average wind speed and direction - Ermelo.

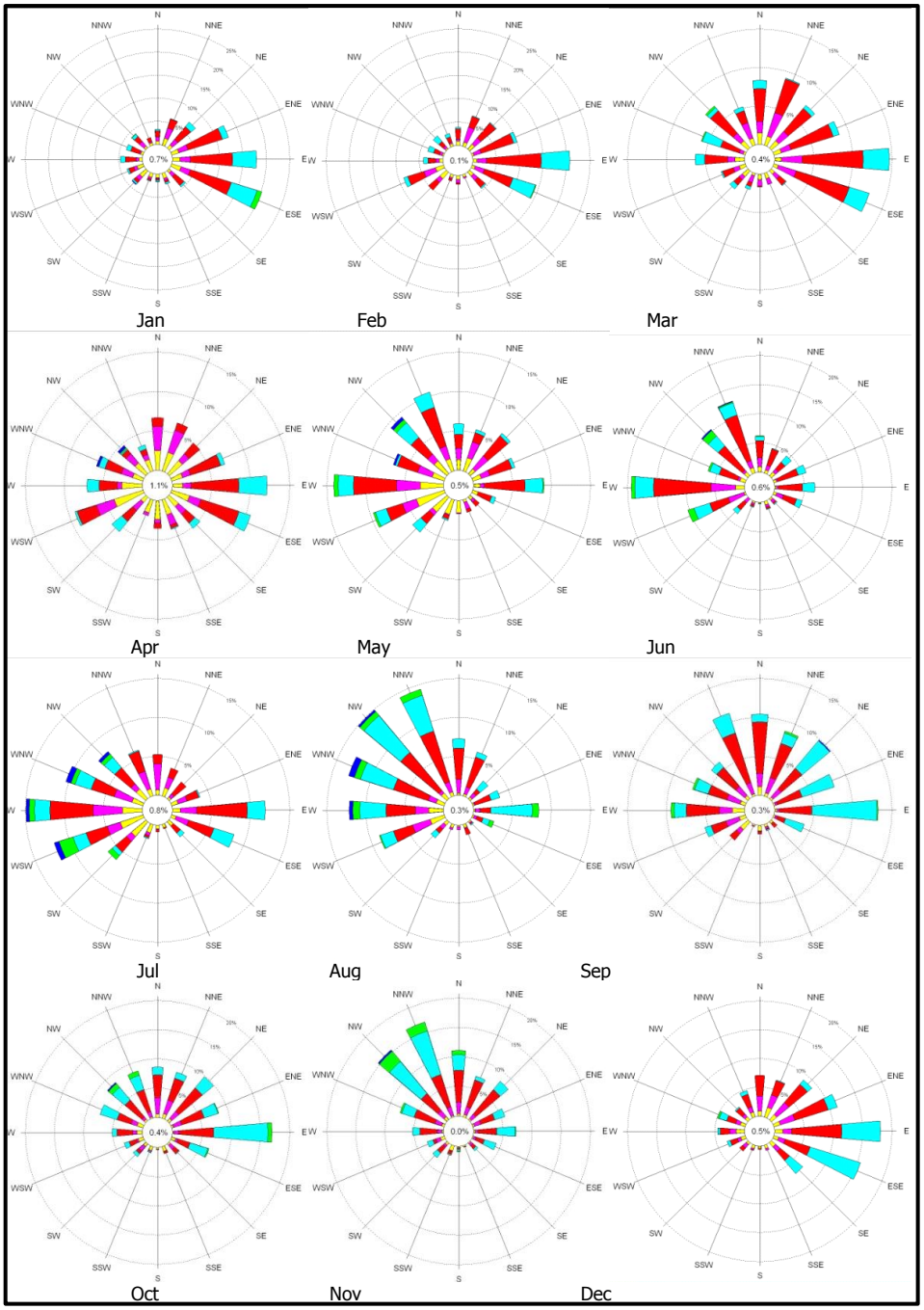


Figure 4-6 Monthly average wind speed and direction - Ermelo.

4.1.2 Geology

4.1.2.1 Regional geology

The Ermelo Coalfield is situated in south east Mpumalanga Province between Carolina in the north and Dirkiesdorp in the south, Morgenzon in the west and Amsterdam in the east. The northern and eastern boundaries are defined by the sub-outcrop of the coal-bearing strata against pre-Karoo rocks. The western and southern boundaries are rather arbitrarily defined as straight lines forming the western boundary with the Highveld Coalfield and the southern boundary with the coalfields of Kwa Zulu-Natal.

All of the coal seams occur within the Vryheid Formation of the Ecca Group (Karoo Supergroup). The Karoo Supergroup comprises the following Groups (decreasing age):

- Dwyka;
- Ecca;
- Beaufort;
- Stormberg; and
- Drakensberg.

The Ecca Group is comprised of the following Formations (decreasing age):

- Pietermaritzburg;
- Vryheid; and
- Volksrust.

Within the Ermelo Coalfield, only the Pietermaritzburg and Vryheid Formations are present with the Volksrust Formation having been eroded away. The Pietermaritzburg Formation, however, is only well developed in the southern part of the coalfield.

There are five major coal seams developed in the Ermelo Coalfield, named from the base up:

- The E Seam;
- The D Seam;
- The C Seam;
- The B Seam; and
- The A Seam.

The B and C Seams have previously been described as coal zones since these seams are often locally split by clastic partings resulting in several coal "seams" separated by thin sand- and siltstone partings. These seams are then renamed as the B-Upper and B-Lower Seams, or C-Upper and C-Lower Seams.

Basement topography and the present-day erosional surface control the distribution of the coal seams and not all five seams may be present at any one locality. The D and E Seams are thin to absent over much of the coalfield and only the E Seam reaches mineable thicknesses in isolated patches in the northern parts of the coalfield. The B and C Seams are most widely developed, and to mineable thicknesses, in the coalfield. The A Seam has, over large areas of the northern and central areas of the coalfield, been removed by erosion. Although to a lesser extent, the B and C Seams have also been removed by erosion.

Locally, fluvial channels cause erosion resulting in the non-deposition and thinning of coal seams. The effects of channelling are evident in the central parts of the coalfield where thick channel sandstones have been delineated which affect the C Upper and C Lower Seams (thinning and non-deposition due to erosion).

The coal seams are generally flat-lying to gently undulating with a regional dip to the south-west. The seams are relatively unaffected by folding although faulting and associated dolerite (igneous) intrusions are common throughout the coalfield. Dolerite intrusions take the form of vertical to near vertical dykes, often intruding

existing faults, and sills, which are parallel to bedding planes. Sills are also often transgressive resulting in the relative displacement of strata. The number of sills increases to the south and up to eight major sills has been identified. An additional effect of dolerite intrusions is the burning or devolatilisation of coal in close proximity to the dolerites. Large areas of coal in the south have either been completely burnt or devolatilised by numerous dykes ranging in thickness from 3 to 5 m.

4.1.2.2 Local geology

At the proposed De Wittekrans Coal Mine, all the major coal seams may be present to some degree, although it is the B Upper, B Lower, C Upper and the C Lower Seams that are of economic interest, which occur generally over the entire area under question. The A Seams (A Upper and A Lower) occur intermittently across the deposit, and will only be exploited where opencast mining occurs.

The B Seams and C Seams occur over the entire property, and will be exploited by both opencast and underground means. The B-Seam is preserved at higher elevated areas over the prospecting area. The seam is developed mostly as carbonaceous shale and shaly coal, with an average thickness of 2.7 m. A prominent glauconitic sandstone marker is found just above the B Seam. The C Seam is parted from the B-Seam by 7 to 15 m thick coarse-grained, poorly sorted, arkosic sandstone and consists mostly of dull torbanitic coal. The seam thickness is constantly developed around 2.5 m. Structurally, the coal seams are relatively undeformed, although some faulting has been identified.

Dolerite intrusions occur in the area, but these do not appear to have had any material impact on the structure of the coal (Figure 4-7).

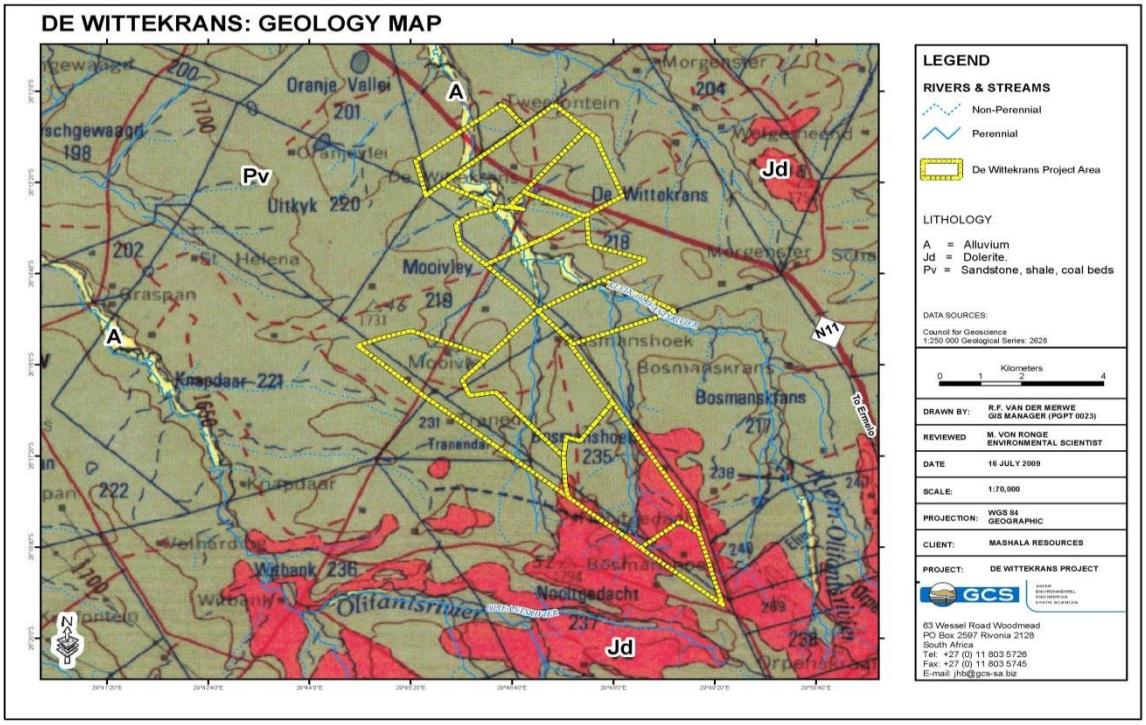


Figure 4-7 Geology of the De Wittekrans Coal Mine area.

4.1.3 Topography

The regions topography has been described as gently to moderately undulating, which is due to it being part of the Highveld plateau (Mucina & Rutherford, 2006).This lends itself to a proliferation of meandering rivers. Grasslands have been found to contribute to water purification. Low hills and the occasional pan depression have been noted in the region (Mucina & Rutherford, 2006). The study area has an elevation between 1595 and 1662 mamsl.

4.1.4 Soils

A Baseline soils, land capability and land use assessment was undertaken by Earth Science Solutions (Pty) Ltd during August 2010 (compiled by I. Jones). The information in the following sections has been drawn from this report. Please refer to Annexure C for the full report.

4.1.4.1 Soil forms

The major soil types present within the project area include those of the orthic phase Hutton, Clovelly, Griffin, Shortlands and shallow Mispah and Glenrosa Form soils, while minor and less significant areas of structured materials occur associated with the much younger and basic intrusives. The hydromorphic form soils are extremely prevalent and of significance to the project location alternatives as the slight topographic slopes and wide expansive drainage lines result in proportionately large areas of transition zone wetlands and wet based soils.

The hydromorphic soils are primarily associated with the Klein Olifants River catchment and its tributaries, The horizontal bedding of the sedimentary lithologies that underlie the site, and the presence of significant hard sandstone partings have resulted in large expanses of hard plinthic horizons both in the lower lying drainage ways and wetland areas, as well as relic land forms at lower midslope and even midslope positions in the topography.

The result of the complex interaction of the natural elements has produced soils that vary from hydromorphic materials with extremes of deep Avalon, Bainsvlei, Bloemdal, Glencoe and Pinedene form soils on the transition zone terries slopes and shallow Avalon, Westleigh, Kroonstad and Sepane Forms associated with the bottomland colluvial environments, and highly structured Katspruit and gleycutanic and vertic Rensburg and Arcadia Forms associated with the alluvial floodplains of the active tributaries and Klein Olifants River.

A summary of the soil forms and their coverage are provided in Table 4-1 and the spatial distribution and size of the different soil types has been captured in a soil map (Figure 4-8).

Table 4-1 Soil coverage across the project area.

Soil code	Soil name	Area (Ha)
4-6 Av	Avalon	161.83
6-8 Av	Avalon	20.31
4-6 Av/Cv	Avalon/Clovelly	8.49
6-8 Av/Cv	Avalon/Clovelly	14.99
4-6 Av/Gc	Avalon/Glencoe	90.25

Soil code	Soil name	Area (Ha)
4-6 Av/Pn	Avalon/Pinedene	56.75
4-6 Av/We	Avalon/Westleigh	16.10
6-8 Cv	Clovelly	44.94
6-8 Cv/Av	Clovelly/Avalon	290.53
4-6 Cv/Gc	Clovelly/Glencoe	32.13
6-8 Cv/Gc	Clovelly/Glencoe	101.75
4-6 Cv/Gs	Clovelly/Glenrosa	21.10
6-8 Cv/Pn	Clovelly/Pinedene	742.94
Dam	Dam	13.32
2-4 Gc	Glencoe	91.21
4-6 Gc	Glencoe	174.09
6-8 Gc	Glencoe	12.10
6-8 Gc	Glencoe	57.32
4-6 Gc/Cv	Glencoe/Clovelly	30.91
4-6 Gc/Cv	Glencoe/Clovelly	10.48
4 Gc/We	Glencoe/Westleigh	84.73
2-4 Gs/Ms	Glenrosa/Mispah	20.84
8-12 Hu/Cv	Hutton/Clovelly	533.69
4-6 Hu/Gc	Hutton/Glencoe	17.14
<4 Lo	Longlands	143.33
O/C	Outcrop	116.03
Pan	Pan	1.46
6 Pn	Pinedene	0.99
4 Rg	Rensburg	25.14
Stream	Stream	234.78
2-4 We/Av	Westleigh/Avalon	22.24
<4 We	Westleigh	180.91
4-6 We/Av	Westleigh/Avalon	56.00
<4 We/Kd	Westleigh/Kroonstad	46.97
4 We/Lo	Westleigh/Longlands	147.96

4.1.4.2 Soil erodibility

The erosion potential of a soil is expressed by an erodibility factor ("K"), which is determined from soil texture, permeability, organic matter content and soil structure. An index of erosion (I.O.E.) for soils is then determined by multiplying the "K" value by the slope percentage. Erosion problems may be experienced when the I.O.E. is greater than 2.

The "K" value is used to express the "erodibility" of a particular soil form. Erodibility is defined as the vulnerability or susceptibility of a soil to erosion. It is a function of both the physical characteristics of that soil as well as the treatment of the soil. Erodibility ratings are expressed as:

- Resistant "K" factor = <0.15
- Moderate "K" factor = 0.15-0.35

- Erodible “K” factor = 0.35-0.45
- Highly erodible “K” factor = >0.45

The average “Erosion Indices” for the dominant soil forms on the project area are shown in Figure 4-2 . The majority of the soils mapped can be classified as having a moderate erodibility index. This is largely ascribed to the generally low organic carbon content and the sensitivity of the soils to solution weathering. These factors are offset by the generally gentle to flat topography and the moderate clay contents. The vulnerability of the “B” horizon to erosion once/if the topsoil is removed must not be under estimated.

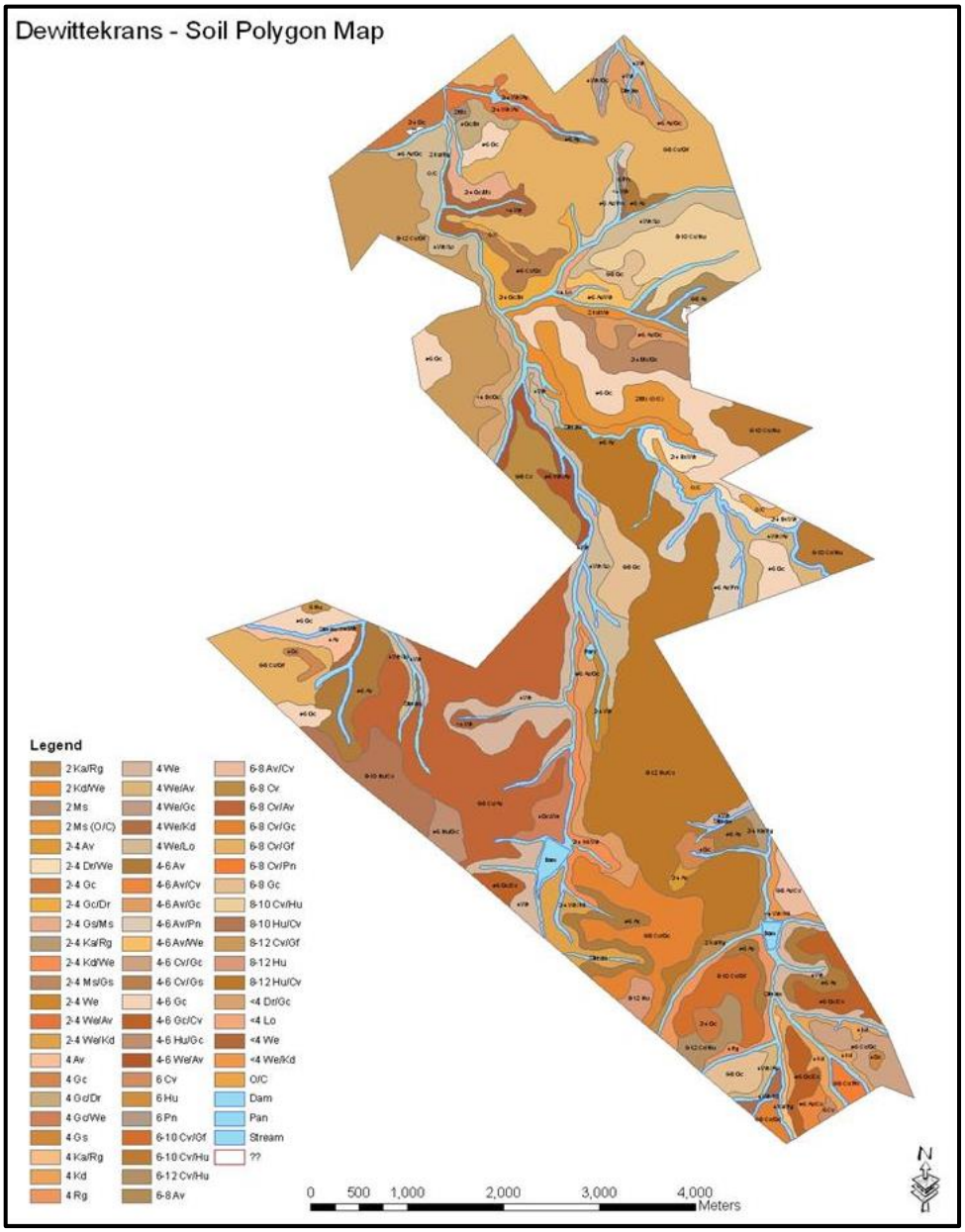


Figure 4-8 Soil polygon map of the project area.

The wet and structured soils are susceptible to compaction due to the swelling clays that are common in the majority of the materials classified. These soils will need to be managed extremely well during the stripping operation, as well as during the stockpiling/storage and rehabilitation stages.

Table 4-2 Erodibility of differing soil forms.

Soil Form	Erodibility Index	Index of Erosion (I.O.E.)
Hutton, Clovelly, Griffin	Moderate	1.30 – 1.40
Glencoe, Dresden	High	1.40 – 1.60
Kroonstad, Katspruit	Moderate to High	1.35 – 1.45
Rensburg, Arcadia	Moderate to High	1.30 – 1.45
Avalon, Pinedene, Bloemdal	Moderate to High	1.15 – 1.35
Mispah, Glenrosa	High	1.45
Westleigh	Moderate to High	1.30 – 1.45

The concerns around erosion and compaction are directly related to the fact that the protective vegetation cover and topsoil will be disturbed during any mining or construction operation. Once disturbed, the actions of wind and water are increased. Loss of soil (topsoil and subsoil) is extremely costly to any operation, and is generally only evident at closure or when rehabilitation operations are compromised.

Well planned management actions during the construction and operational phases will save time and money in the long run, and will have an impact on the ability to successfully "close" an operation once completed.

4.1.4.3 Soil potential

Dry land production potential

The dry land production potential of the shallow soils and the more structured Forms, are poor. The deeper, and apedel soil are easier to cultivate and have a better propensity to both drainage as well as the holding of moisture within the soil that is available to the plant. These soils are more productive dry land materials that are also easier to manage.

Irrigation potential

The irrigation potential for the soils is "moderate to good" in terms of the soil structure and drainage capability. With good water management, and adequate drainage, the deeper (>700 mm) soils could be economically cultivated to irrigated crops. The spatial distribution and occurrence of these soils is limited and it is unlikely that sufficiently large enough areas of soil are available to make the use of irrigation viable on anything other than highly intensive market gardening tunnel gardening.

Irrigation is practice to some extent in the area of study. Again, the spatial distribution of the soils with adequate soil rooting depths will limit the size of the areas that can be cultivated, thus limiting the potential for economic irrigation farming. In addition, for any irrigation to be undertaken in the area on a large (sustainable) scale, it would require the installation of a number of surface water impoundments as storage during the dry months.

Soil utilization potential

In general, the soils that will be disturbed and that will require rehabilitation, are moderately deep to shallow, (ERD = 400 to 800 mm), moderately well drained, with a susceptibility to erosion and compaction and in a significant proportion of the

study area show signs of wetness at depth (shallow or perched water table). The wet based and structured soils will be difficult to work, both from a traffic ability, workability, storage and rehabilitation point of view.

Compaction must be considered carefully as the working of the wet based and structured soils when wet (rainy season), will be detrimental and compaction will occur.

The structure of the soil will affect their workability, and provision will need to be made for the timing of the stripping and rehabilitation works to be undertaken if the structural integrity of these soils are to be maintained.

The potential for the use of the hydromorphic soils for economic crop production and/or market gardening is at best poor, and should not be considered for anything other than as wilderness/conservation lands (preferred option), while the potential for economic farming of the structured soils is considered at best to be "low intensity grazing land". The less structured and non-hydromorphic soils are that cover a substantial portion of the site are considered arable class soils, and as such can be considered for use in low intensity livestock grazing and or arable crop production.

4.1.5 Land use and land capability

A Baseline soils, land capability and land use assessment was undertaken by Earth Science Solutions (Pty) Ltd during August 2010 (compiled by I. Jones). The information in the following sections has been drawn from this report. Please refer to Annexure C for the full report.

4.1.5.1 Land use

The interpretation of the orthophotos (as well as the Google image for orientation) yielded eight land use categories (Figure 4-9). These categories as well as the area occupied by each are presented in

Table 4-3. Land use is often a good indication of Land Capability and it has therefore been included in

Table **4-3**.

Table 4-3 Land use categories and the areas they cover.

Land use category	Area (ha)	Percentage of total %	Land capability class
Dam	16.4	0.4%	Wetland
Dryland Agriculture	1395.1	37.2%	Arable
Grassland	1970.1	52.5%	Grazing
Irrigated Agriculture	301.8	8.0%	Arable
Pan	5.7	0.2%	Wetland
Road	13.6	0.4%	None
Rural infrastructure	23.6	0.6%	None
Woodland	27.3	0.7%	Grazing/Arable
Total	**3753.7**	**100%**	

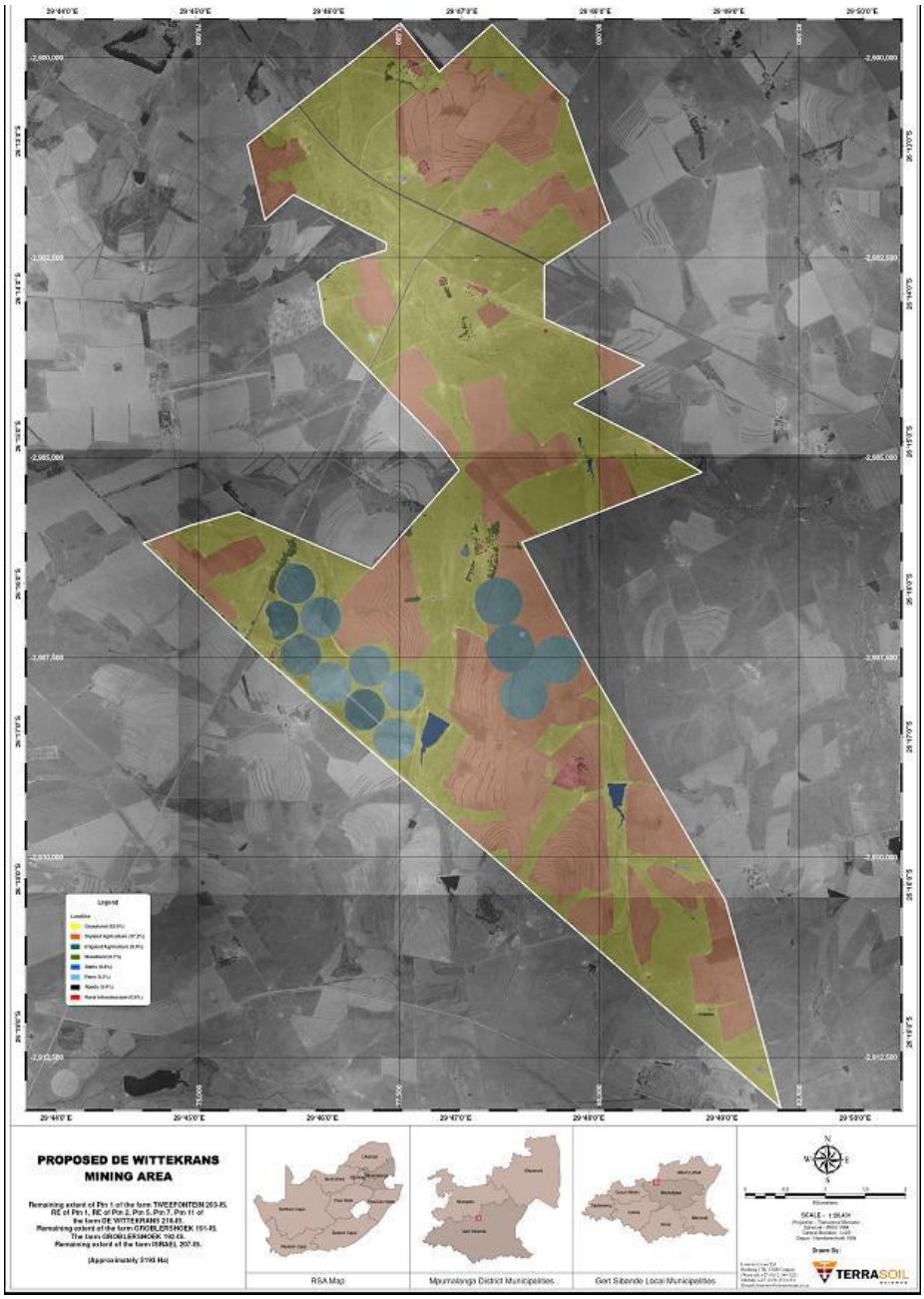


Figure 4-9 Land use of the proposed De Wittekrans mining area.

In conjunction with the soils classified, the climate, ground roughness and topography (Geomorphology) were assessed and used in the determination of the Land Capability Rating. Figure 4-10 and Table 4-4 illustrate the distribution of land capability classes.

Table 4-4 Land capability across the project area.

Land capability	Area (ha)
Arable	1337.55
Grazing	503.11
Wetland	1618.59
Wilderness/Conservation	164.50
Total area (Ha)	**3623.76**

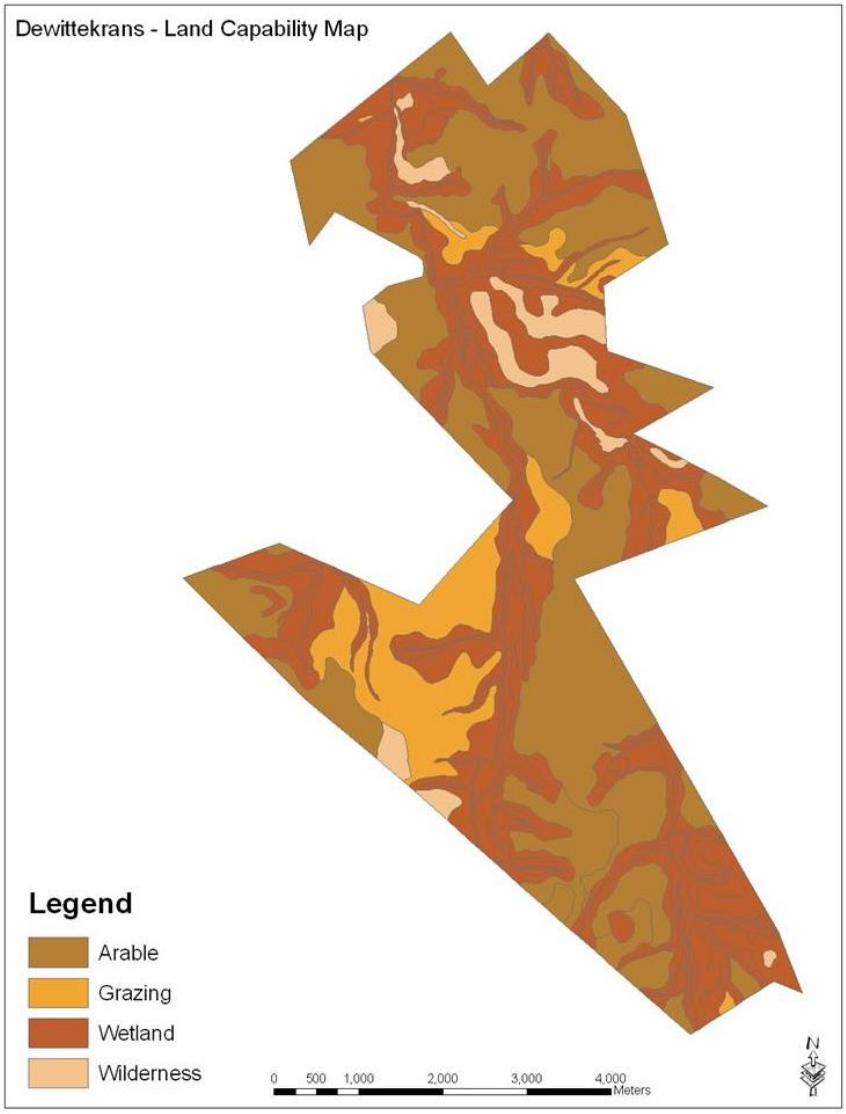


Figure 4-10 Land capability plan.

Arable

Significantly large portions of the project area have been cultivated and are being economically farmed to annual crops under dry land and irrigation. The percentage area of soil that classify as "arable" land is however somewhat smaller, with some of the farming being undertaken on soils that are either less than 700 mm in depth, rocky and inhibited in rooting depth, or are associated with the transition zone wetlands or in some cases cultivation is being undertaken in the wetland zone. The area of actual cultivated land use is therefore not the same as the "arable" land capability delineated on the map.

Grazing

A significant portion of the project area rates as grazing land potential, and is used as such. These areas are generally confined to the shallower (500 to 700 mm) and transitional hydromorphic soil Forms that are moderately well drained. These soils are generally darker in colour, and are not always free draining to a depth of 750 mm, but are capable of sustaining palatable plant species on a sustainable basis, especially since only the subsoil's (at a depth of 500 mm) are periodically

saturated. In addition, there should be no rocks or pedocrete fragments in the Upper horizons of this soil group. If present it will limit the land capability to wilderness/conservation land.

Wilderness/Conservation

The areas that classify as either conservation or wilderness land are found associated with the more structured, and shallower rocky soils (Glenrosa and Mispah) that are associated with non-hydromorphic soils. These are for the most part evident as outcrop or shallow sub-outcrop on the lower midslopes, or occasionally on the crest slopes. This land capability unit is not prevalent in the area of concern.

Wetland

The wetland areas are defined in terms of the wetland delineation guidelines, which use both soil, topography as well as vegetation criteria to define the domain limits.

These zones are dominated by hydromorphic soils that are often structured, and have plant life that is associated with aquatic processes. The soils are generally dark grey to black in the topsoil horizons, high in transported clays, and show pronounced mottling on gleyed backgrounds (pale grey colours) in the subsoil's. These soils occur within the zone of groundwater influence.

This land capability unit is very prevalent in the project area and makes up a significant proportion of the area that could potentially be impacted by the proposed development.

4.1.6 Air quality

An Air quality assessment was undertaken by SDG Consulting CC during August 2010 (compiled by S. Gear). The information in the following sections has been drawn from this report. Please refer to Annexure D for the full Air quality assessment report.

The project is situated on the Mpumalanga Highveld, an area which has been formally declared as an air quality priority area in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEMAQA), to be known as the "the Highveld Priority Area" (Notice No. 1123 of 23 November 2007 contained in Government Gazette No. 30518).

This declaration is in recognition of the extremely stressed nature of the airshed in this region, home as it is, to much of South Africa's coal mining activity and to many coal fired power stations. While the declaration of this hotspot does not have a direct impact on the project, it will mean that in the long term this mine will operate in a legislative environment where proper air quality management will be considered a priority and appropriate management and mitigation measures against excessive emissions will be required in keeping with the broader air quality management plan for the area.

In addition, the air quality officer in charge of this plan may require access to any air quality data or modeling output associated with the mine's operations in order to formulate and properly implement this broader plan. It is imperative, therefore, that an appropriate person within the mine's staff be tasked with the establishment of

sound record keeping procedures to accompany any air quality monitoring that may take place on site in the future.

The mine is situated in a high altitude region characterized by regular summer rains but where the winters are cool, dry and windy, resulting in conditions ideal for the desiccation of the environment and the wind entrainment of any loose material. Areas most affected by dust from the mine will generally lie to the wet and east of the site. No background data is currently available so existing ambient dust cannot be reported on at this time.

4.1.7 Noise and vibration

A Noise and vibration impact assessment was undertaken by dB Acoustics during July 2010 (compiled by B. van der Merwe). The information in the following sections has been drawn from this report. Please refer to Annexure G for the full Noise and vibration impact assessment report.

The current activities which contribute to elevated noise levels in the area include traffic on the N11 and secondary farm roads, farming activities, residential activities near farm houses, animal noises in farm yards, wind noise, aircraft noise and insects and birds in the area in general.

It should be noted that the noise level may be higher during the night-time due to the insects and distant traffic noise of vehicles frequenting the abutting N11. Inversion conditions and wind direction may also increase the prevailing ambient noise levels at times.

The project area is mostly hilly with a small valley consisting of ground that is uneven with both soft (agricultural land) and hard (natural veldt) areas. The prevailing ground conditions and vertical structures will absorb some of the mining activity noise as it propagates in the direction of the noise sensitive areas. There are no formal residential developments in the vicinity of the project area with sensitive receptors consisting predominantly of individual farm houses. No vibration sources that could damage buildings or be harmful to people exist in the vicinity of project area.

Baseline noise surveys were conducted at various noise sensitive receptors both located on the project area and neighbouring the area. A maximum day-time sound pressure level of 84.1dBA was recorded next to the N11 road with the highest maximum sound pressure level in the agricultural district recorded as 60.4 dBA (Figure 4-11). Traffic noise was audible at some of the measuring points towards the south of the project area.

The prevailing ambient noise level for the sections/areas close to the N11 is between 40 and 50 dBA whereas the remainder of the measuring positions some distance from the road is between 30 and 40 dBA during the day-time (Figure 4-11).

During the night-time, a peak noise level of 82.7 dBA was recorded next to the N11. The noise level during the night-time ranged between 30 and 40.0 dBA, which is similar to the day time period (Figure 4-11). This can be attributed to an increase in insect activity during the night, especially crickets, which results in an increase in the contribution of insect noise during the night.

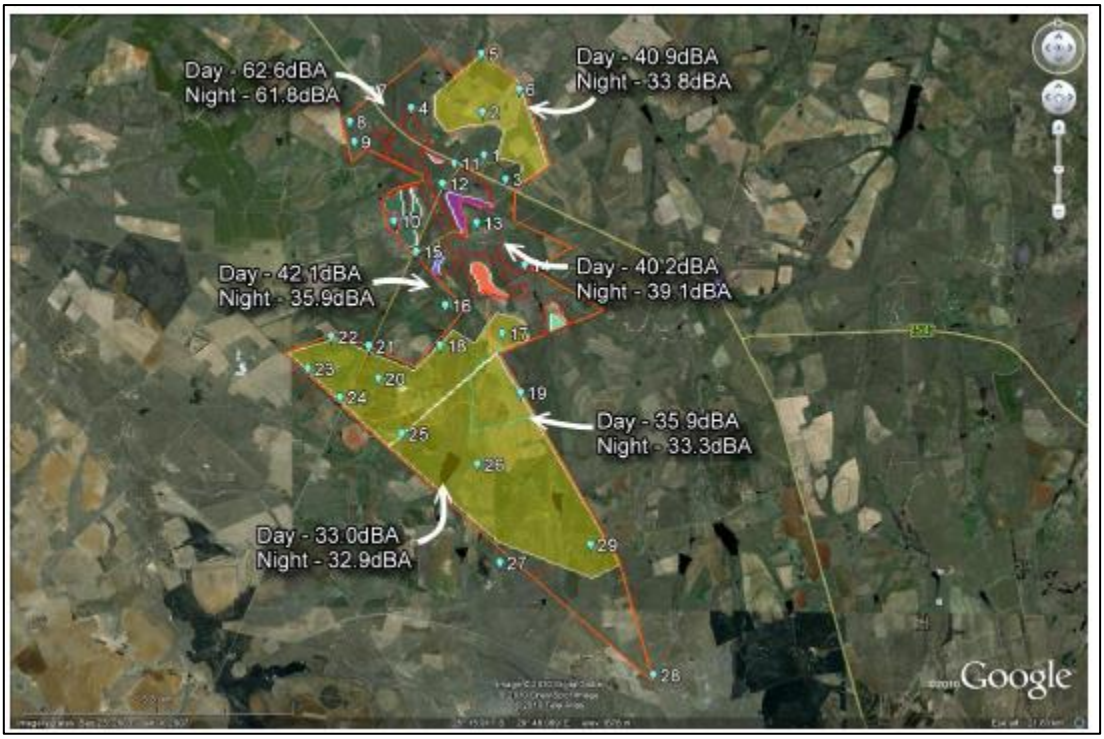


Figure 4-11 Prevailing ambient noise levels in the project area.

4.1.8 Surface water

A hydrological study was undertaken by GCS (Pty) Ltd during July 2009 (compiled by J.F. Hamman) and the report thereof revised during August 2010 (Version 2). The information in the following sections has been drawn from this report. Please refer to Annexure F for the full Hydrological report.

4.1.8.1 Watercourses affected

Locally the Klein-Olifants River, originating at the continental watershed (separating the Indian and Atlantic Ocean Catchments), drain the project area in a northern direction. The Klein-Olifants River is classified as a tributary of the Olifants River.

The Olifants River flows northwards through Witbank Dam (New Doringpoort Dam) and the Loskop Dam and is then forced east by the Transvaal Drakensberg, cutting through this mountain range at the Abel Erasmus Pass. It then flows east to join the Letaba River, before crossing into Mozambique and becoming the Rio dos Elefantes. It then joins the Limpopo River and the Rio Changane before the Limpopo River enters the Indian Ocean at Xai-Xai north of Maputo.

The Olifants River and its tributaries, notably the Klein-Olifants River (originating near Hendrina, joining the Olifants River downstream of the Middelburg Dam), the Elands River, Wilge River and Bronkhorstspruit, rise along the continental watershed in the Highveld grasslands. Thirty-one large dams in the Olifants River catchment include the Witbank Dam (New Doringpoort Dam), Renosterkop Dam, Rust de Winter Dam, Blyderivierspoort Dam, Loskop dam, Middelburg Dam, Ohrigstad Dam, Arabie Dam and the Phalaborwa Barrage in South Africa and the Massingir Dam in Mozambique.

The plant site is located next to a perennial stream which runs into the Klein-Olifants River. The stream is running from south to north with the plants site lying one on the eastern side. The Klein-Olifants River is the main watercourse for this catchment and

is a level 2 river which flows into the Olifants River which is a high priority river, therefore it must be protected and the plant will have to be managed in such a way that there is minimal or no impact on the water resource.

4.1.8.2 Drainage density

Drainage density is defined as the length of drainage per unit area. The term was first introduced by Horton, and is determined by dividing the total length of streams within a drainage basin by the drainage area. A high drainage density reflects a highly dissected drainage basin, with a relatively rapid hydrologic response to rainfall events, while a low drainage density means a poorly drained basin with a slow hydrologic response.

Drainage density for the tributary of the Klein Olifants is 0.439 km/km^2.

4.1.8.3 Flood lines

The 1:50 and 1:100 year flood lines were delineated using the 1:100 and 1:50 year Peak Discharge respectively. This was then used in the hecras model to produce the flood lines. The purpose of delineating the 100 year flood line is to ensure compliance to legislative requirements. The flood lines were delineated for the Tributary of the Klein Olifants River of which a length of approximately 3 700 m was studied.

Results from the study indicate that the site falls out of the 1:100 year flood zone. In accordance with GN 704 the distance of 250 m buffer was considered as this was further than the flood lines. This was shown to also be out of the proposed site area of the benefication plant and therefore there is no restriction on the plant area, as it is complies with the requirements of GN704 regarding restrictions on locality of dams.

The average froude number is 0.8 with the tributary having a maximum velocity of 2.04 m/s. The minimum main channel elevation is based on the survey provided. Where the EG elevation is based on water surface and the energy passing through the tributary. The average slope is 0.005 m/m which is fairly steep in certain areas.

4.1.9 Groundwater

A Hydrogeological study was undertaken by GCS (Pty) Ltd (compiled by P. Labuschagne) in July 2009 (Version 1) and the report revised during August 2010 after a follow-up assessment was undertaken (Version 2). The information in the following sections has been drawn from this report as well as the Hydrological report (Version 2). Please refer to Annexure E for the full Hydrogeological report.

4.1.9.1 Hydrocensus

As part of the field assessment, a borehole census around the proposed mining area was undertaken. Forty five boreholes were visited and water samples and groundwater level data was obtained from some of these boreholes. Six groundwater monitoring boreholes were also drilled during the GCS field assessment.

From the information obtained from the regional hydrocensus survey, it was found that groundwater is used mainly for domestic supply and for livestock watering. The borehole yields from the regional aquifers are relatively low and groundwater cannot be pumped in quantities sufficient for extensive crop irrigation purposes.

4.1.9.2 Aquifer characterization

Kirchner *et al.* (1991) has estimated 2 to 4% of annual effective rainfall recharge for the Karoo Basin. This recharge to the weathered aquifer drains towards regional surface water courses and less than 60% of the recharge emanates in streams. The remainder is withdrawn through evapotranspiration from the weathered aquifer or drained by other means.

The conceptual hydrogeological model of the area was based on the generally accepted model for the Mpumalanga coal fields. Three principal aquifers were identified; the weathered aquifer, the fractured Karoo aquifer and the fractured pre-Karoo aquifer (Hodgson & Krantz, 1998). The Karoo rocks are not known for the development of aquifers but occasional high yielding boreholes may be present. Generally these rock types can be divided into two distinct aquifers, namely a shallow weathered aquifer and a deeper fractured aquifer. The newly drilled boreholes as well as an assessment of the available exploration borehole logs revealed the following:

- In general weathering occurred from 2 to 15 m, these sections were cased by means of steel casing to protect the borehole from collapsing. Seepage was observed in almost all the boreholes on shallow depths within this weathered zone. However, it must be noted that no significant groundwater yields were obtained, all low seepage and NBH1 was almost dry;
- Hard and fresh sandstone/shale were intersected on depths >15m. This can be regarded as the fractured Karoo and regional aquifer. The C Lower Coal Seam is also located within this aquifer; and
- Alluvial deposits were intersected along the Klein Olifants River and significant seepage occurs.

4.1.9.3 Aquifer hydraulics

Aquifer testing was conducted on the new boreholes by applying conventional slug testing. Due to the poor aquifer yield (0.1 l/sec to no seepage at all) it was decided to apply slug tests on the boreholes and measure the recovery time to reach the original piezometric heads. The test graphs and tests results are provided in Appendix C of the Geohydrological Report (Annexure E). The test results indicate that the hydraulic conductivity (K in m/day) corresponds with normal Karoo Aquifer type hydraulic parameters. The values range from 0.01 to 0.0009 m/day.

4.1.9.4 Groundwater levels

The groundwater levels within the boreholes were measured as a first step to determine the groundwater flow directions for the area. It can be seen from the borehole description tables (Annexure E) and the water level summary table (Table 3-4 in Annexure E) that groundwater levels range from 2.3 to 23 mbgl (the pumped water level of BH44 is ignored). The monitoring boreholes on site indicate water levels from 3 to 11 mbgl with an average of 8.3 mbgl.

Available groundwater level data indicate piezometric heads of <1650 mamsl for the proposed opencast mining area and coal floor depths around 1640 to 1590 mamsl. This means that mining will mainly occur within the saturated zone (below the water table for the unconfined$_6$ aquifer zones and below the piezometric head for the confined aquifer zones) of the proposed hydrogeological profile. The piezometric

heads are mainly controlled by fractures, and cracks within the Karoo strata and seepages along the mining profile will occur accordingly.

The site is situated on low yielding aquifers. These aquifers have very low potential in terms of development due to the low yield. The aquifers are of minor regional importance in terms of community water supply and can therefore be classified as a Minor Aquifer System according to the Parsons Classification methods (WRC, 1995). However, for certain farms and smaller communities it is the sole source of water.

4.1.9.5 Groundwater quality

Groundwater samples were collected during the hydrocensus investigation. Overall, neutral pH values and fairly low TDS concentrations were obtained. The groundwater quality from borehole Tweefontein1 possibly indicate the impact of agricultural activities, as suggested by the elevated nitrate (NO_3) concentration in the groundwater. The groundwater of the newly drilled boreholes generally has a good quality with sodium and bi-carbonate dominant character.

4.1.10 Aesthetic quality

A Visual impact assessment was undertaken by Newtown Landscape Architects during May 2009 (compiled by Y. Martin). The information in the following sections has been drawn from this report. Please refer to Annexure H for the full Visual impact assessment report.

Landscape character, landscape quality (Warnock, S. & Brown, N., 1998) and "sense of place" (Lynch, K., 1992) are used to evaluate the visual resource i.e. the receiving environment. A qualitative evaluation of the landscape is essentially a subjective matter. In the study undertaken the aesthetic evaluation of the project area was determined by the professional opinion of the author based on site observations and the results of contemporary research in perceptual psychology. The criteria provided within the Visual impact assessment report were used to assess landscape quality, sense of place and ultimately to determine the aesthetic value of the project area.

4.1.10.1 Landscape character

Landscape character types are landscape units refined from the regional physiographic and cultural data derived from 1:50 000 maps, aerial photographs and information gathered on the site visit. Dominant landform/land use features (e.g., hills, rolling plains, valleys and urban areas) of similar physiographic and visual characteristics, typically define landscape character types.

The project area is characterised by rolling grass plains with some low hills and depressions with streams / rivers. The site mainly consists of three dominant natural landscape types: low hills, the Klein-Olifants River, and grassland areas. Three other types, mainly derived from man-made intervention, also occur within the project area. These include the agricultural areas, built-up areas (residences) and infrastructure (such as the N11, R517, the R38 and other farm roads).

The project area is situated in a slight depression that extends from a hill north of the N11 to the hills south of the N11 with the Klein-Olifants River transecting the site. The open cast mining activities are located to the centre of the site and are located on both sides of the Klein-Olifants River. The underground mining is located towards the edges of the site (hills).

Most of the adjacent properties are farms with expansive grasslands and farmsteads scattered throughout these areas. There are two farmsteads located to the north and two located to the south of the proposed washing plant.

The closest town is Hendrina whilst other towns in the area include Breyton, located approximately 22 km to the east of the site and Ermelo, located approximately 40 km southeast of the site.

The vegetation of the proposed site is mostly Eastern Highveld Grassland with small patches of Soweto Highveld Grassland to the south of the site. The Eastern Highveld Grassland is characterized by slightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grassland grass composition.

4.1.10.2 Visual resource value / scenic quality

Scenic quality ratings were assigned to each of the landscape units described in the previous section. The highest value is assigned to the rolling grassland plains with its low hills and depressions. The Klein-Olifants River and associated streams are also rated high. The combination of these natural features, which is characteristic of these areas, and the farmsteads create a more natural and rural environment with a strong sense of place.

The landscape types with the lowest scenic quality rating are the infrastructure, the N11, R517 and the R38. The town of Hendrina also has a low scenic quality.

Based on this, the scenic quality values for the various landscape types within the project area can be described as high to moderate. This is due to the fact that landscape types with a high scenic quality (hills, grassland and river) are mixed with those with a lower quality (roads, residential areas) around the site and within the project area. This is tabulated in Table 4-5 below.

Table 4-5 Value of the visual resource - Scenic quality.

High: Rolling grassland plains, rivers and streams	Moderate: Farmsteads scattered throughout site incl. the agricultural fields	Low: Infrastructure, Hendrina
Distinct landscape that exhibits a very positive character with valued features that combine to give the experience of unity, richness and harmony. It is a landscape that may be considered to be of particular importance to conserve and which has a strong sense of place. It may be sensitive to change in general and may be detrimentally affected if change is inappropriately dealt with.	Common landscape that exhibits some positive character but which has evidence of alteration /degradation/erosion of features resulting in areas of more mixed character. It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with but change may not require special or particular attention to detail.	Minimal landscape generally negative in character with few, if any, valued features. Scope for positive enhancement could occur.

4.1.10.3 Sensitive viewer locations

The sensitivity of visual receptors and views are dependent on the location and context of the viewpoint, the expectations and occupation or activity of the receptor or the importance of the view (which may be determined with respect to is

popularity or numbers of people affected, its appearance in guidebooks, on tourist maps, and in the facilities provided for its enjoyment and references to it in literature or art).

Therefore, using these criteria, residences, especially the surrounding farmsteads, are regarded as highly sensitive viewpoints. The residences that are located close to the mining activities will be the most sensitive viewers. Other viewpoints, such as those from the N11 and the local roads dispersed throughout the study area, are considered moderately sensitive viewpoints.

4.1.10.4 Non-sensitive visual receptors

Non-sensitive visual receptors would typically be people at their place of work, or engaged in similar activities, whose attention may be focused on their work or activity and who therefore may be potentially less susceptible to changes in their views. At this stage there are no views that could be considered as non-sensitive, as most of the views are from farmsteads and local farm roads. It should also be kept in mind that the proposed mine is the only one in this particular area and therefore intrusive to the proposed area. It is for this reason that most of the views towards the mine will be highly sensitive.

4.2 BIOLOGICAL ENVIRONMENT

4.2.1 Flora

A Fauna and flora baseline assessment was undertaken by Resource Management Services (REMS) during December 2008. The information in the following sections has been drawn from this report. Please refer to Annexure I for the full Fauna and flora assessment report.

The majority of the project area is dominated by Eastern Highveld Grassland. This vegetation unit is rated Endangered and it has been found that 72% of the Eastern Highveld Grassland is under medium pressure from mining developments with only approximately 0.8% of these grasslands included under statutory reserves.

About 1800 ha of the project area has been converted to agriculture (crop farming), approximately 18% is hydromorphic grassland and tributaries associated with the Klien Olifants River, 3% is represented by rocky outcrops and 27% is considered natural (upland) grasslands.

From the site visit, it was identified that the project area contains the following zones or habitats (Figure 4-12, Table 4-6):

- Rocky Outcrops - These are mainly found along the Klein Olifants River System
- Grasslands
    - Natural Grasslands (often associated with rocky areas)
    - Hydromorphic Grasslands
    - Transformed/Disturbed Grassland (i.e. through intensive cattle crazing)
- Riverine & Aquatic
    - Palustrine River Systems
    - Dams

- Transformed Areas
    - Alien Bush clumps
    - Agricultural – Crop/Pasture Areas
    - Built-up

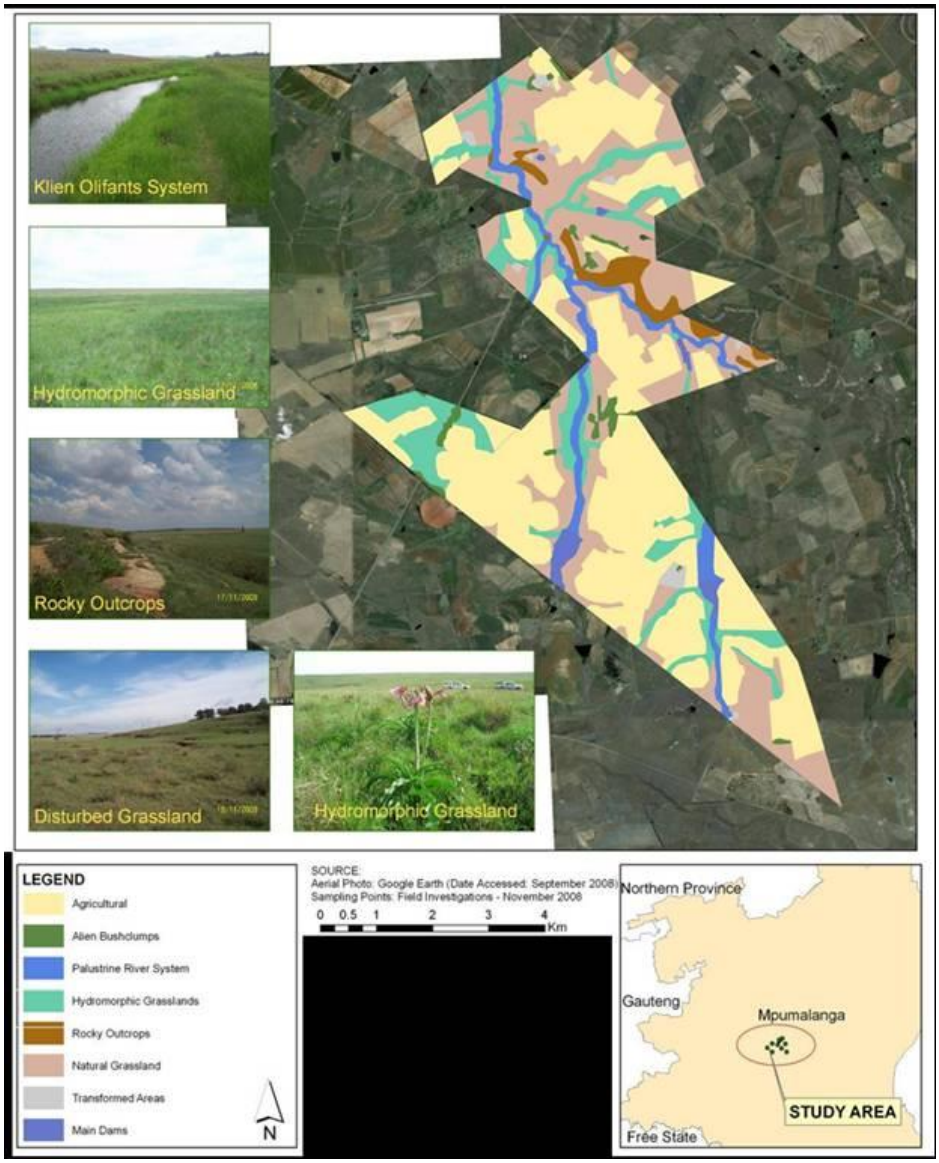


Figure 4-12 Different habitats found within the project area.

Of the habitats found on site, a large percentage of the project area has been transformed through agricultural activities. Almost 50% of the project area is currently used for agricultural purposes, either maize (*Zea mays*), potato (*Solanum tuberosum*) or pasture grass (*Eragrostis spp, Digitaria* spp) farming. However, at least 27% of the project area is under natural grassland. These are often associated with the Klein Olifants, its tributaries and the rocky outcrops. These natural areas are potential habitat for rare and threatened species.

Table 4-6 Broad habitat types found within the project area.

Habitat Types	Habitat Size	% Total Area	Conservation Importance
Transformed Areas			
Agricultural Fields	1800.96	47.96	Low
Alien Bush Clumps	61.6	1.64	Low
Transformed - Built-up	36.35	0.97	Low
Riverine and Aquatic			
River Systems – specifically the Klein Olifants and associated tributaries	212.02	5.65	High
Large Dams	50.03	1.33	Moderate
Grassland Habitat			
Hydromorphic Grasslands	463.46	12.34	Moderate-High
Rocky Outcrops	105.67	2.81	High
Natural Grassland	1024.72	27.29	Moderate-High

4.2.1.1 Red data/endemic species

The Threatened Plant Species Programme (TPS) is currently revising all threatened plant species assessments made by Craig Hilton-Taylor (1996), using IUCN Red Listing Criteria modified from Davis *et al.* (1986). According to the TPS interim Red Data list of South African plant taxa (updated October 2007), there are over 201 Red Data listed species within Mpumalanga Province, of which 14 species are Critically Endangered (CE), 19 Endangered (EN) and 59 are Vulnerable (VU).

Although the project area is situated in an area that is currently been utilized mainly for crop cultivation and cattle farming, sufficient habitat for species of conservation significance do occur, specifically within the hydromorphic grasslands along the Klein Olifants River system.

The following protected species have been recorded during the site visit:

- *Eucomis autumnalis* (Common Pineapple Lily) – Found within the *Andropogon appendiculatus - Kyllinga erecta* moist grassland.
- *Crinum bulbispermum* (Orange River Lily) – Found within the *Andropogon appendiculatus - Kyllinga erecta* moist grassland; *Scirpoides burkei - Helichrysum aureonitens* damp grassland; *Sorghum versicolor - Monopsis decipiens* and *Fuirena pubescens - Centella asiatica* wet grasslands.
- *Gladiolus dalenii* (African Gladiolus) – Found within the *Tristachya leucothrix – Diospyros lycioides* rocky outcrops
- *Disa woodii* – Found within the *Andropogon appendiculatus - Kyllinga erecta* moist grassland and *Fuirena pubescens - Centella asiatica* wet grasslands.

The following fern species were recorded within the *Tristachya leucothrix – Diospyros lycioides* rocky outcrops:

- *Pellaea calomelanos;*
- *Cheilanthes quadripinnata;*
- *Blechnum austral;*
- *Cheilanthes viridis;*

- *Cheilanthes hirta; and*
- *Cheilanthes eckloniana.*

4.2.1.2 Alien and invader species

In terms of the amendments to the regulations under the Conservation of Agriculture Resources Act, 1983 (Act 43 of 1983, CARA), landowners are legally responsible for the control of alien species on their properties. Declared weeds and invasive species had been divided into three categories in accordance with CARA.

These categories are as follows:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.
- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year flood line of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species are allowed.

During the site visit two of Category 1 and two of Category 2 listed alien invasive species were identified. *Cirsium vulgare* (Scottish Thistle) was found mainly within the moist grassland areas adjacent to the Klein Olifants and associated tributaries. In some areas this species was quite prolific, whereas *Datura stramonium* (Thorn Apple) was mainly located adjacent to agricultural fields. Although less than 1.6% of the site was dominated by alien bush clumps, the common species within these clumps namely *Eucalyptus camaldulensis* (Red River Gum), is considered a Category 2 listed alien invasive species. A grove of *Populus alba* (White Poplar) was also recorded within a seasonal wetland in the north eastern section of the project area on the farm Tweefontein.

4.2.2 Fauna

A Fauna and flora baseline assessment was undertaken by Resource Management Services (REMS) during December 2008. The information in the following sections has been drawn from this report. Please refer to Annexure I for the full Fauna and flora assessment report.

Faunal species were identified throughout the project area through actual observation, capture, evidence of presence and communication with resident farmers. Approximately 23 mammal species, 74 avifaunal species, 10 reptiles and amphibians and 34 invertebrate species were recorded during the survey.

Conservation important faunal species are listed in the following sections.

4.2.2.1 Avifauna

Vulnerable species identified:

- *Ciconia nigra* (Black Stork) – Found along the Klien Olifants River System; and
- *Eupodotis caerulescens* (Blue Korhaans) – Found within the *S. plumosum (Stoebe vulgaris) – E. chloromelas* Disturbed Grassland.

4.2.2.2 Mammals

Near threatened species identified:

- *Leptailurus serval* (Serval) – Identified by local farmers within the hydromorphic grasslands;
- *Atelerix frontalis* (South African Hedgehog) – Identified by local farmers within the rockier grasslands; and
- *Crocidura* (shrew) species – Found within the hydromorphic grasslands.

4.2.2.3 Reptiles

Near threatened species identified:

- *Homoroselaps lacteus* (Spotted Harlequin Snake) – Found within the *T. triandra – H. contortus* Rocky Grassland.

4.2.2.4 Invertebrates

Although no Conservation Important invertebrate species were recorded during the survey, habitat for *Metisella mennix* (Marsh Sylph) did occur within the tributaries to the Klein Olifants River System, where patches of the grass *Leersia hexandra* were recorded.

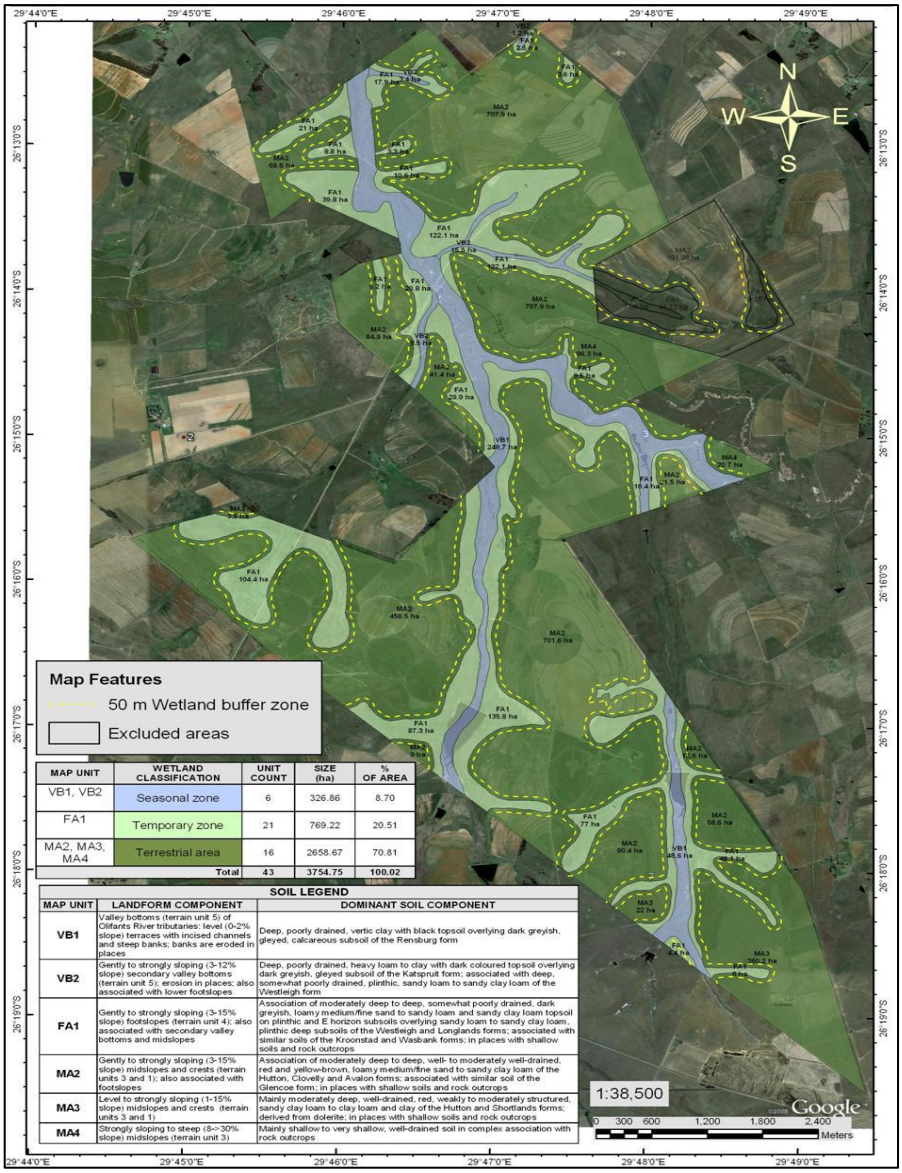
4.2.3 Wetlands

A Wetland delineation was undertaken by Resource Management Services (REMS) during December 2008. The information in the following sections has been drawn from this report. Please refer to Annexure J for the Wetland delineation report.

The wetland delineation report identifies and delineates the wetland zones using soil-landform and vegetation indicators. The soil-landform survey was conducted according to standard methodology at a semi-detailed level. The following wetland zones were delineated: two separate seasonal zones comprising valley bottoms 327 ha in extent; and a temporary zone covering mainly footslopes 769 ha in extent (Figure 4-13). The project area is 3 755 ha in extent, hence the wetlands account for 29% of the area (REMS, 2008).

The hydrophyllic vegetation was associated mainly with the seasonal and temporary wetland zones and permanent/ semi-permanent farm dams. There was a low abundance and frequency of hydrophyllic plants in all temporary wetland zones. The wetlands were of moderate importance to the ecosystem functioning of the Klein Olifants River, which supplies water to downstream users (agriculture, mining, urban areas and conservation) and therefore must be managed with long term sustainabilty of these enterprises (REMS, 2008).

It was also reported that due to human-induced impacts, such as gully erosion, overgrazing and the presence of the sand and tar roads, the wetland zones have been negatively affected to varying degrees (REMS, 2008).



MAP UNIT	WETLAND CLASSIFICATION	UNIT COUNT	SIZE (ha)	% OF AREA
VB1, VB2	Seasonal zone	6	326.86	8.70
FA1	Temporary zone	21	769.22	20.51
MA2, MA3, MA4	Terrestrial area	16	2658.67	70.81
	Total	43	3754.75	100.02

SOIL LEGEND

MAP UNIT	LANDFORM COMPONENT	DOMINANT SOIL COMPONENT
VB1	Valley bottoms (terrain unit 5) of Olifants River tributaries: level (0-2% slope) terraces with incised channels and steep banks; banks are eroded in places	Deep, poorly drained, vertic clay with black topsoil overlying dark greyish, gleyed, calcareous subsoil of the Rensburg form
VB2	Gently to strongly sloping (3-12% slope) secondary valley bottoms (terrain unit 5); erosion in places; also associated with lower footslopes	Deep, poorly drained, heavy loam to clay with dark coloured topsoil overlying dark greyish, gleyed subsoil of the Katspruit form; associated with deep, somewhat poorly drained, plinthic, sandy loam to sandy clay loam of the Westleigh form
FA1	Gently to strongly sloping (3-15% slope) footslopes (terrain unit 4); also associated with secondary valley bottoms and midslopes	Association of moderately deep to deep, somewhat poorly drained, dark greyish, loamy medium/fine sand to sandy loam and sandy clay loam topsoil on plinthic and E horizon subsoils overlying sandy loam to sandy clay loam, plinthic deep subsoils of the Westleigh and Longlands forms; associated with similar soils of the Kroonstad and Wasbank forms; in places with shallow soils and rock outcrops
MA2	Gently to strongly sloping (3-15% slope) midslopes and crests (terrain units 3 and 1); also associated with footslopes	Association of moderately deep to deep, well- to moderately well-drained, red and yellow-brown, loamy medium/fine sand to sandy clay loam of the Hutton, Clovelly and Avalon forms; associated with similar soil of the Glencoe form; in places with shallow soils and rock outcrops
MA3	Level to strongly sloping (1-15% slope) midslopes and crests (terrain units 3 and 1)	Mainly moderately deep, well-drained, red, weakly to moderately structured, sandy clay loam to clay loam and clay of the Hutton and Shortlands forms; derived from dolerite; in places with shallow soils and rock outcrops
MA4	Strongly sloping to steep (8->30% slope) midslopes (terrain unit 3)	Mainly shallow to very shallow, well-drained soil in complex association with rock outcrops

Figure 4-13 Wetland delineation map including semi-detailed soil-landforms (REMS, 2008).

In the site, map units VB1, VB2 (seasonal wetland zone) and FA1 (temporary zone) had been affected moderately by human impact due to overgrazing causing *inter alia* gully erosion, as well as constructing of roads and dams. All these wetlands have a moderate importance on sediment trapping, stream flow regulation and flood attenuation within the catchment. The FA1 wetland unit is in the most natural with few modifications on the Present Ecological Status (PES) scale. Habitat degradation is mainly due to overgrazing. The roads probably inhibited subsurface flow of water through footslope soils. The present ecological conditions reflect the current and past grazing pressure and fire regime history of the area. The FA1 zone has most of the wetlands biodiversity and has a higher conservation importance, this is due to its size (REMS, 2008).

4.2.3.1 Soil-landform map

The distribution of the soil-landform resources is given on the semi-detailed soil-landform map (Figure 4-13). The map legend, contained in Figure 4-13 indicates the

dominant soil component as well as the terrain unit and slope class. The sizes of the map units are given in Figure 4-13 (REMS, 2008).

4.2.3.2 Description of the hydrophyllic vegetation

Vegetation is an important component to delineate transitions between wetland zone(s) and terrestrial areas. Certain plants only occur under specific adaphic conditions and are therefore, useful in distinguishing between different soils hydrological regimes. Obligate and faciultative species were used to delineate the wetland boundaries and describe its ecological state. This site has a high frequency and abundance of generalist terrestrial plants growing in the temporary and seasonal wetland zones and very few specialist wetland plant species this is mainly due to the absence of permanent wetlands on the project area (Figure 4-13 and Table 4-11) (REMS, 2008).

4.2.3.3 Seasonal wetland

These wetlands account for 8.7% of the total area of the site, occur on the valley bottoms and some secondary valley bottoms (Figure 4-14). Plants from the *Fuirena pubescens – Centella asiatica* community are on either side of the non-perenial Klein Olifants River, in which the species composition changes along the gradient from south (upstream) to north (downstream). Furthest south *Elocharis palustris*, *Juncus acatissimus* and *J. oxycarpus* (obligate species) occur only in seasonal seeps. Whereas these species only occur around the farm dams upstream. *Limosella maior* (a herb and facultative species) is also found around the small farm dams and seasonal seeps and wetlands downstream. The grass *Helitrichon turgidulum* (a facultative species) is only found in the grasslands and seeps downstream. The semi-permanent pools in the river (judged to be semi-permanent) contain the obligate species, *Phragmites australis* (a reed) and *Typha capensis* (a bulrush), in which weavers built their nests. The facultative graminoids *Cyperus obtusiflorus*, *Festuca scabra* and *Leersia hexandra* were only found in the upstream grassland communities. Whilst downstream *Agrostis bergiana var. laeviuscula* and *Agrostis lachnantha var. lachnantha* both obligate species were found in the *Andropogon appendiculatus – Kyllinga erecta* community. The grass *Andropogon appendiculatus* a facultative species was found throughout this wetland zone within the former vegetation community.

4.2.3.4 Temporary wetlands

These are the largest wetlands in the area accounting for 20.5 % of the sites surface area (Figure 4-14). The graminoids *Cyperus pseudovestitus, C. rigidifolius* and *Stiburus conrathi* only occur in the downstream *Fuirena pubescens – Centella asiatica* community. Whilst *Pycreus macranthus* only occurs within the *A. appendiculatus- K. erecta* grasslands. These graminoids are all a facultative species. Variation between the upstream and downstream vegetation indicate that the turn-over of species diversity within the gradient (beta diversity) shows evidence of the areas previous higher levels of biodiversity (before modern agricultural practices).

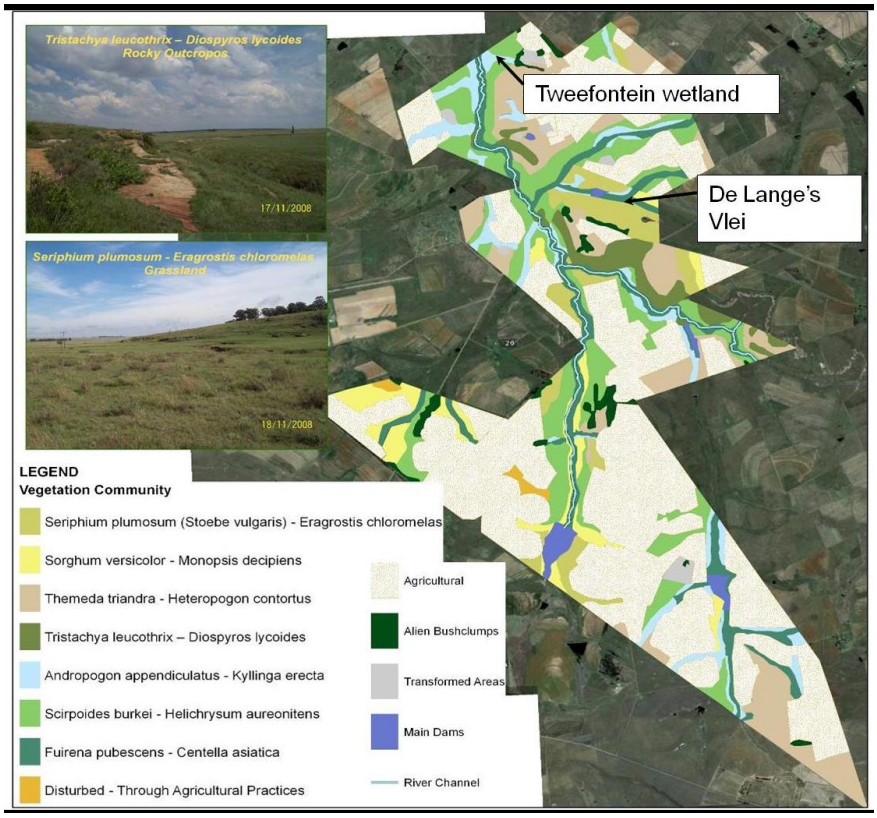


Figure 4-14 Vegetation community map of the project area (REMS, 2008).

4.2.3.5 Specific wetlands

The Tweefontein wetland has infestations of the invasive tree *Populis abla* (Figure 4-14) in the secondary valley bottom. These inhibit a portion of the subsurface and underground flow of water from reaching the Klein Olifants River.

De Lange's Vlei has seen intense grazing pressure the vlei has been trampled excessively and the stream is eroding with several head-cuts migrating upstream. A scour hole has formed downstream of each of these headcuts with sediment being deposited at the junction of the stream and the Klein Olifants River. The vegetation along the lower reaches is indicative of poor veld management practices most of the palatable grasses have been replaced by nonpalatable species including shrubs in the *Seriphium plumosum – Eragrostis chloromelas* community (Figure 4-14). A pair of *Gallinago media* (Great Snipe), palaeartic migrating birds, were seen in this wetland. Their habitat is specific to wetlands and they are classified as near threatened on the endangered species list and are seldom seen in the Grassland Biome.

4.2.4 Aquatic ecology

A Biomonitoring and aquatic assessment was undertaken by Econ@uj, a consortium of environmental specialists based in the Zoology Department of the University of Johannesburg, during August 2010 (compiled by W. Malherbe & M. Ferreira). The information in the following sections has been drawn from this report. Please refer to Annexure K for the Biomonitoring and aquatic assessment report.

4.2.4.1 Surface water quality

Five sites were selected for the purpose of the study (Figure 4-15). The first site (Mashala 1) is situated above any of the potential impacts. The second and third sites are situated on a tributary of the Klein Olifants River on the farm Boschmanshoek (Mashala 2 and 3). The sites were selected above and below the proposed site for the processing plant. The fourth site (Mashala 4) was selected downstream of the proposed open cast pits, while the fifth site (Mashala 5) is situated below all the proposed activities next to the N11 highway.

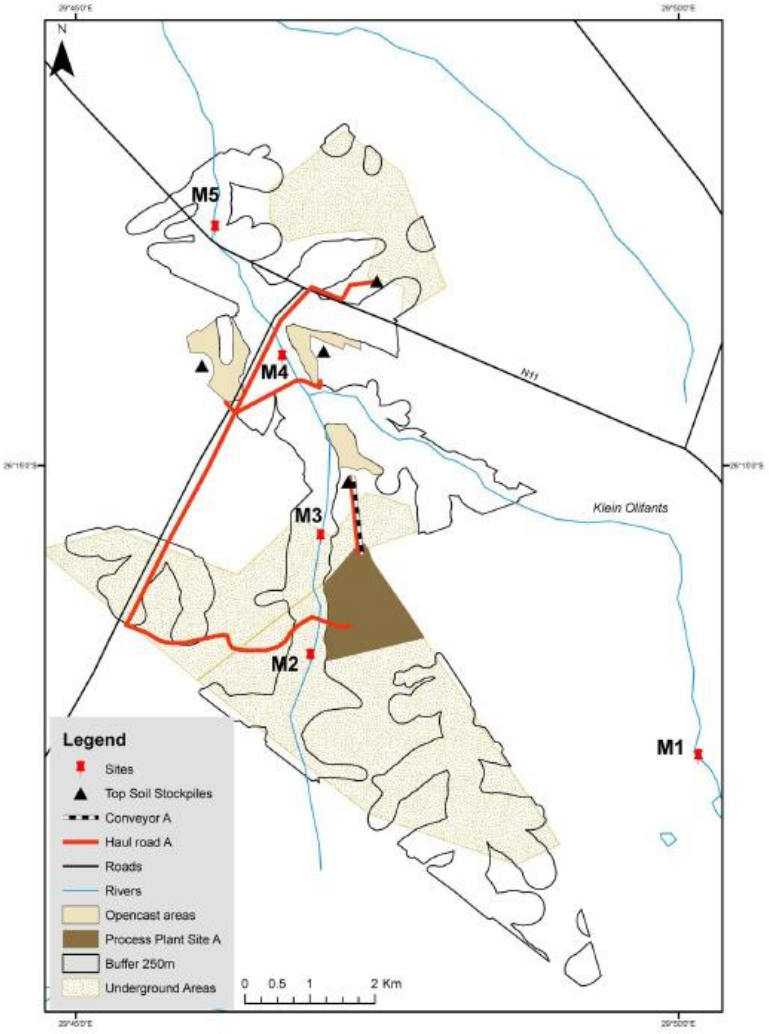


Figure 4-15 Map showing the position of the water quality sampling sites.

The results for the baseline water quality assessment are presented in Table 4-7. The water quality variables across sampling dates were averaged and compared with the Target Water Quality Requirement (TWQR) for the protection of aquatic ecosystems (DWAF, 1996) presented in Table 4-7.

Table 4-7 Combined water quality results for all sampling dates of selected sites.

Parameter	Unit	Sites				TWQR
		Mashala 1	Mashala 2	Mashala 4	Mashala 5	
Conductivity	µS/cm	490.33	432.00	454.00	446.33	
Temperature	°C	9.97	10.27	11.93	9.17	
pH	-	8.26	8.32	8.27	8.17	±15%
Oxygen saturation	%	95.30	109.30	114.47	105.63	80 - 120%
Oxygen content	mg/l	8.73	10.05	10.13	10.14	
Calcium, Ca	mg/l	25.5	25	26	25	NA
Magnesium, Mg	mg/l	27	17.15	19.4	18	NA
Sodium, Na	mg/l	25.5	27	30	31	NA
Potassium, K	mg/l	2.5	3.75	3.2	3.5	NA
Free and Saline Ammonia as NH_4	mg/l	<0.1	<0.1	<0.1	<0.1	< 0.25
Nitrate, NO_3	mg/l	45	40.5	33.5	35.5	
Nitrate as N	mg/l	17.03	1.925	<0.1	0.625	
Nitrite as N	mg/l	3.875	0.475	<0.1	0.175	
Sulfate, SO_4	mg/l	< 0.1	<0.1	<0.1	<0.1	NA
Chemical Oxygen Demand, O_2	mg/l	38.5	46.5	42.5	42.5	NA
Arsenic, As	mg/l	<0.02	<0.02	<0.02	<0.02	0.01
Selenium, Se	mg/l	0.033	0.058	0.033	0.075	0.002
Aluminium, Al	mg/l	0.13	0.103	0.007	0.007	0.005
Nickel, Ni	mg/l	<0.003	0.002	<0.003	<0.003	NA
Manganese, Mn	mg/l	0.001	0.008	0.016	0.041	0.18
Iron, Fe	mg/l	0.055	0.075	0.024	0.065	NA
Zinc, Zn	mg/l	0.027	0.086	0.045	0.032	< 0.002
Lead, Pb	mg/l	0.008	0.023	<0.01	<0.01	0.0002
Cobalt, Co	mg/l	0.005	0.006	<0.001	0.004	NA
Copper, Cu	mg/l	0.008	0.006	0.005	0.013	0.0003
Total Chromium, Cr	mg/l	0.003	0.004	0.003	<0.003	0.007
Cadmium, Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.15
Uranium, U	mg/l	<0.004	<0.004	<0.004	0.004	NA
Phosphate	mg/l	<0.12	0.17	0.23	0.3	NA

The pH, conductivity, temperature and oxygen were all within the recommended guidelines of DWAF (1996). The conductivity and pH are some of the variables that could change should mining activities start. Generally, conductivity increases due to increased salt loads from mining runoff while pH could decrease due to AMD. A change in these variables will result in a loss of some aquatic species from the system. A decrease in pH can also allow various metal levels to increase and become bioavailable to aquatic organism which in turn could cause ecological effects.

The salt concentrations were similar for all sites during June to August 2010 at the selected sites. No TWQR for aquatic ecosystems are available at present but salt concentrations (Ca, Mg, Na, K) should remain at the levels identified in this study as any changes in these concentrations could cause effects on the aquatic

ecosystem. The concentrations of inorganic nitrogen during the June survey were within the acceptable limit of less than 0.25 mg/l at Mashala 2, Mashala 4 and Mashala 5. The levels at Mashala 1 were above the limit indicating that the water is in an eutrophic condition due to increased nutrients. The levels during July 2010 were all below the detection limit and the TWQR for aquatic ecosystems. The increased nutrients are due to the farming in the area and livestock using the rivers for drinking water. The concentrations for sulphate were also similar at all sites during June to August 2010. However, the concentrations are elevated, but no TWQR exist for this variable. The chemical oxygen demand (COD) concentrations were similar during all the samples from June to August 2010. The COD values were slightly elevated. Phosphate levels were also slightly elevated.

The metal concentrations measured at all sites during June to August 2010 were either below the detection limits or below the TWQR set for the specific variable. However, the aluminium and copper concentrations were higher than the TWQR. This however is possibly due to natural levels found at the site rather than due to some pollution source. Metal concentrations could increase due to mining activities as dust, sedimentation and polluted water may carry metals into the aquatic ecosystem. Once in the aquatic ecosystem these metals can either have an effect on the aquatic biota or sink out into the sediment. The sediment metals could pose a potential problem in the future as changes in environmental conditions can cause them to dissolve into the water and cause effects on the aquatic biota. The metal concentrations measured here should not increase significantly as the levels from this study are baseline values (Malherbe and Ferreira, 2010).

4.2.4.2 Resource class and river health

The results of the response models for fish, macro-invertebrates, and habitat components are provided as Ecological Categories ranging from Natural (A) to Critically Modified (F) (Table 4-8). The varying driver and responder components and indices are discussed in more detail in the following section.

Table 4-8 Ecological categories, key colours and category descriptions presented.

Class	Ecological category	Description
A	Natural	Unmodified state - Un-impacted state, conditions natural
B	Good	Largely natural - Few modifications, mostly natural
C	Fair	Moderately modified - Community modifications, some impairment of river health
D	Poor	Largely modified - Distinct impairment of river health, impacted state
E	Seriously modified	Seriously modified - Most community characteristics modified, seriously impacted state
F	Critically modified	Critically modified - Extremely low species diversity and abundance, unaccepted modified state

Habitat availability and diversity are major determinants in the overall community structure of aquatic macro-invertebrates, therefore it is of the utmost importance to evaluate habitat quality when applying biomonitoring methodologies and assessing river health. The habitat quality and diversity were assessed by means of the Habitat Quality Index (HQI) and the Integrated Habitat Assessment System (IHAS) (McMillan, 1998). They were implemented by taking note of various observations on a

provided score sheet. The values of the indices were then calculated as a percentage. A rating system for each index then described the habitat quality of the given site. The classification system used to classify the habitat integrity of the sites in the study is shown in Figure 4-16. These indices were not applied at Mashala 3 as the indices were developed for the assessment of riverine habitat integrity and the river at this point forms a wetland.

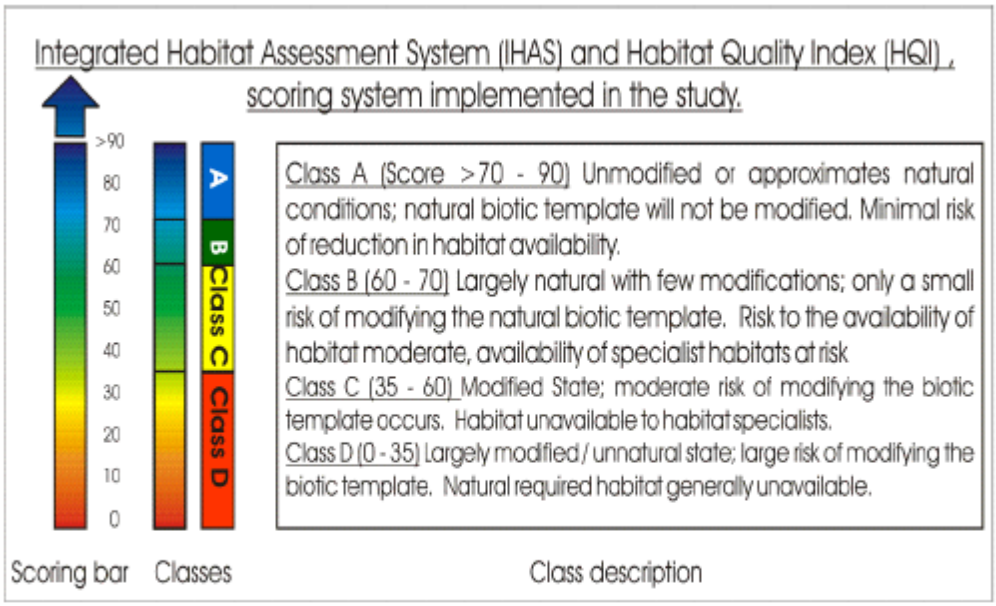


Figure 4-16 The Scoring System, classes and class description of the IHAS and HQI habitat indices implemented.

The standard SASS-5 protocol (Dickens and Graham, 2002) was followed to collect macro-invertebrate samples and various biotopes in which macro-invertebrates may occur were sampled. Three biotopes were sampled including: stones (in current, out of current and bedrock), vegetation (marginal and aquatic) and gravel, sand and mud (GSM).

SASS-5 results from the data obtained from the project area were analysed according to Table 4-9.

Table 4-9 The SASS-5 results and the method applied in assigning ecological classes.

SASS-5 Score	ASPT	Class	Condition
> 140	> 7	A	Natural
100 - 140	5 - 7	B	Good
60 - 100	3 - 5	C	Fair
30 - 60	2 - 3	D	Poor
< 30	< 2	E/F	Seriously modified

According to the State of The Rivers Report (Ballance *et al.*, 2001) the in-stream and riparian habitats in the Upper Olifants WMA is in a fair to unacceptable state. The in-stream habitat of the Klein Olifants River catchment is said to be in a poor state. Results of the habitat quality assessment of the project area (Table 4-10) indicates that, apart from the IHAS results for Mashala 4, the instream habitat at all the sites was in a fair to poor state.

Table 4-10 Final scores and the ecological classes obtained for the in-stream habitat of the selected sites.

	Mashala 1	Mashala 2	Mashala 3	Mashala 4	Mashala 5
IHAS	48	52	-	75	46
HQI	33	35	-	56	34
IHAS class	C	C	-	A	C
HQI class	D	D	-	C	D

The main reasons for the change in habitat integrity observed at all the sites were a change in in-stream flow and the resultant sedimentation. On nearly every farm through which the Klein Olifants River flows, several small farm dams have been constructed. Farm dams have also been constructed on the tributary of the Klein Olifants River above the proposed site for the processing plant. The flow alterations that have been caused by these dams have led to a loss in different flow types (velocities) at all the sites. As a result most of the habitat is in the form of pools or slow flowing areas. The flow alterations have also led to serious erosion and the resultant sedimentation at all of the sites. The sedimentation has directly caused the loss of riffles as a habitat at nearly all the sites apart from Mashala 4. Along with the flow alterations, land use in the form of grazing, further contributes to the heavy silt loads within the associated systems.

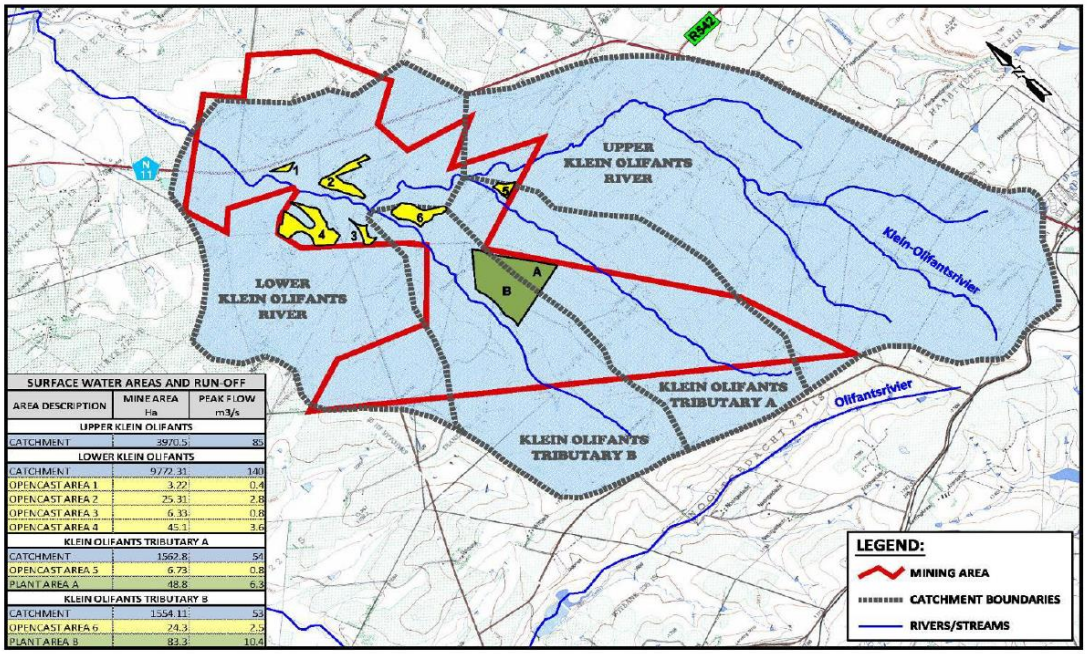


Figure 4-17 Sub-basin catchment boundaries within the project area.

Table 4-11 Evaluation of various ecosystem services contained within each wetland landform and its importance in the Klein Olifants river catchment.

Map unit	Landform component	Present ecological state (PES)	Size (ha)	Ecosystem services				
				Flood attenuation ****	Stream-flow regulation **	Sediment trapping ****	Biodiversity maintenance **	Provision of harvestable resources **
VB1	Valley bottom - channelled with terraces	**C** Overgrazing, gully erosion, roads and dams	298.3	3	4	2	3	1
VB2	Valley bottom – channelled and unchannelled	**C** Overgrazing, gully erosion, roads and dams	28.6	3	3	3	4	1
FA1	Footslope	**B** Overgrazing and roads	769.0	3	3	3	4	2

Size is seldom important	*
Size is usually moderately important	**
Size is usually very important	***
Size is usually very important	****

Key to the importance of the wetland components in the catchment:

5	Very important
4	Important
3	Moderate importance
2	Little importance
1	Marginal importance

Key to the Present Ecological Status categories (PES) categories (from Kleyhans 1999):

A	Unmodified or approximates natural conditions
B	Largely natural with a few modifications
C	Moderately modified, with some loss of natural habitats
D	Largely modified, a large loss of natural habitats and basic ecosystem functions
E	Seriously modified, extensive loss of habitats and ecosystem functions
F	Critically modified, the modifications have resulted in almost complete loss of habitat

5.1 SOCIO-ECONOMIC ENVIRONMENT

A Social impact assessment was undertaken by GCS (Pty) Ltd during June 2009 (compiled by P. Ramsaroop). Please refer to Annexure L for the full Social impact assessment report. The information provided below has been drawn from the Social impact study (2009), the De Wittekrans Social and Labour plan (2009) as well as the Local Integration Development Plan (IDP) of Msukaligwa Local Municipality (2007 - 2012).

5.1.1 Administrative setting

This project area falls in the Msukaligwa Local Municipality which covers 830 957 ha within the Gert Sibande District Municipality. The total population in the Msukaligwa Local Municipality is 124 319 people.

5.1.2 Municipal analysis

The municipality has over the past 12 years of the democratic government strived to provide and improve basic services and infrastructure to its communities in order to achieve statutory obligation of ensuring a better life for all. In its endeavour to improve service delivery, the municipality has extended its services to rural communities/farms by providing water boreholes where farm owners consented to these services. It should however be noted that service provision at some rural/farm areas becomes difficult due to resistance by farm/land owners, which poses a challenge to the Municipality. All urban areas within the municipality have access to running water, which includes informal settlement areas where water is provided through communal taps. The municipality has further endeavoured to meet the millennium target of eradicating the bucket system by providing water borne sewerage system at Kwazanele Extension 4 and VIP toilets at Silindile informal settlement.

Urban migration is also posing a challenge, especially in Ermelo with the increase of illegal squatting, making it difficult for the municipality to render proper sanitary services and waste removal. Provision of land for housing purposes is therefore the biggest challenge for the Municipality and based on the financial status of the municipality, it becomes difficult to fund the procurement of land from our limited budget. The municipality relies on funding from the Department of Land Affairs (DLA), Department of Agriculture and Land Affairs (DALA), DPLG and other funding institutions to assist in purchase of land. The municipality with the assistance of the district and the Department of Local Government and Housing need to speed up the process of development of the By-laws to control the illegal squatting so that land can be allocated accordingly.

Msukaligwa Municipality has also provided free basic water to its communities and subsidised indigent residents. The provision of free basic electricity still remains a challenge to the municipality. Eradication of informal settlements is a big challenge for the municipality as this impacts on community health due to poor sanitary services and refuse removal and inaccessibility to some sections of the settlement as result of poor/none existence of roads.

The municipality faces a large challenge to ensure that there is access roads available for residents to critical areas and social amenities, these include access to

economic opportunities, thus more work needs to be done to improve access to all these critical areas. The poor condition of many roads in the area also impacts on the local economic development and tourism industry. Heavy trucks transporting coal are causing damage to the municipal, national and provincial roads. The national roads damaged by the heavy trucks will be maintained by the South African National Roads Agency and the maintenance of N11 commenced on June/July 2007.

A major challenge for the municipality is dealing with the unemployment problem (Table 4-12 and Table 4-13). The unemployment statistics reveals that approximately 23% of the municipal population is unemployed, 37% are employed and 41% are not economically active. This means that 41% of the population falls below the age of 16 and above the age of 65 years old. These percentages do not include people who generate a livelihood from subsistence agriculture, grants, handouts, pensions etc.

Table 4-12 Work status statistics (Demarcation Board Statistics, 2001).

Description	Msukaligwa Local Municipality
Paid employee	25 921
Paid family worker	252
Self-employed	1 784
Employer	607
Unpaid worker	65
Not applicable	96 180

Table 4-13 Employment statistics (Demarcation Board Statistics, 2001).

Description	Msukaligwa Local Municipality
Employed	28 083
Unemployed	17 361
Not Economically Active	31 208

Maize, sunflower, wheat, soya beans, beans, and potatoes are produced in the surrounding areas. The Nooitgedacht Agricultural research station offers an extensive agricultural support service, such as research on wool, grass and seedlings. Ermelo is also South Africa's largest wool producing area per hoof and this makes up a large portion of the manufacturing sector. The annual Merino Wool Festival and Agricultural Show in March attract thousands of tourists each year, thus contributing to the economy of the area.

Since 2001, there has been a large increase in mining activities in Msukaligwa. This has been brought about by investor confidence in mining and positive commodity prices. Coal mining is also an enormous economic contributor to the area, and promotes economic growth and employment creation in the town of Ermelo. The majority of towns within the municipality used to be an activity node rendering a service mainly based on the railway, catering for the surrounding farming community and coal mining industry. With the closure of Mining the early 1 9905 railway activities have seized. The closure of business activities (i.e. the 01K Depots - Oos Transvaal Kooprasies) in Davel witnessed the towns economic base almost collapse.

The Msukaligwa Local Municipality has developed a Local Economic Development (LED) Plan and specific points are raised with regards to the mining industry:

- Difficult for local contractors to obtain contracts from the mines for general work e.g. cleaning of offices, equipment etc.
- Needs capital to start up business.
- The potential of local mines must be used e.g. Wesselton mine.
- Mine related opportunities exist in the area e.g. in Breyten clothes for mines are made by local women and Xstrata coal is also exporting this clothes to Australia.
- Important that mines create other opportunities for people in the area due to the short working time of mines.
- Municipality can assist the development of mining in the area by compiling a database of the local contractors in the area as well as mines and link the two parties with each other.
- Municipal projects must be coordinated with poverty projects (and other community projects) of mines, therefore it is necessary to communicate and interact with the local mines in the area.

5.1.3 Municipal environmental information

The Msukaligwa Municipality will partner with the District, community, private sector and other government sector departments to facilitate promote and support an environment that is free and safe, promote human dignity and human rights. The municipality will support all efforts both government and civil society that seek to attain the ideals of the rights contained in the bill of rights. The municipality through the District will in partnership with other spheres of government strive to provide infrastructure that will enhance provision of social services and other related programs.

The local municipality is faced with a challenge of providing waste management services in such that it has to deal with the legacy of unpermitted landfill sites, unclosed and rehabilitated landfill sites and shrinking air space in the current existing sites. The mounting operational expenses coupled with huge negative environmental risks and challenges posed by these sites, as well as other challenges to manage generation of increased waste due to increase economic development, urbanization, mining and industrial activities within the municipality remains a big challenge.

The municipality through its integrated waste management strategy will in partnership with the District, private sector and civil society will strive to partner to achieve the following goal:

- Recycling;
- Waste Management and Minimization;
- Waste control and eradication awareness;
- Efficient Waste Management [planning and control]; and
- Promotion of environmentally friendly waste management practices.

Provision of clean drinking water (potable) is still also a challenge and this can be as a result of a high number of rural / farmlands within the municipality.

5.1.4 Traffic assessment

A Traffic assessment was undertaken by Route[2] – Transport Strategies during August 2010 (compiled by J. Botha). The information in the following sections has been drawn from this report. Please refer to Annexure M for the full Traffic assessment report.

The project area is located to the south of the N11, a national road under the jurisdiction of SANRAL, and east of the D383, a provincial district gravel road linking Davel and the N17 with the N11. This gravel road mainly gives access to farms in the area.

12-hour traffic counts were conducted during 2010 at the intersection of the N11 and the D383. The existing weekday peak hour traffic volumes are summarised in Figure 4-18. Traffic data was also obtained from SANRAL for the N11 between Ermelo and Hendrina.

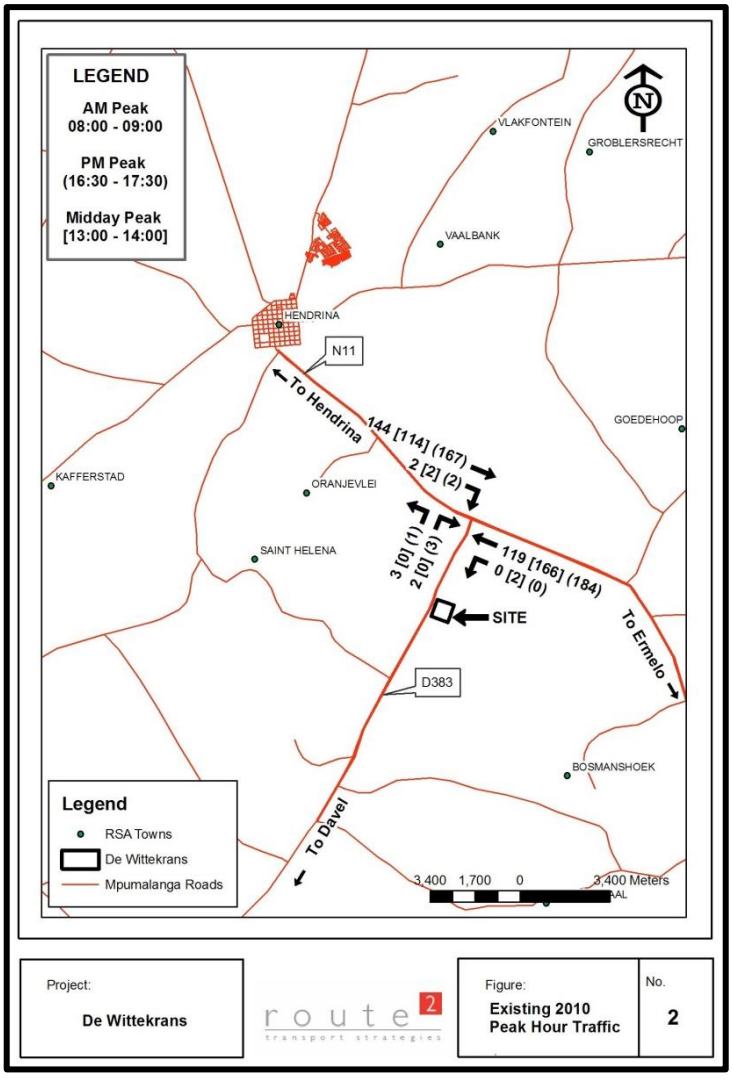


Figure 4-18 Existing 2010 peak hour traffic.

This data is for the year 2008 and can be summarised as follow:

- Average Daily Traffic (both directions) = 3 647 vehicles
- Average Daily Truck Traffic (both directions) = 1 077 vehicles
- Percentage Heavy Goods Vehicles (HGVs) = 29,5%
- Highest volume vehicles to Hendrina at 18:00 = 382 vehicles
- Highest volume vehicles to Ermelo at 14:00 = 274 vehicles

5.2 CULTURAL AND/OR HISTORICAL ENVIRONMENT

A Heritage assessment was undertaken by PGS Heritage & Grave Relocation Consultants during July 2010. The information in the following sections has been drawn from this report. Please refer to Annexure N for the full Heritage assessment report.

During the Heritage survey 36 sites of heritage significance were identified (Figure 4-19). The heritage sites consist of 29 cemeteries with a total of approximately 352 graves, 6 farmsteads and one rock arts site. The rock art site is located within a kilometer radius from the eastern most boundaries of the project area and 1.9 km from the closest mining activity.

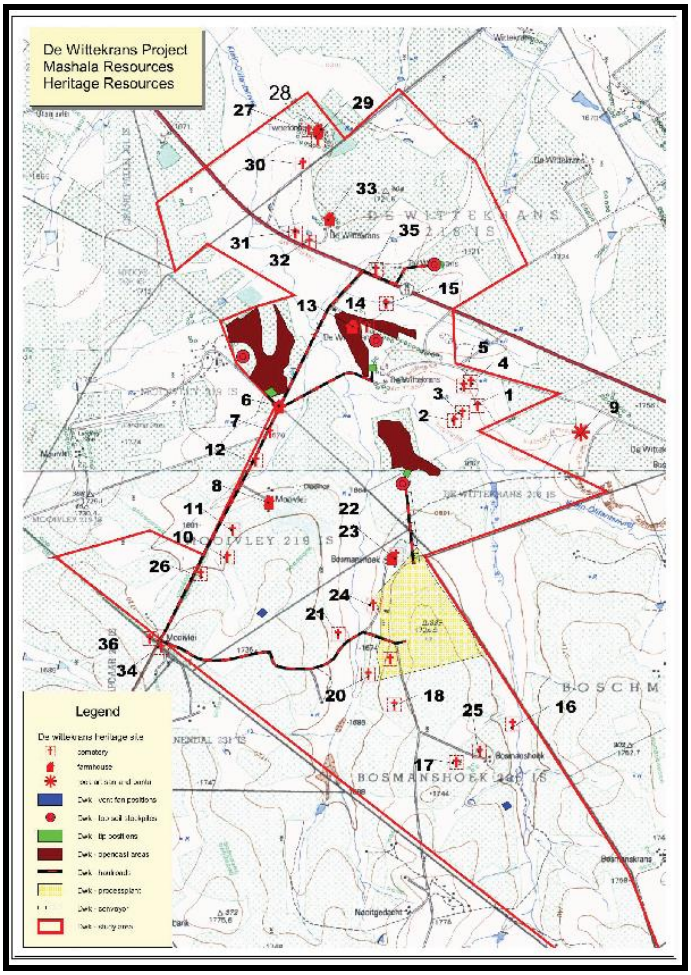


Figure 4-19 Heritage sites within the vicinity of the project area.

6. LEGAL, POLICY AND ADMINISTRATIVE FRAMEWORK

6.1 INTRODUCTION

This section summarises the policy, legal, and administrative framework within which the EIA has been carried out to date. In addition, this section introduces the regulatory authorities responsible for reviewing this Final Scoping Report.

6.2 RELEVANT SOUTH AFRICAN LEGISLATION APPLICABLE TO THE PROJECT

An EIA is required for the proposed mining project in terms of the MPRDA and the Regulations promulgated under NEMA. An EMP, based on the findings of the EIA, a Waste Management Licence Application (in terms of the NEMWA) and an IWULA (in terms of the NWA will also form part of this process.

The mining right application has been submitted during 2010 and the associated EIA process was completed. The EIA and EMP compiled as part of the EIA process satisfied the requirements as set out by the DMR. The EIA process adopted for this project is thus designed to satisfy the requirements of the NEMA. In summary the following key legislation is relevant to this EIA process:

- Mineral and Petroleum Resources Development Act, 2002 and applicable
- Regulations;
- National Environmental Management Act, 1998 and applicable Regulations;
- National Environmental Management: Waste Act, 2008; and
- National Water Act, 1998.

Other legislation applicable to the project includes:

- National Heritage Resources Act, 1999 (Act 25 of 1999);
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004);
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and applicable Regulations, Standards and Notices published in terms of NEMAQA;
- Conservation of Agricultural Resources Act , 1983 (Act 43 of 1983); and
- Municipal by-laws.

6.2.1 Mineral and Petroleum Resources Development Act, 2002

The purpose of the MPRDA is "to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and to provide for matters connected therewith."

The MPRDA establishes that environmental management principles are relevant and binding to all mining operations. Government Notice R527 of the MPRDA is a comprehensive listing of environmental regulations related to mining. The most relevant Regulations to this project are Regulations 63 and 69, which state that pollution control and waste management principles must be implemented. Where the generation and production of waste at source is not avoidable, it must be

disposed of in a responsible and sustainable manner (in compliance with the NEMWA).

Section 37 of the MPRDA confirms that the principles set out in the NEMA apply to all prospecting and mining operations and must be carried out in accordance with the generally accepted principles of sustainable development.

The EMP has however been compiled in terms of Section 39(1) and R51 of the MPRDA. An EIA, undertaken in terms of R50, is a necessary pre-requisite for the EMP. The EMP was submitted to the Regional Director of Mineral Development at the DMR (Mpumalanga Office) for approval in September 2010 with additional information provided in March 2011 under the reference number MP 30/5/1/1/2/3006. The proposed De Wittekrans Coal Mine has not yet been granted a Mining Right in terms of the MPRDA.

6.2.2 National Environmental Management Act, 1998

The purpose of the NEMA is "to provide for co-operative governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordination environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith."

The Duty of Care Principle is discussed in Section 28 of NEMA and it states that "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such to harm the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment…"

The NEMA EIA Regulations, which replaced the Environmental Conservation Act, 1989, 1989 (Act 73 of 1989) have been promulgated and came into effect on 3 July 2006. Sections 24 and 24D of NEMA, as per Government Notices R386 and R387 of April 2006, contain schedules of activities that may have substantial detrimental effects on the environment and which require authorisation from the competent environmental authority. These activities are known as 'listed activities'. The amended EIA Regulations came into effect on 2 August 2010 with amendments to listed activities in Listing Notices 1 and 2 (R544 and R 545 respectively) as well as an additional activity schedule, Listing Notice 3 (R546). The lists are more comprehensive in terms of the type of activity and the location of such activity to be authorized by the competent authority.

An application for environmental authorisation in terms of NEMA was submitted to the Department of Economic Development, Environment and Tourism (DEDECT) in July 2012 and the application was accepted by DEDECT on 1 August 2012 with Ref nr. 17/2/3 GS-126. However exemption was granted in terms of the provision of Section 50 of the Environmental Impact Assessment Regulations (EIA), 2010. MDEDET issued a new Ref nr. 17/2/3/ GS-200 on 10 September 2013.

Listed activities identified for the proposed De Wittekrans Coal Mine, under R544 and R545 of the NEMA which are included in this application for environmental authorisation are listed in

Table 6-1.

A single EIA Report and EMP document will be prepared and submitted to both the MDEDET and DEA for authorization of the proposed project and listed activities.

Table 6-1 Listed activities under R544 and R545 requiring authorisation.

Relevant notice	Activity number	Description of listed activity as per project description
R. 544 (18 June 2010)	Activity No 9	The principle of keeping clean water out of the mining operation and retaining dirty water shall apply to the proposed mine. A series of clean water trenches are to be constructed along the southern and northern boundaries to divert clean water away from the opencast pits and mine area and towards the pollution control dam. A series of clean water trenches are also to be constructed to clean channel water away from the mine area and back into the natural environment.
R. 545 (18 June 2010)	Activity No 8	Substation (transmission and distribution of electricity) more than 275 kilovolts
R. 544 (18 June 2010)	Activity No 11	Construction of channels and bridges within 32 meters of a watercourse.
R. 545 (18 June 2010)	Activity No 19	A pollution control dam will be constructed to collect the dirty water from the mining operation. The size of the pollution control dam still needs to be established. The water from the pollution control dam will be used for dust suppression. Clean and dirty water holding tanks will have a combined capacity of 50000 cubic meters or more.
R. 544 (18 June 2010)	Activity No 13	The contractor's yard will accommodate offices, workshops and diesel storage facilities for the appointed contractor. A containerised store will be provided by the contractor, in the contractor's yard, to hold stores of high use items such as oils, grease, air filters, etc. The size of these facilities still needs to be established. Explosives containers will have a combined capacity of between 80 and 500 cubic meters.
R. 544 (18 June 2010)	Activity No 22	Permanent haul and access roads are to be constructed. The haul roads will be constructed of suitable material and will conform to the minimum safety requirements in terms of slope and width. Haul roads will be wider than 8 meters
R. 545 (18 June 2010)	Activity No 15	An undeveloped, area of more than 20 hectares will be transformed for the mining activities.
R. 544 (18 June 2010)	Activity No 39	Expansion of bridges within 32 meters of a watercourse
R. 545 (18 June 2010)	Activity No 10	Transfer 50000 cubic meters or more of water per day
R. 545 (18 June 2010)	Activity No 19	Construction of dam where highest part of the dam wall is 5 meters or more, or dam with high-water mark more than 10 hectares
R. 545 (18	Activity No 20	The mining operation required a mining right. The

Relevant notice	Activity number	Description of listed activity as per project description
June 2010)		application for a mining right has been submitted to the Department of Mineral Resources (Mpumalanga) (Ref No MP 30/5/1/2/2/504 MR) - Not currently enacted

6.2.3 National Environmental Management: Waste Act, 2008

The purpose of the NEMWA is "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 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."

The NEMWA must be read with the applicable provisions of NEMA and its interpretation and application must be guided by the national environmental principals contained in Section 2 of NEMA.

GN718 in terms of the NEMWA lists waste management activities as activities that have, or are likely to have a detrimental effect on the environment.

- Paragraph 3 states that a person who wishes to commence, undertake or conduct a Category A listed activity, must conduct a basic assessment process, as stipulated in the EIA regulations made under Section 24(5) of NEMA as part of a waste management licence application.
- Paragraph 4 states that a person who wishes to commence, undertake or conduct a Category B listed activity must conduct an EIA process, as stipulated in the EIA regulations made under Section 24(5) of NEMA, as part of a waste management licence application.

An application for a Waste Licence in terms of NEMWA was submitted to the DEA in August 2012 and the application was accepted by DEA on 22 October 2012 with Ref nr. 12/9/11/L1053/6.

In terms of GN718 of 2009, under NEMWA, various Category A and B waste management activities were identified for the De Wittekrans Coal Mine. These are listed in Table 6-2.

Table 6-2 Listed activities under GN 718 requiring a Waste License.

Relevant notice	Activity number	Description of listed activity as per project description
R. 718, Schedule Section 19(1)	Category A, Activity No 2	The temporary storage of hazardous waste (incl. used hydrocarbons) at the salvage yard/sorting area which will have the capacity to store more than 35 m3 of hazardous waste at any one time.
R. 718, Schedule Section 19(1)	Category A, Activity No 4	The temporary storage of waste tyres in a waste tyre storage area which will exceed 500 m2.
R. 718, Schedule Section 19(1)	Category A, Activity No 18	The construction of the salvage yard/sorting area which are an activity listed in Category A of the Schedule.

R. 718, Schedule Section 19(1)	Category A, Activity No 18	The construction of a waste tyre storage area which is an activity listed in Category A of the Schedule.
R. 718, Schedule Section 19(1)	Category B, Activity No 1	The storage of slimes/slurry and discard from the beneficiation plant in a co-disposal facility.
R. 718, Schedule Section 19(1)	Category B, Activity No 1	The storage of waste water (i.e. hazardous waste) in pollution control dams.
R. 718, Schedule Section 19(1)	Category B, Activity No 1	The storage of waste water in a mine water balancing dam.
R. 718, Schedule Section 19(1)	Category B, Activity No 7	The treatment of effluent and wastewater at the wash bay, effluent separation and water recycling system facilities which will have an annual throughput capacity of more than 15000 m^3.
R. 718, Schedule Section 19(1)	Category B, Activity No 7	The treatment of sewage at the sewage treatment plant which will have an annual throughout capacity of more than 15000 m3.
R. 718, Schedule Section 19(1)	Category B, Activity No 11	The construction of the co-disposal facility which is an activity listed in Category B of the Schedule.
R. 718, Schedule Section 19(1)	Category B, Activity No 11	The construction of pollution control dams which is an activity listed in Category B of the Schedule.
R. 718, Schedule Section 19(1)	Category B, Activity No 11	The construction of mine water balancing dam which is an activity listed in Category B of the Schedule.
R. 718, Schedule Section 19(1)	Category B, Activity No 11	The construction of the wash bay, effluent separation and water recycling system facilities which is an activity listed in Category B of the Schedule.
R. 718, Schedule Section 19(1)	Category B, Activity No 11	The construction of the sewage treatment plant which is an activity listed in Category B of the Schedule.

6.2.4 National Water Act, 1998

The purpose of the NWA is "to provide for fundamental reform of the law relating to water resources; to repeal certain laws; and to provide for matters connected therewith."

The NWA gives effect to the rights enshrined in the Constitution of the RSA with regards to water resource management. Furthermore, it aims to provide for the protection, usage, development, conservation, management and control of the country's water resources in an integrated manner.

The NWA provides the legal basis upon which to develop tools and means to affect the said activities. One of these tools is the authorization of the water uses as defined in Chapter 4 of the NWA.

The NWA identifies 11 consumptive and non-consumptive water uses, which must be authorised under a tiered authorisation system, which include Scheduled uses, General Authorisations, or Licenses. It allows for the "Reserve" and provides for public consultation processes in the establishment of strategies and making decisions, and guarantees the right to appeal against such decisions.

In terms of the NWA, a person who wishes to use, or who uses water in a manner that is not a Schedule 1 use, not covered under a General Authorisation, or in a manner that is not regarded or declared as, an existing lawful use, may only use that water under the authority of a license. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed license on the resource quality, and that such assessment be subject to the EIA regulations.

Sections 40 and 42 of the NWA allow the responsible authority to require an assessment of the likely effect of the proposed license on the resource quality, and that such assessment is subject to the EIA regulations as promulgated under NEMA.

Section 27 of the NWA specifies some factors regarding water use authorisation that must be taken into consideration. These include:

- The efficient and beneficial use of water in the public interest;
- The socio-economic impact of the decision whether or not to issue a license;
- Alignment with the catchment management strategy;
- The impact of the water use and source and resource directed measures; and
- Investments made by the applicant in respect of the water use in question.

Several water uses, as defined in terms of Section 21 of the NWA, will form part of the proposed project. An application for an IWULA in terms of NWA was submitted to the DWA in November 2012 (Reference number to be assigned).

Water uses included in the IWULA are listed in Table 6-3.

Table 6-3 Summary of IWULA water uses applied for.

Water Uses	Proposed development
Section 21 (a): Taking water from a water resource	Abstracting water from borehole NBH4
	Re-use of water from PCD and Mine water balancing dam for use in the sewage treatment plant, water treatment plant, coal beneficiation plant as well as other mining activities
Section 21 (b): Storing (clean) water	Potable storage water tank
Section 21 (c): Impeding or diverting the flow of water in a watercourse	Access road river crossing
	Road transecting wetland
Section 21 (i): Altering the beds, banks, course or characteristics of a watercourse	Mining closer than 500m from wetland (infrastructure as well as other mining activities)
	Mining under a wetland
Section 21(g): Disposing of waste which may detrimentally Impact on a water resource	Pollution control dam
	Mine water balancing dam
	Bulk water storage tanks
	Sewage treatment plant
	Water treatment plant
	Plant make up water tank
	Co-disposal facility (Slurry dam)
	ROM stockpile
	Stockpiles associated with benefication plant
	Overburden stockpiles for opencast pits
	Dust suppression with mine water
	In-pit water storage for opencast pits
Section 21(j): Removing, discharging or disposing of water found	Dewatering opencast pit 1
	Dewatering opencast pit 2

Water Uses	Proposed development
underground if it is necessary for the efficient continuation of an activity or for the safety of people	Dewatering opencast pit 3
	Dewatering underground sections

6.3 ADMINISTRATIVE FRAMEWORK

This section summarises the key administrative bodies relevant to the project.

6.3.1 Department of Mineral Resources (DMR)

The DMR through its Mineral Regulation Branch (MRB) is responsible for regulating the mining and minerals industry to achieve transformation and contribute to sustainable development.

The purpose of the MRB is to administer the MPRDA and other applicable legislation. This is to ensure the granting of prospecting and mining rights in terms of the MPRDA and to promote mineral development, including urban renewal, rural development and black economic empowerment. It is responsible for coordinating and liaising with national, provincial and local government structures for efficient governance. It is also tasked with addressing past legacies with regard to derelict and ownerless mines and enforce legislation regarding mine rehabilitation by means of regulated environmental management plans.

The DMR through its MRB is responsible for authorizing the EMP in terms of the MPRDA and liaising with MDEDET, DEA and DWA in terms of the EIA approval processes for NEMA, NEMWA and IWULA.

6.3.2 Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) and the Department of Environmental Affairs (DEA)

In South Africa, EIA is the responsibility of both national and provincial government institutions. Policy formulation and coordination takes place at national level, while approval of EIA's for most development proposals has been devolved to the provinces. In terms of R1184, the then Minister of Environmental Affairs and Tourism designated the provinces as competent authorities, i.e. they are empowered to authorise development activities. Therefore, in terms of the NEMA authorisation process for the proposed project, the responsibility for approval of this EIA rests with the MDEDET.

However, for the application for a waste management licence in terms of NEMWA, the nature of the activities applied for will determine which authority acts as the competent authority to authorise the application. Since the waste management licence application for the proposed De Wittekrans Coal Mine includes activities listed under Category B of GN718, the responsibility will lie with the national department i.e. DEA.

6.3.3 Department of Water Affairs (DWA)

The DWA is the custodian of South Africa's water resources. It is primarily responsible for the formulation and implementation of policy governing the water sector. It also has overall responsibility for water services provided by local government.

The NWA provides DWA with the tools for the optimal management of South Africa's water resources. The registration of water use is one of these tools and is a statutory obligation for this project. As such an IWULA is required to be submitted to DWA for approval.

7. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

During the scoping phase of the EIA (this phase), a number of specialists will undertake an initial analysis (baseline study) of the project area and highlight the key issues that would require detailed assessment during the EIA phase. The methodology used to determine key potential impacts, issues and gaps in the study included a number of site visits to the area as well as initial consultations with interested and affected persons (I&APs) to determine their key concerns (the public participation process thus far is presented in Section 8). As an EIA process has already been completed as part of the Mining Right application, most of these specialists have already completed their investigations and reports.

This section presents a summary of the key issues and impacts that were identified as part of the previous EIA process, by the specialist's reports and during the public participation process.

7.1 PHYSICAL ENVIRONMENT

7.1.1 Soils, land use and land capability

The impact on the soils of opencast mining and its related infrastructure will be significantly higher than for the underground bord and pillar mining, all be it that the infrastructure needed on surface is likely to be the same or similar.

The presence of ferricrete layers within the soil profile is considered an indication of soil water movement within the profile at some time in the soil pedogenisis. Some of these layers are however found in mid and lower midslope positions and occasionally in much higher topographic positions. These zones can only be explained in terms of their relict nature, and are a reflection of an old land form that has been left in an elevated topographic position due to the preferential weathering of the streams and waterways through the area. These materials cannot be considered to be actively contributing to the surface or groundwater systems, and are not "wetlands" in the true sense.

The land capability of the opencast mining areas and the surface infrastructure associated with these activities will be altered from moderate potential arable agriculture and low intensity grazing with significant areas of wet based soils, to that of "mining land and wilderness/conservation" status for the life of the mining operation and beyond. The underground operations, if confined to bord and pillar mining will have limited impact, with the possibility of subsidence and collapse of the surface at or close to the adit entrances to the underground operations and/or around the ventilation shafts.

The land use for all areas that are affected by surface activities will be permanently changed from moderate to poor arable land and moderate to low intensity grazing lands (present use) to mining land use.

7.1.2 Air quality

Under normal, responsible, operation a number of areas of potential emissions are readily identified:

- Dust and associated emissions during building, operational and decommissioning phases;
- Dust emissions during operation, particularly associated with loading and offloading of material, dumping of overburden and waste rock, and the transport of the coal either via truck or conveyor;
- Fugitive dust emissions associated with the wind entrainment of large areas of exposed earth, dumped material and coal that will be created during the project; and
- Vehicle emissions associated with the building, operation and decommissioning phases.

It should also be noted that, as with any coal mining operation, the potential for fire exists which could lead to long term, sustained and significant impacts on the surrounding air quality.

7.1.3 Noise and vibration

Under normal circumstances a number of areas of potential noise and vibrations are readily identified:

- The increase in the ambient noise levels due to the opencast mining operations and associated blasting activities;
- The increase in the ambient noise levels due to the ventilation shafts;
- The increase in the ambient noise levels due to the necessary transportation of coal to the Eskom Power stations; and
- Impact of blasting activities on surrounding properties.

The noise impact on the environment and the people residing in the vicinity of the proposed mine will have to be proactively managed during the construction and operational phase. The residents will have to be informed of the anticipated shift in the prevailing ambient noise levels, which will be temporary during the construction phase and more permanent during the operational phase.

The vibration issue will have to be communicated to the residents whereby they are briefed on the different kinds of vibration and at which level damage to structures may occur.

The noise impact on the environment and the people residing in the vicinity of the mine will be low to moderate during the construction phase and moderate during the operational phase.

7.1.4 Surface water

Sediment/transport erosion:

- During the life of mine the land profile will be altered due to stripping of vegetation. When it rains it will lead towards sediment being picked up and carried off, leaving eroded surfaces.

Deterioration of water quality:

- Pollutants from the dams or conveyor could spill and be washed into the river reducing its quality.

The opencast mining risk is very low because little impact will be on the surface runoff. The total area of the opencast mining is approximate 136 ha of the catchment area of 10 800 ha. This about approximately 1% if the area. The variation in the rainfall patterns of more that this percentage. After the rehabilitation the surface runoff will be reinstated.

The mine needs to adhere to all necessary legislation of the NWA. When this is implemented a very low risk will be enforced onto the environment.

If all mitigation measures are carried out correctly there should be no major damage to the local surface water system.

7.1.5 Groundwater

Groundwater levels in the aquifers surrounding the mining area will be lowered due to the mine dewatering. This will lead to groundwater flow directions and gradients being reversed towards the mining area, thereby containing pollution to the immediate vicinity of the mining activities. The groundwater levels will be lowered by a maximum of 50 m within the opencast mining areas and by 1 m up to 100 m away. The lowering of the groundwater levels will also impact on the base flow volumes to streams within the zone of influence.

The groundwater levels in the mining area will start to recover when the mine dewatering stops during closure. This will lead to the re-establishment of groundwater levels, flow directions and flow gradients to near pre-mining levels. This will re-establish the base flow rates within the zone of influence. The effect of operational de-watering will remain for a period of approximately 30 years after mine closure. The rebound of the groundwater levels will enable contamination to migrate away from the mining area, and could possibly lead to decant.

With rising groundwater levels, when mine dewatering stops, there is an increasing risk of decant from the mining area. Any seepage into the mining area will find its way towards the lowest point in the mine where it will accumulate and the mine void area will start to fill. Decant from the proposed mine portal is highly unlikely, as the coal seam dips away from the holdings. However, an area of possible decant through subsurface seepage at the topographical low towards the non-perennial stream, was identified.

Groundwater will flow into the mining areas; the combined average rate is roughly 300 m^3/day. The water will have to be pumped from the mining areas and evaporated from ponds, used in the plant or used for dust suppression, depending on whether the mine operates in a water deficit or surplus environment. It is expected that there will be a water deficit and therefore the water pumped from the underground workings can be used in the plant area. Any additional or recirculated water will be contained in evaporation ponds where it will evaporate.

Contamination of the surrounding aquifer system will be caused by:

- Poor quality seepage from opencast pits due to oxidation of back-fill material and exposed coal seams;

- Poor quality seepage from underground workings due to exposed coal seams and oxidation;
- Poor quality seepage from surface infrastructure; and
- Spillage of oils and liquids.

7.1.6 Aesthetic quality

Visual impacts would result from the construction, operation and closure phase of the proposed De Wittekrans Coal Mine. Specifically, impacts would result from the opencast mining and associated dumps together with the plant and discard being seen from sensitive viewpoints (I.e. impacts of views from residences) and the negative effects (relating primarily to visibility and intrusion) on the scenic quality and sense of place of the landscape of the proposed site.

It was determined that the intensity of the visual impact of the proposed project would be moderate to high and that the significant of this impact would be moderate to high, negative. With successful mitigation measures the significance can be reduced to moderate.

7.2 BIOLOGICAL ENVIRONMENT

7.2.1 Terrestrial fauna and flora

The existing disturbances that threaten the viability of the habitats, and therefore the animals associated with them include, but are not limited to:

- Human disturbances in terms of harvesting of plants and hunting of animals;
- Agricultural activities such as cattle, pasture and crop farming;
- Alien plant invasion, with particular reference to problem species associated with crop farming;
- Alien animal invasions – domestic dogs, cats, pest rodents and birds species impact on the functioning of the natural ecosystems;
- Increased Erosion of the River Systems due to extensive cattle grazing within the wetland areas; and
- Use of insecticides and herbicides.

It was concluded that a buffer of 250 m is required along the Klein Olifants System and its associated habitats. All mitigation should be performed on site to conserve this important system both as an important water resource within the Upper Olifants and as habitat for fauna and flora species.

7.2.2 Wetlands

The following impacts have been associated with the wetlands:

- Impact on the wetland from opencast mining;
- Impact on the Klein Olifants River; and
- Impact on threatened wetland vegetation.

Due to human-induced impacts, such as gully erosion, overgrazing and the presence of the sand and tar roads, the wetland zones have been negatively

affected to varying degrees. A buffer strip of 250 m from the wetland boundary is recommended to protect the wetland habitat from construction and mining activities. This is to maintain the water holding and filtering properties of the wetland soil and the surface roughness of the intact vegetation both of which annenuate floods, trap sediment and provide habitat for numerous plants and animal species.

7.2.3 Aquatic ecology

The following impacts have been associated with the aquatic ecology:

- Sedimentation and siltation of the river;
- Surface water quality;
- Pollution runoff from site; and
- Change in hydrological regime.

The impacts identified on the biological communities and water quality is due to the numerous land use activities in the area. These effects are due mainly to livestock watering, agriculture and decrease flow due to dams. These effects are relatively small but if it is taken into account that this is the Upper reaches of one of the biggest catchments in South Africa, the aquatic health should remain as good as possible. This will then indicate that as the system is already only in a fair condition no further degradation should be allowed to occur. Therefore all the mining impacts should be properly mitigated by using mining best practice to ensure all possible impacts are mitigated. If no mitigation occurs, the aquatic ecosystem health will decrease significantly.

7.3 SOCIO-ECONOMIC ENVIRONMENT

In terms of social impacts associated with the proposed construction phase of the mine, the most significant are:

- The potential impacts associated with the influx of construction workers includes:
    - Cultural clashes with the local people;
    - Increase in theft and crime in the area;
    - Increase in sexually transmitted diseases; and
    - Increase in pregnancy amongst the younger girls in the area.
- Loss of sense of place;
- Degradation of the gravel roads;
- Poaching of skilled labourers by the mine;
- Creation of economic development, employment and business opportunities for the area and the broader region as a whole. In this regard many members of the local community indicated that this would result in loss of their local work force as they would not be able to compete with the mine wages and benefits; and
- Opportunities for education, skills development and training linked to the mine as well as local economic development linked to the mine's Social and Labour Plan.

In terms of potential social impacts associated with the proposed operational phase of the mine, the most significant are:

- Inability to rehabilitate disturbed areas and return them to productive farmland (agriculture and grazing);
- Pollution of the environment, specifically water bodies (groundwater and surface water);
- Visual effect of mine is a disturbance to the farm like atmosphere in the area;
- Dust from trucks travelling along the road as well as potential dust from the proposed opencast mining operations;
- Noise and vibrations generated by the proposed mining operation; and
- Creation of employment and business opportunities.

7.3.1 Traffic impact

With regard to the traffic generation and impact, it is estimated that in a worst case scenario 30 truck movements will be made to and from the mine during daylight hours.

SANRAL will probably require upgrades to the intersections of the N11 and D383.

7.4 CULTURAL AND/OR HISTORICAL ENVIRONMENT

7.4.1 Heritage and/or cultural sites

During the survey 36 sites of heritage significance were identified.

The heritage sites consist of 29 cemeteries with a total of approximately 352 graves, 6 farmsteads, and one rock arts site. The rock art site is located more than 2 km radius from the eastern most boundary of the mine area.

Therefore no impacts are envisaged.

8. PUBLIC PARTICIPATION

The principles that govern communication with society at large are included in the principles of the NEMA, and the EIA Regulations (GN R544, R545 and R546 of 2010) - South Africa's overarching environmental legislation. Public participation is an essential regulatory requirement for an environmental authorisation process, and is guided by Regulations under the NEMA; specifically the EIA Process Regulations (GN R543 of 2010). These are considered to be more extensive public participation requirements than those contained in the MPRDA and consequently as a demonstration of best practice, it was decided to use these for the MPRDA process undertaken from 2008 to 2011. The results of this process are briefly described in Section 8.3 below.

A comprehensive public participation was initiated in the early stage of the Scoping phase undertaken for the authorisation processes in terms of NEMA, NEMWA and NWA. The public participation commenced during 2012 and information obtained from the previous process was used to guide the current process that is also based

on the EIA Process Regulations (GN R543 of 2010). The public participation was initiated in order for the concerns of I&APs, authorities and the wider public to be recognized. The public participation process is an ongoing process that will be ongoing throughout the EIA/EMPR phase of the NEMA, NEMWA and NWA authorisation processes.

8.1 OBJECTIVES OF PUBLIC PARTICIPATION

Public participation is the involvement of all parties who potentially have an interest in a development or project, or who may be affected by it, directly or indirectly. It is a process leading to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer to work together to produce better decisions than if they had acted independently.

The objectives of public participation are to provide sufficient and accessible information to stakeholders in an objective manner to assist them to:

During the Scoping Phase:

- Raise issues of concern;
- Make suggestions for enhanced project benefits;
- Verify that their issues and concerns have been recorded;
- Assist in commenting on reasonable alternatives; and
- Contribute relevant local knowledge and information towards the environmental assessment.

During the Impact Assessment Phase:

- Verify that their issues have been considered in the environmental investigations;
- Contribute relevant local knowledge and information towards the environmental assessments; and
- Comment on the findings of the environmental assessments.

During the Decision-making Phase:

- When the lead authority has made a decision stating whether or not the project may proceed, registered stakeholders are informed of that decision; and
- Stakeholders are also provided with information regarding the appeal process, should they wish to appeal the decision.

8.2 IDENTIFICATION OF I&APS, STAKEHOLDERS AND AUTHORITIES

In terms of the 2010 EIA Regulations under the NEMA, stakeholders are required to formally register as I&APs for the EIA process.

The I&AP database for the current NEMA, NEMWA and IWUL applications project includes both pre-identified and registered key stakeholders and landowners. The basis of the current I&AP database was the database of the previously conducted Mining Right Application for the De Wittekrans Coal Mine following the Minerals and Petroleum Resources Development Act (MPRDA). The majority of the key

stakeholders were pre-identified but a few registered as a result of the notification documents (site notices, advertisements, notices in public places, and notification letters/faxes/emails that were distributed within organisations and/or departments (Table 7-1).

The proposed study area includes approximately six properties. All landowners were sent notification and invitations to participate and comment via registered post, fax and/or email. A few surrounding landowners requested to be registered as a result of the notification documents and the site notices placed at various points within the study area (Table 7-1).

In line with the 2010 EIA Regulations, future consultation will take place mainly with registered I&APs. The various authorities, directly affected I&APs and key I&APs are registered stakeholders by default.

Table 8-1 List of contacted and registered I&APs, stakeholders and authorities.

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
National Governmental Departments								
Millicent	Solomons	National Department of Environmental Affairs	Director - Environmental Impact Evaluation	012 395 1852	012 320 7539	msolomons@environment.gov.za	Private Bag X447	Pretoria
Molese	Morokane	National Department of Water Affairs	Resource Protection and Waste	012 336 8697	012 323 0321	vgk@dwaf.gov.za / MorokaneM@dwa.gov.za	Private Bag X313	Pretoria
Annette	Stoltz	National Dept of Agriculture, Forestry and Fisheries				annettes@nda.agric.za	Private Bag X120	Pretoria
Mumsy	Gazide	National Dept of Agriculture, Forestry and Fisheries	Director - Land Use & Soil Management	012 319 7620	012 319 7593	MumsyG@nda.agric.za	Private Bag X120	Pretoria
Tele	Maphoto	National Department of Rural Development and Land Reform	Chief Land Claims Commissioner	012 312 8386	012 323 0162		Private Bag X833	Pretoria
Lucky	Legodi	National Department of Rural Development and Land Reform		012 312 8006	012 323 3693	lmlegodi@ruraldevelopment.gov.za	Private Bag X833	Pretoria
Provincial Governmental Departments								
Martha	Mokonyane	Mpumalanga Department of Mineral Resources	Managing Director	013 653 0500	013 690 3288/ 2390	martha.mokonyane@dmr.gov.za	Private Bag X7279	Emalahleni
Johann M.	Van Aswegen	Mpumalanga Department of Water Affairs	Director Institutional Establishment	013 932 2042/ 082 807 4198	013 932 2071	VaswegJ@dwaf.gov.za/ vanAswegenJ@dwa.gov.za	Private Bag X11259	Nelspruit
M.	Mahunonyane	Mpumalanga Department of Water Affairs	Acting Chief Director	013 759 7310/ 082 513 7888	013 759 7525	MahunonyaneM@dwa.gov.za	Private Bag X11259	Nelspruit
Thokozani	Metiso	Mpumalanga Department of Agriculture, Rural Development and Land Administration		072 915 6362	017 819 2072	thokozani@environ1.agric.za	P.O. Box 2777	Ermelo

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
G.	Xaba	Mpumalanga Department of Agriculture, Rural Development and Land Administration	District Director	013 766 6082/ 6048/ 6020	013 766 8429	gxaba@mpg.gov.za/ infoardla@mpg.gov.za	Private Bag X11219	Nelspruit
Justus	Mohlala	Mpumalanga Tourism and Parks Agency		013 759 5300	086 586 3858	justus@mtpa.co.za	Private Bag X11338	Nelspruit
Frans	Krige	Mpumalanga Tourism and Parks Agency		084 232 2902		frans@mtpa.co.za/ franskrige@telkomsa.co .za	Private Bag X11338	Nelspruit
Koos	De Wet	Mpumalanga Parks Board		013 235 2395/ 083 6281925	013 235 2732	KdeWet@mweb.co.za	Private Bag X1088	Lydenburg
S.A.	Mbatha	Mpumalanga Department of Roads & Transport		013 947 3709	013 947 3779		Private Bag X4018	Kwa-Mhlanga
Jenn	Lavin	SAHRA Mpumalanga		021462 4502		jlavin@sahra.org.za		
Derrick	Ndlovu	South African Local Government Association (SALGA) - Mpumalaga	Environmental Manager	013 752 2366	013 752 5595	dndlovu@salga.org.za		
Zithini	Dlamini	Mpumalanga Department of Land Affairs		013 755 3499/ 082 461 8960	013 755 3529/ 013 755 1224	zwdlamini@ruraldevelopment.gov.za	Private Bag X11305	Nelspruit
C.A.	Habile	Gert Sibande District Municipality	Municipal Manager	017 801 7008	017 811 1169		P.O. Box 550	Secunda
Thami Bafana	Dlamini	Msukaligwa Local Municipality	Municipal Manager	017 801 3504/ 082 698 7486	017 801 3661	tbwdlamini@msukaligwa.gov.za	P.O. Box 48	Ermelo
D.S.	Nkosi	Msukaligwa Local Municipality	Ward 10 Councillor	073 943 8421	017 801 3851		P.O. Box 48	Ermelo
W.D.	Fouche	Steve Tshwete Local Municipality	Municipal Manager	013 249 7263	013 243 2550	mmoffice@stevetshwetelm.gov.za	P.O. Box 14	Middelburg
Queen	Mbuli	Steve Tshwete Local	Executive Director	013 249				

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
		Municipality - Infrastructure Services		7208				
Elphus Fani	Mathebula	Steve Tshwete Local Municipality	Ward 3 Councillor	013 249 7042/ 082 900 1266	013 243 2550		P.O. Box 14	Middelburg
NGOs								
Michael	Yorke-Hart	South African National Roads Agency (SANRAL)		012 426 6227		yorkehm@nra.co.za	P.O. Box 415	Pretoria
Agriba	Sibanyoni	SANRAL Northern Region		012 884 8000	012 348 0883	sibanyonia@nra.co.za	Private Bag X17	Lynwood Ridge
Lungile	Motsisi	Eskom	Servitude and Investigations Department	011 800 5734	086 655 7036	motsisl@eskom.co.za	P. O. Box 1091	Johannesburg
Chris	Wells	Transnet	Acting Group Chief Executive	011 308 3000	011 308 2638	enquiries@transnet.net	P.O. Box 72501	Parkview
Carolyn	Verdoorn	Birdlife South Africa	Division Manager - Policy & Advocacy	011 789 1122/ 0899/ 082 776 8333		advocacy@birdlife.org.za	P.O. Box 515	Randburg
Jonas	Els	Afgri		013 293 0032		afgri@afgri.co.za	P.O. Box 11054	Centurion
Hans	Van Der Merwe	Agri SA		012 322 6980	012 320 0557	afrisa@agriinfo.co.za	P.O. Box 1508	Pretoria
N.L.	Bosman	Agri Mpumalanga		017 819 1295	017 819 1297	mlunie@mweb.co.za	P.O. Box 619	Ermelo
Lemson	Betha	Wildlife and Environment Society of South Africa (WESSA)		013 656 5932		lbetha@wessanorth.co.za	P.O. Box 435	Ferndale
Daleen	Strydom	Mpumalanga Wetland Forum		013 764 2869/ 082 335 8122		strydomd2@dwa.gov.za		
Anique	Greyling	Endangered Wildlife Trust		011 486 1102/ 082 822 8393		ewt@ewt.org.za	Private Bag X11	Parkview
Ursula	Franke	Endangered Wildlife Trust		017 811 2817/ 083		ursulaf@ewt.org.za	Private Bag	Ermelo

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
				332 8859			X9013	
Jann	Jackson	uMnotho Wesizwe Group		011 706 3060	011 706 3115	jann@volcano.co.za	P.O. Box 785788	Sandton
Avhadakali	Mamatsharaga	SANBI - Nelspruit	Curator	013 752 5531	013 752 6216	a.mamatsharaga@sanbi.org.za	P.O. Box 1024	Nelspruit
Anthea	Stevens	SANBI - Pretoria		012 843 5000		a.stevens@sanbi.org.za	Private Bag X101	Pretoria
Other stakeholders								
Bart	Van Der Steen			013 691 5178/ 083 654 4053		bartvds@xsinet.co.za	P.O. Box 6012	Tasbet Park
Msizi	Mncwango			013 691 5700	013 691 5720		20 Aritea, Roberd Estate	Middelburg
Hennie	Kruger			083 434 6274/ 013 297 1783			P.O. Box 34	Rietkuil
Kosie	Oosthuysen			082 894 0150/ 013 297 1783				
Pieter	Oosthuysen							
Elizma	Duvenhage					duvenhage@redcactus.co.za	P.O. Box 14468	Hatfield
Mbali	Xulu					mxulu@hotmail.com		
Johan H.	Janse Van Vuren			083 635 4454/ 013 293 8020	011 559 2286	johanj@uj.ac.za	P.O. Box 26 / P. O. Box 524	Florida Hills/ Auckland Park
Marlaine	Andersen	Leads2Business		011 559 2441		malrainea@L2B.co.za	P.O. Box 1097	Hilton
Koos	Pretorius			083 986 4400	086 514 6085	d.zoekop@lando.co.za	P.O. Box 201	Belfast
Thoko	Lukhele	Land occupier at Mooivlei Farm		071 360 2849		thokolukhele@gmail.com		
Other stakeholders								

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
Anel M.	Schulze (Anvin Beleggings Trust)	De Wittekrans	Farm 218, Portion0 (Re)	013 293 7800/ 083 628 8213	086 647 2403	anvin@lantic.net	P.O. Box 639	Hendrina
Tobie	Du Toit	De Wittekrans	Farm 218, Poertion 1 (Re)	011 455 3550/ 082 466 2448		tpdutoit@telkomsa.net	No. 1A Shannon Road	Bedfordview
Samuel Jacobus	Landman	De Wittekrans	Farm 218, Portions 7 & 11	013 293 8016/ 082 371 2572	086 655 8056	tabitha@webmail.co.za	P.O. Box 400	Hendrina
B.	De Lange (Plaas De Wittekrans)	De Wittekrans	Farm 218, Portion 10 (Re)	013 293 7801/ 082 862 7313		delange@redcactus.co.za	P.O. Box 167	Hendrina
Manie	Prinsloo (Marmic Trust)	De Wittekrans	Farm 218, Portion 5	013 753 4513/ 082 460 3856	013 755 2169	manie@propval.co.za	P.O. Box 12214	Nelspruit
Corrie	De Vos (Riccor Boerdery Pty Ltd)	Groblershoek & Israel	Farms 191 , Portion 0 (Re) & Farm 207, Portion 0	013 293 7812/ 082 388 3008	086 655 4907	riccor@gogoconnect.co.za	P.O. Box 469	Ermelo
	Van Der Merwe (Voorsorg Plase Pty Ltd/ A3 Boerdery)	Groblershoop	Farm 192, Portion 0	015 501 0063	086 672 4201/ 015 601 0203	cilanie@lantic.net	P.O. Box 63	Dendron
	Van Niekerk (Voorsorg Plase Pty Ltd/ A3 Boerdery)	Groblershoop	Farm 192, Portion 0	015 501 0063	086 672 4201/ 015 601 0203	cilanie@lantic.net	P.O. Box 63	Dendron
John A.V.	Schickerling	Tweefontein	Farm 203, Portion 1 (Re)	013 293 7812/ 084 581 3049			P.O. Box 776	Hendrina
Surrounding landowners								
Roelof J.J.	Van Vuren	Bosmanshoek				foleor@live.co.za	P.O. Box 12191	
Marius	Cornelius	De Wittekrans					P.O. Box 5542	
B.	Van der Merwe (dBA)			011 782 7193			P.O. Box 1219	
G.	Volscchenk			084 240		meubels@ovation.co.za	P.O. Box	

Name	Surname	Organisation	Position	Telephone	Fax	Email	Address	City/Town
	(Morgenster Boerdery)			4413			202	
Hans	Prinsloo	De Wittekrans		079 899 9858/ 084 555 6664	086 642 1340	hans.prinsloo@santam.co.za		
Vincent	Schulze	De Wittekrans		013 209 7800/ 071 119 2975/ 083 628 8213	013 293 7802	anvin@lantic.net	P.O. Box 639	
Alphius	Pretorius					mariepretorius14@gmail.com	P.O. Box 98	

8.3 PUBLIC PARTICIPATION UNDERTAKEN DURING THE MINING RIGHT APPLICATION PROCESS

As mentioned earlier, a public participation process satisfying the NEMA EIA Regulations was undertaken from 2008 to 2011 as part of the mining right application process of the MPRDA. The actions and results of this process are briefly described below. Copies of any correspondence, meeting minutes, documentation and proof of said actions are available on request.

8.3.1 Government authorities

The following Government Authorities was notified:

- Department of Minerals Resources (DMR);
- Mpumalanga Department of Agriculture and Land Affairs (MDALA);
- Department of Water Affairs (DWA);
- Mpumalanga Tourism and Parks board Agency (MTAPA);
- National Department of Agriculture (NDA);
- South African Heritage Resources Agency (SAHRA); and
- Msukaligwa Municipality.

A meeting with the relevant Authorities was held on 09 July 2008 at the Msukaligwa Library in Ermelo. The objective of the meeting was to determine the potential issues associated with the project, understand the concerns of the Authorities, and define the scope of work for the compilation of the EMP. The above mentioned authorities were invited to the meeting.

8.3.2 I&APs and stakeholders

The stakeholder database for the public participation process comprised a total of 259 I&APs.

8.3.2.1 Advertisements and site notices

Advertisements regarding the project including background information, the assessment process being followed and the details and the purpose of public meetings were placed in the following local papers:

- The Highvelder (24 November 2008); and
- Middelburg Observer (28 November 2008).

Site notices were placed at the following locations on 18 and 19 February 2009:

- On site at the farm De Wittekrans 218 IS(both sides of the N11);
- The pick and pay (Hendrina); and
- Notices were given to the ward councillors to distribute to the public.

8.3.2.2 Background Information Document

A Background Information Document (BID) was sent to all I&APs by means of e-mail, fax and/or post. The BID included details of the proposed project, as well as the purpose for compiling an EMP, requirements of the MPRDA and the EMP process.

The BID also included relevant contact details and a comment/registration sheet for I&APs to complete. I&APs were invited to register and send responses by fax, telephone or e-mail.

8.3.2.3 Public meeting

A public meeting was held on Wednesday, 3 December 2008 in the Msukaligwa Public Library at the Msukaligwa Civic Centre. All identified I&APs were contacted and invited to the meetings. At the meeting the background to the project, as well as the environmental approach, was explained. The attendees were provided with an opportunity to raise issues, concerns, questions and their views. All of these were documented during the discussion session.

8.3.2.4 Scoping meeting

An introductory meeting was held on 3 December 2008 before the Environmental Scoping Report was submitted to the DMR Mpumalanga. The comments raised during the scoping meeting as well as the additional comments raised during the scoping review period, where incorporated into the EIA/EMP.

8.3.2.5 Land occupier and community meetings

Focus meetings were held with the land occupiers as well as farm workers of the affected properties during the last week of March 2011. Private meetings were also held with land occupiers located on property adjacent to one of the proposed opencast pits. This community is located on the Farm Mooivlei adjacent (west) to the farm De Wittekrans 218 IS.

8.3.3 Issues raised and comments received

8.3.3.1 Comments from Government authorities

Issue or Comment	Raised by
No mining may occur within 100 m of a public road. • Revise mine plan • Include statement that "Area applied for, in accordance with the provisions of Regulation 17 of the Mine Health and Safety Act, excludes any area within 100 m of any public roads, railways, cemetery or residential area.	DMR Directive
Describe the potential impact of Acid Mine • Drainage on the physical environment and on the interested and affected parties. • Provide sustainable mitigation measures and the cost thereof.	DMR Directive
Provide a plan that lists all the main mining activities, their location and the aerial extent: • Location of initial box cut and sequence of mining thereof • Pollution control dams • Conveyor belt • Clean and dirty water trenches • Access roads • Other associated mining activities.	DMR Directive

Provide a full detail of all co-operation agreements, lease agreements, or management control agreements concerning access control over land and adjacent land, within the "fly rock" danger zone of influence and the necessary approvals of the principal inspector of mines.	DMR Directive
Provide the following: • ecological management plan; • Fire Management plan; and • Surface and runoff management plan.	DMR Directive
Describe the impacts associated with decant into the Klein Olifants River, and provide possible mitigation measures and the cost thereof.	DMR Directive
Provide the management cost for concurrent rehabilitation (including the cost of each management measures proposed for each identified potential impact) and the cost for final rehabilitation and the said cost must also be reflected in the mining work programme, in order to meet the requirements of section 39(4)(a)(iii) of the Act.	DMR Directive
Provide a rehabilitation plan, which must be in line with the closure objectives as informed by the baseline environment description.	DMR Directive
Provide realistic mitigation measures to modify, contain or stop any activity, process or actions leading to environmental degradation or migration of pollution into the environment	DMR Directive
Address all issues and concerns from the I&APs (See below).	DMR Directive
DWAF had concerns regarding the Upper Vaal River and the degradation of water quality.	Mr J Daffue (DWAF)
The municipality raised the concern that the mine would impact on their water use.	Mr Boer (Msukaligwa Municipality)
The municipality queried if the impact of the mine on the municipality dams had been assessed.	Mr Boer (Msukaligwa Municipality)

8.3.3.2 Comments received from I&APs

Issue or Comment	Raised by
The issue regarding the location of the public meetings was raised as it was felt that it would be more practical to have all public meeting is Hendrina.	Mrs A Schulze
The issue regarding the use of local labour vs. the use of outside labour was raised.	Mrs A Schulze, Mr C De Vos
The issue regarding the social impact on the families of the labourers that lived on the surrounding farms where raised	Mrs A Schulze
The impact of the opencast mining on the Klein Olifants River was raised.	Mr H Prinsloo
Concern was raised regarding the impact of increased traffic on the roads where raised. The farmers felt that conveyors would be more acceptable	Mrs A Schulze
Concern has been raised regarding the impact of mining on farm properties, as well as farming operations.	Mr B van de Steen
Concerns have been raised regarding the application for a water use license.	Mr B van de Steen
Concerns were raised regarding the increase in heavy vehicle traffic on the N11 and the dirt road to Davel. Questions were	Mr B van de Steen,

Issue or Comment	Raised by
also raised in terms of the safety aspect, dust generation and if the road would be able to cater for the amount of heavy traffic envisaged	Prof JHJ van Vuuren
Concerns were raised regarding mining in of the opencast area and its impacts on the Wetlands	Mr B van de Steen
Concerns were raised regarding the amount of box-cuts, final voids and the placement of the box cut material	Mr B van de Steen
Concerns were raised regarding the crossing of streams by heavy moving vehicles.	Mr B van de Steen
Concerns were raised that the mine could poach skilled operators from the local farmers.	Mr B van de Steen
Concerns were raised due to the lack of a housing policy. It has been requested that measures should be taken to ensure that no informal housing develops, be it by Mashala's employees, by the employees of Mashala's contractors or by any other part that may see the presence of the mine as an opportunity.	Mr B van de Steen
The comment was raised that the scoping report did not mention the dangers and impact of spontaneous combustion.	Mr B van de Steen
The comment was raised that the area is a high fire-hazard area.	Mr B van de Steen
The comment was raised that the water pollution and water management where poorly addressed in the Scoping report.	Mr B van de Steen
The comment was raised that the Fauna section was incomplete.	Mr B van de Steen
Concerns were raised regarding the both the EMP and EIA as they seem to be very open-ended as well as vague and non-committal.	Mr B van de Steen
Concerns were raised regarding the general lack of standards that are provided against which the rehabilitation of especially the opencast mine and the environmental performance can be measured.	Mr B van de Steen
Concerns were raised regarding the results and conclusions drawn for Acid Base Accounting while the study is still outstanding.	Mr B van de Steen
Concerns were raised regarding the preservation of water and wetlands.	Mr B van de Steen
Concerns were raised regarding the effect decant will have on the Klein Olifants River and on the Olifants River system as a whole. The effects on the river system as a whole and especially the cumulative effect of the proposed opencast mine together with existing mining in the catchment area of the greater Olifants River system is not addressed in any depth. The conditions in which the opencast pits will be left on closure i.e. backfilled or open?	Mr B van de Steen
Comments were made regarding the hydrological assessment that makes the assumption that the shale/sandstone that will be stripped above the coal will be backfilled to the lowest possible elevation during the roll-over method of mining as this is not commonly practiced in the mining industry.	Mr B van de Steen
Concerns were raised regarding the fact that the report does not provide a post-mining topography.	Mr B van de Steen
Concerns were raised regarding the proposed management technique of dumping topsoil on any piles where spontaneous combustion occurs as it raises serious questions as to the proposed use of topsoil for all kind of other purposes besides rehabilitation.	Mr B van de Steen

Issue or Comment	Raised by
Concerns were raised regarding the fact very few details are available on the mining and the processing process.	Mr B van de Steen
Concerns were raised regarding the effect of the road transportation of the coal (reference is made to a study still to be carried out).	Mr B van de Steen
Concerns were raised regarding the public participation process as it seems to have excluded the farm workers, their families and the other households who live in traditional or non-formal dwellings.	Mr B van de Steen
A request was made that three more interested parties be contacted and registered as I&APs.	Prof JHJ van Vuuren
Concerns were raised regarding the groundwater, surface water and dust management.	Prof JHJ van Vuuren
Concerns were raised regarding water: • Impact on borehole water ie. levels & quality • Impact of open cast on the quality of the river • Where will the water from De-watering go?	Mr M Prinsloo
Concerns were raised regarding the impact on borehole water as well as fountains as he is a cattle farmer.	Mr V Schulze, Mr B de Lange
What will happen to boreholes that are adjacent to the Klein Olifants River?	Mr V Schulze, Mr B de Lange
Concerns were raised regarding the Rock Art as they are only around 500 m from the open cast – what will impacts be?	Mr V Schulze, Mr B de Lange
Concerns were raised regarding the cone of depression and whether the boreholes will dry up.	Mr V Schulze, Mr B de Lange
Concerns were raised regarding the roll-over re-vegetation as it is not a natural process. What is the mine going to do to introduce indigenous grass?	Mr V Schulze, Mr B de Lange
This farm has a large settlement and concerns were raised regarding the: • Dust pollution for these people; • Increase in feet will result in an increase of unwanted children; • Increase in AIDS.	Mr V Schulze, Mr B de Lange
Questions were raised regarding the motivation of the project and how it will be achieved: • Provision of sustainable employment • On-going economic input in the area • What is provision of regional socio economic benefit and economic injection?	Mrs A Schulze
Concerns were raised regarding the Rock Art: There are Koi and San rock art in the area at 4 sites. What is the impact of blasting going to be on these sites?	Mr K Landman
Questions were raised on the size of open cast that is feasible?	Mr K Landman
Farm Morgenster Ptn 3 alongside the Carolina Road. Comments were made regarding: • I&AP has an old open cast mine adjacent that was never rehabilitated. Currently a lot of acid water that pollutes toward the Komati River catchment. • The new proposed mine is going to pollute towards the	Mr Volschenk

Issue or Comment	Raised by
Klein Olifants – so both systems will be polluted. • Supports the Highveld Head Water Group – a group that has financial backing in opposing developments such as the proposed mine.	
Farm De Wittekrans. Questions were asked regarding: • What is the size of the open cast? • What is the size of the underground workings? • What is the volume of the underground workings? • More clarity on the 50m buffer zone around the wetland and exact position of where it will be. • The wetlands are not clearly defined and the two maps at the meeting do not correspond – open cast overlaps with the existing wetlands and hillside wetland areas. This issue must be clarified.	Mr B de Lange
Situated on Groblershoop 192 IS. Comments were made regarding: • The seed potatoes cultivated on Groblershoop are susceptible to illnesses. These illnesses can be distributed via dust, water and uncontrolled movement. • AI3 farming is totally against the De Wittekrans project	Mr C van der Merwe
1) The total decant will be around 100 – 300m^3 - how did the specialist arrive at 319m^3? 2) The size of the open cast has not been finalized – when will this be done? 3) The mine plans have not been finalized – when will this be done? 4) The calculations of rain water and the ingress into the open cast is incorrect and must recalculated. 5) The meeting is commenting on facts which have not been finalized. What is the purpose of the meeting then? 6) The MPRDA legislation is questionable. It does not allow enough time for consultation and the understanding of what is going to happen by those most affected. The rights of I&APs are not upheld. 7) As Representative a CD will all relevant issues; concerns; inputs; maps and calculations were handed to Mr Andrew Lipchitz on 15 March 2009. Why did this CD not go through to the environmental consultants? 8) The fill of the open cast after closure can be calculated. The report does not reflect this. An estimate should be available. 9) A project of his size if not properly managed will add to the water problems already experienced. All water from the mine must be treated – this is very expensive and will influence the sustainability of the entire proposed project. Only R1m has been earmarked for water management – this not enough?? 10) The treatment of all mine water must be quantified and methods of treatment must be clear. An approach of zero decant = zero impact must be possible. 11) What about a RO plant – this is an expensive option with additional problems of pollution. 12) What about other possible land uses – not mining? 13) Rehabilitation and the statement of rehabilitation are too broad. It should be specifically quantified. The same with the EMP. 14) I&APs must have all the facts and figures. 15) How will water in the pits be kept to 3-5m below surface? This is not discussed in the report. 16) How deep is the coal seam and which of the 3 Seams will	Mr K Pretorius

Issue or Comment	Raised by
be mined? 17) The C Coal seam is at 1630 mamsl and the vlei is at 1660 mamsl. So the vlei water will flow into the pit and any backflow will be polluted water to the vlei / wetlands area. This is unacceptable. 18) The flow of water into the pit from the vlei area will cause the vlei area to become dry – this may not happen. 19) Wetlands will be denied water, they will get less water than usual and this will result in 80 – 90% of the wetlands dying. 20) Water coming down hill will first enter the pit area – this will first fill up before water will flow out into the wetlands. By this time the water will be polluted and this may not happen. 21) Can a system not be developed that will actively put water back into the wetlands area? 22) What guarantee do we have that the Mine will keep only one strip open for mining at any given time? 23) The roll-over method is not acceptable. Different grades of stone and rock will be mixed and as such the infill into mined areas will be done incorrectly. 24) The infill procedure must be done according to a specific process as different aggregates of rock are needed at specific depths. This procedure and need is not described in the document. 25) Who will decide what type of aggregate is loaded and where must it be dumped – who will oversee this process? 26) Will any of the evaporation ponds be lined and if so with what type of lining? 27) If the quantity of water is too much for treatment and the cost is too high what will happen with water out of the mine workings? 28) A 50 m buffer line is not enough if there is going to be mining underneath the wetlands as well. This will drain the wetlands of its water. 29) What percentage of water will be drained from the wetlands area? 30) What is the long term growth and sustainability of water for the area? 31) Then Klein Olifants River already has a deficit / shortage / over allocation. How will this proposed development further impact on the system? Quantify! 32) Is this proposed project sustainable? 33) Is this proposed project the best land use? 34) What is the impact on the bigger system – cost? 35) During the meeting with the state departments, was this project discussed as well or only the Wesselton Project? 36) One of the farmers being represented (Mr Botha de Lange) claims that he was never notified of the meeting or what the mine intends to do. 37) Heritage sites in the area – the impact of blasting has not been addressed and needs to be quantified. 38) Noise – will the mine be using the USBN Standards: Yes / No? 39) These standards do not have any guidelines on mud houses. 40) USBN Guidelines are not applicable to Highveld conditions. 41) USBN Guidelines are not applicable for the type of houses in the area i.t.o. AIRBLAST. 42) How about a survey of all structures so that we can replace if damage occurs? 43) The method of assessment of structures must be agreed upon beforehand – before mining operation commence.	

Issue or Comment	Raised by
44) A map of noise levels must be produced and circulated. 45) Ambient levels – these levels must be indicated on a map as well. 46) Presently windows rattle from the blast of mining operations 25 km away. 47) What about the noise from the reverse hooters of the trucks? Does this now become part of the ambient noise and at what level? 48) The weather data used was data pertaining to Witbank. The data used should have been that of Ermelo as Ermelo has the type of weather experienced in the vicinity of the proposed mine. 49) Why was the data not calculated for events where dense cloud cover is present? 50) Can a better noise vs. weather model be modulated? 51) Noise should also be assessed for a typical summer day / night as well as a winter day / night. 52) Events of high / low humidity should also be calculated. 53) Noise and wind directions must also be calculated. 54) Natural night sounds, although high in Dbl is an acceptable noise / level, but the raising Dbl level through unnatural causes is not acceptable. It is a question of quality. 55) Dust suppression: The amount of water that is needed to effectively suppress the dust will result in wetting the area to such an extent that the trucks will not be able to use the roads. The mitigation of dust suppression is not effective and needs to be looked at again. 56) Is the area in which the proposed mine is to be developed not part of the Pollution Act (As the Vaal Triangle) and as such will the dust pollution be allowed? 57) There are houses within the dust footprint – how is this going to be addressed? 58) What will the dust ingress / pollution into the vlei area be – quantify? 59) What will the impact of dust be on the quality of grazing in the area? 60) What will the impact of dust be on agricultural activities such as maize? 61) Closure Plan: The budget for water treatment is only R26 million. The time frame is for 2-3 years and this is not enough. Water must be treated and evaporation methods are not acceptable! 62) Hydrology / Surface Water: The mitigation issues are not discussed broadly enough. The same goes for the mitigation measures for the wetlands. 63) Mitigation measures must be fully discussed and described in detail. All positive and negative impacts must be quantified. 64) What will the source of the work force be? What will their training be and what skills will be passed on to them? 65) The document refers to a number of surveys still to be done – surely these should be done before the actual document is finalized? 66) (Ref: 6.1.1) Financials relating to the footprint area is a problem. Some aspects of the operation has budget allocated and some do not have. Issues are hanging loose "in the air". Budgets are not correct and must be re-investigated. 67) Soil & Land Capabilities: Removal of infrastructure. Subsidence will happen but capital for rectification has been budgeted for, but only for 2 – 3 years. What happens	

Issue or Comment	Raised by
thereafter? How will future problems be mitigated? 68) (Ref. 7.3.1) Rehabilitation: Land use issues will be consulted with the authorities. Should this not be done with more emphasis on the environment? End land use – impact on the sustainability of the project – how will they fit together? 69) Current land use vs. Future land use – what will the loss in productivity be? 70) "Area will be returned to previous productivity levels" – this can never happen. At best 40% of the original only. Why make this type of statement in the document? 71) Conveyors – a conveyor system has never been assessed. This information must be included in the document as such a system will impact on dust emissions. 72) (Ref. 6.4) Closure phase. Mitigating measures for the maintenance of vegetation. No plans are included. What can you do at a later stage? A mine plan is a plan for closure not operation. 73) Reference is made to residual impacts – what are these impacts? 74) (Ref. 6.4.2) Water pollution structures. The area will return to pre-mining stage where possible? In future grazing will support only 1 animal per 10Ha where today it is 2.5 animals per 10 ha. The statements in the document do not reflect actual facts. 75) (Ref. 6.4.4) Mine residue deposits. Will these be placed on plastic liners? How much residue do we expect: 6-7 million tons? Such dumps decant acid water. Mitigate? Clean-up? How? 76) Post closure – surface water impact. Consultation with DME / DWAF regarding the discharge. Fact – closure cannot happen unless DWAF approves. Can one still start a mine if you do not know if you will be able to get permission to close? A workable closure plan must be developed now. As technology improves the closure plan must be adjusted. 77) Mention is made of decant points but the volumes are not mentioned. Must be quantified. 78) Social Impacts are most likely during the decommissioning phase. This may not happen if the mine decides to carry on operations on the adjacent mineral rights they hold on the area known as Knapdaar. Are you planning on opening these fields as well? 79) Financial Provisions: A complete cost for closure must be assembled INCLUDING that for the treatment of water. 80) Is the mine going to buy out the farmers? Or Hire the farms for the duration of the mining operation? Are you going to give the farms back afterwards? 81) What financial model is being used? The Golder guideline is not acceptable nor is it cast in stone.	
Geluksdraai trust owns the farm Bosmanshoek 235, which lies at the southern tip of the indicated mining area. Questions were asked regarding: 1) Will this farm be affected at all by mining activities? The two boreholes on the farm are not shown on any of the maps. Will mining activity not have an effect on the supply of water from the boreholes? It is the only source of drinking water on the farm (location of boreholes are S26 18 48.9;E29 48 56.7 (windmill 15m deep) and S26 19 08.8;E29 49 00.07 (submersible pump 30 m deep)) 2) No biophysical surveys where done. The buffer zone which has been recommended needs to be monitored properly	Prof. JHJ van Vuren

Issue or Comment	Raised by
during the construction and operational phase. The surface aquatic habitat integrity of the river was not determined. 3) No baseline information is available on the surface water quality and the reports lacks information on the macro-variables and metal concentrations that are used to assess water quality by comparing the values to the Water Quality Guidelines for the natural environment published by DWAF in 1996. 4) No attention was given to the impact that the proposed mining activity will have on the surface water downstream of the project. 5) No information is provided on the diversity of aquatic organisms in the river and its tributaries. The present ecological state of surface water was not determined. Assessments on fish, aquatic invertebrates and river habitat have to be done before mining activities start. There is no baseline data that can be used to assess whether changes in the aquatic macro invertebrates population has taken place. 6) No mention is made of a surface water Biomonitoring programme during the construction phase and during normal operations. A programme is needed where selected water quality variables, aquatic organism diversity and aquatic habitat assessments are used to establish water quality at predetermined intervals. 7) The EMP refers to the monitoring of water quality after the mining operations in the Klein Olifants River but includes only pH, EC. SO4 and siltation. to do a proper water quality assessment more variables will have to be monitored (TDS, turbidity, metals that have the potential to accumulate in the surface water after disturbance of the proposed magnitude. 8) The dangers of acid mine drainage (AMD) and decanting is addressed in this report but final approval cannot be granted before a full acid mine drainage report has been provided and accepted. Decanting and AMD remain a threat to surface water and the introduction of effective measures to deal with it, are prerequisites for final approval of the mine.	

8.4 PUBLIC PARTICIPATION DURING THE SCOPING PHASE

The public participation process followed to date for the Scoping phase of this application is summarised in Table 8-2.

Table 8-2 Summary of public participation process followed to date

PUBLIC PARTICIPATION PHASE			
ACTION	**DESCRIPTION**	**PUBLICATION/PLACE**	
Announcement of Project	Placement of project announcement newspaper advertisements	Highveld Tribune Middelburg Observer	February 2013 08 February 2013
	Placement of project announcement site notices	20 A2 site notices (English, & Afrikaans) were placed at key locations within and around the proposed study area	06 February 2013
	Placement of project announcement poster notices	A3 posters (English & Afrikaans) were placed at key public locations within and around the town of Hendrina in whose vicinity the proposed study area is located	06 February 2013
	Project announcement notification of key I&APs and landowners	Key I&APs and Landowners were notified via registered post, fax and/or email	04 February 2013 – Ongoing
Draft Scoping Report public review announcement	Placement of Draft Scoping Report at public venues for review	Report Placement: Hendrina Public Library; Geo Soil and Water offices & website; and EIMS Offices & website	20 June 2013
	Draft Scoping Report availability notification to all registered I&APs (key stakeholders & landowners)	Notifications via registered post, fax and/or email	20 – 21 June 2013
Notification of Exemption	All I&AP's notified of granted Exemption.	Notifications via registered post, fax and/or email	23 September – 26 September 2013
Final Scoping Report public review announcement	Final Scoping Report availability notification to all registered I&APs (key stakeholders & landowners)	Notifications via registered post, fax and/or email	26 September - 9 November 2013

8.4.1 Issues raised and comments received during the scoping phase.

NAME	DATE	METHOD	Comment	RESPONSE
PARTICIPATION/ REGISTRATION				
Mr. W.D. Fouche (via Ms. Queen Mbuli) – Steve Tshwete Local Municipality Manager	13 Feb 2013	Letter via email	Your submission on 08 February 2013 regarding the above-mentioned matter is hereby acknowledged. The executive director responsible to deal with this matter is as follows: Executive Director – Infrastructure Services (013 249 7208), letter number 78840.	The contact details provided by the Steve Tshwete local municipal manager were noted and updated in the key stakeholders Interested and Affected Party database.
Ms. Elize Etsebeth _ Hyundai Middleburg	08 Feb 2013	Email	We are a commercial dealer for HD 72/65 H100 and panel vans plus our Multicab. Please if you need any trucks or bakkies phone us.	This information was noted.
Mr. Mannie Prinsloo	11 Feb 2013	Email	Please may I register as an Interested and Affected Party (I&AP) for the above-mentioned project (contact details included).	EIMS thanked Mr. Prinsloo for his response to the initial notification, and notified him that he has been registered as an Interested and Affected Party on the project's database as per his request.
Mr. Bart van de Steen	11 Feb 2013	Email & telephone	I would like to register as an Interested and Affected Party for Mashala Hendrina Coal's De Wittekrans Coal Mine Project (contact details included). Mr. Van De Steen also called and had the following comments: He has a number of concerns with regards to the EIA report for the Mining Right application – particularly with regards to the proposed transportation of coal to Davel, whereby he does not think the road can withstand the increase in traffic; and since there is a school near the said road, he is concerned about the	EIMS thanked Mr. van de Steen for his response to the initial notification, and notified him that he has been registered as an Interested and Affected Party on the project's database as per his request. EIMS informed Mr. Van De Steen that the current process (as per distributed notifications), is for the NEMA, NEMWA & IWUL applications and is not part of the completed Mining Right applications to which the mentioned EIA report refers. However, with respects to the comments

			safety of the school children; - Suggested adding SANBI Middelburg/Mpumalanga to I&AP database as well as uMnotho Wesizwe (who have rights in the vicinity of the project area); 1. - Queried the status of existing Mashala Hendrina Coal De Wittekrans and Knapdaar projects; - Mentioned that to his knowledge, another entity called uMnotho Wesizwe has either prospecting or mining rights in the vicinity of De Wittekrans study area and wanted to know if they were part of the current project's process. 2. - He stated that many people within study area are interested in the prospect of jobs that may arise from the proposed mine. He asked that it be included in the project's conditions to hiring that not only should preference for jobs be given to local people but mostly to those from neighboring farms as they are the people that will be the most exposed to the negative impacts (e.g. dust, noise) that might arise from the proposed mining activities, especially since the negative impacts are likely to outweigh the positive impacts. Mr. van de Steen mentioned that he was very happy with the public participation followed during the mining right application process.	received, as part of the NEMA, NEMWA and IWUL application, numerous potential impacts will be identified and assessed during the Scoping and EIA phases of the project. The reports presenting the findings of both phases will be made available to the public including all registered I&APs for their review and comment. Should Mr. Van De Steen's comments not be addressed in these reports or should he had further comments or concerns, he may submit these during the commenting periods of each phase, which will be announce to the public and all registered I&APs in due course. All comments from I&APs will be included in this issues and responses report to be submitted with both the Draft Scoping and EIA reports to the competent authority. This was noted and SANBI branches (Pretoria and Nelspruit) were contacted to get their details which were then added to the key stakeholder's database. EIMS further sent the initial notification documents to the contacts at SANBI Pretoria and Nelspruit. EIMS let Mr. van De Steen know that the De Wittekrans Mining Right application process is separate from this current process, and the EIA Report was submitted in 2010. EIMS would find out about the status of the Knapdaar project. EIMS has since established that the latter project is still currently in the prospecting phase. EIMS has since added uMnotho Wesizwe to the key stakeholder database and sent them the initial notification documentation. EIMS let Mr. Van De Steen that his comment will be recorded, as it is in this Issues and

				Responses report, which will be submitted along with the Scoping and EIA reports to the competent authorities. As mentioned previously, Mr. Van De Steen's comments may be addressed in the Scoping and/or EIA reports as one of the identified (in Scoping phase) and assessed (during EIA phase) impacts. Should these not be addressed, he may further submit his comments during the upcoming public comments periods. EIMS informed Mr. Van De Steen that all efforts will be directed at keeping all registered I&APs informed of available reports and opportunities to provide comment. All comments will be included in the documents to be submitted to the decision-making authority.
Mr. Alphius Pretorius	20 Feb 2013	Telephone	Requested to be registered as an Interested and Affected Party (contact details provided).	Mr. Pretorius was added to the database, all provided contact details included.
Ms. Thoko Lukhele – Mooivlei farm land occupier	01 Mar 2013	Telephone	Ms. Lukhele called to find out what the project was about and who is applying. She further asked how one may register. Ms. Lukhele provided her preferred contact details and requested to be registered.	EIMS let Ms. Lukhele know that the project pertains to the applications for environmental Authorisation, Waste Management Licence, and Integrated Water Use Licence for the proposed De Wittekrans coal mine (which already went through a mining right application process, not part of this project). EIMS further informed Ms. Lukhele that Mashala Hendrina Coal was the applicant, and that to register one needs to provide EIMS with contact information and consent to the added to the interested and Affected Party database for future involvement. EIMS after receiving contact details from Ms. Lukhele, added these to the I&AP database and emailed her a copy of the initial notification letter.
Ms. Carolyn Ah Shene-Verdoorn –	25 Feb 2013	Letter via email	Bird Life South Africa hereby wishes to register as an Interested and Affected party for the	EIMS thanked Ms. Ah Shene-Verdoorn for responding to the initial notification and

Birdlife South Africa			Mashala Hendrina Coal (Pty) Ltd mining right application for the proposed De Wittekrans Coal Mine, on the western side of the N11 between Ermelo and Hendrina, Mpumalanga. Mining activities are often accompanied by environmental impacts that compromise both avifauna and biodiversity in general. Bird Life South Africa is concerned by the environmental impacts of this mining application that cannot be mitigated, including human influx, habitat destruction, erosion, air-, water- and noise-pollution. This proposed opencast coal mine falls within the Amersfoort-Bethal-Carolina District Important Bird Area (IBA). This IBA has been recognised by Bird Life South Africa and Bird Life International as both a national (SA 018) and global (ZA 014) IBA that is critical for the conservation of IUCN Red Data List (i.e. threatened) and grassland endemic bird species. As such, Birdlife South Africa is concerned about the possible avifaunal impacts from mining. Of the 213 bird species recorded in the Southern African Bird Atlas Project 2 (SABAP2) for this IBA, 14 regionally threatened species have been recorded, including the regionally critically endangered Wattled Crane *Bugeranuscarunculatus* and endangered Botha's Lark *Spizocorysfringillaris*. This IBA is thought to still hold a significant proportion of the global population of Botha's Lark, a South African endemic species. The grassland areas also support, even regionally, vulnerable bird species: Denham's Bustard *Neotisdenhami*,	informed her that Birdlife South Africa has been registered as an I&AP. EIMS further let Ms. Ah Shene-Verdoorn know that once further documentation was available, Birdlife South Africa and all other registered I&APs would be timeously informed. EIMS contacted Ms. Ah Shene-Verdoorn telephonically to clarify that the current process being undertaken was for the applications for Environmental Authorisation and Waste Management and Water Use Licences and not the Mining Right application. EIMS was able to inform Birdlife South Africa that the final reports regarding the Mining Right application were submitted in 2010 and provided them with the department of Mineral Resources (DMR) reference number for the project as per their request. Furthermore, EIMS provided Birdlife South Africa with contact details towards getting further information regarding the mining right application previously conducted.

			White-bellied Korhaan *Eupodotissenegalensis*, African Grass Owl *Tytocapensis*, Southern Bald Ibis *Geronticuscalvus,* Lesser Kestrel *Falco naumanni*, Blue Crane *Anthropoidesparadiseus* and Grey Crowned Crane, *Balearicaregulorum*. Thus all three of South Africa's crane species are represented in these grasslands. Numerous wetlands, which potentially hold threatened and migratory water bird species, occur in the area. Water birds are at the greatest risk from the impacts of opencast coal mining. Other grassland endemic bird species (i.e. those found only in South Africa, Lesotho and Swaziland) also occur in this IBA. These include Buff-streaked Chat *Campicoloidesbifasciata*, Sentinel Rock Thrush *Monticolaexplorator* and Southern Bald Ibis. These are also particularly sensitive to the impacts of opencast coal mining. For more information, a Google Earth map and link to the SABAP2 data for the Amersfoort-Bethal-Carolina District IBA, please visit http://www.birdlife.org.za/conservation/iba/iba-directory/341-amersfoortbethalcarolinab. In a 2012 media release, Birdlife South Africa urged government to offer equal recognition to food production, water security and the conservation of our cultural and natural heritage, especially when assessing mining applications. Birdlife South Africa is not opposed to all mining, but rather to unsustainable activities in inappropriate areas that potentially negatively impact threatened and endemic bird species and their habitats. Birdlife South Africa does not support prospecting or mining of any resource within IBAs or adjacent natural areas, and therefore	

			strongly objects to the application for a mining right for coal in this De Wittekrans Project. Please notify us when the Scoping Report and Draft Environmental Impact Assessment Report are available for review and comment.	
Mr. Johan Wentzel	22 Jun 2013	EIMS website Email	I would like to access your documents (on EIMS website) I am an I&AP re the De Wittekrans coal project south of Hendrina. I am not sure how to register. I have a stake in the mine in the sense that some coal rights originally belonged to me and I will still benefit from it in the long run, hence my interest. I also lived on that farm for a number of years and know certain risk factors that you will probably not find in literature.	EIMS contacted Mr. Wentzel and assisted him on how to register on the EIMS website in order to access the Draft Scoping Report (and associated annexures). EIMs thanked Mr. Wentzel for responding to the notification and noted his association with the affected farm and area. EIMS contacted Mr. Wentzel to ensure he had been able to register after clarifying the registration steps with him.
Ms. NT Mathebula – Mpumalanga Department of Agriculture, Rural Development & land Administration (DARDLA)	10 Jul 2013	Fax	Your application dated 21 June 2013 in the above-mentioned regard, has reference. Receipt of your application is hereby acknowledged and you will be informed of this Directorates comments in due course. At this stage the Department would like to register as an Interested/ Affected Party. This application's reference number is (DAARDLA 15/3/1/1/99) and you are requested to please use this reference in any future correspondence or enquiries in this regard.	EIMS called Ms. Mathebula to clarify that the application was submitted to MDEDET as the competent authority, and DARDLA was notified as a commenting authority. Ms. Mathebula noted the distinction and asked that EIMS send her the BID for the project. EIMS emailed the BID to Ms. Mathebula.
REQUEST FOR DOCUMENTATION				
Dr. Koos Pretorius	04 Feb 2013	Email	Please send me all the relevant documents.	EIMS thanked Mr. Pretorius for responding to project's initial notification, and included the following details: Please be advised that the purpose of this Public Participation Process pertains specifically to the required NEMA, NEMWA, and Water Use License environmental process only. A previous

				round of public participation was undertaken in support of the Mining Right (MPRDA) application process and this process serves to satisfy the requirements for public participation for the processes mentioned above. The notification sent out earlier this week serves to notify all I&APs of the initiation of the NEMA, NEMWA and WULA processes. Once further documentation (Background Information Document and Scoping Report etc.) is available, all registered I&APs such as yourself will be notified in a timeous manner about their availability and where to access the documentation for review as well as to provide us with valuable comment.
Mr. Tobie du Toit – Landowner Portion 1Re of De Wittekrans 218	04 Feb 2013	Email	Thank you for the notification. I presume I will remain an Interested and Affected Party and receive future updates?	EIMS thanked Mr. Du Toit for his response, and notified him that has been registered as an Interested and Affected Party on the project's database and will continue to receive notifications regarding this project.
Mr. Roelof van Vuren	06 Feb 2013	Email	Kindly furnish with the relevant and applicable information on a frequent basis.	Thank you very much for your response to our notification, you have been registered as an Interested and Affected Party on our database and will continue to receive timeous notifications/ information regarding this project.
Prof. Johan van Vuren	21 Feb 2013	Email	Thanked EIMS for the information regarding project and asked to be kept on the emailing list. He noted that he is a trustee of a family trust that owns the farm adjacent to farm Israel. He further requested to see the information on the expected impacts and the bio-physical information that will be used for the EIA.	EIMS thanked Mr. Van Vuren for responding to the initial notification and details of his association with the study area. IEMS further informed Mr. Janse van Vuren that he has been registered as an Interested and Affected party and once further documentation is available, he will be notified with details.
Dr. Koos Pretorius	22 Jun 2013	Email	Please send me an electronic copy.	EIMS prepared an electronic copy (CD) and sent it to Dr. Pretorius via speed services post.

PROCESS & PROJECT ISSUES				
Ms. Jenna Lavin - SAHRA	26 Feb 2013	Email with letter	Thank you for notification, please find letter attached regarding SAHRA's requirement that all applications be submitted digitally via SAHRIS (SAHRA will not accept requests for comment or decision on applications in any other format).	EIMS contacted Ms. Lavin to enquire regarding the digital submission of the initial notification and Ms. Lavin provided EIMS with a copy of a guide to submitting an application on the SAHRIS. EIMS has since registered and submitted the initial documentation digitally.
Ms. Anne-Marie Botha – AMP Property management and land Acquisition	25 Apr 2013	Email	Ms. Botha saw the site notice next to the N11 and informed EIMS that Eskom is in the process of planning a new 132kv power line (Zamokuhle – Estancia) in the vicinity of the De Wittekrans study area. She requested that EIMS send her the map of the study area as per displayed on the site notice, as well as information regarding the EIA. Ms. Botha informed EIMS that the proposed power line has already been approved and provided a map showing its proposed route.	EIMS thanked Ms. Botha for responding to the site notices placed around the study area, and notified her that she has been registered as an I&AP for the project. Furthermore, EIMS highlighted that the notification pertains to the Environmental Authorisation, Waste management and Integrated Water Use Licence applications and not the Mining Right application (which was undertaken as a separate process and final reports submitted in 2010). EIMS included a map of the study area indicating the affected farms as per the map on the site notice in response to Ms. Botha's request. In addition, EIMS sent Ms. Botha a copy of the initial notification letter sent out to pre-identified key stakeholders and landowners.
Ms. Jenna Lavin - SAHRA	06 May 2013	Letter via SAHRIS	Please select the link below to view the letter from SAHRA for the above application. On the right hand side of the page you will see a box labelled "Official Comments and Decisions", select the date 3 May 2013. This will take you to the text of the letter and to a link to the .pdf of the letter. Please can you confirm receipt of this letter?	Thank you very much for responding to the digitally submitted initial notification regarding the applications for Environmental Authorisation, Waste management Licence and Integrated Water Use Licence for the proposed De Wittekrans coal mining development. This serves to acknowledge receipt of SAHRA's comments in this regard.
Ms. Jenna Lavin - SAHRA	06 May 2013	Letter via SAHRIS	Thank you for your indication that development is to take place in this area. In terms of the National Heritage Resources Act, no 25 of	EIMS acknowledged receipt of the comments from SAHRA via SAHRIS and that all comments have been noted

			1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years and structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. In terms of Section 38(8) of the NHRA, before any development proposed in terms of the MPRDA (2002) is approved, it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done that satisfies Section 38(3) of the NHRA. Appropriate mitigation, which involves recording, sampling and dating sites that are to be destroyed, may be required depending on the nature and significance of the resources identified. As such, SAHRA requires that a Heritage Impact Assessment report be completed and submitted for assessment. This report should be inclusive of an assessment of impacts to archaeological resources and an assessment of impacts to palaeontological resources by suitably qualified practitioners. This assessment of heritage resources must satisfy Section 38(3) of the NHRA. The requested Archaeological Report must identify the archaeological sites and assess their significance and make recommendations (as indicated in section 38(3) of the NHRA)	EIMS further asked for clarification from SAHRA regarding the Heritage Impact Assessment Report, which has been requested for this study as per your letter with comments (dated 03/05/2013). EIMS informed SAHRA that the Mining Right Application as per the MPRDA process was completed and all relevant documents (including the Heritage Impact Assessment Report) submitted in 2010. The current application process is as per the NEMA, NEM:WA and Water Act. EIMS highlighted that the Heritage Impact Assessment Report conducted and submitted during the Mining Right Application (MPRDA) process is available, and asked SAHRA if the said report should be re-submitted online via SAHRIS. EIMS subsequently submitted the Heritage Assessment Report via SAHRIS after clarification and instruction on registration by the SAHRA official Ms. Jenna Levin.

			about what mitigation may be required. A palaeontological study must be undertaken to assess whether or not the development will impact upon significant palaeontological resources. Alternatively, a letter of exemption from a Palaeontologist is required to indicate that this is unnecessary. If the area is deemed sensitive or if significant heritage is identified, a full Palaeontological Report may be required. The impacts of the proposed development on any other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and significant cultural landscapes or viewscapes must also be assessed. SAHRA looks forward to receiving this heritage report and will provide comment before the project can commence.	
Ms. Jenna Lavin - SAHRA	10 June 1013	Letter via SAHRIS	In our letter dated 03 may 2013, SAHRA requested that a full HIA be completed investigating the development on all heritage resources. The above report was submitted in response to this letter. Although an assessment of palaeontological resources was requested with the letter from SAHRA dated 03 May 2013,	EIMS thanked SAHRA for their response to the submitted HIA Report and let the project case officer, Ms. Jenna Lavin, know that their comments have been forwarded to the project manager including their request for a palaeontological assessment.

			no such assessment has yet been submitted to SAHRA. Despite the great level of detail in the submitted HIA, SAHRA is unable to issue a Final Comment for this application as no assessment of the impact to palaeontological resources has yet been submitted. As such SAHRA has a number of requests (see Correspondence with I&APs for full details) as follows: palaeontological study; further investigation of structure identified as Site 13 in the HIA report; recommended exhumation & relocation of graves at Sites 14 & 19 is endorsed; recommendations included in the Noise & Vibrations specialists study as well as the Air Quality & Dust specialist study with regards to impact on rock art at Site 9 are endorsed; a detailed Conservation Management Plan must be established for Site 9; and a Conservation Management Plan must be established for the remaining heritage sites (Sites 1 to 8, 10 to 12, 15 to 18, and 20 to 36). SAHRA will await the submission of the above information before issuing a Final Comment for this project. Should it not be possible to adhere	

			to the above conditions, the applicant must consult with SAHRA regarding the reasons for non-compliance.	
Ms. Jenna Lavin - SAHRA	21 June 1013	Email	Please can you load the De Wittekrans case on SAHRIS so that I may assess it as is required in terms of Section 38 (8).	EIMS loaded the Draft Scoping Report and all annexures on SAHRIS.
Dr. Koos Pretorius	20 Jul 2013	Email	Please advise as to the status of the Mining Rights application.	EIMS informed Mr. Pretorius that since the submission of the final reports for the Mining Right Application, the project team has been awaiting a decision from the Department of Mineral Resources. Once the decision has been communicated to the project team, the registered Interested and Affected parties will be notified.
Ms. Celia Adams – Steve Tshwete Local Municipality	27 Jun 2913	Email with letter	Your submission received on 25 June 2913 regarding the above-mentioned matter is hereby acknowledged. The Executive Director responsible to deal with this matter is as follows: Executive Director – infrastructure Services.	EIMS noted this and confirmed that the Executive Director contact details were included in the I&AP database.
Dr. Koos Pretorius	05 Aug 2013	Email	I see that my comments during the MPRDA phase were summarised. Please note that a sustainable plan for the post closure phase of the mine must be done now. Attached is a summary of the legal framework for this. This	EIMS thanked Dr. Pretorius for his continued input and involvement regarding the De Wittekrans project. Furthermore, EIMS let Dr. Pretorius know that the project team is currently preparing the final documents and his

			was not done during the MPRDA phase and should the mining right be granted, it will be appealed on, inter alia this. There must also be a reasoned argument of why this area must be mined when considering the sensitivity of the ecology and the high potential soils and the impacts on them and the lack of a financially viable closure plan that is fully quantified at this stage. The map in the scoping report (3.2) does not show how the new mine plan will avert these. I have attached three documents dealing with the above issues.	comments will be taken into consideration.
Prof. Johan van Vuren	05 Aug 2013	Email	I worked through the draft scoping report and have the following remarks: The farm Bosmanshoek 235 is not included in table 1.3 but is included in the mining area as shown in fig 1.3. Bosmanshoek is the southern tip of the mining area on the fig. Could you please provide clarity on whether it is included or not? Bosmanshoek is indicated as grassland habitat (Fig 4.12) but there is 55Ha crop farming on the	EIMS thanked Prof. Van Vuren for his input and continued involvement. With regards to hid query regarding farm Bosmanshoek, EIMS informed Prof. van Vuren that they checked the cadastral divisions within the study area and noted that the farms Israel, Groblershoek & Globlershoop (included in the study) are positioned where the farm Bosmanshoek appears on the 1996 topographical map. Moreover, EIMS conducted a Deeds search for the farm Bosmanshoek and the results were such that the information regarding the

			farm.	Bosmanshoek farm indicated that some of the portions of the said farm no longer existed or the information was unknown. EIMS asked Prof. van Vuren for advice based on the map showing the topographical background (indicating where Bosmanshoek farm is) and the latest cadastral division of the farms and their names in the same vicinity (Israel 207, Globershoek 191 and Globlershoop 192), whether there were any portions of the farm Bosmanshoek that still existed within the indicated study area. Pertaining to the comment regarding the classification of Bosmanshoek as a grassland habitat, during the Scoping phase of the project it was established that the said area was historically classified as grassland. The area will be assessed further in more detail during the EIA phase to establish its current status which as your input suggests also includes cultivated land (i.e. crop farming).
Prof. Johan van Vuren	19 Aug 2013	Email	Attached please find a copy of an earlier cadastral map of Bosmanshoek 235. It belongs	EIMS thanked Prof. Van Vuren once again for his continued engagement with the project as well

			with Geluksdraai 240 to Geluksdraai Trust (No 8385/95) since January 1996. Please note that Bosmanhoek 235 is south next to Israel outside the mining area as shown with the yellow boundary and to the west of Geluksdraai 240. It is outside the boundaries of the planned mining area as shown on the GCS map but could still be impacted by mining activities? The effect of mining close by on the ground water availability and quality is not dealt with in the report and is of great concern. Attached is a map prepared by Mapco, Standerton in 2003 for the farm clearly showing Bosmanhoek 235 and Geluksdraai 240.	as for the information he provided regarding farm location of farm Bosmanshoek. EIMS confirmed with Prof. Van Vuren that Bosmanshoek is within the study area for this project, and that as such the landowner's database has been updated accordingly. Moreover, EIMS informed Prof. Van Vuren that all his comments thus far have been included in the Issues and Responses Report to be submitted along with the Final Scoping Report to the competent authority. He was also informed that more detailed impact assessment studies will be undertaken during the upcoming EIA phase, and that his concern regarding the impact of proposed mining activities on groundwater (availability and quality) has been noted to be considered during the EIA investigations. The EIA Reports will be made available for comment to all I&APs, and notification of the availability of the said reports will be distributed to I&APs.

8.5 CONTINUED PUBLIC PARTICIPATION DURING THE IMPACT PHASE

The public participation process will continue during the EIA phase of this application and actions to be undertaken are summarised in Table 8-3.

Table 8-3 Summary of public participation process to be undertaken.

Public Participation Phase			
Action	**Description**	**Publication/Place**	**Date**
Draft EIA Report public review & public meeting announcement	Newspaper advertisements to announce the availability of Draft EIA Report and details of public meeting	Highveld Tribune Middelburg Observer	To be announced
	Draft EIA Report availability notification & details of public meeting to all registered I&APs (key stakeholders & landowners)	Notifications via registered post, fax and/or email	To be announced
	Placement of Draft EIA Report at public venues for public review	Hendrina Public Library; Geo Soil and Water offices & website; and EIMS Offices & website	To be announced
Draft EIA Report public meeting	Public meeting to present the findings of the EIA Phase to the public and all registered I&APs	Venue still to be confirmed	To be announced
Public review announcement of Final EIA Report	Notification of availability of Final EIA report to all registered I&APs (key stakeholders & landowners)	Notifications via registered post, fax and/or email	To be announced
Announcement of Record of Decision	Newspaper advertisement of Record of Decision	Highveld Tribune Middelburg Observer	To be announced
	Notification of availability of Final EIA report to all registered I&APs (key stakeholders & landowners)	Notifications via registered post, fax and/or email	To be announced

9. PROJECT MOTIVATION: NEED AND DESIRABILITY

The Msukaligwa Local Municipality has developed a LED Plan and specific points are raised with regards to the mining industry:

- Difficult for local contractors to obtain contracts from the mines for general work e.g. cleaning of offices, equipment etc.
- Needs capital to start up business
- The potential of local mines must be used e.g. Wesselton mine.
- Mine related opportunities exist in the area e.g. in Breyten clothes for mines are made by local women and Xstrata coal is also exporting this clothes to Australia.
- Important that mines create other opportunities for people in the area due to the short working time of mines.
- Municipality can assist the development of mining in the area by compiling a database of the local contractors in the area as well as mines and link the two parties with each other.

- Municipal projects must be coordinated with poverty projects (and other community projects) of mines, therefore it is necessary to communicate and interact with the local mines in the area.

The De Wittekrans Coal Mine operation will create a significant number of employment opportunities, not only during the construction phase but also during the operational phase of the project. The De Wittekrans Coal Mine will provide employment opportunities for a workforce from the residential areas of Hendrina/Ermelo. This residential area houses many historically Disadvantaged South Africans that require employment.

Mashala Hendrina Coal will adopt a systematic, fully integrated process of workforce planning as outlined in the Social and Labour Plan (SLP), that involves proactively planning ahead to avoid skills surpluses or shortages. This integrated process is designed to ensure that the right people are in the right roles to meet the current and future organisational requirements. This includes identifying the skills required and the mechanisms by which those skills will be acquired. Such human resource planning mechanisms will continue to be utilised during the life of the operation.

A preferential procurement policy will be developed during the 2014 period that will clearly state the Mine's commitment to BEE. In terms of the Mining Charter, the policy will specifically focus on procurement from Historically Disadvantaged South African (HDSA) vendors and to promote new opportunities for meaningful participation by HDSA companies in De Wittekrans Coal Mine's procurement spend.

The policy will make provision for the following methodology:

- New suppliers will be required to disclose information regarding their ownership/control and internal BEE programmes;
- De Wittekrans Coal Mine will put measures into place to monitor and verify the status quo of various suppliers and to ensure that such information is reliable;
- Preference will be given to products supplied and services rendered by HDSA suppliers;
- The Mine will encourage suppliers to form partnerships or joint ventures with HDSA supplier companies where there is no HDSA mine tendering to supply the required goods or services; and
- Tender requirements will be comprehensively communicated to HDSA companies.

The company is committed to ensure that all employees in need of basic numeracy and literacy training have access to accredited ABET facilities.

9.1 SKILLS DEVELOPMENT

Skills Requirements to conduct the intended mining operations, 500 employees will be employed on the mine when it is fully operational. Note that all mining operations will be contracted out.

De Wittekrans Coal Mine is not yet an operating mine that has reached and maintained its proposed production level. The personnel on the mine will however have the necessary skills to conduct the mining operations.

Since De Wittekrans Coal Mine is not in existence, all required infrastructure would need to be constructed. Thus the construction work necessary to bring the mine into operation is the construction of the haul road, pit ramp, initial box-cut, and overburden stockpiling areas, ROM stockpiling area and storm water diversion channels. Mining will consist of the removal of coal from the B and C coal seams.

Rehabilitation of the opencast operations will be conducted concurrently with the mining phase. Once the operational phase is complete, rehabilitation activities will consist of rehabilitation of stockpiling areas, plant area and haul roads. This phase of mining will also include the dismantling of any associated structure built on the mine e.g. workshops, change rooms and mine offices.

The mine closure phase will be dedicated to maintenance areas as well as compiling a closure plan.

9.2 ENTERPRISE DEVELOPMENT

Mashala Hendrina Coal undertakes to:

- Ensure that a performance management system is implemented as per schedule;
- Ensure that each individual employee, or contractor employee has a suitable career plan mapped out for the companies specific needs;
- Ensure that the plans for these individuals are in fact implemented;
- Ensure that supervisors and management review progress with employees at regular intervals;
- Monitor and review the plans and the progress from time to time, but at least after one year for reporting purposes;
- Implement fast tracking of specific employees where the need and opportunity exist; and
- Make every effort to develop and promote their own employees rather that employing skilled workers from outside.

9.3 PREFERENTIAL PROCUREMENT

A preferential procurement policy will be developed during the 2014 period that will clearly state the Mine's commitment to BEE. In terms of the Mining Charter, the policy will specifically focus on procurement from HDSA vendors and to promote new opportunities for meaningful participation by HDSA companies in De Wittekrans Coal Mine's procurement spend.

9.4 EMPLOYMENT EQUITY

De Wittekrans Coal Mine fully subscribes to the principles of the Mining Charter, and strives to achieve more than the minimum requirements.

The mine believes that Employment Equity is an integral part of building an effective and representative workforce and to ensuring equality for all employees. The Mine will therefore develop an Employment Equity Policy to ensure that HDSA employees, especially women, are developed and targets are met. Particular effort

will be directed at identifying HDSA's with talent, and providing accelerated training and development initiatives to assist their progression.

These vacancies require skills to conduct the intended mining operations. 500 employees will be employed on the mine when it is fully operational. Note that all mining operations will be contracted out.

9.5 SOCIO-ECONOMIC IMPACT OF THE MINE IF AUTHORISED AND NOT AUTHORISED

There's a socio-economic impact that will be positive during the operational phase. The social benefit is through the creation of employment as this will improve the livelihoods of Previously Disadvantaged Individuals (PDIs). The economic benefit will be through local/regional businesses benefiting as service providers and local contractors. The mine will also contribute to the local and district municipality and national focus by the required paying of rates and taxes.

9.5.1 The socio-economic impact of the mine if authorized

Mashala Hendrina Coal has the intention of developing a coal mine that consists of both opencast and underground sections with their associated infrastructure on site. Although the proposed project will only create a small addition to the existing employment opportunities in the area, the project will ensure the following:

- A mining operation with a sustainable life of mine;
- Provision of sustainable employment (retention);
- On-going economic input into the area;
- Provision of a regional socio-economic benefit;
- Economic injection into the region in terms of small business enterprises (e.g. community services);
- On-going supply of export and local coal;
- Supply of coal to ESKOM when needed; and
- Improved environmental management commitments.

If the mine was to go ahead, it would have favourable economic impacts on both the local and regional economies.

The proposed De Wittekrans Coal Mine will ensure the following benefits for the surrounding community:

- A mining operation with a sustainable life of mine of approximately 20 to 30 years;
- Provisions of sustainable employment;
- On-going economic inputs into the area;
- Provision of a regional socio-economic benefit; and
- Improved environmental management commitments.

Expenditure on the construction and operation of the mine will lead to positive economic impacts as they would constitute an injection of capital into the local and regional economy resulting in increased commercial activity.

Coal will be produced for the local (e.g. Eskom) and international markets. The production and sale of coal will ensure a constant inflow of foreign capital into South Africa and into the project region.

The proposed project would create job opportunities to approximately 500 people. It is the intention of the mine to give priority to the local community when recruiting people for the jobs associated with the mine activities.

9.5.1.1 Agricultural impact

The surrounding farms are mostly used for grazing and agriculture and during the operational phase there is a possibility that the water quality in the area and the implications of a decline in the water quality may occur. The amount of silt in the water will be limited as far as possible.

9.5.1.2 Water resources impact

The main potential impact which was identified and will be mitigated in this regard includes the following:

- Wetlands;
- Groundwater; and
- Surface water.

The water will be re-cycled and re-use on De Wittekrans Coal Mine and there will be no discharge of water.

Approximately 500 people will be on site per day. Water requirements for a mining environment are approximately 100 litres to 150 litres per person per day

9.5.1.3 Recreational impact

Since no recreational activities exist around the proposed De Wittekrans Coal Mine, no impact could be determined on these sectors.

9.5.1.4 Domestic impact

The project area is located in the Msukaligwa Local Municipality and strategically located in the provincial context, as it is located between Johannesburg in Gauteng and Nelspruit in Mpumalanga province. It is also located close to the economically thriving metropolitan municipalities in Gauteng namely Ekurhuleni and Tshwane.

Furthermore, it is located 10 km from the N12 highway, which joins the N4 Maputo corridor, the main link between Gauteng, Mpumalanga province and Mozambique (Victor Khanye Local Municipality IDP, 2009-2010).

A major challenge for the Msukaligwa Municipality is dealing with the unemployment problem. The unemployment statistics reveals that approximately 23% of the municipal population is unemployed, 37% are employed and 41% are not economically active. This means that 41% of the population falls below the age of 16 and above the age of 65 years old. These percentages do not include people who generate a livelihood from subsistence agriculture, grants, hand-outs, pensions etc.

9.5.2 The socio-economic impact of the failure to authorise the mine

Mashala Hendrina Coal has already invested significantly in the proposed mining activity by compiling the necessary legal documentation, which includes the Mining Right Application including the EIA and EMP, this Scoping Report, the application for an Integrated Water Use Licence, the Integrated Water and Waste Management Plan and various specialist studies.

The generation of additional business sales and employment opportunities will initiate an on-going ripple effect through the sub-region, resulting in an increase in product and service value measured in Gross Geographical Product (GGP). Employment opportunities and local economy development will be lost for the Hendrina/Ermelo area if the De Wittekrans Coal Mine activities are not authorised by MDEDET and DEA.

The lifespan of the mine will be approximately 25 to 35 years and will ensure that a certain number of employment opportunities are created for that period and that the local businesses are supported. Mashala Hendrina Coal, through its SLP will embark on an upliftment program for previously disadvantaged persons residing in close proximity to the mine. If the mining is not to commence it might result in the sterilization of the reserves for an extended period, which will cause loss of revenue to the local municipality and the district at large.

The coal reserves are within the Mashala Hendrina Coal prospecting area. As such, Mashala Hendrina Coal is currently the only company that has the exclusive right to apply for the exploitation of these reserves. This commitment is shown by the pre-mining environmental investigation that was carried out using different specialists.

Mashala Hendrina Coal has already invested substantially for the proposed project. The discontinuation of the project will result in the loss of investment to the Mashala Hendrina Coal's shareholders. Based on the result of the exploration programme, Mashala Hendrina Coal has established a market for the type of coal that is available in these reserves.

In view of the above, the consequences of not proceeding with this project will have a detrimental impact on the employment opportunities to be created, the surrounding previously disadvantaged community, the owners of the mine (with their BEE partner), and the coal inland and export market. This may also result in the sterilization of the reserves for an extended period, which will cause loss of revenue to the coal municipality and the district at large.

The following opportunities are being created with the De Wittekrans Coal Mine. If this project is not approved these crucial opportunities for the area will be lost:

- Loss of economically viable and mineable reserves;
- An opportunity to ensure sustainable job creation will be lost;
- Loss of local and regional development opportunities.
- Loss of regional, socio-economic benefit; and
- Loss of the opportunity to update and improve the current environmental commitments.

Currently the land is used for the cultivation of potatoes and grazing. If the project was not to continue the existing agricultural activities will continue. Unfortunately this

will also imply that the economic benefits associated with the mining activities would not take place.

If the mine was to go ahead, it would have favourable economic impacts on both the local and regional economies. The failure to authorise the water uses would result in the loss of local and regional development opportunities.

10. EIA PLAN OF STUDY

The Plan of Study for Environmental Impact Assessment (EIA) as required in terms of NEMA is outlined below. It describes the approach that will be taken for the EIA.

This section includes the following information:

- A description of the tasks that will be undertaken as part of the EIA process, including any specialist studies or specialised processes, and the manner in which such tasks will be undertaken, i.e. the Approach to Impact Assessment;
- An indication of the stages at which the competent Authority will be consulted;
- A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity, and
- Particulars of the public participation process that will be conducted during the environmental impact assessment process.

10.1 APPROACH TO IMPACT ASSESSMENT

The following specialist studies have been undertaken as part of the EIA process of the mining right application:

- Soil, land use and land capability assessment;
- Air quality assessment;
- Noise, blasting and vibration assessment;
- Hydrological (surface water) assessment;
- Hydrogeological (groundwater) assessment;
- Visual impact assessment;
- Fauna and flora assessment;
- Wetland delineation;
- Biomonitoring and aquatic assessment;
- Social impact assessment;
- Traffic impact assessment;
- Heritage and archaeology assessment;
- Closure plan;
- Social and Labour plan; and
- Integrated water use licence application.

The specialist reports are included as part of this Scoping Report and will also be included in the EIA report.

10.2 STUDY AREA

The direct footprint of the proposed project, upstream and downstream areas, local topography, directly affected landowners and neighbouring properties make up the study area where baseline surveys have and will continue to take place. In addition, consideration is given to the wider geographical context where applicable (existing information will be utilised to inform the wider context).

10.3 SPECIALIST STUDIES

The following specialist study will be undertaken as part of the EIA process:

- Wetland assessment including PES and EIS status determination.

10.4 ENVIRONMENTAL IMPACT ASSESSMENT

10.4.1 Stages at which the competent authorities will be consulted

The relevant competent authorities have been and will continue to be consulted at various stages of the EIA process. A meeting with the relevant competent authority will be conducted during the EIA phase to discuss the findings of the EIA phase presented in the Draft EIA report prior to finalising the said report, and this report will be made available to the public for their review and comment.

10.4.2 Methodology for assessing impacts

To ensure uniformity, the assessment of potential impacts will be addressed in a standard manner so that a wide range of impacts is comparable. For this reason a clearly defined rating scale has been/will be provided to the specialist to assess the impacts associated with their investigation. Each impact identified has been/will be assessed in terms of probability (likelihood of occurring), extent (spatial scale), intensity (severity) and duration (temporal scale). To enable a scientific approach to the determination of the impact significance (importance), a numerical value has been/will be linked to each rating scale. The sum of the numerical values then defines the significance. The criteria outlined below will be applied to the impact assessment for the De Wittekrans Coal Mine EIA.

Table 10-1 Probability.

Category	Rating	Description
Definite	3	More than 90 % sure of a particular fact or of the likelihood of that impact occurring
Probable	2	70 to 90 % sure of a particular fact or of the likelihood of that impact occurring
Possible	1	40 to 70 % sure of a particular fact or of the likelihood of that impact occurring
Improbable	0	Less than 40 % sure of a particular fact or of the likelihood of that impact occurring

Table 10-2 Extent.

Category	Rating	Description
Site	1	Immediate project site
Local	2	Up to 5 km from the project site
Regional	3	20 km radius from the project site
Provincial	4	Provincial
National	5	South African
International	6	Neighbouring countries/overseas

Table 10-3 Duration.

Category	Rating	Description
Very short-term	1	Less than 1 year
Short-term	2	1 to 5 years
Medium-term	3	5 to 10 years
Long-term	4	10 to 15 years
Very long-term	5	Greater than 15 years
Permanent	6	Permanent

Table 10-4 Intensity.

Category	Rating	Description
Very low	0	Where the impact affects the environment in such a way that natural, cultural and social functions are not affected
Low	1	Where the impact affects the environment in such a way that natural, cultural and social functions are only marginally affected
Medium	2	Where the affected environment is altered but natural, cultural and social function and processes continue albeit in a modified way
High	3	Where natural, cultural or social functions or processes are altered to the extent that they will temporarily cease
Very high	4	Where natural, cultural or social functions or processes are altered to the extent that they will permanently cease

Table 10-5 Significance Rating.

Score	Significance Rating
2 – 4	Low
5 – 7	Low to Moderate
8 – 10	Moderate
11 - 13	Moderate to High

Score	Significance Rating
14 – 16	High
17 – 19	Very High

11. NEXT STEPS IN THE EIA PROCESS

The next step will be to finalise the specialist studies that will inform the impact assessment. During the impact assessment phase, the issues raised by stakeholders and the potential impacts of the proposed project on the environmental and socio-economic status of the area will be examined in detail. Stakeholder issues will therefore assist to drive the EIA process.

When complete, the findings of the specialist studies will be integrated into a single report, the Draft EIA Report and EMPR. The report will then be made available for stakeholder comment, after which it will be finalised and submitted to the decision-making Authorities for a final decision.

12. REFERENCES

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13. ANNEXURES

Annexure A	Departmental letters and notifications
Annexure B	Maps and figures
Annexure C	Soil, land use and land capability assessment
Annexure D	Air quality assessment
Annexure E	Hydrogeological (groundwater) assessment
Annexure F	Hydrological (surface water) assessment
Annexure G	Noise, blasting and vibration assessment
Annexure H	Visual impact assessment
Annexure I	Fauna and flora assessment
Annexure J	Wetland delineation
Annexure K	Biomonitoring and aquatic assessment
Annexure L	Social impact assessment
Annexure M	Traffic impact assessment
Annexure N	Heritage and archaeology assessment
Annexure O	Issues and responses report