mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

# SCOPING REPORT

# FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

**NAME OF APPLICANT:** Exxaro Coal Mpumalanga (Pty)Ltd

**TEL NO:** 017 616 2255
**FAX NO:** 017 616 2205
**POSTAL ADDRESS:** Private Bag X 5006, Kriel, Mpumalanga
**PHYSICAL ADDRESS:** Matla Coal, Located at Latitude
**FILE REFERENCE NUMBER SAMRAD:** MP30/5/1/2/3/2/1/ (327) MR

## IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

**It is therefore an instruction that** the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

**It is furthermore an instruction that** the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

## OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process—

(a) identify the relevant policies and legislation relevant to the activity;
(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
(e) identify the key issues to be addressed in the assessment phase;
(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

_____

# SCOPING REPORT

**2)** Contact Person and correspondence address

**a)** Details of:

### i) The EAP who prepared the report

Name of The Practitioner: **Riana Panaino**
Tel No.: **011 803 5726**
Fax No. : **011 803 5745**
e-mail address: **rianap@gcs-sa.biz**

### ii) Expertise of the EAP.

**Riana Panaino**

Riana is an Environmental Consultant at GCS (Pty) Ltd and works for the Environmental Unit. Environmental Management Plans, Environmental Impact Assessments, Water Use License Applications, Basic Assessment Report, Public Participation.

#### (1) The qualifications of the EAP

**Riana** holds a BSc. Botany & Zoology and BSc. Hons. Biodiversity & Conservation from the University of Johannesburg

#### (2) Summary of the EAP's past experience.

Refer **to Appendix 2** for a detailed CV.

b) **Description of the property.**

**Farm Name:**

***Properties within the Mining Right***

| Farm name | Farm portion | Farm name | Farm portion |
|---|---|---|---|
| BAKENLAAGTE | 84 | MOEDVERLOREN | 24/88 |
| BAKENLAAGTE | 1/84 | MOEDVERLOREN | 25/88 |
| BAKENLAAGTE | 2/84 | MOEDVERLOREN | 26/88 |
| BAKENLAAGTE | 3/84 | MOEDVERLOREN | 27/88 |
| BAKENLAAGTE | 5/84 | MOEDVERLOREN | 28/88 |
| GROOTPAN | 2/86 | NASMANUS | 132 |
| GROOTPAN | 3/86 | NASMANUS | 1/132 |
| GROOTPAN | 5/86 | NOOITGEDACHT | 1/94 |
| GROOTPAN | 6/86 | NOOITGEDACHT | 2/94 |
| GROOTPAN | 7/86 | NOOITGEDACHT | 4/94 |
| GROOTPAN | 10/86 | NOOITGEDACHT | 6/94 |
| GROOTPAN | 12/86 | ONVERWACHT | 97 |
| GROOTPAN | 13/86 | ONVERWACHT | 2/66 |
| GROOTPAN | 14/86 | ONVERWACHT | 1/97 |
| GROOTPAN | 15/86 | ONVERWACHT | 2/97 |
| GROOTPAN | 19/86 | ONVERWACHT | 3/97 |
| GROOTPAN | 20/86 | ONVERWACHT | 4/97 |
| GROOTPAN | 21/86 | ONVERWACHT | 5/97 |
| GROOTPAN | 23/86 | RIETVLEI | 2/62 |
| GROOTPAN | 24/86 | RIETVLEI | 3/62 |
| GROOTPAN | 25/86 | RIETVLEI | 4/62 |
| GROOTPAN | 26/86 | RIETVLEI | 6/62 |
| GROOTPAN | 29/86 | RIETVLEI | 7/62 |
| GROOTPAN | 30/86 | RIETVLEI | 8/62 |
| GROOTPAN | 31/86 | RIETVLEI | 9/62 |
| GROOTPAN | 32/86 | RIETVLEI | 11/62 |
| HAASFONTEIN | 1/85 | RIETVLEI | 12/62 |
| HAASFONTEIN | 4/85 | RIETVLEI | 14/62 |
| HAASFONTEIN | 5/85 | RIETVLEI | 15/62 |
| HAASFONTEIN | 6/85 | SCHAAPKRAAL | 2/93 |
| KORTLAAGTE | 67 | SCHAAPKRAAL | 3/93 |
| KORTLAAGTE | 1/67 | STREHLA | 10/261 |
| KORTLAAGTE | 2/67 | UITVLUGT | 1/255 |
| KORTLAAGTE | 3/67 | UITVLUGT | 2/255 |
| KORTLAAGTE | 4/67 | VAALPAN | 68 |
| KORTLAAGTE | 5/67 | VIERFONTEIN | 5/61 |
| KORTLAAGTE | 6/67 | VIERFONTEIN | 10/61 |
| KORTLAAGTE | 7/67 | VIERFONTEIN | 11/61 |
| KORTLAAGTE | 8/67 | VIERFONTEIN | 17/61 |
| KORTLAAGTE | 9/67 | VIERFONTEIN | 18/61 |
| KORTLAAGTE | 10/67 | VIERFONTEIN | 19/61 |
| KRUISEMENTFONTEIN | 1/95 | VIERFONTEIN | 20/61 |
| KRUISEMENTFONTEIN | 2/95 | VIERFONTEIN | 21/61 |
| MATLA POWER STATION | 141 | VIERFONTEIN | 22/61 |
| MOEDVERLOREN | 1/88 | VIERFONTEIN | 23/61 |
| MOEDVERLOREN | 2/88 | VIERFONTEIN | 26/61 |
| MOEDVERLOREN | 3/88 | VIERFONTEIN | 27/61 |
| MOEDVERLOREN | 4/88 | VIERFONTEIN | 28/61 |
| MOEDVERLOREN | 5/88 | VIERFONTEIN | 52/61 |
| MOEDVERLOREN | 14/88 | VIERFONTEIN | 53/61 |
| MOEDVERLOREN | 15/88 | VLAKPAN | 7/89 |
| MOEDVERLOREN | 20/88 | VLAKPAN | 8/89 |
| MOEDVERLOREN | 21/88 | VLAKPAN | 9/89 |
| MOEDVERLOREN | 22/88 | WELTEVREDEN | 10/307 |
| MOEDVERLOREN | 23/88 | WELTEVREDEN | 6/307 |

**Matla is negotiating with Anglo for a possible Land Swop, these properties will be discussed in more detail in the EIA when Anglo and Exxaro have agreed on the specific properties.**

**Farm Name:**

| Farm Name | No. | Portion |
|---|---|---|
| KORTLAAGTE | 67 IS | 1 |

| | | | |
|---|---|---|---|
| ***Properties associated with Phase 1 stooping*** | KORTLAAGTE | 67 IS | 10 |
| | RIETVLEI | 62 IS | 14 |
| | VIERFONTEIN | 61 IS | 27 |
| | VIERFONTEIN | 61 IS | 22 |
| | MATLA POWER STATION | 141 IS | 0 |
| | GROOTPAN | 86 IS | 23 |
| | GROOTPAN | 86 IS | 10 |
| | GROOTPAN | 86 IS | 29 |
| | GROOTPAN | 86 IS | 30 |

| | |
|---|---|
| **Application area (Ha)** | **Surface area of 3127ha of which the stooping area accounts to 232.17ha** |
| **Magisterial district:** | **Nkangala / Gert Sibande** |
| **Distance and direction from nearest town** | **South West of the town Kriel (Ga Nala)** |

**21 digit Surveyor General Code for each farm portion**

| Farm Name | No. | Portion | SG Code |
|---|---|---|---|
| KORTLAAGTE | 67 IS | 1 | T0IS00000000006700001 |
| KORTLAAGTE | 67 IS | 10 | T0IS00000000006700010 |
| RIETVLEI | 62 IS | 14 | T0IS00000000006200014 |
| VIERFONTEIN | 61 IS | 27 | T0IS00000000006100027 |
| VIERFONTEIN | 61 IS | 22 | T0IS00000000006100022 |
| MATLA POWER STATION | 141 IS | 0 | T0IS00000000014100000 |
| GROOTPAN | 86 IS | 23 | T0IS00000000008600023 |
| GROOTPAN | 86 IS | 10 | T0IS00000000008600010 |
| GROOTPAN | 86 IS | 29 | T0IS00000000008600029 |
| GROOTPAN | 86 IS | 30 | T0IS00000000008600030 |

## c) Locality map

(show nearest town, scale not smaller than 1:250000 attached as **Appendix 3).**

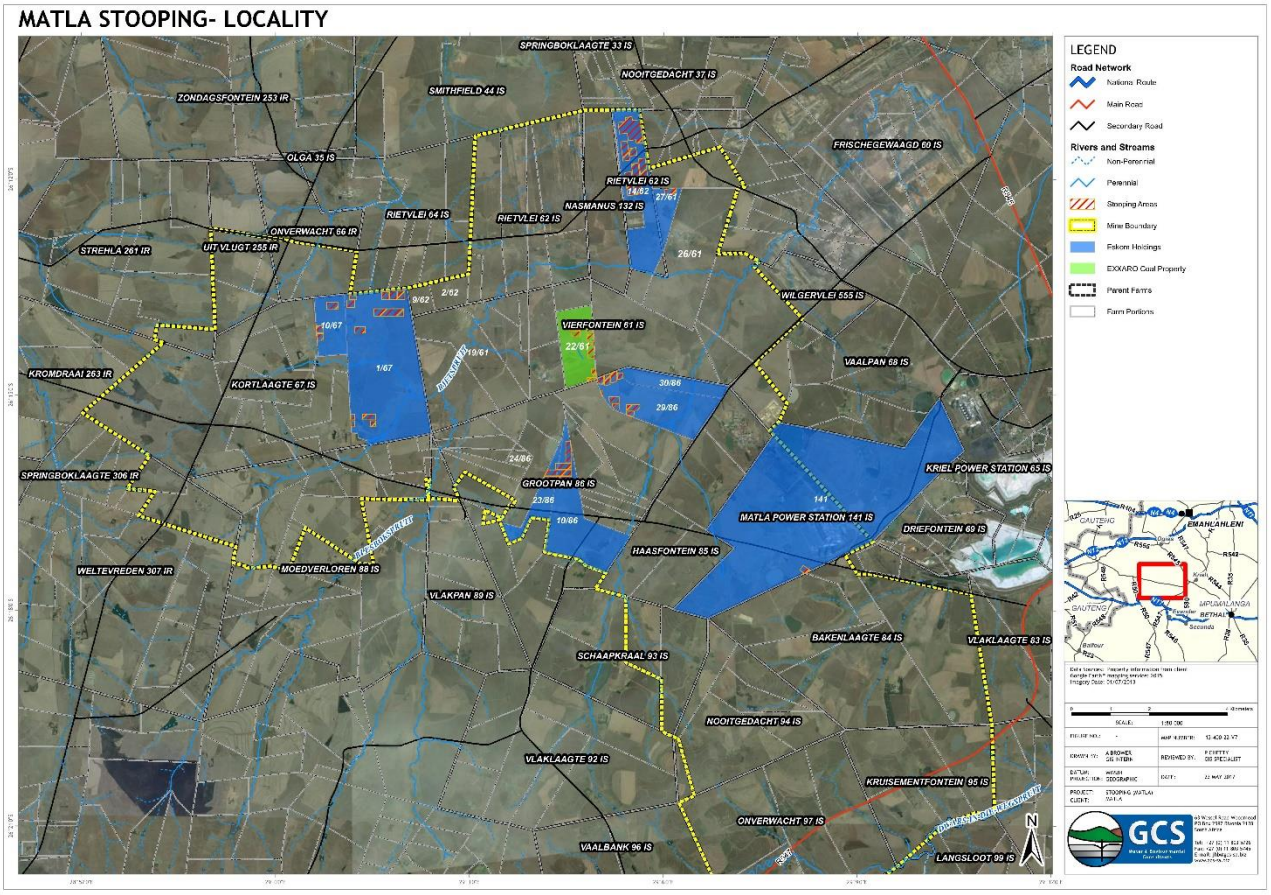



**Figure: 1: Locality map.**

Refer to **Appendix 3** for a larger map.

## d) Description of the scope of the proposed overall activity.

### i) Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**

| **Name of Activity** (E.g. For prospecting, - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc.) (E.g. For mining, - excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.) | **Aerial extent of the Activity Ha or m²** | **Listed Activity** (Mark with an **X** where applicable or affected) | **Applicable Listing Notice** (GNR 983, GNR 984 or GNR 985 as amended by As amended by GNR 324, GNR 326 and GNR 327 of 7 April 2017) |
|---|---|---|---|
| Rehabilitation of goafing areas, where areas are stripped of vegetation and topsoil, shaped and then topsoiled and re-vegetated. | 232 Ha | X | Activity 19 of GNR 983 |
| Application for an IWULA for activities triggered in terms of Section 21 of the NWA | 232 Ha | X | Activity 6 of GNR 984 |
| Rehabilitation of goafing areas, where areas are stripped of vegetation and topsoil, shaped and then topsoiled and re-vegetated. | 232 Ha | X | Activity 15 of GNR 984 |
| Stooping (mining of pillars) | 232 Ha | X | Activity 17 of GNR 984 |

### ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity

**1994 Mining Licence**

A mining licence was awarded to Matla Coal Limited, for the mining of Coal.

**Original EMP – 1997**

The original EMP was compiled for underground Bord and Pillar, Long- and Shortwall mining of approximately 9,45 million tonnes R.O.M. per annum. At the time of the compilation of this EMP Matla has already been in operation for over twenty (20) years.

The Mine consists of a crushing and screening plant, workshops offices and shaft complexes. Processing is limited to the crushing and screening of the run of mine coal to produce a sized product. Rocks removed from the run of mine product are put onto a discard dump and the product is sent to Eskom via conveyor belts. Matla has recently included an air jig plant at Mine 3 as an addition to their beneficiation process in order to conserve water on site. This does not change the process, it simply makes the plant more water efficient.

The waste material, consisting of sandstone and carbonaceous shale, were dumped in heaps on the dump. An additional berm wall had been constructed +300m from the dump on the western side in order to divert all polluted run-off resulting from the dump into two big pollution control dams. These dams were designed by civil engineers and they have clay linings up to the sandstone layer.

At No 1 Mine, all raw sewage is pumped directly to Matla Power Station for treatment. At No's 2 and 3 Mines all the domestic waste water is piped to the individual sewage plants consisting of, activated sludge type with an aeration ditch, clarifier and drying beds with chemical dosage of chlorine chips and feri-chloride. Water from the workshops flow via oil separators into the settling pond. Treated sewerage is then pumped to the Spruit

The solid domestic waste was dumped on the rock dump. This was however not the long term management plan for the Mine's domestic waste. A contractor has been appointed and all domestic waste is sent to Middelburg domestic waste site and hazardous waste is sent to Holfontein landfill.

At Mine 1 polluted surface run-off water is channeled into settling dams via oil separators. The overflow of these dams flow into an evaporation dam. Negligible underground water is pumped to surface. At Mine 2 excess underground water is pumped into a large evaporation dam. Emergency facilities exists by means of a farmers pan. Cut-off drains around the shaft complex divert the clean run-off water directly into the spruit. Excess underground water is pumped into proposed settling ponds at Mine 3.

**EMP Amendment – 2006**

Matla Coal applied for authorisation to extract coal from the No. 5 seam horizon at E'Tingweni Mine, using conventional board and pillar mining (drill and blast). This coal was produced for use in both the local and export markets. Construction of the box cut at E'Tingweni Mine for auger mining was initiated during August 2000. The box cut was completed and experimental auger mining was undertaken in the area. The pre-feasibility phase had shown positive results and resulted in the need for Matla Coal to amend its EMPR in order to start mining the No. 5 seam.

Construction of an access shaft, a crushing and screening plant, stockpiles and 2 new settling dams were planned at E'Tingweni Mine. Recycling of mine water at Mine 2 was proposed, as was the construction of a river diversion at Mine 3.

Matla Coal further applied to extend the total extraction currently being undertaken at Mine 3, towards the north central area, which necessitated a river diversion. A rock dump was constructed at Mine 1 in order to cater for the additional waste rock produced at both Mine 2 and Mine 3. The mining method of total extraction was extended to allow the mining of a new block in the north-west corner of the No. 2 seam.

Matla Mine 1 is an underground bord and pillar mine, which mines the 4 seam. Matla Mine 2 utilises both bord and pillar and total extraction coal mining methods to mine the 2 seam. Total extraction of a wall in the north-east area was underway, but bord and pillar mining is utilised in that area if required. A wall in the north-west area is also mined using a combination of both methods. Matla Mine 3 previously utilised bord and pillar method coal mining to mine the 4 seam.

**EMP for Mine 1 New Shaft – 2009**

Matla Coal applied for authorisation for a new shaft for Mine 1 to access the coal reserves that are located within the approved mining right area. A proposed new overland conveyor system would deliver the coal to the infrastructure at the Matla Coal Plant.

Infrastructure associated with the project included the following:

- An incline shaft to provide employees access to the underground workings and to convey coal to the surface
- A vertical ventilation shaft
- Office complex with change house and parking
- A helicopter landing pad
- Workshops and consumable store
- Sewage treatment plant
- Wash bay
- Storm water management structures
- Pollution control structures
- Potable water pipeline from Matla Power Station
- Potable water reservoir and pump house
- Electricity supply from the Matla Power Station
- Electrical substation
- Access roads
- Three additional vertical ventilation shafts that will be developed approximately 3 km south-west of the Matla 1 new access shaft site
- Coal silos
- Crusher and screening plant
- Overland conveyor

This Environmental Management Programme (EMP) amendment was undertaken to meet the requirements of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (hereafter referred to as the MPRDA), which replaced the Minerals Act. The Environmental Impact Assessment (EIA) process for mining as laid out in the MPRDA was followed during the compilation of the 2009 EMP Amendment.

## EMP for the Water Treatment Plant (WTP) – 2012

During 2011 – 2012 Mala coal applied for authorisation for the construction of a Water Treatment Plant (WTP). Initially a site selection study was conducted with regards to the most preferred option for location of the water treatment plant and brine ponds in terms of engineering and cost effectiveness by Digby Wells and Associates in December 2010. The assessment was conducted for seven (7) proposed sites. Site 7 was selected as the most ideal option for the location of the water treatment plant and non-discharge brine disposal ponds followed by two alternative sites, namely Sites 1 and 2 (please refer to Figure 1-1). The three (3) sites that ranked favourable for the establishment of the proposed development were investigated by specialists at a desktop level.

During a meeting held at the Exxaro head office on 27 July 2011, the Exxaro project team stated that underground flood events occurred at Matla Coal. During this meeting it was decided by the project team to go ahead with the establishment of the water treatment plant on Site 7. The urgency of establishment of the WTP was highlighted by the Exxaro team, due to the potential risks to Health and Safety aspects of the employees of the colliery, should another flood event occur. For this reason, the outcomes of the Site Selection Study for the three preferred options were not taken into consideration as part of the decision making process in selecting Site 7.

The initial Environmental authorisations were approved in June 2012, where after an amendment to the initial EMP was submitted and approved in October 2013.

## Application for the inclusion of Stooping

This Section describes the proposed mining method, and associated activities for the proposed extension of mining.

Matla proposes to stoop (or totally extract) pillars at the previously underground mined areas with the intent to reclaim the remaining coal reserves by using the conventional board and pillar mining method (drill and blast).

The reclamation of the remaining coal reserves will utilise the existing current operations' infrastructure.

### Mining process

Stooping of pillars or retreat mining is a term used to reference the final phase of an underground mining technique known as room and pillar mining. This involves excavating a room or chamber while leaving behind pillars of material for support. This excavation is carried out in a pattern advancing away from the entrance of a mine. Once a deposit has been exhausted using this method, the pillars that were left behind initially are removed, or 'pulled', retreating back towards the mine's entrance. After the pillars are removed, the roof (or back) is allowed to collapse behind the mining area (**Error! Reference source not found.**).

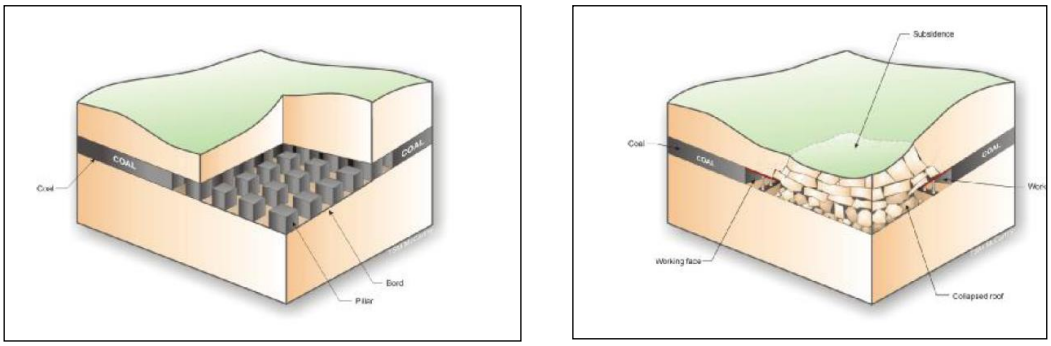



**Figure 2: Stooping illustrated**

Pillar removal must occur in a very precise order in order to reduce the risks to workers, due to the high stresses placed on the remaining pillars by the abutment stresses of the caving ground.

## e) Policy and Legislative Context

| **APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT** (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process); | **REFERENCE WHERE APPLIED** |
|---|---|
| **NEMA** | **Throughout document** |
| **MPRDA** | **Throughout document** |
| **NWA** | **Throughout document** |

## f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The proposed project/activity will result in extension of the life of mine with additional six (6) years. The additional coal resources will supply Eskom with coal for power generation. The activity will also impact positively on the local as well as regional economy. Should the stooping be approved, and the life of mine increased, the district municipality will continue to benefit from the mining operations. In addition the proposed activity will have less impacts in the environment as it is to be situated in an area already zoned for mining activities and already impacted by mining.

The LOM extension will ensure:

- Employment opportunities for a further six (6) years. With the increase in job cuts in the mining sector at present, job security is of vital importance;
- Continued positive impact on the local economy; and
- Continued coal supply to Eskom's Matla Power Station for power generation.

## g) Period for which the environmental authorisation is required

The environmental authorisation will be required to accommodate both the operation and decommissioning phases of the mine.

## h) Description of the process followed to reach the proposed preferred site.

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

### i) Details of all alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;

(b) the type of activity to be undertaken;

(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Several alternatives as assessed are discussed below.

## Project Alternative

### Mining Method alternative

Alternatives considered for mining method of the stooping of pillars are briefly discussed in the section below.

*Stope and fill*

Where large bulk ore bodies are to be mined at great depth, or where leaving pillars of ore is uneconomical, the open stope is filled with backfill, which can be a cement and rock mixture, a cement and sand mixture or a cement and tailings mixture. This method is popular as the refilled stopes provide support for the adjacent stopes, allowing total extraction of economic resources.

This method is not preferred due to it being economically unviable due to the material required for filling.

*Development of Open Cast Pits*

*Advantages of Opencast mining.*

Open-pit mining (as opposed to underground mining) has several advantages:-

- Low cost of recovery - large trucks can enter the mine, get filled up with rock from a large excavator and drive away to the processing plant.
- No need to leave stability pillars, necessary to hold up underground mine workings but which may contain valuable ore that is effectively lost to the mining company.
- Ease of beneficiation - surface mines are usually composed of materials (oxides in the case of metalliferous mines) that are easier to handle and easier to treat in order to recover their marketable product as a result of being so close to surface.
- Safer environment - so much less problem of rock falls, hanging wall collapse resulting in a lower injury rate than in underground mine.

However the areas proposed to be stooped, are too vast for the development of opencast pits, and would prove economically non-viable.

In addition, this method will have a greater impact on the biophysical environment. As with all forms of large-scale mineral extraction, opencast mining can have a negative impact on the surrounding environment and ecosystems. The removal of the overburden destroys the pre-existing landscape and contributes to erosion. Even after final rehabilitation of the pits have been completed, the geology of the area is completely destroyed, which will cause ongoing issues, especially in terms of decant water.

### Site Alternatives

*Preferred Site*

Since the Matla Coal is already in existence, and the proposed stooping project will be a reclaiming of the remaining coal reserves within the existing operations, no other site alternatives to the proposed site (the existing property) were considered. The advantage of this expansion is that no new additional properties will be disturbed on the surface, reducing potential environmental impacts.

**No-Go Alternatives**

If the mining operation were not to proceed, the potential environmental impacts associated with mining is not expected to occur, and the continued impacts associated with current agricultural and livestock grazing practices would continue.

If the mining operation were to proceed then the proposed project would have the following anticipated positive social impacts:

- Increase the longevity of the mine, enabling long term employment opportunities;
- The continued contribution to the local municipal tax base;
- The continued involvement of Matla Coal with regards to training and capacity building of its employees and subsequent improvement of the livelihoods of the employees' families; and
- The commitment of Matla Coal with regards to social development project and support.

If the proposed mining operation does not proceed, then all the potential positive benefits, as described, would not materialise.

### ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The Public Participation Process (PPP) will be initiated once the NEMA Application is accepted by the DMR. The section below details the PPP to be undertaken during the Scoping Phase of the proposed project. The PPP will be undertaken as set out in the NEMA EIA Regulations.

**Advertisements**

In terms of the EIA Regulations, advertisements (in English) will be placed in one (1) local and one (1) regional newspaper. Advertisements will be placed during the following phases of the project:

- Project Initiation/Commencement (following receipt of the Reference Number from the DMR) to inform of the Public Meeting ESR Phase.

**Site Notices**

In terms of the EIA Regulations it is compulsory that site notices be placed on the boundary of the property on which the activity is proposed to take place. Site notices will be erected at appropriate locations on the site. These site notices will be printed on an A2 size poster and laminated.

A map showing to location of the site notices will be included with the Final ESR report.

**Written Notifications and Background Information Documents**

Written notification in the form of registered letters, facsimiles, and/or electronic mail will be utilised for notification purposes. Such written notifications will be utilised to notify registered stakeholders/Interested and Affected Parties (I&APs) of the following phases of the project:

- Project initiation and commencement during the Environmental Scoping Phase; and
- Notification of public meetings.

A Background Information Document (BID) will be provided to the stakeholders/I&APs which contained the basic facts about the proposed project. The BID will include as a minimum, the following information:

- A project description;
- A locality map;
- An outline of the environmental process being followed;
- The details of the public consultation process; and
- The contact details of the appointed Environmental Assessment Practitioner (EAP).

BIDs will also be distributed to potential stakeholders/I&APs by hand and by placement in a public venue for access to stakeholders/ I&APs that had not registered as yet. The BID will be produced in English.

**Public Meetings**

A public meeting will be undertaken in order to ensure a comprehensive understanding of the proposed project by all stakeholders/I&APs and to address all comments and concerns raised. Throughout the PPP all issues, concerns and comments raised by stakeholders/I&APs will be documented in an Issues and Response Register (IRR).

Refer to **Appendix 5** for the PPP documentation.

### iii) Summary of issues raised by I&Aps

(Complete the table summarising comments and issues raised, and reaction to those responses)

| Interested and Affected Parties<br>List the names of persons consulted in this column, and<br>Mark with an X where those who must be consulted were in fact consulted. | | Date Comments Received | Issues raised | EAPs response to issues as mandated by the applicant | Consultation Status (consensus dispute, not finalised,etc) |
|---|---|---|---|---|---|
| **AFFECTED PARTIES** | | | | | |
| Landowner/s | X | None to date | None to date | None to date | Consultation to be initiated |
| Lawful occupier/s of the land | X | None to date | None to date | None to date | Consultation to be initiated |
| Landowners or lawful occupiers on adjacent properties | X | None to date | None to date | None to date | Consultation to be initiated |
| Municipal councillor | X | None to date | None to date | None to date | Consultation to be initiated |
| Municipality | X | None to date | None to date | None to date | Consultation to be initiated |
| Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e | X | None to date | None to date | None to date | Consultation to be initiated |
| Communities | X | None to date | None to date | None to date | Consultation to be initiated |
| Dept. Land Affairs | X | None to date | None to date | None to date | Consultation to be initiated |
| Traditional Leaders | X | None to date | None to date | None to date | Consultation to be initiated |
| Dept. Environmental Affairs | X | None to date | None to date | None to date | Consultation to be initiated |
| Other Competent Authorities affected | X | None to date | None to date | None to date | Consultation to be initiated |
| **OTHER AFFECTED PARTIES** | | None to date | None to date | None to date | None to date |
| **INTERESTED PARTIES** | | None to date | None to date | None to date | None to date |

## iv) The Environmental attributes associated with the sites

## (1) Baseline Environment

### (a) Type of environment affected by the proposed activity.
(its current geographical, physical, biological, socio- economic, and cultural character).

## Geology

Regional Geological setting

The underlying geology of the study area is typical of the coalfields on the Mpumalanga Highveld, and is dominated by sandstones and shales of the Karoo Sequence (Vryheid formation). Recent alluvial deposits occur along the larger drainage line that traverse the area, while small isolated outcrops of medium-grained porphyritic granite occur immediately to the north of sites 1 and 2. The sandstones typically weather to form sandy soils that are allow easy infiltration of rainwater and limit runoff (only 4.7 % of rainfall ends up as runoff), and which are conducive to the formation of extensive hillslope seepage wetlands in those areas where an aquitard (i.e. an impermeable layer, e.g. sandstone or a plinthic layer) creates perched water tables. Pans are also common in the area.

Currently the area surrounding the sites is used extensively for agricultural purposes; mostly dry land cultivation of maize, but also livestock grazing. Extensive mining activities also take place within the general area, both opencast and underground mining.

The Karoo Supergroup in the Matla area comprises the Eco Group and the Dwyka Formation. The Ecca sediments consist predominantly of sandstone, siltstone, shale and coal. Combinations of these rock types are often found in the form of interbedded siltstone, mudstone and coarse-grained sandstone. The Ecca sediments overlie the Dwyka Formation (loosely referred to as the Dwyka tillite). The latter consists of a proper tillite, sandstone and sometimes a thin shale development. The upper portion of the Dwyka sediments may have been reworked, in which case carbonaceous shale and even inclusion of coal may be found. The Dwyka sediments are underlain by felsitic rocks of the Bushveld Complex.

Presence of Dykes, Sills and Faults

Tectonically, the Karoo sediments are practically undisturbed. Faults are rare; however, fractures are common in rocks such as sandstone, and coal.

Dolerite intrusions, in the form of sills or dykes, cause various mining problems, i.e. devitalized coal, weakened roof strata and/or displaced coal seams. The intrusion of a sill in the Mine 1 area caused extensive devolatisation of the overlying 2 Seam, resulting in the exclusion of Mine 1, 2 seam from mineable reserves. Pressure on the overlying strata, due to the intrusion, resulted in two intersecting joint patterns, which generally have a NE - SW and NW - SE strike respectively. Dolerite from the underlying sill intruding the overlying strata through the joint patterns resulted in a high frequency of dykes in the Mine 1 area.

In the Mine 2 underground short wall mining area there are almost no intrusions, except for one small dyke, and this therefore affords Matla Coal the opportunity to utilise underground short wall mining methods.

Underground Mine Geology / Coal Distribution

The coal deposit at Matla forms part of the Highveld Coalfield. The coal seams are found within the Vryheid Formation of the Karoo Super group. The stratigraphic sequence within the Matla area includes five coal seams that are numbered from the bottom upwards from 1 to 5. Economic reserves are found in the 2 seam, 4 seam (lower) and the 5 seam. The seam depths vary but are on average as follows:

- 5 Seam: - 35 to 50 m below surface;
- 4 Seam: - 75 to 85 m below surface; and
- 2 Seam: - 100 to 120 m below surface.

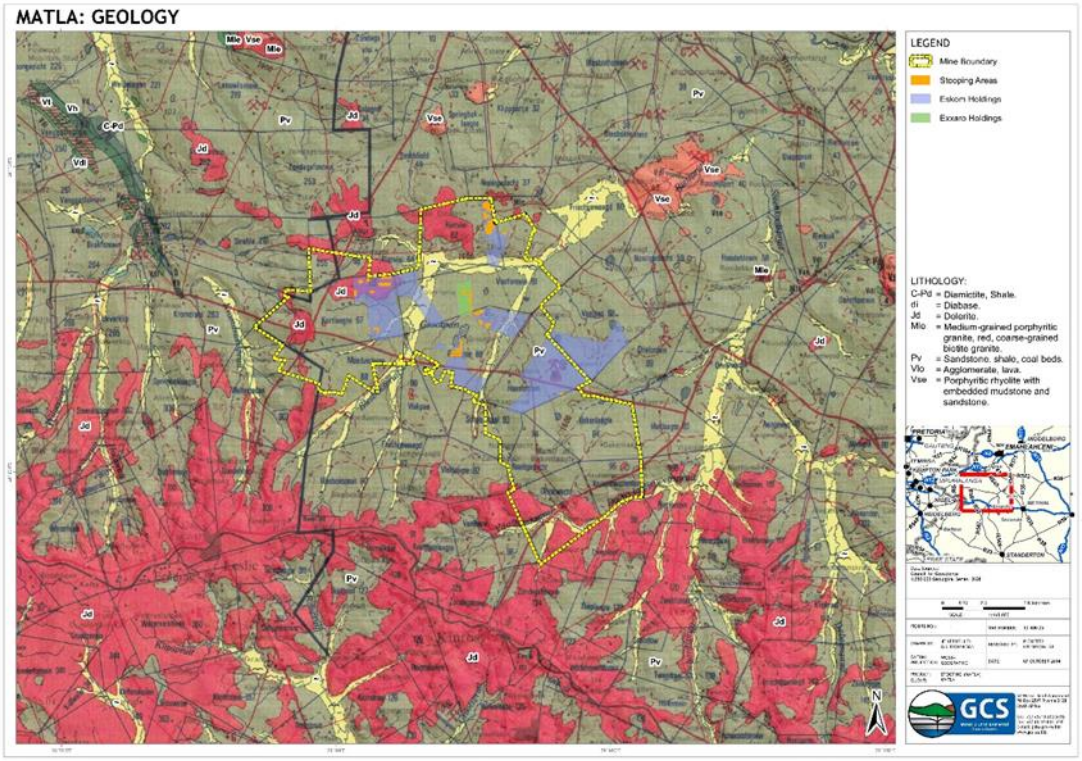



**Figure: 3: Matla Geological Map**

## Topography

The surface elevations within the Matla Coal mining area lies between 1 565 to 1650 mamsl, and the area consists of gently rolling hills and valleys draining toward the north. The slope of the area varies between three to eight percent (3 % - 8 %) and between zero to three percent (0 % - 3 %). The slope length varies from 500 meters to 1000 meters and the slope shape varies from convex to concave. In various areas, the topography has been altered due to surface subsidence of undermined areas, which in some places has resulted in the formation of ponds and wetlands.

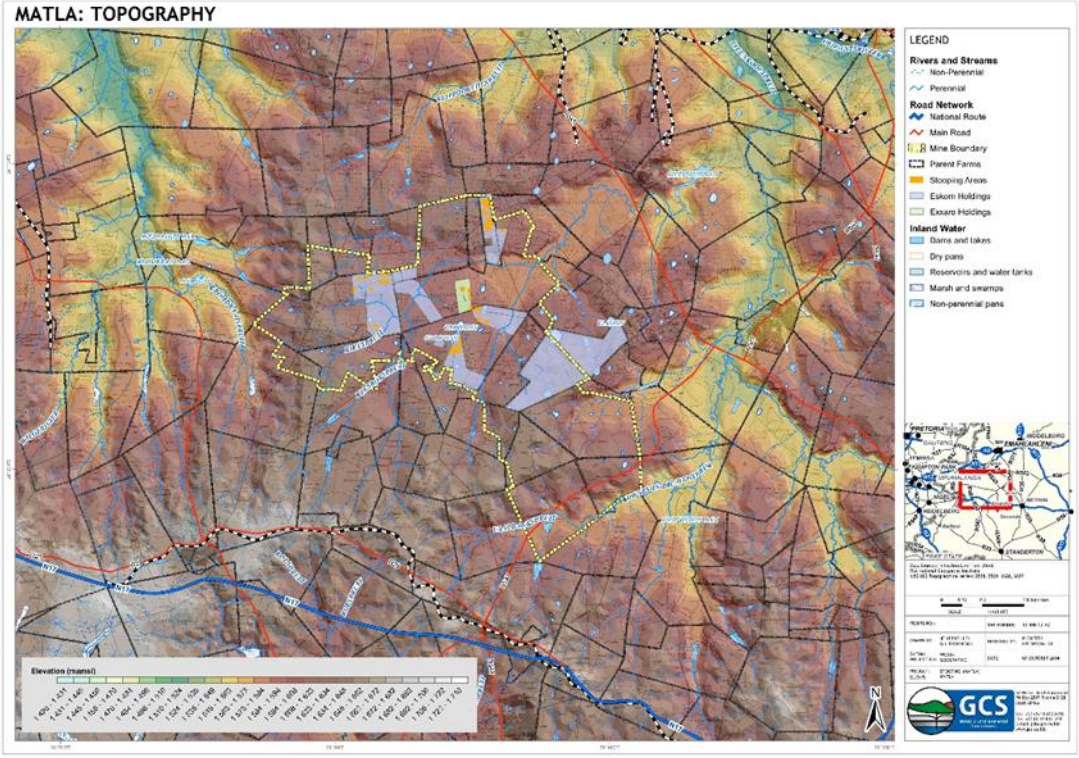



**Figure: 4: Topography of the study area**

## Climate

Regional Climate

The climate is a typical Highveld climate and is generally dry with moderate summers and cold winters. The mean monthly and mean annual rainfall is 59 mm and 711 mm respectively. The maximum rainfall intensity measured over a 24-hour period, as measured at Kriel Police Station in 1955, is 205 mm. The mean monthly wind direction is north-west, whilst the mean monthly wind speed is approximately 4.4 m/sec. The Kriel area has the following features (Shultze, 1974):

- Warm to hot summers with average temperatures being 27ºC, extremes of up to 35ºC are sometimes encountered;
- Cold winters with average temperatures being 15ºC, extremes of up to –10ºC are sometimes encountered;
- Drought periods during the rainy season are frequent to occasional;
- 0 - 9 rain days per month may be expected;
- Low lying topographical areas experience heavy mist from April to September;
- Hail occurs on average 2.8 days per annum; and
- Frost occurs from 120 - 150 days per annum from April to September.

Information on climatic conditions prevailing in the vicinity of Matla Coal has been obtained from the South African Weather Services and mine records.

Temperature

Temperatures in the vicinity of the mine are warm to hot during summer and cold in the winter. Mean temperatures vary from 26ºC in the summer to 15ºC in the winter.

**Table 1: Rainfall in the Matla Coal Region**

| Month | Average Daily Maximum Temperature (ºc) | Average Daily Minimum Temperature (ºc) |
|---|---|---|
| January | 25.6 | 13.8 |
| February | 25.2 | 13.2 |
| March | 24.6 | 11.8 |
| April | 21.8 | 8.6 |
| May | 19.5 | 4.4 |
| June | 16.5 | 0.8 |
| July | 17.1 | 1.0 |
| August | 19.9 | 3.8 |
| September | 23.2 | 7.5 |
| October | 23.9 | 9.9 |
| November | 24.0 | 11.8 |
| December | 25.3 | 13.1 |
| *Annual* | *22.2* | *8.3* |

Monthly and Annual Rainfall

The annual average precipitation at Matla Coal is relatively low and variable. Annual rainfall values range from 550 mm– 800 mm with an average of approximately 754 mm per annum.

Most precipitation occurs over the period November to January with an average of approximately ninety (90) rain days per annum. Rainfall over the period May to September is generally low or absent, with a noticeable increase in the months of October to April. Rainfall events in the region occur mainly in the form of thunderstorms and heavy showers.

Extreme Conditions

Rainfall and temperature extremes are indicated in Table 2. The highest recorded rainfall event over a 24-hour period was 205 mm on 24 December 1995. The highest monthly average rainfall was reported in 1983, and was recorded as 287 mm. The highest temperature recorded at the Matla Coal was 34.4ºC in 1983 and the lowest daily maximum was -9.2ºC in 1964.

**Table 2: Rainfall and Temperature Extremes in the Matla Coal Region**

| Condition | Parameter | Recorded Extreme Values |
|---|---|---|
| Rainfall | Maximum In 24 Hours | 205 mm (1955/12/24 ) |
| | Highest Monthly | 287 mm (1983) |
| Temperature | Highest Daily Maximum | 34.4ºC (1983) |
| | Lowest Daily Maximum | -9.2ºC (1964) |

## Soils

Soil Classification

The major soil forms encountered include those of the orthic phase, Hutton, Clovelly, Griffin, Glenrosa, and Man Made Soils along with the hydromorphic forms, including the Pinedene, Avalon, Bonheim, Bloemdal, Westleigh, Rensburg, and Kroonstad. The overall soil types defining the area are of sandy-clay to loam and sandy-clay to clay nature.

*Hutton(Hu)*

The Hutton Form soils mapped comprise predominantly fine grained sandy, to silty loams or fine to medium grained sandy clay loams, varying from those with a single grained structure, to those with an apedal structure. These soils generally returned pale red brown to yellow red colours in the topsoils, and fine to medium grained sandy, and silty clay loams, with dark orange reds and dark red colours in the sub soil horizons. The relatively high magnesium and iron content of the parent rocks from which these soils are derived, impart the strong red colours noted. Clay contents generally vary from as low as 10 % to 15 % in the sandy topsoils. In the topographically lower lying areas, the high clay contents are associated with the colluvial-derived material, generally associated with the wetland areas, and flood plain environments. The subsoil clay percentages range from 25 % to 35 % depending on the position that they occupy in the topographic sequence.

In almost all cases mapped, the soils classify as having a mesotrophic leaching status and are generally luvic in character. This implies that the soils are only moderately leached (as evidenced by their red colours), and have formed in-situ. These soil forms generally occupy the upper and upper midslopes and are most often found in association with the Griffin and Clovelly Form soils. Effective rooting depths vary from 800 mm to 1,000 mm.

Chemically, these soils are of the more productive soil forms in the area, the dominant nutrients returning moderate reserves of calcium (Ca) and magnesium (Mg), with lower than required reserves of sodium (Na) and potassium (K) for most economical agricultural activities. Additions of fertilizers are required if economically sustainable farming is to be undertaken on a long-term basis.

*Clovelly (Cv) and Griffin (Gf)*

Soils of the Clovelly and Griffin Form have very similar characteristics to the Hutton Form described above, and are generally derived from the same parent materials within the same lithological sequence. The physical characteristics of these soils mapped vary in nature, from those with a very fine to medium grained sandy and / or silty loam, with pale grey brown to yellow brown colours and a single grained orthic topsoil ("A" horizon), on a yellow to yellow/red dystrophic "B", to those with a more clay rich sandy clay loam, displaying much darker yellow reds and less leached colours. These soils exhibit a predominantly dystrophic leaching status and luvic characteristics.

Generally, these soils were noted to interface directly on a hard rock contact with only a thin saprolitic layer. This phenomenon is due mainly to the horizontal or sub horizontal bedding of the sandstone parent material from which they are derived. These sandy to sandy-clay loams are confined predominantly to the midslope and lower midslope positions, and evidence a thin plough pan layer at approximately 150 mm to 400 mm, an indication of the depth to which the soils have generally previously been compacted.

The effective rooting depths vary from a minimum of 200 mm to 600 mm where they are inhibited by physical or chemical barriers. Compaction and erosion are physical hazards to be aware of, and catered for, when working with these soil types. Chemically, these soils returned results similar to the Hutton soils described above.

*Pinedene (Pn) and Avalon (Av)*

The Pinedene and Avalon Forms mapped fall within the "hydromorphic" category of soils as classified. These soils are generally found associated with, and down slope of the dry, sandy loams and sandy clay loams (Clovelly, Hutton and Griffin Form soils), and form the transition zone of the moist grasslands.

Chemically, these soils (characteristics are similar within these same forms) are moderately well leached returning significantly lower amounts of calcium (Ca) and magnesium (Mg) as well as sodium (Na), potassium (K) and phosphate (P). The leaching of the nutrients from these soils is significant, and the pale colours are evidence of the movement of water within the profile.
By definition, these soils vary in the degrees of wetness at the base of their profile, i.e. the soils are influenced by a rising and falling water table, hence the mottling within the lower portion of the profile, and the pale background colours.

Depths of utilisable agricultural soil (to top of mottled horizon) vary from 200 mm to 800 mm. The deeper rooting depths (>600 mm) are considered potentially utilisable soils, with those less than 400 mm being considered to have a wilderness capability. In general, these soils are high in transported clay in the lower "B" horizon with highly leached topsoils and pale denuded horizons at shallow depths. The nutrient status is generally low.

These soils will be more difficult to work due to the wetness factor, both during the mining operation, as well as on rehabilitation. Compaction is a problem to contend with if these soils are to be worked during the wet months of the year. Stockpiling of these soils should be done separately from the dry soils, and greater care is needed with the management of erosion problems during storage. Any strong structure that develops during the stockpiling stage will need to be dealt with prior to the use of this material for rehabilitation. Royalty

*Glencoe (Gc)*

The Glencoe soil forms are confined to the lower slope positions slightly upslope of the Avalon and Westleigh Form soils. These soils are characterised by a hard plinthic (ouklip) layer at the base of the profile, and are classified as wet soil types. It should be noted however that these soil forms are often found in mid, and in some cases, upper midslope positions, as residual or old land forms.

Physically these soils returned fine to medium grained, pale red to brown, apedal structure in the topsoils (“A” horizon), with moderate to low clay contents (6 % – 12 %) and moderate to low water holding capabilities (40 – 60 mm/m). The subsoils are generally pale yellow / red to pale red in colour, returning moderate clays (12 % – 22 %), fine to very fine-grained sand fractions, with a concretionary layer at the interface between the “B” horizon and the hard plinthic “C”. Chemically, the soils are similar to the Avalon and Pinedene soil forms described already. Hazards to be managed on these soils include the impeded drainage caused by the hard plinthic layer, compaction in the wet state, and erosion.

*Kroonstad (Kd)*

The Kroonstad Forms are found associated exclusively with the wetland and vlei areas alongside the rivers and around the prominent pan features. The hydromorphic nature of these soils renders them highly susceptible to compaction and erosion. Re-working of these soils for rehabilitation purposes will need to be undertaken during the dry months of the year, and will require that the structure is broken down if these soils are to be used for topdressing of areas prior to replanting.

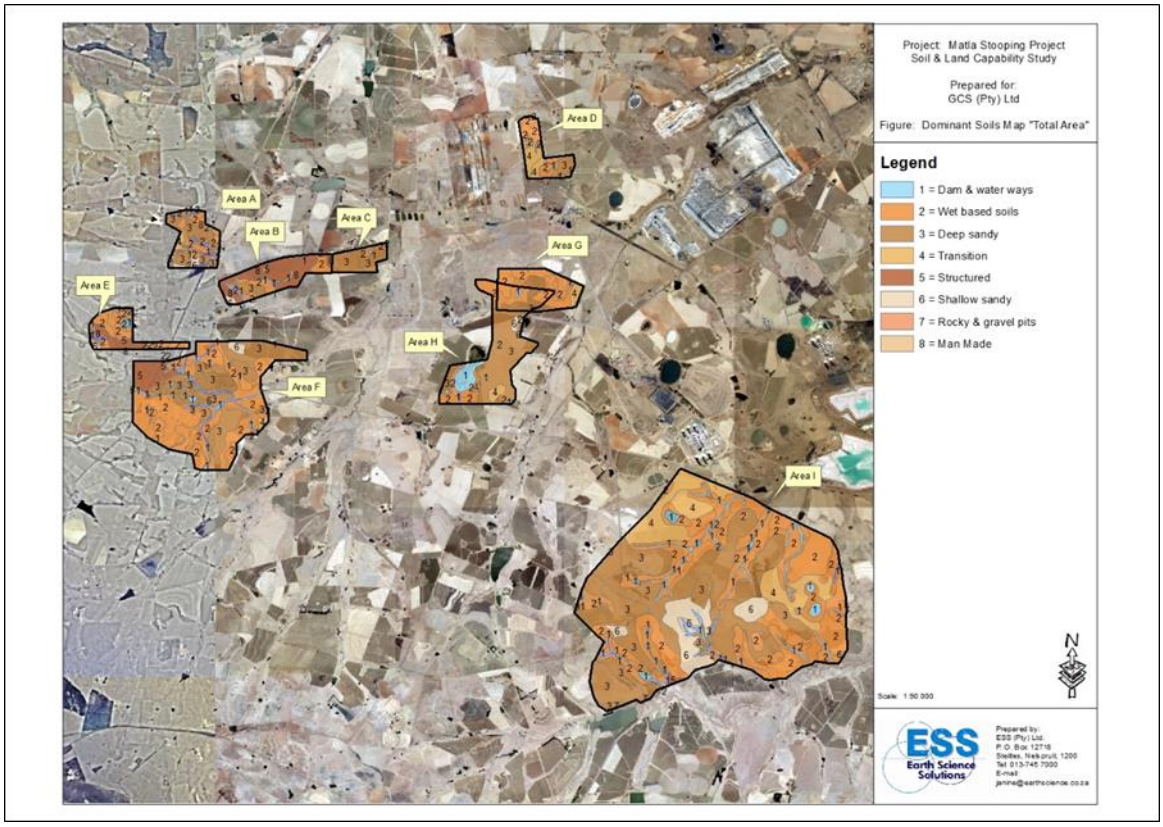



**Figure: 5: Soils of the study area**

## Land Capability

*Arable and Grazing*

The land capable of sustaining arable crop production will require the utilisation of the deep well drained, red (Hutton) and yellow-brown (Clovelly) soils that occur on the midslope and upper midslope positions. In addition, there are some of the deeper hydromorphic soil forms that are capable of sustaining agricultural crop production, if good management practices are employed. The more structured and shallow hydromorphic soils are not considered to be arable soils under the classification.

The areas that classify as grazing land are generally confined to the shallower and transitional zone, 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 subsoils (at a depth of 500 mm) are periodically saturated. In addition, there should be no rocks or pedocrete fragments in the upper horizons of any of the soil groups. If present, these would limit the land capability to wilderness land.

The soils that overlie the area that is proposed for development are influenced to a great extent by the parent materials from which they are derived, the climatic conditions and their position in the topography. With a

moderately flat to undulating topography and wide open drainage channels associated with the valley bottom, the lower slopes are associated with a moderately wide transition zone between the wet based soils that characterise the floodplains and the relatively much drier soils that make up the lower midslopes, midslopes and crest slopes.

In general, the crest slopes are relatively shallow and rockier, while the lower midslopes are characteristic of the colluvial environment with accumulation of eroded material from upslope and are dominated by much deeper materials.

In summary, the initial indications from the desktop study and walk over scoping investigation are that the majority of the soils that occupy the valley bottom are of an alluvial nature, relatively young soils with all of the aspects associated with immature materials, while the lower midslopes are dominated by colluvial and transported soils and in-situ materials. In contrast, the midslopes and upper-midslopes to crest positions are dominated by erosive conditions resulting in much shallower soils and a rockier environment.

In general, the soils that will be affected can be grouped into those that have a wetness characteristic and those that do not. These are extremely significant differences that will need to be mapped out in detail, and the different materials will need to be kept separate for rehabilitation purposes.

The soils of the alluvial plains are generally higher in dispersive clays, have a lower in-situ permeability with a resultant higher water holding capability and poor drainage characteristics, have a relatively large proportion of wet based to wetland soil forms, and are of the more difficult materials to handle. In contrast, the upper slopes and crest slope environments are characterised by shallow soils that are better drained and have a more friable texture.

The midslope and lower midslope positions are more complex and relatively more sensitive to impact due to their susceptibility to erosion and compaction. The duplex nature of some of these soils renders them extremely venerable to erosion once the vegetation and topsoil's have been removed. These soils will need to be mapped in some detail where they are going to be disturbed.

The majority of the dryland soils are likely to return Eutrophic to mesotrophic characteristics (low rainfall area with variable climatic conditions) with sandy loams and sandy clay loams textures that are dry, friable and have moderately well drained profiles. At best these soils have moderate water holding capabilities. In contrast, the colluvial and wet based (plinthic and gleyed) soils are likely to comprise significantly greater percentages of clay, varying greatly in composition, with both swelling (smectite) and non-swelling forms, strong to extremely strong structure (strong blocky to massive), with associated degrees of high water holding capabilities and poor drainage characteristics.
Some of the more common soils that are typical of these conditions include:

- The orthic phase dry, sandy to sandy clay loams (Hutton, Clovelly, deep Glencoe and Avalon, Pinedene, Bainsvlei, Valsrivier and Griffin Forms), along with the more obvious hydromorphic soils, including such

forms as the shallow Glencoe, Avalon, Westleigh, Dresden, Longlands, Sepane, Kroonstad and Katspruit, with the extreme cases of gleyed Rensburg Form.

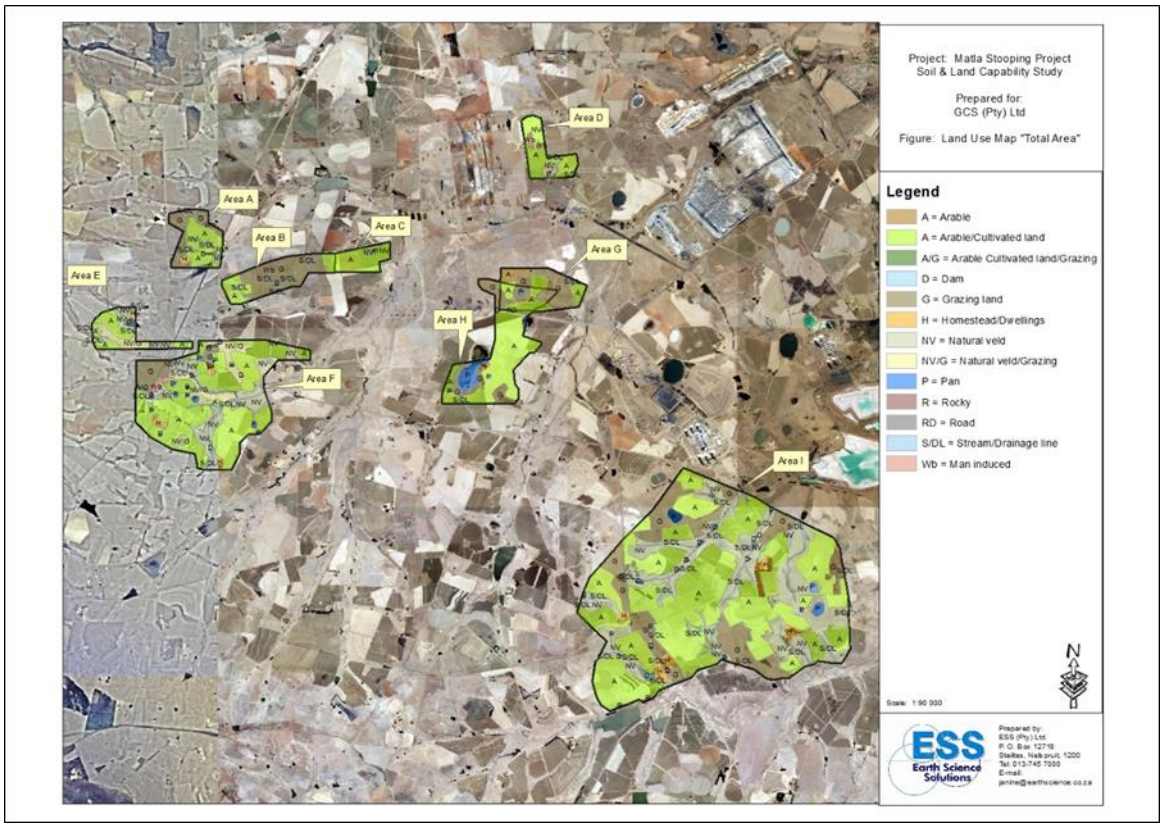



**Figure: 6: Land Use of the study area**

## Biodiversity

### Fauna

It is important to view the study area on an ecologically relevant scale; consequently, all sensitive animal species (specific faunal groups) known from Mpumalanga are included in this assessment. Detailed regional and scientific data on all faunal groups are lacking (notably for most of the invertebrate groups) and as a result only data sets on specific faunal groups allow for habitat sensitivity analyses based on the presence/ absence of sensitive faunal species (Red Data species) and their specific habitat requirements.

Ten Red Data butterflies are known inhabitants of Mpumalanga, nine of which are not known from the southwestern parts of Mpumalanga in which the study area is located. The Marsh Sylph (Metisella meninx), is considered to have a high probability of occurring in the study area.

Five Red Data frogs are known from Mpumalanga Province, only two of which are listed globally (IUCN Red List 2011); one as Vulnerable and one as Endangered. The Giant Bullfrog (*Pyxicephalus adspersus*) is estimated to have a moderate probability of occurring in the study area.

Ten Red Data reptiles are known inhabitants of Mpumalanga; only three are known from the southwestern parts of Mpumalanga. The two grass lizards; Coppery Grass Lizard (*Chamaesaura aenea*) and Large-scaled Grass Lizard (*Chamaesaura macrolepis*), are known from the general region of the study area. Striped Harlequin Snakes (*Homoroselaps dorsalis*) are considered to have a moderate-low probability of occurring in the study area.

Sixty-three Red Data terrestrial mammals are known inhabitants of Mpumalanga, forty-two of which are not known from the south-western parts of Mpumalanga. A further seven species occur in the region but insufficient habitat to meet their specific needs Seven species have moderate habitat potential and one species a moderate-high habitat potential and a moderate-high probability of occurring the study area. The Forest Shrew, *Myosorex varius* (Insectivora: Soricidae), is estimated to have a high probability of occurring in the study area.

Results of the site surveys revealed the following preliminary habitat sensitivities for the macro habitat types within the study area:

- Agricultural Fields (medium-low faunal sensitivity);
- Cultivated Fields (medium-low faunal sensitivity);
- Man-made Dams (Impoundments) (medium-high faunal sensitivity);
- Degraded Grassland (medium faunal sensitivity);
- Drainage Lines (high faunal sensitivity);
- Endorheic pans (medium-high faunal sensitivity);
- Exotic trees (medium-low faunal sensitivity);
- Moist Grassland (medium-high faunal sensitivity);
- Natural Grassland (medium-high faunal sensitivity); and
- Other Infrastructure (low faunal sensitivity).

**Flora**

The study area is located in the Mesic Highveld Grassland Bioregion, more specifically defined by Mucina and Rutherford as the Eastern Highveld Grassland (Endangered). Portions of the Eastern Temperate Freshwater Wetlands vegetation type is also captured within the study area.

Information obtained from the SANBI database indicates the known presence of approximately 183 plant species within the ¼ degree grids that is sympatric to the study area, which is regarded an underrepresentation of the true floristic diversity of the region. An appraisal of the growth forms reflects the grassland physiognomy with a high percentage of the species comprising herbs (58 species, 31.7%) grasses (34 species, 18.6 %), and geophytes (29 species, 15.8 %). The prominence of wetlands in the region is indicated by the presence of

numerous cyperoides (22 species, 12.0 %). The grassland physiognomy is further strengthened by the absence of trees and shrubs.

The presence of wetland habitat types is indicated by the presence of a diverse composition of cyperoid species. Seven plant species of conservation importance are known to occur in the study area, namely:

- *Boophane disticha;*
- *Crinum bulbispermum;*
- *Hypoxis hemerocallidea;*
- *Pelargonium sidoides;*
- *Gladiolus robertsoniae;*
- *Kniphofia typhoides;* and
- *Nerine gracilis.*

These species are mostly associated with wetland habitat types and flowers during the summer period. Other species that are likely to be present within the study area and the immediate surrounds include the following genera:

- *Zantedeschia* species;
- *Eucomis* species; and
- *Gladiolus* species.

Remaining natural vegetation of the study area and surrounds is representative of the regional vegetation types, exhibiting a species composition and vegetation structure that is comparable to existing data describing the regional vegetation types. This category includes the natural grassland of the study area, exhibiting numerous smaller variations that have developed because of varying biophysical habitat conditions. Adverse impacts on natural vegetation include high grazing pressure, incorrect burning regimes and infestation by weeds and pioneer species from nearby agricultural areas, all resulting from anthropogenic activities. Zonality of natural vegetation is observed in the study area by the presence of natural wetland related habitat that include endorheic pans and drainage lines of varying characteristics.

Due to the high levels of transformation, the study areas reflect the long-term impacts that are particularly evident from aerial photographs and visual observations. Vegetation of heavily disturbed and manmade habitat, termed anthropogenic, synanthropic, ruderal or agrestal, falls within the broadly conceived concept of azonality as well. Results of the photo analysis and site investigations revealed the presence of the following macro habitat types within the sites as well as the immediate surrounds:

- Agricultural Fields (low floristic sensitivity);
- Cultivated Fields (low floristic sensitivity);
- Man-made Dams (Impoundments) (medium-high floristic sensitivity);
- Degraded Grassland (medium-low floristic sensitivity);

- Drainage Lines (high floristic sensitivity);
- Endorheic pans (high floristic sensitivity);
- Exotic trees (low floristic sensitivity);
- Moist Grassland (high floristic sensitivity);
- Natural Grassland (medium-high floristic sensitivity); and
- Other Infrastructure (low floristic sensitivity).

**Avifauna**

The study area is characterised by four broad habitat types that range from natural grassland (including moist and degraded grassland), wetland-associated landscape features (i.e. endorheic pans, manmade impoundments and drainage lines), and agricultural land (including cultivated land) to exotic plantations. Approximately 7% of the study area consists of wetland features of which 75% is represented by natural entities (e.g. drainage lines and endorheic pans) and 25% of artificial dams (impoundments). These features are of great avifaunal interest based on recent anecdotal observations:

- Many waterbird species tend to congregate (or moult) on the pans and dams during winter;
- Some of the pans provide important breeding platforms for a diversity of Anatid taxa;
- Some of the pans provide ephemeral foraging habitat for "near-threatened' species; and
- The drainage lines are flyways for a variety of bird species, especially in a landscape affected by intense agricultural activities.

The Eastern Highveld Grassland is restricted to undulating plains and includes a number of low hills and pan depressions. SABAP2 database suggests that the study area is likely to sustain on average 68.3 species (based on 8 pentad grids and a total of 17 observer cards). During the dry season site visit, a total of 90 bird species were identified from the study area. The observed totals are well within the limit (> 50%) of the number of species likely to occur (based on SABAP2 data) and provide a realistic indication of the thoroughness and general coverage of the study area during the winter survey period.

About 44% of the observed species composition consists of obligate aquatic and wetland specialist taxa, 18% consists of species with strong grassland affinities, while the remaining 38% are unspecialised taxa. The high richness of aquatic and wetland taxa repeats the importance of the wetland features on the study area.

Three species of conservation concern were recorded during the site visit: the globally "near-threatened" Maccoa Duck (*Oxyura maccoa*) and Blue Korhaan (*Eupodotis caerulescens*) (BirdLife International, 2008), and the national "near-threatened" Secretarybird (*Sagittarius serpentarius*).

Areas of high avifaunal importance include Wetland Features, Natural & Moist Grasslands:

- The manmade impoundments and endorheic pans facilitate moulting of waterfowl and provide a refuge for waterbirds during the winter season;
- The endorheic pans conform to an interconnected system with high variability amongst each other in terms of salinity and water levels. They provide foraging habitat for the globally "near-threatened" Maccoa Duck (*O. maccoa*) and two "near-threatened" flamingo species;
- Some of the endorheic pan systems show extensive areas of mudflats which are critical important foraging habitat for small Charadrius plovers and Palaearctic migrants, e.g. scolopacid shorebirds;
- Some of the manmade impoundments provide roosting and breeding habitat (trees) for wading bird species;
- The *Imperata cylindrica* grassland patches (as part of the moist grasslands) provide suitable breeding and roosting habitat for the vulnerable African Grass Owl (*Tyto capensis*);
- The drainage lines and associated grassland series represent local flyways and dispersal networks for wading birds and waterfowl; and
- Some grassland patches (especially on the Farm Onverwacht 97) provides an interconnected corridor of foraging habitat for threatened or declining terrestrial bird species.

Digby Wells Environmental is currently undertaking biomonitoring at site and the findings from these reports will be included in the EIA/EMP.

## Surface Water

The Matla project area (surface right boundary) is situated in the upper reaches of the Olifants Water Management Area (WMA 4) and within two (2) Quaternary Catchment Area's (QCA's) namely B11E and B11D. Themba (Turf Highveld) veld type dominates the land cover of the area. The average annual rainfall of the area varies between 600 and 800mm with summer rainfall contributing to most of the total. The mean annual accumulated stream flows of the project area are in the order of 50 to 100mm.

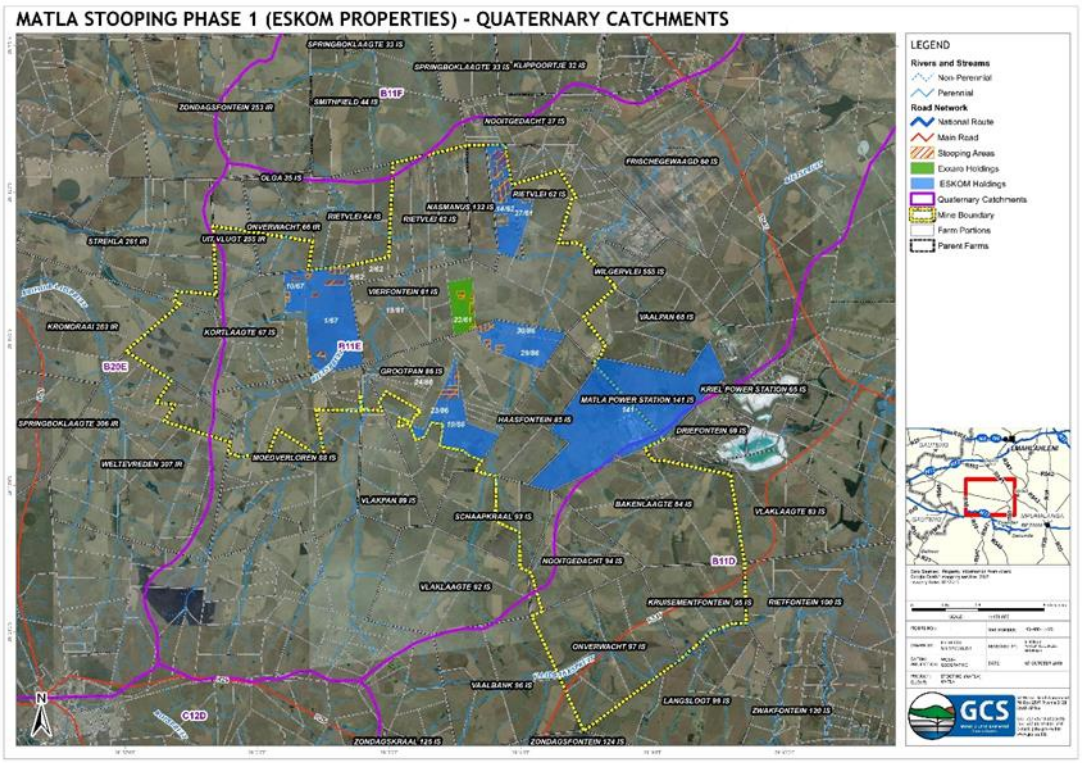



**Figure: 7: Matla Quaternary Catchment**

The natural water resources in and around the area drain in a north easterly direction towards the Rietspruit Dam and eventually to the Witbank Dam. The Rietspruit River flows predominantly across the site area in a north and later eastern direction. A few secondary tributaries of this River as well as a host of small pans and farm dams occur within the site area.

Evaporation

The monthly evaporation totals are presented in Table 3, which includes the A-pan factors and S-pan factors.

**Table 3: Monthly evaporation totals for the region**

| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Monthly evaporation** | 172 | 163 | 179 | 176 | 147 | 145 | 111 | 94 | 76 | 83 | 110 | 143 |
| **Apan factor** | 0.64 | 0.8 | 0.81 | 0.81 | 0.79 | 0.79 | 0.76 | 0.74 | 0.71 | 0.58 | 0.61 | 0.63 |
| **Span factor** | 0.8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.8 | 0.8 | 0.8 |

Rainfall

Rainfall input to the WRSM2000 Model was based on procedures and analysis of rainfall data, which for modelling purposes considers rainfall zones to the associated Quaternary Catchment. Rainfall input to the rainfall-runoff model was based on the monthly average figures given in the WR2005 report for zone B11E and B11D (created for the WRSM2000 model) extending from period 1920 to 2005. The mean annual rainfall for this

region was averaged at 682 mm. Figure 7 shows the total annual rainfall graph for this period. Figure 8 and Figure 9 shows the annual time series of simulated flows for the areas affected by the mining activities in the respective Quaternary catchments.

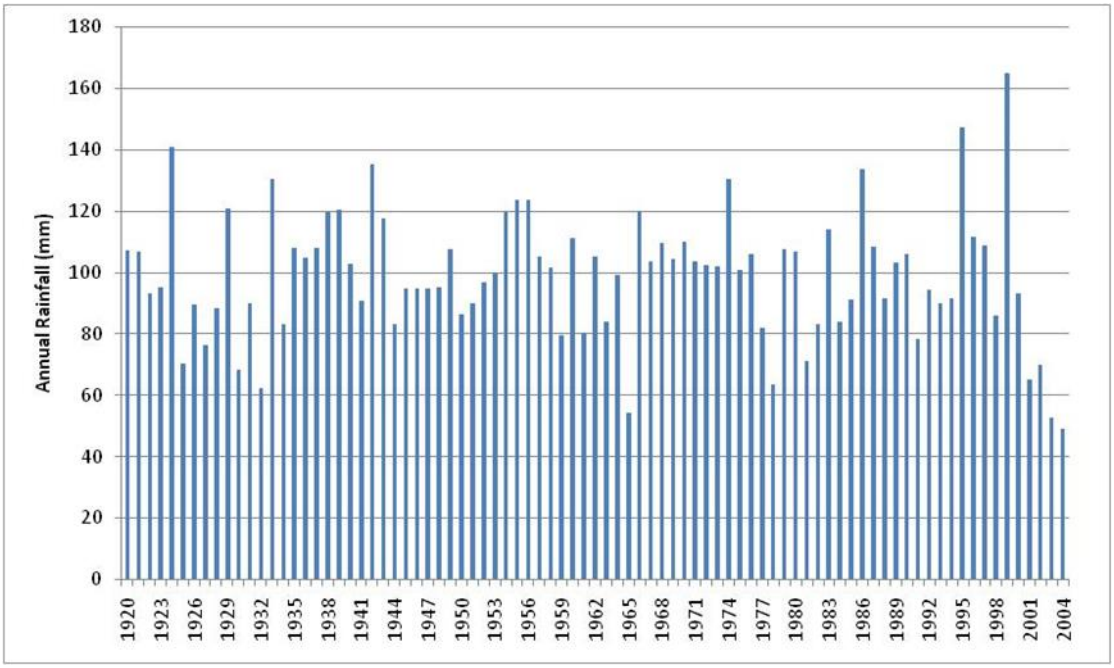



**Figure: 8: Annual Rainfall totals for the Hydrological years 1920 to 2005 over Quaternary Catchment B11E**

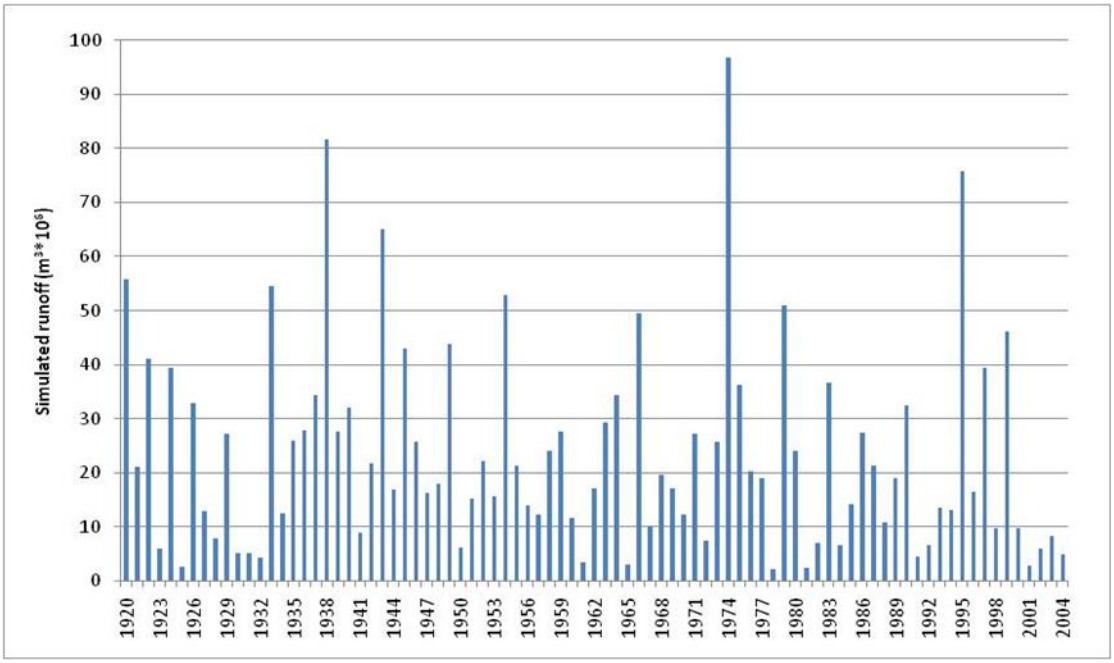


**Figure: 9: Annual simulated runoff totals for the Hydrological years 1920 to 2005 for the areas affected by mining activities for B11E**

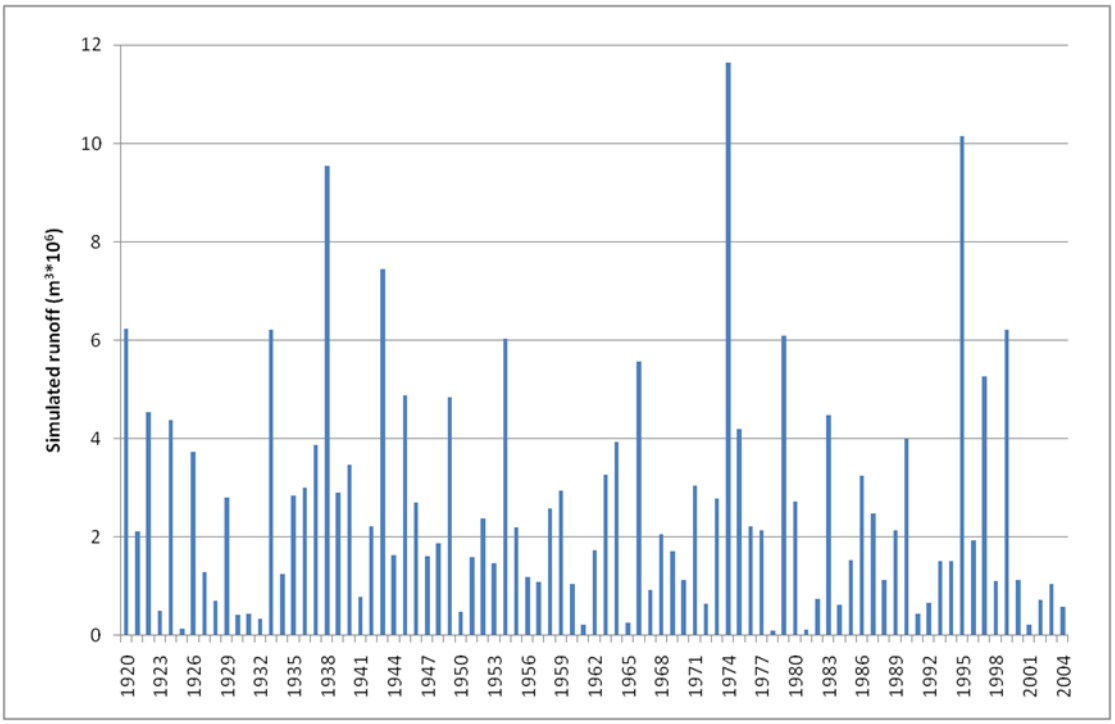



**Figure: 10: Annual simulated runoff totals for the Hydrological years 1920 to 2005 for the areas affected by mining activities for B11D**

Figure 10 and Figure 11 shows the annual seasonal distribution of both rainfall and runoff for the areas impacted by mining activities for the respective Quaternary Catchments.

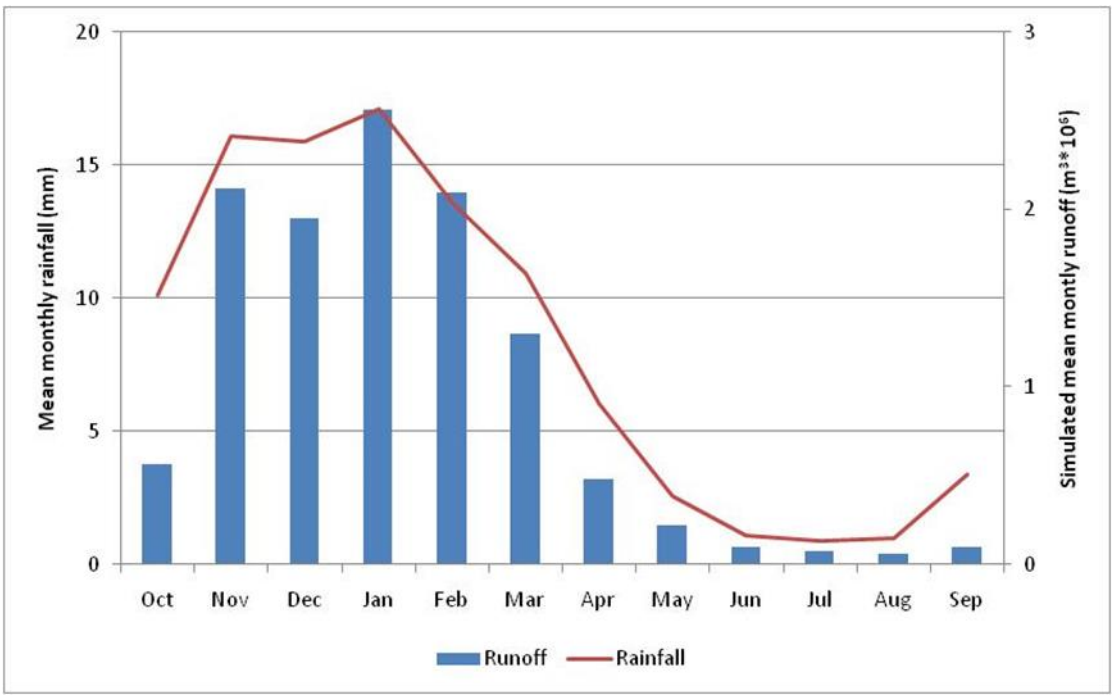


**Figure: 11: Seasonal distribution of rainfall and simulated runoff for B11E volumes based on Hydrological years 1920 to 2005**

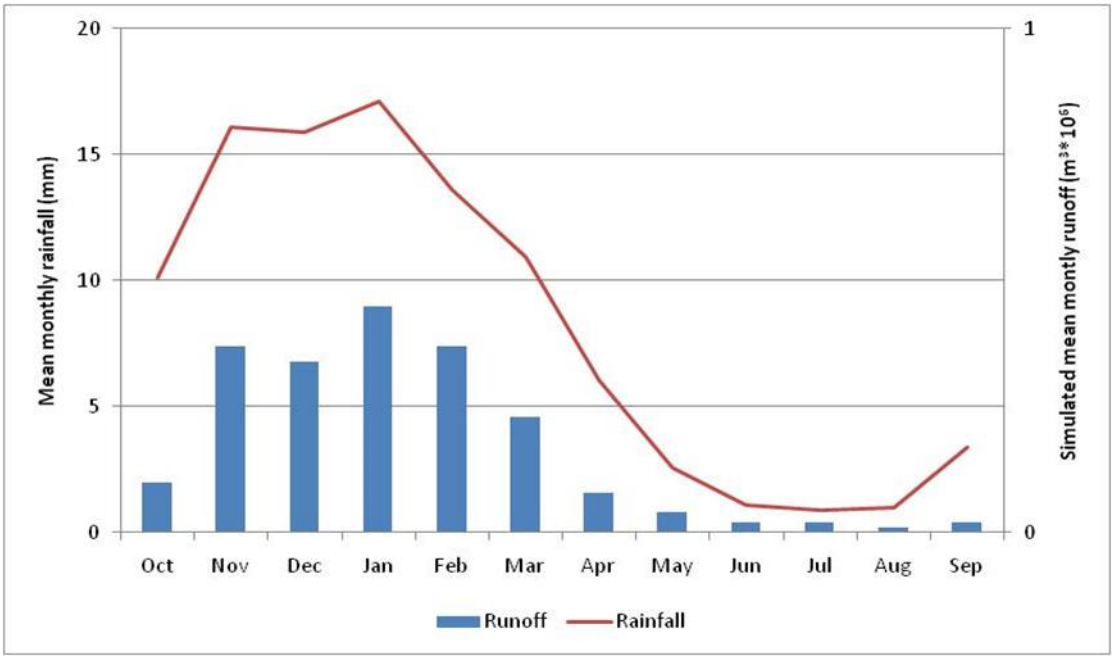



**Figure: 12: Seasonal distribution and simulated runoff B11D volumes based on Hydrological years 1920 to 2005**

## Groundwater

Available information suggests that two main aquifers are present within the Matla lease area:

- An upper shallow weathered aquifer, which is underlain by
- A deeper fractured aquifer.

Other aquifers of local significance include dykes/faults and the margins of coal seams:

- Dykes and faults cutting through the Karoo geology sometimes act as preferred paths for groundwater flow. This is because of the higher degree of fracturing of the Karoo rocks adjacent to these features. However, dykes may also act as barriers to groundwater flowing perpendicular to the dyke. The increased hydraulic conductivity along dykes and faults has not been measured in previous studies.
- No significant groundwater flows along coal seams have been reported at Matla.

### Groundwater Use

Available information for both aquifers indicates that groundwater is mainly used for stock watering and domestic use. The average blow yield of the boreholes is 0.4 l/s. The aquifers are therefore considered to be minor, but have local importance to farmers and other groundwater users.

### Groundwater elevation and flow

2011 Hydrocensus data confirm a correlation between groundwater elevation and topographic elevation and this has been used to develop a piezometric map of the Matla lease area which indicates flow direction. Groundwater at Matla generally flows in a north-easterly direction towards the Rietspruit Dam which lies outside the lease area to the northeast. This flow is controlled by the east and northeast flowing Rietspruit watercourse. There is a westerly component of groundwater flow in the extreme western part of the lease area which lies in the catchment of the north flowing Kromdraaispruit watercourse. The southern portion of the lease area drains east towards the Dwars-in-die-wegspruit watercourse.

The highest groundwater elevations (1 640 mamsl) are found in the southwestern portion of the lease area and are consistent with higher ground and groundwater recharge areas which lie to the south in the upper Rietspruit catchment. The lowest groundwater elevations (1 570 mamsl) are found in the northeast where the Rietspruit flows out of the Matla lease area. The central portion of the Matla lease is characterised by the presence of several pans. These appear to be related to low hydraulic gradient and poor drainage.

Dewatering

In 2011 seven boreholes have groundwater levels lower than expected from the correlation with topographic elevation. These are inferred to indicate four areas of groundwater dewatering:

- A broad zone defined by groundwater levels less than 1 600 mamsl west of Mine 3 in the western part of the lease area. This zone approximately coincides with 2 Seam underground workings beneath the Rietspruit and may indicate dewatering from the mine activities in this area. However, the Rietspruit is considered to be a local groundwater base level and the general lack of groundwater level data over the 2 Seam workings prevents mine dewatering from being confirmed.
- The northeast boundary of the lease area, close to the Kriel Colliery opencast workings. Dewatering associated with the opencast mining may have lowered the level of shallow groundwater.
- The central south boundary of Matla affected by nearby 4 Seam workings.
- The northern portion of the lease area over the 2 Seam, 4 Seam and 5 Seam workings.

Quality

Groundwater samples collected during a hydrocensus in 2011, indicate that groundwater quality generally meets the South African National Standard 241: Drinking Water. The major ion signatures indicate at least two groupings of groundwater composition which suggest that rainfall recharge undergoes two main paths of chemical evolution in the groundwater:

- Cation exchange of Ca and Mg for Na, a common feature of groundwater in Karoo sediments; and
- Mixing with a CaCl and CaSO4 source, possibly as mineral applications to crops which have leached into the groundwater. This group also includes samples with higher NO3 concentrations which suggest fertiliser application.

Baseline groundwater quality is presented in Table 4.

**Table 4: Baseline groundwater quality indicated from hydrocensus samples (2011)**

| Parameter | Mean | Minimum* | Maximum* | SANS:241 Class1 |
|---|---|---|---|---|
| pH | 7.47 | 7.29 | 7.65 | 5-9.5 |
| TDS (mg/l) | 293 | 220 | 391 | 1000 |
| F (mg/l) | 0.24 | 0.15 | 0.37 | 1 |
| Cl (mg/l) | 21.4 | 13.4 | 34.4 | 200 |
| $SO_4$(mg/l) | 12.1 | 5.86 | 24.8 | 400 |
| $NO_3$(mg/l) | 5.20 | 2.45 | 11.0 | (44)** |
| Na (mg/l) | 34.3 | 23.7 | 49.5 | 200 |
| K (mg/l) | 2.95 | 2.32 | 3.75 | 50 |
| Ca (mg/l) | 39.5 | 28.9 | 53.8 | 150 |
| Mg (mg/l) | 14.8 | 10.5 | 20.9 | 70 |
| Al (mg/l) | All samples below detection limit | | | 0.3 |
| Cu (mg/l) | All samples below detection limit | | | 1 |
| Fe (mg/l) | All samples below detection limit | | | 0.2 |
| Mn (mg/l) | 0.06 | 0.05 | 0.06 | 0.1 |
| Ni (mg/l) | All samples below detection limit | | | 0.15 |
| Pb (mg/l) | All samples below detection limit | | | 0.02 |
| Zn (mg/l) | 0.07 | 0.05 | 0.09 | 5 |

*Minimum and Maximum define the 95% confidence interval around the mean assuming a lognormal distribution
**Calculated from standard of 10mg/l $NO_3$ as N

## Noise

The intention is to mine the coal reserves by means of the Stooping process. No additional noise levels or impacts will be experienced as this will be a continuation of the current mining with no additional infrastructure.

## Sites of Historical and Cultural Importance

The entire area was already surveyed during 2012. The latest survey served as confirmation of specific areas to be mined as well as the heritage resources found during the previous survey. Digby Wells Environmental is currently undertaking further heritage studies for inclusion in the consolidated EMP for the whole of Matla.

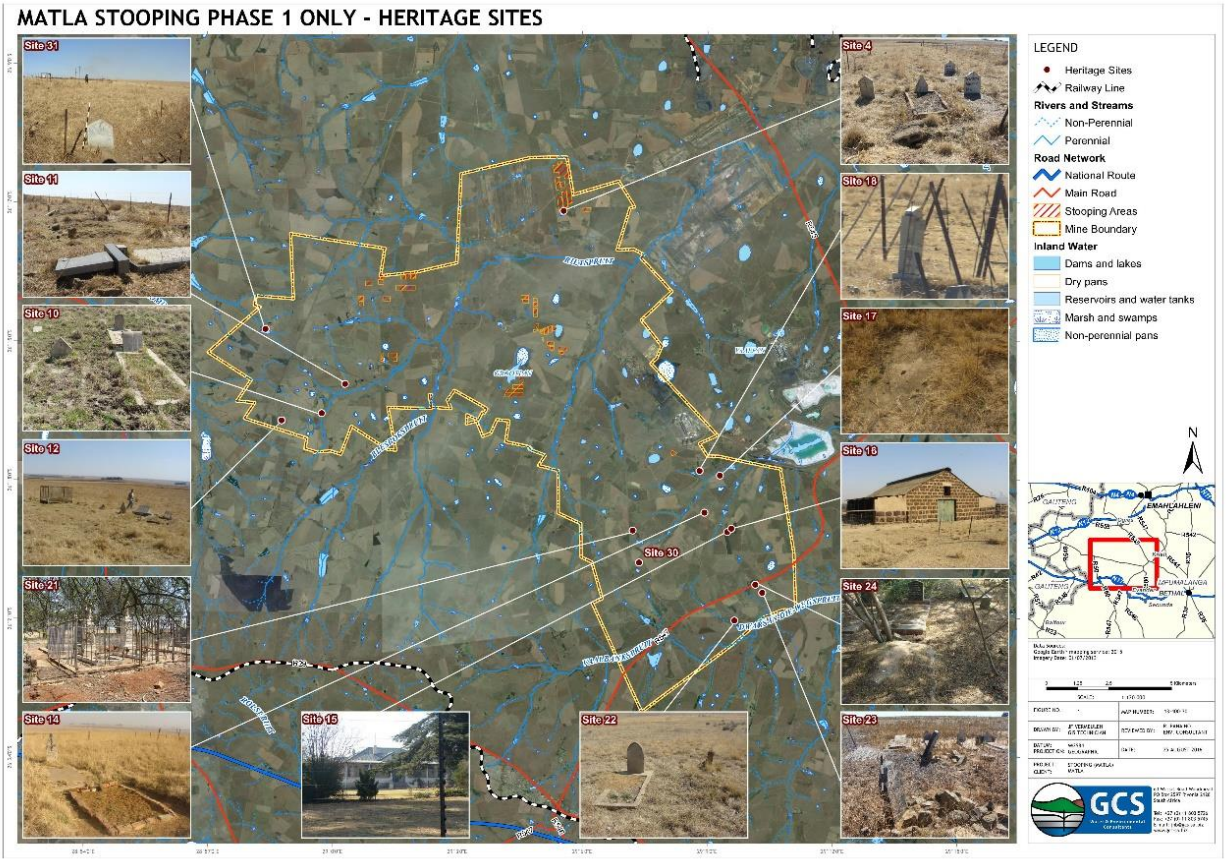



**Figure 13: Heritage sites related to the stooping area**

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).According to the National Heritage Resources Act the following is protected as cultural heritage resources:

- Archaeological artifacts, structures and sites older than 100 years
- Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- Objects of decorative and visual arts
- Military objects, structures and sites older than 75 years
- Historical objects, structures and sites older than 60 years
- Proclaimed heritage sites
- Grave yards and graves older than 60 years
- Meteorites and fossils
- Objects, structures and sites or scientific or technological value.

The National Environmental Management Act states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made.

The evaluation of heritage sites is done by using the following criteria:

- The unique nature of a site
- The integrity of the archaeological deposit
- The wider historic, archaeological and geographic context of the site
- The location of the site in relation to other similar sites or features
- The depth of the archaeological deposit (when it can be determined or is known)
- The preservation condition of the site
- Uniqueness of the site and
- Potential to answer present research questions.

The surveyed area is mostly disturbed due to previous human activities on the site. This includes mainly agricultural activities such as ploughing and the planting of maize and other crops, as well as grazing. Certain areas are covered by grass, which were of different lengths. Some plantation areas (blue gum, poplar, wattle etc.) are also found, in certain cases reasonably inaccessible.

The Matla Power Station dominates the landscape and current mining operations and infrastructure are also to be found nearby.

The fieldwork undertaken during 2012 revealed thirty sites of cultural heritage significance. During the 2014 survey it was found that only fourteen remained within the area to be impacted (the stooping area). An additional site was also identified, making the total number of sites fifteen.

Significant sites included Grave yards, farm houses and outbuildings. It was also noted that this is the main area where the Battle of Bakenlaagte was fought (Personal communication: B. Roux). One however needs to realize that a battle is fought over a large area and that almost the entire mining area may have been part of this particular battle. No photograph was taken as no feature or structure from the battle remains.

For the purpose of this report only the fifteen sites within the stooping area will be discussed. The site numbers from the 2012 report will however be kept in order not to confuse matters. The fourteen remaining sites are 4, 10, 11, 12, 14, 15, 16, 17, 18, 21, 22, 23, 24 and 30. The new site is numbered 31.

**Site 4 – Grave yard**

This is a grave yard consisting of at least 9 graves. The oldest date identified is 1919 and the youngest 1955 (Photos 1 and 2). Various types of graves are evident – cement dressing with cement headstones, granite slabs, heaps of soil, brick borders and some with metal barriers etc. Some of the surnames identified include Mabena, Hlowu and Mloka.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°12.211'S

28°35.469'E

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. Should the mine decide it best to go this route, it has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Photo.1 One of the graves at site no. 4**


**Photo.2 More graves at site no. 4**

**Site 10 – grave yard**

This is a grave yard consisting of at least 9 graves (Photo 3). The graves all have cement borders and headstones, but some re without headstones. The oldest date identified is 1922 and the youngest 1985. One surname was identified, being Mahlangu.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°16.572'S
28°59.740'E

**Photo.3 Some of the graves at site no. 10.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. Usually this option is only allowed if there is a direct impact on the site. Although this area would be an underground mining area, it may collapse resulting in damage to the graves.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

**Site 11 – grave yard**

This is a grave yard consisting of at least 27 graves (Photo 4). Four types of grave features are visible – stone dressing and headstones, heaps of soil, cement dressing or borders and headstones and granite dressings or borders and headstones.

The oldest date identified is 1951 and the youngest 1990. Some have no dates indicated. The only surname identified is Nkosi.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°15.940’S
29°00.302’E

**Photo.4 Graves at site no. 11.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. Although the graves are in an area where underground mining is planned, it may collapse as a result of these activities.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 12 – grave yard**

This is a graveyard with at least 12 graves (Photo 5). One of the graves has a steel fence around it. Some have granite headstones, stone headstones or cement headstones and most have cement or stone borders.

The oldest date identified is 1958, but some are without dates. Two surnames that were identified are Mthombe and Kumalo.
Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated

GPS: 26°16.727'S

28°58.778'E

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

**Photo.5 Graves at site no. 12.**

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. Since the graves may collapse during underground mining activities, this option should be considered.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 14 – grave yard**

This is a grave yard consisting of at least 15 graves between (Photo 6). Various types of graves are evident – brick borders, cement dressing with cement headstones etc.

Only one grave has legible information on its headstone. The date of death on this grave is 1991 and the surname is Mputi.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°18.717'S
29°08.931'E

**Photo.6 Graves at site no. 14.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. Although the mining will be underground, this may cause the graves to collapse.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 15 – Bakenlaagte farm house**

Site no. 15 is the farm house on the farm Bakenlaagte, belonging to Mr. JH Jacobs (Photo 7). The house seems to have been built shortly after the Anglo-Boer War and therefore is older than 100 years. The style is Edwardian.

The building is given a rating of medium cultural significance due to it not being very unique and due to it having been changed over the years. It nevertheless is a typical example of farm houses from this era. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°19.137'S
29°09.482'E

The house falls within the underground mining area which may result in it being damaged, for instance if the soil would cave in. Therefore the recommendation is that the house be documented in full so that the information is

preserved. Should any damage then occur, the mine may apply for a demolition permit from the Mpumalanga PHRA.

**Photo.7 The farm house on the farm Bakenlaagte.**

**Site 16 – Bakenlaagte outbuilding**

Site no. 16 is an outbuilding on the farm yard of Bakenlaagte, belonging to Mr. JH Jacobs (Photo 8). It used to be a wagon house and is very likely older than 100 years. Some other outbuildings, which might be slightly younger is also found here.

The building is given a rating of medium cultural significance. It is a very good example from this era and still is in a good condition. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°19.062'S
29°09.580'E

As the building falls within the underground mining area, it may be damaged during mining activities. For instance, the soil may cave in. Therefore the recommendation is that the house be documented in full so that the information is preserved. Should any damage then occur, the mine may apply for a demolition permit from the Mpumalanga PHRA.

**Photo.8 Outbuilding (wagon house) named site no. 16.**

**Site 17 – grave yard**

This is a grave yard consisting of at least 2 graves (Photo 9). Both are covered with cement slabs. No dates or biographical information are indicated.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°17.915'S
29°09.305'E

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.
The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to

be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

**Photo.9 Graves at site no. 17.**

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. In this case the area will be used for underground mining which may eventually lead to the caving in of the graves.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 18 – grave yard**

This is a graveyard consisting of at least three graves (Photo 10). However the vegetation cover is dense and there may be more. The graves have granite headstones and borders.
The date of death on one of the graves is 1891 and on another one 1933. The surnames identified are Oosthuysen and Du Toit.
Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°17.813'S
29°08.818'E

**Photo.10 Graves at site no. 18.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a

fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. It should be noted that the graves may cave in as a result of it being located on the underground mining area.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 21 – grave yard**

This is a grave yard consisting of 9 graves (Photo 11). The graves have either cement borders and headstones or granite headstones and borders. Some also have metal fencing around it.

The oldest date identified is 1943 and the youngest 2002. Two surnames were identified, being Van den Berg and Van den Heever.
Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°19.106'S
29°07.213'E

**Photo.11 Graves at site no. 21.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. The site lies within the underground mining area. The mining activities may cause the site to cave in.
Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 22 – grave yard**

This is a grave yard consisting of at least 7 graves (Photo.12 Graves at site no. 22.

). Some of the graves are stone packed, with or without headstones. Others have cement borders and headstones.

Only one date was identified, being 1938. No biographical information was legible on any of the graves.
Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

**Photo.12 Graves at site no. 22.**

GPS: 26°21.050'S
29°09.659'E

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. The site may cave in during mining activities as it is situated in the underground mining area.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 23 – grave yard**

This is a grave yard consisting of at least 41 graves. The graves have different grave dressings – stone packed, cement or granite headstones and borders and some only have a stone headstone (Photo.13

Graves at site no. 23.

).

The site seem quite recent – the oldest date identified being 1923 and the youngest 1997. However some of the graves does not indicate a date of death. Only one surname was identified being Mgcina, Tholakele, Nkabinde and Mahlangu. Unknown graves, referring to date of death, count 27.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°20.449’S
29°10.323’E

**Photo.13 Graves at site no. 23.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. In this case the site is within the underground mining area, which may cave in during mining activities.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.
Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 24 – grave yard**

This is a grave yard consisting of at least 9 graves (**Error! Reference source not found.**). The graves have different dressings being granite dressings or borders and headstones, stones with masonry and brick borders with tile dressings.

The oldest date identified is 1915 and the youngest 1952. Three surnames were identified namely Oosterhuis, Van den Berg and Geldenhuys. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.
Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves.
GPS: 26°20.274'S
29°10.157'E

**Photo.14 Graves at site no. 24.**

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. As the graves are inside of the underground mining area, the soil may cave in.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.
Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

**Site 30 – Battle of Bakenlaagte**

**This is the main area where the Battle of Bakenlaagte was fought (Personal communication: B. Roux). One however needs to realize that a battle is fought over a large area and that almost the entire mining area may have been part of this particular battle. No photograph was taken as no feature or structure from the battle remains. A map of the battle is however included (Figure 14 Map of the Battle of Bakenlaagte.**

).

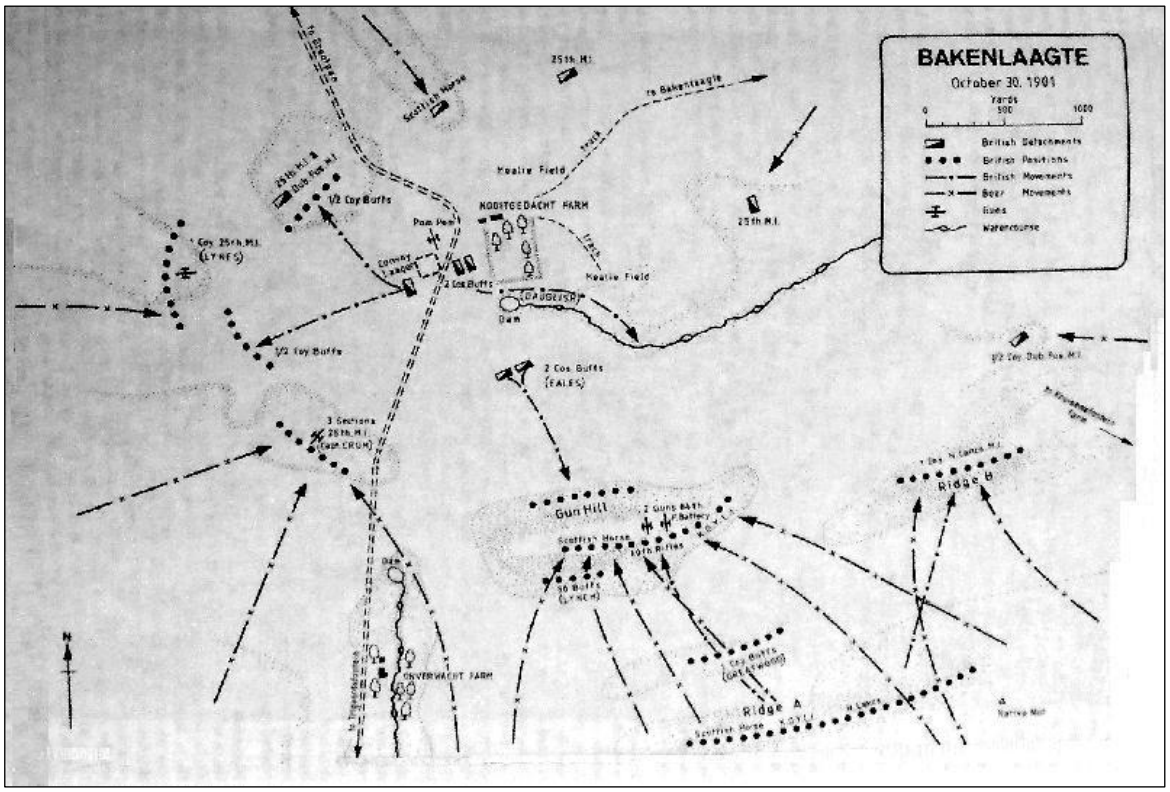



**Figure 14 Map of the Battle of Bakenlaagte.**

As the Anglo-Boer War was an important event in the history of South Africa, the site is given a rating of high cultural significance. However the lack of features has to be taken into consideration. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

GPS: 26°19.800'S
29°07.365'E

The site lies right within the underground mining area. However there is no visible evidence of the battle and therefore the site cannot be preserved. It is also recommended that, should any artifact related to the battle be unearthed or found during activities on site, an archaeologist should immediately be contacted to investigate the find.

**Site 31 – grave yard**

This is a grave yard consisting of at least 17 graves (Photo 16). The graves have different dressings being cement dressings or borders and headstones or stone packed, with or without headstones. No date or surname could be identified as it was not legible.

Graves are always given a rating of high cultural significance due to it being a sensitive matter. Graves with an unknown date are always handled as if older than 60 years. Graves older than 60 years are regarded as heritage graves. It receives a field rating of Local Grade IIIB. It should be included in the heritage register and may be mitigated.

**Photo.15 Graves at site no. 31**

GPS: 26°14.750'S
28°58.393'E

Usually there are two options when dealing with graves. The first option is to leave the graves in situ. This would be possible should there be no direct impact on the graves. However, there always is a secondary impact as descendants may find it difficult to visit the site once mining has commenced. Therefore the site should be fenced in and a management plan should be written for the preservation and maintenance thereof. Such a fence should be erected at least 50 m from the perimeter of the site as blasting closer than that will definitely have a negative impact on the graves.

The Management Plan would detail aspects such as the fence and site management and maintenance. In addition, the plan would provide details on how it will be possible for descendants that might wish to visit the graves, when access will be granted as the mine is compelled to grant access. The fence and site will need to be managed and maintained. The management plan includes inter alia arrangements for security and safety measures. Other measures would include the preservation and maintenance of the site where aspects such as cleaning and upkeep will be dealt with. Such a plan should be written and then monitored annually by an independent heritage specialist.

The plan will have to be approved by the Burial Grounds and Graves Unit (BGG) of the South African Heritage Resources Agency (SAHRA). SAHRA has specific guidelines for management plans and these will have to be followed.

The second option is to exhume the graves and have the bodies reburied. This usually is only allowed if there is a direct impact on the site. As the graves are inside of the underground mining area, the soil may cave in.

Such a process has to be motivated to SAHRA and permits needs to be applied for. It is a lengthy process and includes social consultation in accordance with legislation in order to obtain permission from descendants or at least proof that a concerted effort has been made to do such consultation.

Graves younger than 60 years are handled by a registered undertaker. Graves older than 60 years and those of an unknown date is regarded as heritage graves. In such a case an archaeologist is also involved in the process.

In this case, since it will be underground mining, option 1 would be the way to go. However, one will have to be aware of the possible caving in of soil due to the mining activities. Should this be encountered, option 2 will definitely have to be utilized.

## Visuals

The following visual ratings were established:

- Mine Stooping will be visible from 58 receptors. There were 85 receptors in total within the zone of influence (58/85= 68.2%).
- Life of Stooping will be visible from 63 receptors. There were 100 receptors in total within the zone of influence (63/100= 63%).

Based on the table and impact ratings, the largest visual impact will be as a result of the planned stooping areas primarily because of the large physical extent of the 3 Mine and LOMP coal seams.

## Socio- Economic Conditions

Emalahleni has a large collection of heritage assets, which is currently under threat from rapid development. Emalahleni is probably the most industrialised municipal area in Nkangala and its landscape features mainly underground and opencast coalmines. This area has the largest concentration of power stations in the country. Its mining and industrial history is reflected in the area's heritage places. This includes elements of industrial history, military history, architectural/engineering and graves which should be protected and conserved.

The southern areas of the Emalahleni Municipality form part of the region referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations such as Kendal, Matla, Duvha and Ga-Nala.

### (b) Description of the current land uses.

The land use in the study area was assessed using a number of data sets, both historical as well as information obtained from the recent field studies, the aerial photographic coverage and discussions with the project team. In addition, the time spent in field while mapping the soils and classifying the land capability added to the understanding of the land use and land coverage (Figure 5 7, Figure 5 8 and Figure 5 9).

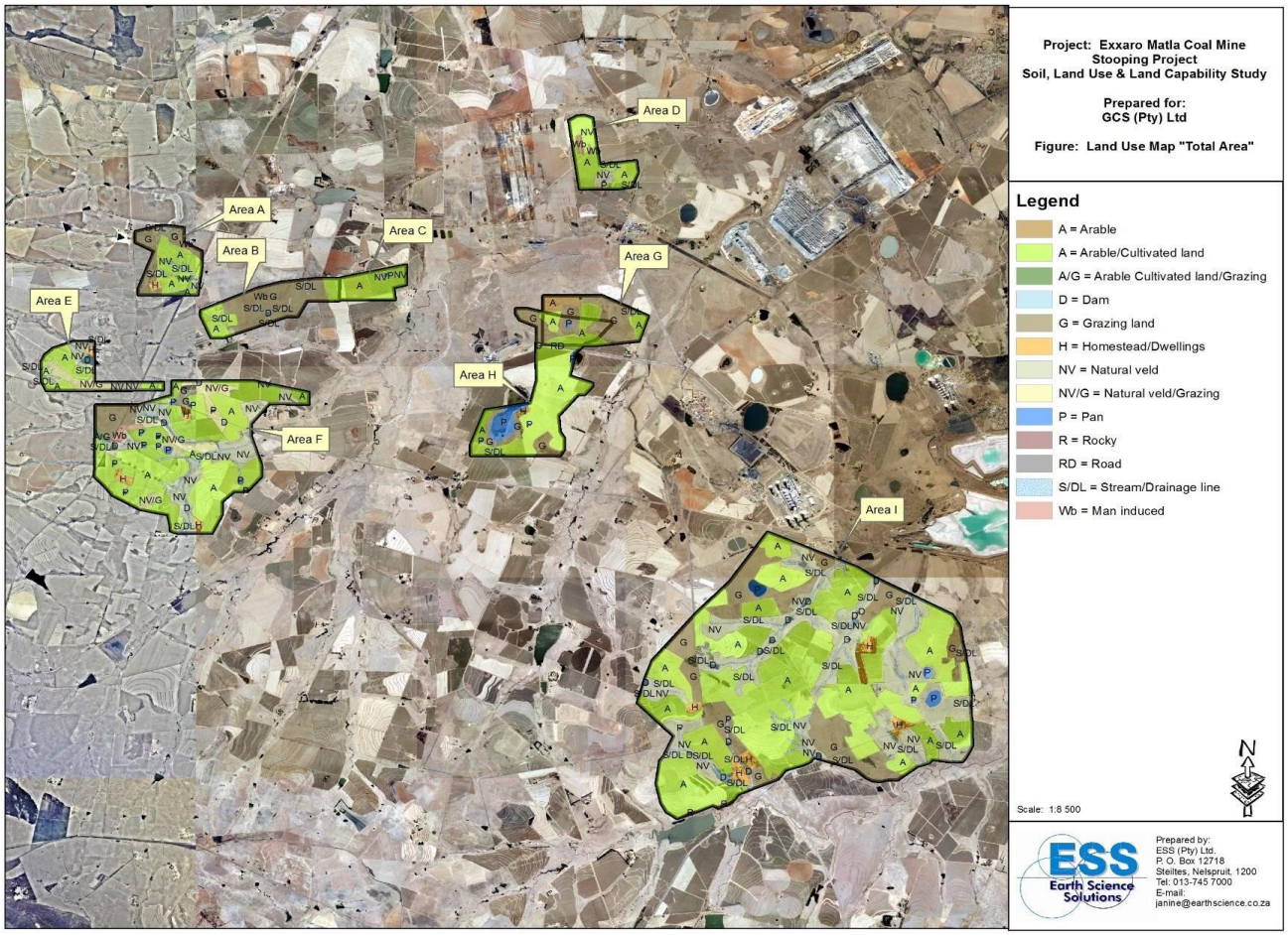



**Figure 15: Pre-construction Land-use of the areas associated with Stooping**

## (c) Description of specific environmental features and infrastructure on the site.

**The proposed Land Use with proposed activities**

*Stooping and Underground Workings*

Matla Coal proposes to stoop (or totally extract) pillars at the previously underground mined areas with the intent to reclaim the remaining coal reserves by using the conventional board and pillar mining method (drill and blast). The proposed activities will occur on all relevant farms and portions within the Matla Coal mining boundary owned by Exxaro and Eskom. The proposed project area covers the entire Matla mining right area which is approximately 22 000 ha in size, however this will exclude wetlands, rivers, registered servitudes, provincial and national roads, privately owned properties and buildings or any other structure or sensitive natural stature protected in terms of national and/or international law. The total area proposed for stooping will be roughly 232ha.

The reclamation of the remaining coal reserves will utilise the existing current operations' infrastructure

*Mining process*

Stooping of pillars or retreat mining is a term used to reference the final phase of an underground mining technique known as room and pillar mining. This involves excavating a room or chamber while leaving behind pillars of material for support. This excavation is carried out in a pattern advancing away from the entrance of a mine. Once a deposit has been exhausted using this method, the pillars that were left behind initially are removed, or 'pulled', retreating back towards the mine's entrance. After the pillars are removed, the roof (or back) is allowed to collapse behind the mining area (**Figure: 16**).

Pillar removal must occur in a very precise order in order to reduce the risks to workers, due to the high stresses placed on the remaining pillars by the abutment stresses of the caving ground.

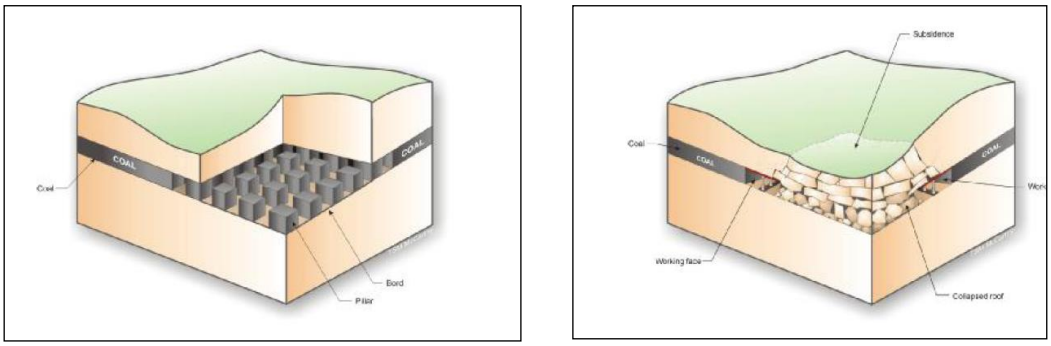



**Figure: 16: Stooping of pillars**

## (d) Environmental and current land use map.

(Show all environmental, and current land use features)

Refer to Figure 15 for the Land Use Map of Matla.

## v) Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts

Based on the environmental setting, as well as the studies conducted, the following impacts have been identified and will be addressed further in detail during the EMP.

*The following section only describes new activities being applied for and the possible impacts associated with those. The detailed consolidation of the management of activities currently authorised and proposed will be given in the EMP.*

## Construction phase

No construction related activities anticipated for the Phase 1 Matla Stooping Project.

## Operational Phase

The following activities have been identified for the construction phase and are expected to lead to negative environmental impacts:

- Underground Mining Of Coal (through stooping);
- Water Management;
- Control Of Clean/Dirty Water Separation through the maintenance of possible subsidence;
- Generation And Handling Of Waste;
- Hydrocarbon Storage;
- Dust Suppression; and
- Active Surface Rehabilitation (to ensure free draining of the surface).

Environmental impacts related to the operational phase activities are identified in a table below.

## Table 5: Impacts related to the operational phase activities

| POTENTIAL ENVIRONMENTAL IMPACT | APPLICABLE MINE AREA | ACTIVITY | ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION | | | | | | | RECOMMENDED MITIGATION MEASURES | ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | D | S | P | ⊢ ⊂ | ST < | SP | | M | D | S | P | ⊢ ⊂ | ST < | SP |
| **GEOLOGY** | | | | | | | | | | | | | | | | | |
| Removal of coal pillars (stooping of underground pillars) | 1 | 1 | 8 | 5 | 1 | 5 | 70 | - | H | Mitigation not possible, geology is permanently altered | 8 | 5 | 1 | 5 | 70 | - | H |
| **TOPOGRAPHY** | | | | | | | | | | | | | | | | | |
| Subsidence as a result of stooping of underground pillars | 2 | **1** | 10 | 5 | 1 | 5 | 80 | - | H | All pillars not to be mined to avoid subsidence. | 6 | 5 | 1 | 5 | 60 | - | M |
| **SOILS, LAND USE AND LAND CAPABILITY** | | | | | | | | | | | | | | | | | |
| Soil Contamination | 2 | **2** | 10 | 4 | 2 | 4 | 64 | - | H | Ensure vehicles are in good condition, dirty water is contained | 4 | 3 | 1 | 4 | 32 | - | M |
| **TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)** | | | | | | | | | | | | | | | | | |
| Indirect impacts on surrounding habitats | 2 | **2** | 6 | 4 | 2 | 3 | 36 | - | M | Prevent the spread of impacts to adjacent habitat | 6 | 4 | 2 | 2 | 24 | - | L |
| **SURFACE WATER** | | | | | | | | | | | | | | | | | |
| Ponding as a result of subsidence due to stooping of underground pillars | 2 | **2** | 4 | 4 | 2 | 3 | 30 | - | M | Ensure area is fee draining. | 4 | 2 | 2 | 2 | 16 | - | L |
| **GROUNDWATER** | | | | | | | | | | | | | | | | | |
| Mine Dewatering impacts on private Groundwater users | 1 | **1** | 4 | 4 | 2 | 3 | 30 | - | M | No mitigation is possible for dewatering as the mine must be kept dry. Maintenance of water and waste management procedures to avoid contaminant seepage to groundwater | 4 | 4 | 2 | 3 | 30 | - | M |
| Impact on groundwater quality | 1 | **1** | 6 | 3 | 2 | 4 | 44 | - | M | Prevent and contain seepage | 4 | 3 | 2 | 4 | 36 | - | M |
| **AIR QUALITY** | | | | | | | | | | | | | | | | | |
| No impacts anticipated | N/A | N/A | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |
| **ARCHAEOLOGY AND HERITAGE** | | | | | | | | | | | | | | | | | |
| No impacts anticipated | N/A | N/A | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |
| **SOCIO-ECONOMICS** | | | | | | | | | | | | | | | | | |
| Positive impacts on the local economy | 1 | **1** | 8 | 5 | 3 | 4 | 64 | + | H | Effective community liaison | 8 | 5 | 3 | 4 | 64 | + | H |
| Change to Land Use Capability of the surface area as a result of subsidence | 1 & 2 | **1 & 2** | 8 | 5 | 2 | 5 | 75 | - | H | The mine will consult with affected surface users prior to stooping activities taking place and on an onging basis, in order to minimise negative impacts | 6 | 5 | 1 | 5 | 60 | - | M |
| **NOISE** | | | | | | | | | | | | | | | | | |
| No impacts anticipated | N/A | N/A | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |

## CLOSURE AND DECOMISSIONING PHASE

The closure and decommissioning phase will involve the following activities:

- Active Surface Rehabilitation

Environmental impacts related to the closure and decommissioning phase activities are identified in a table below.

**Table 6: Impacts related to the closure and decommissioning phase activities**

| POTENTIAL ENVIRONMENTAL IMPACT | APPLICABLE MINE AREA | ACTIVITY | ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION | | | | | | | RECOMMENDED MITIGATION MEASURES | ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | D | S | P | TOTAL | STATUS | SP | | M | D | S | P | TOTAL | STATUS | SP |
| No direct impacts anticipated | 1 | **1 &2** | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |
| Direct impact: reshaping of area | 1 | **1 &2** | 6 | 4 | 3 | 3 | 39 | - | M | The area is to be resurfaced.<br>All slopes to be shaped to accommodate natural flow and vegetation establishment.<br>All slopes to be safe for animals and humans<br>Areas to be revegetated with all indegenous plants | 6 | 4 | 2 | 2 | 24 | - | L |
| Direct impact: soil compaction | 1 | **1 &2** | 4 | 4 | 1 | 2 | 18 | - | L | Correct use of vehicles to prevent compaction<br>Avoidance of work in very wet or waterlogged conditions<br>Use tracked vehicles instead of wheeled vehicles where possible<br>Avoid clearance and earthworks after heavy rain<br>Drive only on demarcated roads<br>Revegetate as quickly as possible after removal of infrastructure | 2 | 4 | 1 | 1 | 7 | - | L |
| Direct impact: soil erosion | 1 | **1 &2** | 6 | 4 | 1 | 3 | 33 | - | M | Minimise infrastructure footprint<br>Manage stormwater and stormwater management measures<br>Employ cut-off trenches or berms until area is established | 4 | 4 | 1 | 2 | 18 | - | L |
| Direct impact: change in land capability | 1 | **1 &2** | 8 | 3 | 2 | 4 | 52 | - | M | No mitigation possible as the agricultural land capability may be severely affected | 8 | 3 | 2 | 4 | 52 | - | M |
| No direct or indirect impacts anticipated | 1 | **1 &2** | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |
| Ponding as a result of subsidence due to stooping of underground pillars | 2 | **2** | 4 | 4 | 2 | 3 | 30 | - | M | Ensure area is fee draining. | 4 | 2 | 2 | 2 | 16 | - | L |
| **GROUNDWATER** | | | | | | | | | | | | | | | | | |
| Indirect impact: groundwater quality | 1 | **1 &2** | 8 | 2 | 2 | 4 | 48 | - | M | Manage water ingress<br>Manage hydrocarbons to avoid spillages | 4 | 3 | 2 | 3 | 27 | - | L |

| POTENTIAL ENVIRONMENTAL IMPACT | APPLICABLE MINE AREA | ACTIVITY | ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION | | | | | | | RECOMMENDED MITIGATION MEASURES | ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | D | S | P | TOTAL | STATUS | SP | | M | D | S | P | TOTAL | STATUS | SP |
| Direct impact: disruption to faunal and floral communites established on site | 1 | **1 &2** | 8 | 2 | 2 | 5 | 60 | - | M | Limit activities to areas requiring rehabilitation onlyRevegetate as quickly as possible to minimise impact on faunal and floral communities | 6 | 2 | 1 | 3 | 27 | - | L |
| Direct impact: re-establishment of faunal and floral communities | 1 | **1 &2** | 6 | 2 | 1 | 3 | 27 | + | L | Re-establish vegetated areas in a timely manner through active planting and maintenance<br>Minimise erosion<br>Manage alien and invasive plant/weed establishment<br>Consider active introduction of faunal species | 8 | 5 | 3 | 4 | 64 | + | H |
| No direct or indirect impacts anticipated | 1 | **1 &2** | 0 | 0 | 0 | 0 | 0 | N | N | N/A | 0 | 0 | 0 | 0 | 0 | N | N |
| Direct impact: fugitive dust emissions | 1 | **1 &2** | 4 | 2 | 2 | 4 | 32 | - | M | Implement appropriate dust mitigation measures<br>Re-covering of exposed areas<br>Implement dust suppression where necessary<br>Rehabilitate exposed areas as soon after infrastructure removal as possible | 2 | 2 | 2 | 3 | 18 | - | L |
| Direct impact: vehicle entrained dust | 1 | **1 &2** | 4 | 1 | 2 | 4 | 28 | - | L | Implement appropriate dust mitigation measures<br>Re-covering of exposed areas<br>Implement dust suppression where necessary<br>Rehabilitate exposed areas as soon after infrastructure removal as possible<br>Manage vehicle movement on site and ensure speed limts are adhered to | 2 | 2 | 1 | 2 | 10 | - | L |
| Indirect impact: wind-blown dust off rehabilitated areas | 1 | **1 &2** | 4 | 4 | 2 | 4 | 40 | - | M | Ensure effective rehabilitation of exposed areas<br>Monitor final rehabilitation for three years after closure (or according to legislative requirements at the time) | 2 | 2 | 2 | 2 | 12 | - | L |
| Direct impact: removal of surface infrastructure | 1 | **1 &2** | 6 | 5 | 2 | 4 | 52 | - | M | Removal/dismantling of all infrastructure<br>Revegetation of disturbed areas | 2 | 2 | 1 | 2 | 10 | - | L |
| Direct impact: rehabilitation equipment and demolition activities | 1 | **1 &2** | 8 | 4 | 2 | 4 | 56 | - | M | In order to operate a front-end loader and an excavator, a noise barrier of up to 5 m may be required.The noise barrier may be any continuous structure (brick, heavy timber wall or earth berm without any apertures).Noise barrier length to extend well beyond the land to be screened from the noise source.Noise monitoring should be undertaken quarterly during the decomissioning and closure phase. | 6 | 4 | 2 | 2 | 24 | - | L |
| Direct impact: noise from rehabilitation activities | 1 | **1 &2** | 8 | 2 | 2 | 4 | 48 | - | M | Maintain noise berms for as long as possible to minimise noise impact<br>Undertake rehabilitation activities in daytime only | 6 | 2 | 2 | 3 | 30 | - | M |
| Direct impact: reduction in noise | 1 | **1 &2** | 6 | 2 | 1 | 3 | 27 | + | L | Remove infrastructure in a timely manner to minimise noise<br>Remove all vehicles/machinery from site that are not required for rehabilitation activities | 10 | 2 | 2 | 4 | 56 | + | M |
| Direct impact: loss of jobs | 1 | **1 &2** | 10 | 5 | 2 | 5 | 85 | - | H | Communicate job losses/retrenchment prior to the decommissioning and closure phase being initiated | 8 | 5 | 2 | 5 | 75 | - | H |

| POTENTIAL ENVIRONMENTAL IMPACT | APPLICABLE MINE AREA | ACTIVITY | ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION | | | | | | | RECOMMENDED MITIGATION MEASURES | ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | D | S | P | TOTAL | STATUS | SP | | M | D | S | P | TOTAL | STA | SP |
| Change to Land Use Capability of the surface area as a result of subsidence | 1 | **1 &2** | 4 | 4 | 2 | 3 | 30 | - | M | Maintain stormwater management structures where necessary<br>Maintain dust monitoring<br>Maintain water monitoring<br>Maintain noise monitoring | 4 | 4 | 2 | 3 | 30 | - | M |
| Indirect impact: water quality deterioration | 1 | **1 &2** | 2 | 3 | 2 | 2 | 14 | - | L | Prevent contamination during rehabilitation activites<br>Monitoring water quality throughout rehabilitation | 2 | 2 | 2 | 2 | 12 | - | L |

## vi) Methodology used in determining the significance of environmental impacts

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

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 will be provided to the specialist to assess the impacts associated with their investigation.

Each impact identified will be assessed in terms of probability (likelihood of occurring), scale (spatial scale), magnitude (severity) and duration (temporal scale). To enable a scientific approach to the determination of the environmental significance (importance), a numerical value will be linked to each rating scale.

The following criteria will be applied to the impact assessment for the EIA/EMP:

- Occurrence
    - Probability of occurrence (how likely is it that the impact may occur?); and
    - Duration of occurrence (how long may impact last?).
- Severity
    - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?); and
    - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).
- Status of Impact
    - +: Positive impact
    - -: Negative impact
    - N: Neutral (no impact)

In order to assess each of these factors for each impact, the following ranking scales were used:

| *Probability:=P* | *Duration:=D* |
|---|---|
| 5 – Definite/don't know | 5 – Permanent |
| 4 – Highly probable | 4 - Long-term (ceases with the operational life) |
| 3 – Medium probability | 3 - Medium-term (5-15 years) |
| 2 – Low probability | 2 - Short-term (0-5 years) |
| 1 – Improbable | 1 – Immediate |
| 0 – None | |

| *Scale:=S* | *Magnitude:=M* |
|---|---|
| 5 – International | 10 - Very high/don't know |

| | |
|---|---|
| 4 – National | 8 – High |
| 3 – Regional | 6 – Moderate |
| 2 – Local | 4 – Low |
| 1 – Site only | 2 – Minor |
| 0 – None | |
| *Status of Impact* | |
| +: Positive | |
| -: Negative | |
| N: Neutral | |

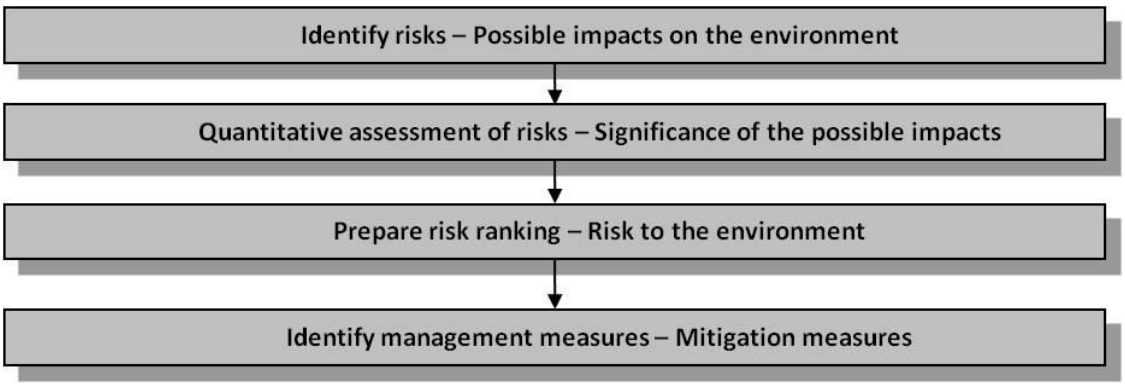
Once the above factors have been ranked for each impact, the environmental significance of each was assessed using the following formula:

**SP = (magnitude + duration + scale) x probability**

The maximum value that can be achieved is 100 Significance Points (SP).Environmental effects were rated as follows:

| ***Significance*** | ***Environmental Significance Points*** | ***Colour Code*** |
|---|---|---|
| High (positive) | >60 | H |
| Medium (positive) | 30 to 60 | M |
| Low (positive) | <30 | L |
| Neutral | 0 | N |
| Low (negative) | >-30 | L |
| Medium (negative) | -30 to -60 | M |
| High (negative) | <-60 | H |

The following process will be followed:



**vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.**

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Refer to **Section 2(d)(v)** for possible positive and negative impacts.

**viii) The possible mitigation measures that could be applied and the level of risk.**

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Refer to **Section 2(d) (v)** for possible mitigation measures.

**ix) The outcome of the site selection Matrix. Final Site Layout Plan**

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

**Consultation with I&APs is still to be conducted .**Once the Environmental Scoping Report has been reviewed and comments from I&APs have been received, this will be incorporated into the final document, and this section will be completed.

**x) Motivation where no alternative sites were considered.**

Alternatives were assessed and are discussed in **Section H** of this Report. Since the Exxaro Matla Coal is already in existence, and the proposed stooping project will be seen as reclaim the remaining coal reserves within an already operations. Matla limits the Phase 1 stooping project to Eskom and Exxaro owned properties only. . The advantage of this reclamation project is that no new additional properties will be disturbed on surface, reducing potential environmental impact.

**xi) Statement motivating the preferred site.**

(Provide a statement motivation the final site layout that is proposed)

Since Exxaro Matla Coal is already in existence, and the proposed stooping project will be seen as reclaim the remaining coal reserves within an already operations. Matla limits the Phase 1 stooping project to Eskom and Exxaro owned properties only. . The advantage of this expansion is that no new additional properties will be disturbed on surface, reducing potential environmental impact.Specialist studies will confirm further positive or negative impacts.

## (i) Plan of study for the Environmental Impact Assessment process

Based on the outcome of the Scoping Phase, an EIA and an EMP Report must be submitted to the DMR for consideration and approval. The following will be undertaken going forward:

### i. Description of alternatives to be considered including the option of not going ahead with the activity.

The proposed project will result in the extension of the life of mine. The additional coal resources will supply Eskom with coal for power generation. The mine has an approved Social and Labour Plan (SLP) which is set out on injecting capital, skills and services into the district municipality. Should this project be approved, and the life of mine increased, the district municipality will continue to benefit from the mining operations.

If the proposed Stooping project is not undertaken, the life of mine will be reduced since the additional resources will not be exploited. In addition the employment rate as well as the regional economy will be negatively affected and the government will not be able to get additional revenue from tax.

### ii. Description of the aspects to be assessed as part of the environmental impact assessment process

**(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.

Based on the outcome of the Scoping Phase, an EIA and an EMP Report will be submitted to the Regional Manager of DMR for consideration and approval. This section details the proposed way forward for the EIA/EMP. The following will be undertaken going forward:

#### Specialist Studies

A number of specialist investigations have been commissioned for the project to ensure that all issues relating to the reclamation Project EIA/EMP are addressed with the appropriate level of detail. The specialist investigations is conducted by a team of professionals, each with specific expertise.

Each specialist study will address the standard requirements for an investigation of this nature. In addition, the issues raised during the consultation process will be addressed / taken into account by the specialists. An outline of the approach and the aspects to be addressed under each study are provided below.

#### *Soils, Land Use and Land Capability Assessment*

A comprehensive soil survey of all potentially affected surface areas will be undertaken in order to:

- Define the soil types on site;
- Define the distribution of soil types;
- Define and describe chemical and physical soil characteristics (based on field work and analyses);
- Identify potential soil problems and limitations;
- Define soil structure and depth (topsoil and subsoil);
- Identify soil impacts (construction, operation and decommissioning), specifically with regard to total extraction (i.e. cracking, potholes);
- Identify soil stockpiling and replacement requirements;
- Identify soil amelioration/rehabilitation with specific reference to rehabilitation of cracks caused by subsidence;
- Identify surface and sub-surface soil erosion potentials;
- Address erosion potential and erosion control (including long-term control strategies); and
- Determine the buffering capacity of soils.

The land capability is required to evaluate the extent of the land capability classes that will be disturbed during mining as well as the economic and ecological implications thereof. Land capability also defines the post-mining land capability that needs to be re-created once site rehabilitation is done.

The land capability assessment will therefore:

- Define the land capability of the affected areas according to arable, grazing, wilderness and wetland potential;
- Describe and quantify the impact of loss of each land capability class represented with specific reference to loss of arable land due to subsidence (wetland formation) as well as the river diversion; and
- Identify post-mining land capability requirements.

***Ecological Assessment***

The objectives of the ecological assessment:

- Formulate a list of species of the area based on previous fieldwork, information obtained from land users and existing literature (the species record will be supplemented by observations of the physical biotopes); and
- Determine which, if any, threatened species are present in the mining area and identify species that will be sensitive to mining activities.

The ecological investigation will include the following activities:

- Determine if / what threatened animal species are present in the proposed mining area;
- Identify species that will be sensitive to mining activities;
- Assess the impact of mining on the resident animals in adjacent areas;
- Assess the impact of loss of habitat on animals (where applicable); and
- Identify means of avoiding, reducing or managing the impacts on fauna.

***Surface Water***

Following on from this desktop surface water scoping report, a full, detailed surface water assessment will be undertaken for the EIA phase of the project.

A holistic approach will be followed and an attempt will be made to link local hydrological, water quality and environmental studies to regional and national concerns, regulations and management strategies. The following activities are planned to finalise the input into the EIA/EMP:

- Storm Water Management Plan;
- Water and Salt Balance;
- Analyse Flood lines; and

***Groundwater***

The plan of study for the EIA/EMP process will include the following tasks:

- Detailed discussions and comparisons of field data to be made part of the impact assessment;
- The update of the conceptual as well as the numerical flow and contaminant transport model for the site;
- The quantitative impact assessment derived from the results of the numerical model. The cumulative impact of the Matla Coal will be assessed.; and
- The development of a groundwater management plan for the site.

***Heritage Investigation***

The objectives of the archaeological study will be to:

- Address the cultural and archaeological aspects of the site;
- Survey the site where the infrastructure will be located;
- Locate, identify, interpret and document all possible sites, features and objects of cultural importance in the area;

- Assess the impact on these sites, features and objects; and
- Suggest possible mitigation measures to reduce the impact on sites, features and objects of cultural importance.

The archaeological investigation undertaken will include the following activities:

- Surveying on foot the site and focusing on areas more likely to contain evidence of human activity (erosion trenches, clumps of trees, bushes, streams and riverbeds);
- Interpreting the 1: 50 000 topographic map of the area;
- Documenting the location of potential sites using a GPS;
- Providing a description and preliminary interpretation of any findings;
- Assessing the sites, features and objects located in terms of their cultural importance, research and scientific value, tourism and educational potential and the potential impact of development on the preservation of important sites; and
- Identifying suitable mitigation measures, if required.

***Social Impact Assessment***

The detailed assessment will be undertaken to determine the potential impacts, as well as cumulative impacts within the area in which the mine is situated in terms of the social and economic components.

The purpose of the social assessments will be to:

- Provide a systematic analysis in advance of the likely impacts that a development event (or project) will have on the day-to-day life of persons and communities;
- Help individuals, communities, as well as organisations to understand and anticipate the possible social consequences on individuals and communities of proposed projects, developments or policy changes; and
- To serve to identify potential social impacts and variables that could influence the eventual project process.

***Wetlands***

The terms of reference of the wetland impacts assessment should be to:

- Delineate the extent of the wetland and riparian habitat to be affected by the proposed project.
- Describe the soil and vegetation of the delineated wetland and riparian habitats based on onsite observations.

- Determine the present conservation importance of the delineated wetland areas using the WET-EcoServices tool (Level 2) developed by Kotze et al. (2009).
- Determine the present conservation importance of the delineated riparian areas using the Ecological Importance and Sensitivity tool developed by DWAF (1999).
- Determine the Present Ecological State of the delineated wetland areas using the WET-Health tool (Level 1) developed by Macfarlane et al. (2009);
- Determine the Present Ecological State of the delineated riparian areas using the Index of Habitat Integrity (IHI) tool developed by Kleynhans et al. (2009);
- Identify, describe and assess the potential impacts to be imparted on the delineated wetland and riparian habitats resulting from the establishment an operation of the proposed mine.
- Provide mitigation measures to avoid, minimise, repair and/or offset the severity/magnitude of the potential impacts on the delineated wetland and riparian habitats.

### Ongoing Public Participation

Once the Environmental Scoping Report has been reviewed and comments from I&APs have been incorporated, the compilation of the EIA and consolidated EMP will commence. The document will incorporate the various specialist reports, where required, and will again be made available for comment. The comments will be incorporated and the document will be submitted to the DMR for a final decision.

A feedback meeting will be held with the stakeholders and authorities in order to give them an opportunity to comment on the document as well as ask relevant questions about aspects associated with the project. Once completed, the comments will be incorporated into the EIA and consolidated EMP and the DMR will be asked to make a final decision on the EIA/EMP.

### Additional Applications

In addition to the application for additional Activities related to Stooping under NEMA, the existing EMP's will be consolidated and stooping included in terms of a Section 102 application, and it will be necessary for Exxaro Coal to undertake a consolidation of current licences and application for new activities in terms of the National Water Act (Act No. 36 of 1998) (NWA).

## iii. Description of aspects to be assessed by specialists

Refer to (ii) for specialist studies to be undertaken.

## iv. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

Refer to **Section 2(d)(iv).**

## v. The proposed method of assessing duration significance

Refer to **Section 2(d)(iv).**

## vi. The stages at which the competent authority will be consulted

Meetings were held with the competent Authorities (DWS – 23 November 2016 and DMR – 6 December 2016) prior to submission of the application form, in order to confirm the listed activities and process going forward with regards to the consolidation of the EMP's and the IWUL's. Another meeting will be scheduled by the time of submission of the final EIA/EMP.

## vii. Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

### 1. Steps to be taken to notify interested and affected parties.

**(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).**

Public participation process will include the following:

**Advertisements**

In terms of the EIA Regulations, the commencement of the EIA process for the project will be advertised within local and regional newspapers. The notification documentation will be compiled in such a way as to address the requirements of the NEMA, MPRDA as well as the NWA process.

**Site Notices**

In terms of the EIA Regulations it is compulsory that site notices be placed on the boundary of the property on which the activity is proposed to take place. These site notices will be printed on an A2 size poster and laminated. Six (6) site notices will be erected.

**Background Information Document (BID) and Information Letters**

A BID that contains basic facts about the proposed project will be compiled and distributed to all I&APs via post, fax, e-mail and/or by hand. The following will be included in the BID:

- A locality map;
- An outline of the process being followed; and
- The details of the public consultation process.

BIDs will be distributed to all existing Stakeholders on the database together with a cover letter. The BID will be produced in English.

Information letters will be distributed to registered (for the purposes of this project) stakeholders during the following phases of the project:

- Introduction of the project (pre-application);
- Availability of the Scoping Report for Review to Stakeholders;
- Submission of the final Scoping Report to the Authorities;
- Availability of the EMP Revision for Review to Stakeholders; and
- Progress feedback at the end of the EMP Phase, when authority decision has been obtained (NEMA, NWA, MPRDA).

**Stakeholder Meetings**

Two (2) Stakeholder meetings will be scheduled during the project phases (1 at Scoping and 1 at the EIA Feedback).

**Issues and Response Document**

Throughout the PPP the issues and response document will be compiled as new comments or concerns are received from the public. The following issues will be highlighted in the issues and response document:

- A description of Stakeholders;
- Issues, concerns and suggestions; and
- Recommendations on how to address relevant issues.

This report will form the basis of the Scoping Report, and will be used to convey significant issues to the client and authorities to inform the environmental and technical aspects of the project.

The Issues and Response Document will be updated during the course of the project and will be included as final into the final EIA/EMP which will be submitted to the authorities.

**Review of Reports**

After the completion of each report (Scoping, EIA/EMP, IWULA and IWWMP), I&APs will be afforded an opportunity to comment on these. All comments received will be recorded and included into the final reports submitted to the relevant authority.

A hard copy of the report will be placed at a public venue for public review. Where I&APs do not have the means to access these reports, GCS will provide them with a pdf version on CD or place the report on the GCS website from where it can be downloaded.

The public will be afforded with 30 calendar days (or as stipulated by the regulatory authority) to comment on the Draft Scoping Report, where after the document will be amended as the final version. Once these review periods have been completed the final report will be submitted to the relevant environmental authorities for approval.

### 2. Details of the engagement process to be followed.

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage).

Refer to section vii) above for the Public Participation process to be followed.

### 3. Description of the information to be provided to Interested and Affected Parties.

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land).

Refer to section vii) above for the Public Participation process to be followed, documents to be provided during consultation as well as contents of the said documents.

## viii. Description of the tasks that will be undertaken during the environmental impact assessment process

Refer to Section (iv) for the environmental impact significance rating methodology as well as impact identification

**(ix) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.**

Refer to **Section (iv)** for the environmental impact significance rating methodology, impact identification as well as proposed mitigation measures.

## l) Other Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

**(1) Impact on the socio-economic conditions of any directly affected person. (**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

A baseline Social Impact study has been initiated by GCS and the final report will be submitted during the EIA phase. Impacts identified during the assessment have been incorporated in the tables under **Section (iv).**

**2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act**. **(**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

A baseline Social Impact study has been initiated by GCS and the final report will be submitted during the EIA phase. Impacts identified during the assessment have been incorporated in the tables under **Section (iv).**

## m) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4)**.

Not Applicable. Alternatives were assessed and addressed in **Section H** of this Report.

**j) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION**

**I _____herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.**

**_ _____**
**Signature of the EAP**
**DATE:**

**k) UNDERTAKING REGARDING LEVEL OF AGREEMENT**

**I _____herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.**

**_ _____**
**Signature of the EAP**
**DATE:**

**-END-**

**NEMA ENVIRONMENTAL SCOPING REPORT ANNEXURES**

**APPENDIX 1: QUALIFICATIONS OF EAP**

**APPENDIX 2: EAP'S CURRICULUM VITAE**

**APPENDIX 3: LOCALITY MAP**

**APPENDIX 4: INFRASTRUCTURE MAP (INDICATING LISTED ACTIVITIES)**

**APPENDIX 5: PUBLIC PARTICIPATION PROCESS**

**APPENDIX 6: SPECIALIST REPORTS**

**APPENDIX 7: A3 MAPS**

# Appendix 1
# Qualifications of EAP

GCS
Water & Environmental Consultants

# Appendix 2
# Curriculum Vitae of EAP

GCS
Water & Environmental Consultants

# Appendix 3
# Locality Map

GCS
Water & Environmental Consultants

# Appendix 4
# Listed Activities Map

GCS
Water & Environmental Consultants

# Appendix 5
# Public Participation Process (PPP) Documents

**PPP is to be initiated once the NEMA application is submitted to the DMR. The Final ESR for submission to the DMR will contain all PPP documents compiled and distributed to date.**

GCS
Water & Environmental Consultants

# Appendix 6
# Specialist Reports

**Final Specialist reports will be submitted with the Draft and Final EIA/EMP documents. All specialist studies are currently in draft format.**

GCS
Water & Environmental Consultants

# Appendix 7
# A3 Maps