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**Section 102 Amendment for Consolidation of all  
Matla EMP's and the inclusion of Phase 1  
Stooping at Exxaro Matla Coal Mine**  
**In terms of the Mineral and Petroleum Resources Development Act, 2002  
(Act No. 28 of 2002) and the National Environmental Management Act,  
1998 (Act No. 107 of 1998)**

**Draft Environmental Management Programme**

July 2018



**GCS Project Number: 13-400 & 16-1208**  
**Client Reference: Matla stooping and consolidation**



**Section 102 Amendment for Consolidation of all Matla EMP's and the inclusion of Phase 1 Stoooping at Exxaro Matla Coal Mine**

**Draft Environmental Management Program Report**

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GCS's opinions, conclusions and recommendations are based upon information that existed at the time of the start of the production of this Document.

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## 1 INTRODUCTION

### 1.1 Details of the EAP

GCS Water and Environment (Pty) Ltd (GCS) have been appointed as the independent Environmental Assessment Practitioners (EAP) to undertake the environmental processes required to obtain approval for the proposed listed activities, as requested by the relevant competent authorities. The contact details of the EAP are provided in Table 1.1.

**Table 1.1: Name and Address of Environmental Assessment Practitioner.**

ITEM	COMPANY CONTACT DETAILS
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The curriculum vitae (CV) of Ms Riana Panaino is provided at the end of this document.

### 1.2 Project Description

#### 1.2.1 Background to the Existing Authorisations

##### 1.2.1.1 1994 Mining Licence

An old order mining licence was awarded to Matla Coal Limited, for the mining of Coal.

##### 1.2.1.2 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 ferri-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.

#### *1.2.1.3 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.

#### *1.2.1.4 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.



#### *1.2.1.5 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. 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 Colliery. 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.

#### *1.2.2 Application for the inclusion of Stoooping*

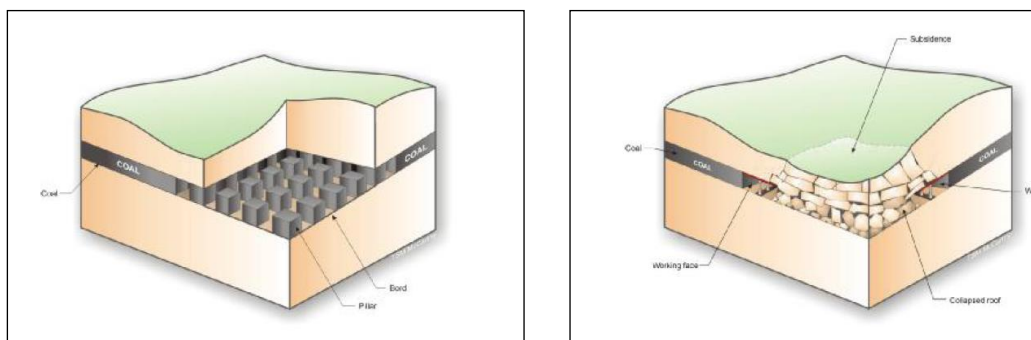
This Section describes the proposed mining method, and associated activities for the proposed extension of mining.

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.

### 1.2.2.1 Mining process

Stooeping 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 1.1).



**Figure 1.1 Stooeping 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.

## 2 LEGAL REQUIREMENTS

### 2.1 Environmental Regulations

For most of its history, the mining industry in South Africa has not been subjected to comprehensive environmental regulation. However, in recent years, this has changed significantly and the industry is now required to comply with a multifaceted network of mining and environmental legislation. There are no shortages of policy and legal frameworks to ensure “responsible” mining in South Africa. The Minerals and Mining Policy for South Africa, 1998 affirmed that the State, as custodian of the nation’s natural resources will support mining development while maintaining and enhancing environmental awareness of the mining industry in accordance with national environmental policy, norms and standards.

To this end, 10 principles on sustainable mining were adopted. These include the adoption of the precautionary approach as well as the polluter pays principle; assertion that a consistent standard of environmental impact management would be adopted, irrespective of the scale of mining concerned; encouraging the mining industry to reduce problems of pollution by promoting a culture of waste minimisation through re-cycling, and re-use of waste products; and ensuring the effective implementation of environmental management measures and monitoring of occurrences of pollution, amongst others.

For the purposes of this application, authorization in terms of the National Environmental Management Act, Act No.107 of 1998 (hereinafter referred to as “NEMA”), the Minerals and Petroleum Resources Development Act, Act No. 28 of 2002 (hereinafter referred to as the “MPRDA”), and the National Water Act, Act No. 36 of 1998 (hereinafter referred to as the “NWA”) is applied for.

### **2.1.1 The Constitution**

The Constitution reigns supreme and the advancement of human rights is one of the foundations of South Africa’s democracy. Furthermore, the Bill of Rights plays a central role in the democratic regime because it embodies a set of fundamental values which should be promoted at all times. One of the fundamental values is contained in Section 24 and is, arguably, the cornerstone for environmental governance in South Africa which includes the mining industry. Section 24(a) proclaims the right of everyone “to an environment that is not harmful to their health or well-being”.

Mining companies are thus duty-bound to constitutional, legislative, and other measures to prevent pollution and ecological degradation, promote conservation and to develop in a sustainable manner.

Two particular judgments deserve consideration in that they contain a comprehensive analysis of the nature and content of the environmental right within the sustainability context. Firstly, the court in *BP Southern Africa (Pty) Ltd v MEC for Agriculture, Conservation and Land Affairs* 2004 5 SA 124 (WLD) confirmed that environmental interests should be balanced with justifiable economic and social development well beyond the interests of the present living generation.

The court justified the latter with Section 24(b), since this Section requires the environment to be protected for the benefit of present and future generations. The court confirmed the importance of sustainable development and predicted that it will “...play a major role in determining important environmental disputes in the future”.

Within this context, the mining industry (and the accompanied social and economic development it should bring with it) is constitutionally bound to uphold the environmental right. The court in *Fuel Retailers Association of Southern Africa v Director General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province 2007 6 SA 4 (CC)* attempted to balance these social, environmental and economic concerns by recognising the importance of economic and social development for the well-being of human beings. However, the court emphasised that development and the environment are inexorably linked and development cannot exist upon a weakening environmental base. Consequently, the promotion of development requires the protection of the environment.

The constitutional environmental right elevates the importance of environmental protection and conservation, and emphasises the significance that South Africans attach to a sound and healthy environment. In addition, the environmental right applies horizontally and this implies that the mining industry has to exercise a duty of care if liability, on the basis of the constitutional environmental right, is to be avoided. The constitutional environmental right is given effect to by means of detailed statutory provisions ranging from framework to sectoral legislation which relate to mining.

### ***2.1.2 Environmental principles***

Section 2(1) (c) of NEMA provides that:

“The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and... serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment...”

Any decision taken in respect of the proposed application for environmental authorization should take into account the principles as set out in Section 2 of NEMA.

GCS acknowledge that these principles serve as guiding principles because they are binding, enforceable and justiciable. By adhering to these principles, GCS promotes a cautious approach when advising on the activities, processes and daily operations of the Matla mining operation and advocates compliance with environmental regulatory measures.

The principles contained in Section 2 of NEMA are the corner stone of environmental governance and liability in South Africa and is based on the foundation of sustainable development. These principles all apply directly to mines by virtue of Section 37(1) of the MPRDA which provides that regard must be had to the NEMA principles by stipulating that the principles set out in Section 2 of NEMA:

- “a) apply to all prospecting and mining operations, as the case may be, and any matter or activity relating to such operation; and
- b) serve as a guideline for the interpretation, administration and implementation of the environmental requirements of this Act.”

Section 37(2) of the MPRDA further provides that:

“Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations.”

(Own emphasis)

By virtue of Section 37(1) of the MPRDA, these principles apply to the mining sector and therefore the mining industry must adopt a risk-averse and cautious approach; prevent negative impacts or effects of their activities on the health and well-being of people and the environment; and pay for all their pollution since they remain liable for the effects of their policies, projects, programmes, products, processes, services or activities throughout their life cycles.

When a competent authority takes a decision in terms of NEMA or any other law concerned with environmental protection, the principles must serve as guidelines. More specifically, the principles should guide the interpretation and implementation of the liability regime of NEMA and any other law concerned with environmental protection including mining related legislation. The following principles are particularly important and are discussed below.

#### *2.1.2.1 Polluter pays principle*

The polluter pays principle (PPP) is reflected in the provision that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

In essence, the PPP means that “polluters and users of natural resources (should) bear the full environmental and social costs of their activities”. The PPP can also be described as an economic principle that requires the polluter (the mining industry in this instance) to be held liable to compensate or pay for pollution prevention, minimisation and remediation.

Therefore, the crux of the principle is to impose economic obligations when environmental damage is caused by a polluter and this is achieved by setting minimum rules on liability for environmental damage.

#### *2.1.2.2 Precautionary principle*

The precautionary principle provides guidance during development or when anything occurs which might harm the environment and where there is scientific uncertainty.

NEMA stipulates and requires “a risk averse and cautious approach” to be applied and that decision-makers should take “into account the limits of current knowledge about the consequences of decisions and actions”. This approach is also acknowledged in the White Paper on a Minerals and Mining Policy for South Africa in that:

“...during decision-making a risk averse and cautious approach that recognises the limits of current environmental management expertise will be adopted and where there is uncertainty, action is required to limit the risk.”

The precautionary principle requires the mining industry to take adequate precautionary measures to safeguard against contamination, pollution or degradation of the environment and where there is uncertainty, the action taken should be to limit the risk to the environment.

#### *2.1.2.3 Preventive principle*

The preventive principle is reflected in the concept that the disturbance of ecosystems and loss of biological diversity are to be “...avoided, or...minimised and remedied.”

Furthermore, the principle prescribes that the disturbance of the landscape and the nation’s cultural heritage is to be avoided, and where it cannot be altogether avoided, must be minimised and remedied. Any negative impacts on the environment and on people’s environmental rights should also be anticipated and prevented, and where they cannot be altogether prevented they should be minimised and remedied.

The principle aims to minimise environmental damage by requiring that action be taken at an early stage of the process, and if possible, before such damage actually occurs. Broadly stated, it prohibits any activity which causes or may cause damage to the environment in violation of the duty of care established under environmental law. The preventive principle bestows on the mining industry an obligation to take steps to avoid causing certain types of damage to the environment, including the environment beyond their own territory or property.

#### *2.1.2.4 Cradle-to-grave*

A cradle-to-grave stewardship perspective indicates the adoption of a comprehensive ecological view of the impacts of a process on the environment, commencing with research, development and design through the extraction and use of raw materials, production and processing, storage, distribution and use, to the final disposal of the product and the waste generated as a by-product.

The integrated consideration of all the environmental impacts forms part of this cycle. The “cradle-to-grave” principle advocates liability as a result of, or caused by, policies, programmes, projects, products, processes, services and activities.

Given the general purpose of NEMA, together with the other sustainability principles, this legal liability may include to rectify, remedy or compensate for environmental damage or degradation. The principle also recognises that environmental impacts, pollution or degradation may be associated with the entire life cycle of a mine, that is, from the identification, exploration phase through project planning, implementation, operations and post-operational closure, decommissioning and rehabilitation. Thus, the mining industry will remain liable for the damage or degradation caused by its activities throughout the life cycle of the mining operations until decommissioning and rehabilitation.

### **2.1.3 *The National Environmental Management Act***

As stated above, NEMA provides for a comprehensive array of principles which cumulatively aim to create among others, corporate socially responsible behaviour by establishing legal liability for environmental damage as well as damage to human health and well-being.

Apart from these principles, NEMA also contains mechanisms, procedures and structures to facilitate pollution prevention, minimisation and remediation.

Chapter 7 of NEMA contains essential provisions dealing with liability for environmental damage in South Africa and two key elements form part thereof; namely: pollution prevention and remediation.

A duty of care is contained in Section 28, which encompasses the main liability provision which applies retrospectively and therefore also to historical pollution. Section 28(1) applies to all forms of pollution, including mining pollution, and is formulated generally by providing a duty of care to avoid, minimise and/or remedy pollution or environmental degradation.

In terms of this subsection, the duty imposes liability on an almost non-exhaustive category of persons, because it refers to "every person".

Section 28(2) goes even further and imposes the duty on a range of people including owners or people in control of land or premises and people who have the right to use the land or premises on which, or in which, an activity or process is, or was, performed or undertaken, or any other situation exists which causes, or is likely to cause, significant pollution or degradation to the environment.



The duty of care imposes strict liability since Section 28(1) requires reasonable persons to take reasonable measures. Subsection (3) provides an indicative range of measures that can be considered as “reasonable measures” and these may include measures to investigate, assess and evaluate the impact on the environment; inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation, contain or prevent the movement of pollutants or the causing of degradation, eliminate any source of the pollution or degradation and to remedy the effects of the pollution or degradation.

One can identify from the wording an obligation to prevent and minimise pollution or degradation and this indicates that remediation is clearly part of South African law. Where a mine fails to take reasonable measures to prevent or minimise pollution, it can be directed to do so by the relevant authority and if it does not comply with the directive, measures will be taken by government on its behalf, but at the mine’s expense.

Under Section 34(7), liability is specifically extended to the director of the mining company concerned in his or her personal capacity, in other words, the director is personally liable.

Furthermore, Section 43 provides that if directors failed to take all reasonable steps to prevent the offence being committed, and monetary advantage was gained, they may be personally liable for damages or compensation, have to pay a fine, or have to comply with remedial measures determined by the Court, and may even have to pay the State’s investigative costs. The latter was confirmed in *Minister of Water Affairs and Forestry v Stilfontein Gold Mining Co Ltd and Others* 2006 5 SA 333 (W) where the court held, in a telling statement that:

“To permit mining companies and their directors to flout environmental obligations is contrary to the Constitution, the Mineral Petroleum Development Act and to the National Environmental Management Act. Unless courts are prepared to assist the State by providing suitable mechanisms for the enforcement of statutory obligations an impression will be created that mining companies [and their directors] are free to exploit the mineral resources of the country for profit over the lifetime of the mine, thereafter they may simply walk away from their environmental obligations. This simply cannot be permitted in a constitutional democracy which recognises the right of all of its citizens to be protected from the effects of pollution and degradation.”

#### **2.1.4 The Mineral and Petroleum Resources Development Act**

Section 43(1) of the MPRDA and Section 24R of NEMA provides key insight into how the MPRDA approaches liability. In terms of this section, mining companies remain liable for, inter alia, any pollution and ecological degradation until the Minister has issued a closure certificate.

Granting of permission to mine or prospect, among others, is conditional on an environmental management programme and plan being submitted and accepted by the relevant government authority. Section 43 is one of the most important provisions as it deals with the responsibility for any environmental liability, pollution or ecological degradation until the issue of the closure certificate. It is important to note that environmental liability will not necessarily cease or fall away by the issuing of a closure certificate. In addition to the broader liability provisions above, Section 45 provides that the relevant authority may direct a mine to undertake remedial measures where:

“...any prospecting, mining, reconnaissance or production operations cause or results in ecological degradation, pollution or environmental damage which may be harmful to the health or well-being of anyone and requires urgent remedial measures.”

Where the mine fails to take these measures, the relevant authority will act on its behalf and then recover costs incurred from the mine. If the mine fails to compensate the authority, the latter is empowered to seize and sell the mine’s property to recover the costs. The mine will thus remain financially liable for the rehabilitation, even if it chooses to ignore the government directive.

### 2.1.5 *The National Water Act*

One of the main and ever-continuing concerns in South Africa is the sustainability of water management, and the costs associated with the prevention and remediation of pollution in a country with an average rainfall far below international standards.

The NWA is one of the government's answers to some of these challenges and functions as sectoral legislation within the framework of NEMA.

Section 19 of the NWA mirrors the provision of Section 28 of NEMA and addresses the prevention and remediation of the effects of pollution. The NWA provides a wide duty of care in that:

“(1) an owner of land, a person in control of land or a person who occupies or uses the land on which-

(a) any activity or process is or was performed or undertaken; or

(b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.”

The words “likely to cause pollution” broadens the scope of the duty, which enables an activity, or situation that is land-based, to trigger the application of the duty. The “reasonable measures” are not prescribed, but may include measures intended to:

“cease, modify or control any act or process causing the pollution; comply with any prescribed waste standard or management practice; contain or prevent the movement of pollutants; eliminate any source of pollution; remedy the effects of pollution; and remedy the effects of any disturbance to the bed and banks of a watercourse.”

The NWA, furthermore, provides for water use authorisations which a mine will have to apply for, before commencing with its primary activity of mining. Various conditions may be attached to these licenses and a breach thereof will result in criminal and civil liability. The conditions attached to water use authorisations will function alongside the additional protective measures, duty of care and statutory liability provisions provided by the NWA and other legislation to regulate a whole array of water issues.

The detrimental impact of mining on water resources is further regulated by the NWA in a comprehensive set of regulations titled: “Regulations on the Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources”. In terms of these regulations:

“No person in control of a mine or [mining] activity may place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation.”

Regulation 7 provides for a whole array of provisions which specifically aim to protect water resources from mining.

These provisions state that every person in control of a mine or mining activity must take all reasonable measures to, inter alia: prevent water containing waste or any substance which causes or is likely to cause pollution from entering any water resource; design, modify, locate, construct and maintain all water systems including residue deposits, to prevent the pollution of any water resource through the operation or use thereof; cause effective measures to be taken to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns; prevent the erosion or leaching of materials from any residue deposit or stockpile from any area; and ensure that water used in any process at a mine or activity is recycled as far as practicable.

These provisions specifically relate to the protection of water resources and they clearly set out further additional liabilities for mines as far as their water resource protection activities are concerned.

## **2.2 Environmental process**

The environmental processes involved with the project will be undertaken in three (3) parallel processes namely the NEMA process for all the associated listed activities and the MPRDA process to develop a consolidated EIA/EMP for the DMR, and the NWA process regarding the consolidation of existing IWUL’s and water uses that will be associated with the proposed stoooping project. The NEMA and MPRDA processes will be an integrated process and only one EMP will be compiled and submitted to the DMR.

The following documents will be compiled and submitted to the indicated competent authorities:

- Section 102 EMP in terms of the MPRDA to include all new activities into the consolidated EMP (including the Financial Provision) as well as the Listed activities in terms of NEMA;
  - In terms of the One Environment System (As of 08 December 2014) all Mining related activities are approved as part of the MPRDA process. The Minister of Mineral Resources will, as of 08 December 2014, issue environmental authorisations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), for mining and related activities. The Minister of Environmental Affairs will be the appeal authority for these authorisations.
- Consolidated IWULA and Integrated Waste and Water Management Plan (IWWMP) under NWA: Department of Water and Sanitation (DWS).

The various environmental authorisation processes being followed for this project are described in the sections which follow hereunder.

### ***2.2.1 The ONE-Environmental System***

On the 8th of December 2014 the various departments that regulate mining activities introduced a system that would improve competitiveness of the South African mining sector. This system was ultimately created to represent government's commitment to improve and enhance the way of doing business in the mining sector.

Furthermore this system will streamline the South African licensing process for mining, environmental authorisations and water use. The competent authority will now be the DMR, while the DEA will remain the appeal authority.

### ***2.2.2 The process in terms of MPRDA***

Mines and mining related activities are regulated by the MPRDA, therefore in terms of Section 102 of the MPRDA, Exxaro requires authorisation for the proposed activities and the consolidation of the EMP's in the form of an amendment application, which must be approved by the DMR in Mpumalanga.

The MPRDA process will address the project as a whole including all activities regarding the Expansion area.

The application to amend the EMP requires the compilation and submission of a consolidated EMP. This report is compiled in compliance with Regulation 51 of GN R527, dated 23 April 2004 (published in terms of Section 107(1) of the MPRDA) (hereinafter referred to as the “MPRDA Regulations”) as well as the Guidelines, and takes into consideration all aspects included in these documents.

The EIA/EMP will contain the following:

- An assessment of the environment likely to be affected by the proposed operations;
- An assessment of the nature, extent, duration, probability and significance of the identified potential environmental, social and cultural impacts of the proposed operation, including cumulative impacts;
- A comparative assessment of the potential operation, as well as a comparison of other potential land uses for those sites;
- Identification of appropriate mitigatory measures for each significant potential impact of the proposed operation;
- Description of the stakeholder engagement process undertaken during the course of the assessment, issues that were raised and questions asked by I&APs and authorities, and how these issues and questions were addressed;
- Identification of gaps in knowledge, report on the adequacy of predictive methods, underlying assumptions and uncertainties encountered in compiling the required information;
- Description of the arrangements for monitoring and management of environmental impacts;
- A description of the environmental objectives and specific goals for the management of the identified environmental and socio-economic impacts during all phases of the development (construction, operation, decommissioning and post-closure);
- A description of the appropriate technical and management options chosen for each environmental, socio-economic, cultural and historical impact for all project phases;

- Action plans to achieve the specific goals set out, as well as timeframes for the implementation of mitigatory measures;
- Procedures for environmental related emergencies and remediation;
- Planned monitoring and environmental management programme performance assessment;
- An environmental awareness plan; and
- An undertaking by the applicant to comply with the provisions of the MPRDA and regulations thereto.

### 2.2.3 The process in terms of NEMA

Section 24(1) of NEMA requires that the potential consequences of or impacts on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority. Where environmental impact assessment has been identified as the instrument to be utilised in achieving the aforementioned, an application for environmental authorisation needs to be obtained. The identified activities are listed under GNR R982, R983, R984 and R985 of the NEMA Regulations of 04 December 2014.

The listed activities (Table 2.1 and Table 2.2) which are triggered by the proposed mining operation are contained in Listing Notice 1 and 2 (GN R983, GN 984). Activities contained in Listing Notice 1 require a Basic Assessment (BA) process to be followed and activities in Listings 2 require a Scoping and EIA process be followed.

**Table 2.1. Listed activities triggered under GN R983 (as amended)**

Activity No (s) (in terms of the relevant or notice):and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
<b>National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations 2014</b>		
GN R983, 4 December 2014, Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The underground Stoooping will cause subsidence in close proximity to wetland areas

**Table 2.2. Listed activities triggered under GN R984**

Activity No (s) (in terms of the relevant or notice):and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
<b>National Environmental Management Act, 1998 (Act No. 107 of 1998)</b>		

Activity No (s) (in terms of the relevant or notice):and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
<b>Environmental Impact Assessment Regulations 2010</b>		
GN R984, 4 December 2014, Activity 6	The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent,...	Application for an IWUL for activities triggered in terms of Section 21 of the NWA
GN R984, 4 December 2014, Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation	Rehabilitation of goafing areas, where areas are stripped of vegetation and topsoil, shaped and then topsoiled and revegetated.
GN R984, 4 December 2014, Activity 17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including-  (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or  (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;	Stooing is a method of mining and Matla Coal needs to amend their mining works programme to include stooing. A Section 102 application will then be required.

The DMR is regarded as the competent authority for all mining related activities and as such an amendment to the approved EMP will be developed for the proposed expansion and submitted to DMR (Emalahleni) for assessment and authorisation as per discussions with DMR on 20 December 2016.

#### **2.2.4 The process in terms of NWA**

In addition to the MPRDA authorisation, activities which have the potential to impact on a water resource require a water use licence (WUL) issued by the Department of Water and Sanitation (DWS), under the NWA. Section 21 of the NWA identifies certain water uses which have to be authorised. A consolidated Water Use Licence Application (WULA) and an accompanying Integrated Waste Water Management Plan (IWWMP) must be submitted to the DWS and will include the following new activities for stooing, dust suppression and stockpiles:

- Section 21(c): Impeding or diverting the flow of water in a watercourse; and
- Section 21 (i): Removing, discharging or disposing of water found underground.



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

The IWWMP is used as a management tool by Exxaro to manage water emanating from their operations, using best practices in the interest of protecting the water resources which may be affected.

A WUL may be issued for a maximum period of 40 years with a specified review period. The WUL also prescribes a set of conditions to protect water resources, and gauge the impact of the water use. These have to be strictly adhered to for as long as the water use continues. This may extend beyond the life of the mining operation, as Matla will be responsible for impacts caused by the mining operations after decommissioning and closure.

Furthermore, Section 27 of the NWA specifies that the following factors, regarding water use authorization, must be taken into consideration:

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

Section 27 considerations will be included in the WULA and IWWMP. This will assist Matla in ensuring that the water uses applied for, are undertaken in a manner that does not negatively impact on the public, water resources, or downstream water users or compromise any of the country's international obligations with regards to shared water resources.

### **2.3 Environmental Assessment Practitioner**

In terms of Section 17 of the NEMA, the applicant has to appoint Environmental Assessment Practitioners (EAPs) before applying for an environmental authorisation of any activity listed in terms of GNR 983, 984 and 985.

For this purpose Exxaro has appointed GCS Water and Environment (Pty) Ltd t/a GCS (Pty) Ltd (GCS) to undertake the necessary environmental assessments and to ensure that all legislative requirements are adhered to as part of the environmental authorisation processes.

GCS provides a professional, independent consulting service in the fields of water, environmental, engineering and earth sciences. The GCS team consists of highly trained staff that has extensive experience in the fields of hydrogeology, hydrology, earth sciences, engineering geology, engineering and environmental sciences.

GCS have considerable experience in Southern Africa and undertake investigations for environmental assessments. The environmental scientists carry out all aspects of environmental assessments and management programmes.

GCS was founded in 1987 and the broad GCS client base ranges from individuals, engineers, municipalities and mines, to Independent States and Governments. GCS is an independent practice, which is wholly owned by the partners of the company.

GCS is an independent environmental consulting firm and has undertaken the Environmental Impact Assessment (EIA)/Environmental Management Programme (EMP) Report development. GCS is also responsible for the Public Participation Process (PPP) pertaining to the proposed operation. The EAP is independent and has no vested interest in the outcome of the environmental authorization applications.

## **2.4 Description of Activities that could Impact on the Environment**

### ***2.4.1 Activities previously authorized:***

Due to Matla being operational for a long period of time stretching beyond the implementation of the NEMA and its regulations, most of the earlier EMP's were authorized only under the MPRDA through the then Department of Minerals and Energy (DME). The NEMA EIA regulations came into effect in 2006 and repealed most of the Environmental conservation Act (ECA) which was previously used as a guideline for Environmental studies. The first EMP to include Listed Activities under the NEMA was the Mine 1 New Shaft EMP (under reference number MP 30/5/1/2/3/2/1(327) EM) and was authorized under the DME as the lead authority. Thus the first activities authorized was only post 2006, and are depicted below in Table 2.3.

**Table 2.3: Activities previously authorised**

Activity Description	Regulation	Listed Activity
<b>Licence MP 30/5/1/2/3/2/1(327) EM of 2009: Mine 1 New Shaft</b>		
Construction of a coal transportation conveyor. Length: Approximately 4.2 km Capacity: Approximately 1 800 tons of coal per hour	GN R387 of 2006	Activity 1: The construction of facilities or infrastructure, including associated structures or infrastructure for: (j) the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day.
Sewage treatment plant to be constructed on the proposed Matla 1 new access shaft site. Approximate daily discharge: 250m <sup>3</sup> (250 000 litres)	GN R387 of 2006	Activity 1: The construction of facilities or infrastructure, including associated structures or infrastructure, for: (p) the treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more
Fuel storage facility at the proposed Matla 1 new access shaft site: 10 000 litres  Proposed lubrication storage facilities on the proposed Matla 1 new access shaft site: Gear oil: 10 000 litres Hydraulic lubricant: 10 000 litres Diesel machinery oil: 10 000 litres Road treat: 10 000 litres	GN R386 of 2006	Activity 7: The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1 000 cubic metres at any one location or site.
Construction of a gravel service road next to the proposed conveyor structure  Construction of tarred access roads on the Matla 1 new access shaft site	GN R386 of 2006	Activity 15: The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.
<b>Licence (MDEDET) 17/2/3 N-70 of 2012: Water Treatment Plant</b>		
Water Pipelines	GNR 544 of 18 June 2010	Activity 9: The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more,

Activity Description	Regulation	Listed Activity
		excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse
Brine Ponds	GNR 544 of 18 June 2010	Activity 11: The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
Brine Ponds	GNR 544 of 18 June 2010	Activity 12: The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010;
Possible acid or other chemical storage related to the treatment of the brine pond material.	GNR 544 of 18 June 2010	Activity 13: The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres;
Construction of haul roads	GNR 544 of 18 June 2010	Activity 22: The construction of a road, outside urban areas, with a reserve wider than 13,5 meters or, where no reserve exists where the road is wider than 8 metres, or for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.

Activity Description	Regulation	Listed Activity
WTP and Brine Ponds	GNR 544 of 18 June 2010	Activity 23: The transformation of undeveloped, vacant or derelict land to - residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - except where such transformation takes place for linear activities.
For NWA application	GNR 544 of 18 June 2010	Activity 28: The expansion of existing facilities for any process or activity where such expansion will result in the need for a new, or amendment of, an existing permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.
Road	GNR 544 of 18 June 2010	Activity 47: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - where the existing reserve is wider than 13,5 meters; or where no reserve exists, where the existing road is wider than 8 metres - excluding widening or lengthening occurring inside urban areas.
Diesels storage and other dangerous good storage	GNR 545 of 18 June 2010	Activity 3: The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.
WULA related	GNR 545 of 18 June 2010	Activity 5: The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.
Electricity generation	GNR 545 of 18 June 2010	Activity 8: The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
Pollution Control Dams - depends on the final design	GNR 545 of 18 June 2010	Activity 19: The construction of a dam, where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.
Depends if the road falls within a sensitive area	GNR 546 of 18 June 2010	Activity 4: The construction of a road wider than 4 metres with a reserve less than 13,5 metres

Activity Description	Regulation	Listed Activity
		(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and Western Cape: ii. Outside urban areas, in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
Depends if the storage area falls within a sensitive area	GNR 546 of 18 June 2010	Activity 10: The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and Western Cape: ii. Outside urban areas, in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
	GNR 546 of 18 June 2010	Activity 13: The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list. the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No 544 of 2010. (a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and Western Cape: ii. Outside urban areas, in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
	GNR 546 of 18 June 2010	Activity 19: The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. (a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and Western Cape: ii. Outside urban areas, in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
Licence (DEA) 12/9/11/L649/6 of 2013: Water Treatment Plant		

Activity Description	Regulation	Listed Activity
Brine Ponds	General Notice 718, 3 July 2009	Category B Activity 1: The storage including the temporary storage of hazardous waste in lagoons.
Water treatment facility for the treatment of Process Water	General Notice 718, 3 July 2009	Category B Activity 3: The recovery of hazardous waste including the refining, utilisation or co-processing of waste at a facility with a capacity to process more than 500 kg of hazardous waste per day excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises or unless the Minister has approved re-use guidelines for the specific waste stream.
Water treatment facility for the treatment of Process Water	General Notice 718, 3 July 2009	Category B Activity 5: The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such a facility to treat such waste.

### 2.4.2 New activities requiring authorisation

The inclusion of the Stopping Project into the Matla Operations will entail the activities that could impact upon the receiving environment are anticipated for each phase of the project:

- Construction Phase:
  - No construction phase activities anticipated as this will be a continuation of mining activities within the current infrastructure.
- Operational Phase:
  - Underground Mining Of Coal - stopping / total extraction; and
  - Concurrent surface rehabilitation.
- Closure Phase:
  - Active Surface Rehabilitation
- Residual Impacts; and
- Cumulative Impacts

The listed activities in terms of NEMA as shown in Table 2.1 and Table 2.2 and will therefore require an environmental application for approval of the proposed activities before Stopping can commence.

**Table 2.4. Listed activities triggered under GN R983 (as amended)**

Activity No (s) (in terms of the relevant or notice);and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
<b>National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations 2014</b>		
GN R983, 4 December 2014, Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The underground Stopping will cause subsidence in close proximity to wetland areas

**Table 2.5. Listed activities triggered under GN R984**

Activity No (s) (in terms of the relevant or notice);and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
<b>National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations 2010</b>		
GN R984, 4 December 2014, Activity 6	The development of facilities or infrastructure for any process or activity	Application for an IWUL for activities triggered in



Activity No (s) (in terms of the relevant or notice);and date of the relevant notice:	Listed activity:	Description of project activity that triggers listed activity
	which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent,...	terms of Section 21 of the NWA
GN R984, 4 December 2014, Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation	Rehabilitation of goafing areas, where areas are stripped of vegetation and topsoil, shaped and then topsoiled and revegetated.
GN R984, 4 December 2014, Activity 17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including-  (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or  (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;	Stooeping is a method of mining and Matla Coal needs to amend their mining works programme to include stooeping. A Section 102 application will then be required.

### 3 PURPOSE OF THE EMPR

The Matla Management Team has decided to consolidate all environmental authorisations (EMPs and IWULs) in order to achieve the following:

- Better management of the various legal requirements set out in each authorisation,
- Improvement in the management of the costs associated with the implementation of the legal requirements; and
- To avoid duplications in compliance related matters and ensure all reporting requirements are met.

The purpose of the EMPr for the proposed consolidation of all existing Matla EMPs would be:

- To describe how potential negative environmental impacts will be managed through appropriate mitigation measures;
- To improve on management actions that have not been effective;
- To describe actions that could be taken to rehabilitate the affected areas especially during the construction phase;
- To prescribe monitoring actions that will ensure that the environmental management programme is adhered to; and
- To describe how potential positive environmental impacts will be maximised.

During the previous environmental process, various impacts were identified and mitigation measures developed for these impacts. These mitigation measures have been organised and co-ordinated into the consolidated EMPr, which will guide the operations at the mine. The EMPr will remain in force for the whole duration of the project and will be subject to various audits. The EMPr is a living document which may be subject to necessary updates in the interest of best practices.

#### 3.1 General Objectives of the EMPr

Through the development of the consolidated EMPr, Matla wants to achieve the following objectives:

- Identify all possible impacts;
- Have detailed mitigating measures in place that the contractors and sub-contractors have to adhere to in order to avoid or minimise identified impacts;
- Define corrective measures that need to be implemented should non-conformances occur;
- Propose measures to eliminate possible negative long term impacts that may result from the construction phase;

- Propose the best practice rehabilitation measures; and
- Ensure the health and safety of all relevant role players.

The overall objective of the EMPr is to reduce or mitigate negative environmental consequences resulting from the operational and closure process and to limit negative impacts as far as possible. The EMPr also aims to enhance positive impacts. The environmental objectives of the EMPr are to ensure that all necessary steps will be taken to ensure the following with regard to the above identified impacts:

- That appropriate pollution control and other environmental protection measures are taken by the applicant, in accordance with all applicable laws and regulations;
- That the applicant will not degrade the degree of environmental impact beyond existing environmental conditions; and
- That, socio-economic and bio-physical conditions will be addressed in order to ensure that minimal negative impacts are caused.

### **3.2 Approval and Implementation of the EMPr**

Department of Mineral Resources (DMR) must approve the EMPr before it can be used as a legal binding document. The EMPr must ensure that the conditions of the Environmental Authorisation (EA) are implemented and adhered to. Copies of the approved EMPr must be made available to the following persons at all times:

- The applicant; and
- The workers on site who participate in the operation and closure of the mine.

The EMPr must be explained to the applicant, the mine manager, contractors and all workers who will participate in the operation and closure process.

It remains the responsibility of the applicant and owner to ensure that regular internal audits are performed during the operation and closure to ensure that the enhancement and mitigation measures are implemented.

## **4 ROLES AND RESPONSIBILITIES**

In order to ensure the success of the EMPr, it is important to assign definite roles and responsibilities. Compulsory adherence is to be made to the EMPr. The obligations of the EMPr create a legally binding document in terms of environmental legislation and civil law. It is important that contractors and sub-contractors ensure that all relevant aspects of the EMPr are communicated to all of their employees. It is the duty of the contractors, sub-contractors and their employees to fulfil the project objectives with specific reference to the prevention and mitigation of impacts caused by the mining activities. It is the responsibility of the DMR to ensure that the development takes place according to the relevant legislation.

### **4.1 Government Departments**

As the responsibility for the protection of our natural heritage lies with the government departments, they have the power to conduct site inspections to ensure that the development complies with all legislation, regulations and standards. They may enforce penalties where non-compliance occurs.

### **4.2 Mine / Environmental Manager**

The Mine Manager/Environmental Manager will oversee all of the activities. He/she will be responsible for the activities on site and see to the implementation of the EMPr. He/she will establish a communication network between the different components conducting the work. All incidents and reports will be made to the Environmental/Mine Manager. Ultimate responsibility in terms of compliance to the EMPr lies with the Environmental/Mine Manager.

### **4.3 Main Contractor**

The ultimate on-site responsibility for environmental matters lies with the Main Contractor Engineer. They will be responsible for day to day direction and management on the site throughout the Mine life.

### **4.4 Environmental Officer**

An Environmental Officer (EO) or Safety, Health and Environmental Quality (SHEQ) Officer will be appointed.

It will be the responsibility of the EO/SHEQ Officer to:

- Oversee that the day to day activities that will take place on site comply with the EMPr and the relevant legislation;

- To prepare a detailed communication strategy for liaison with I&APs, stakeholders and contractors;
- Manage and document forward and backward information flows between the Main Contractor/Engineer and the I&APs and Matla. This includes information pertaining to monitoring and evaluation;
- Assist Matla upon request, with daily project communication with I&APs;
- Ensure meaningful participation with the I&APs, including capacity building exercises where the need is identified;
- Give induction and environmental awareness training;
- Ensure that a record keeping system is maintained; and
- Promote co-regulation, shared responsibility and a sense of ownership amongst all parties involved.

#### **4.5 Environmental Control Officer**

In order to ensure full compliance to the EMPr and in effect the legislation, Matla must appoint an Environmental Control Officer (ECO) who is an outside, independent proponent.

The responsibilities of the ECO will be:

- To monitor the mining activities through regular site inspections to ensure compliance to the EMPr;
- To assess the EMPr as to its effectiveness in mitigating and preventing impacts;
- To assess compliance to the EA;
- To advise the Mine Manager, Resident Engineer, Main Contractor and Environmental Officer in respect to the activities and its impact on the environment;
- To identify any non-compliances and to advise to the immediate action and remediation;
- To compile feedback reports every month and communicate the findings to the Mine Manager and contractors;
- To write an annual compliance report and submit it to the regulatory authority, in this case the DMR;
- To ensure monthly project meetings are undertaken with the contractors and the Mine Manager to discuss the findings made during the site visits;
- To ensure that the best environmental options are followed throughout;
- To ensure that a proper training, awareness and competence training programme is implemented; and
- To, where necessary, update the EMPr as new issues may arise.

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## 5 ENVIRONMENTAL OBJECTIVES, MITIGATION AND MANAGEMENT MEASURES

In terms of The Constitution of the Republic of South Africa everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The needs of the environment, as well as I&APs should thus be integrated into overall project management. This EMP provides a tool for meeting this objective by providing detailed mitigation and management commitments by Matla for the operation and eventual closure of the mine.

**Table 5.1** provides the objectives, management measures and action plans recommended to manage the potential impacts rated during the different phases. In addition to the management measures provided the table indicates the person responsible to ensure that these commitments are adhered to and implemented.

Table 5.1: Management measures to obtain objectives and favourable outcomes

POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	OBJECTIVE	RECOMMENDED MITIGATION MEASURES	ACTION PLAN	OUTCOME	RESPONSIBLE PERSON
<b>AREAS: 1) UNDERGROUND MINE AREA 2) SURFACE AREA ABOVE STOOPING 3) INFRASTRUCTURE AREAS MINE 1, 2, 3 4) WTP 5) MINE 1 NEW SHAFT</b>						
<b>GEOLOGY</b>						
Change in geological structure	1		Mitigation not possible, geology is permanently altered	No Action Plan required due to permanent alteration		na
<b>Topography</b>						
Surface subsidence	2	To enhance run-off and minimize (avoid where possible) pond forming	Reshape topography	Adhere to surface rehabilitation plan	Surface drainage similar to pre-mining environment	Environmental Manager
<b>Soil, Land Use and Land Capability</b>						
Erosion	2, 3	Avoid soil erosion	Concurrent and timeous surface rehabilitation. Control and auditing of vehicle movements.	Implement Soil Management and Rehabilitation Plan	Well established land cover and effective rehabilitation	Environmental Manager
Loss of soil resource and eco system services	2, 3	To conserve soil resources and to maintain the viability of soil disturbed by the development of the mine and associated infrastructure	Concurrent and timeous surface rehabilitation. Control and auditing of vehicle movements.	Implement Soil Management and Rehabilitation Plan	Well rehabilitated topsoil layer supporting vegetation	Environmental Manager
Salinisation as a result of ponding	2	To enhance run-off and minimize (avoid where possible) pond forming	Concurrent and timeous surface rehabilitation. Contour and shape after subsidence. Ensure free are is free draining.	Implement Soil Management and Rehabilitation Plan	Surface drainage similar to pre-mining environment	Environmental Manager
Contamination of vadose zone as a result of ponded water ingress	2	Avoid ponding and contamination of the vadose zone	Concurrent and timeous surface rehabilitation. Contour and shape after subsidence. Ensure free are is free draining.	Implement Soil Management and Rehabilitation Plan	Surface drainage similar to pre-mining environment. No soil contamination.	Environmental Manager
Soil contamination and degradation	2, 3, 4	To minimise the amount of physical and chemical degradation occurring in soils.	Avoid spills and contaminants entering the environment	Regular inspections will be done. Areas will be identified and necessary clean up undertaken. Should large spills occur, these will be cleaned immediately. Storage areas and vehicle maintenance areas will be surfaced and will have appropriate runoff containment measures, such as bunds and canals, in place. All chemical, fuel and lubricant storage areas will be underlain by impermeable substrates. Chemicals will be stored according to the Material Safety Data Sheet (MSDS), in bunded area with an impermeable surface. Vehicles will be regularly serviced according to a pre-planned maintenance programme. An incident management system, including procedures and training, will be implemented by Matla for the purpose of dealing with incidents. Major spillage incidents will be reported to the DMR, DWS, and DARDLEA. Appropriate remedial measures will be implemented in consultation with these regulatory authorities. Conveyor belts should be monitored and maintained to avoid spills into the environment. Conveyor belts spill areas should be contained. Implement the waste management plan.	Limited soils contamination and degradation	Environmental Manager
Soil compaction	4	To avoid soil compaction outside of built areas	Control access onto stored or unprotected materials	Restrict access to soil stockpiles and areas of storage. Implement soil rehabilitation plan.	Minimal impact to soil properties.	Environmental Manager
Change in landuse	2, 3, 4	To rehabilitate the area to a similar pre-mining landuse.	Shape topography to avoid ponding Rehabilitate affected areas	Implement Soil Management and Rehabilitation Plan	Effective rehabilitation that allows for a land use similar to the pre mining state.	Environmental Manager
Change in land capability	2, 3, 4	To rehabilitate the area to a similar pre-mining land capability.	Shape topography to avoid ponding Rehabilitate affected areas	Implement Soil Management and Rehabilitation Plan	Effective rehabilitation that allows for land capability similar to the pre mining state.	Environmental Manager
<b>Biodiversity</b>						
Change in flora species of conservation importance	2, 3, 4, 5	protect areas of high diversity where possible	Exclude areas of high sensitivity where possible. Minimising operational footprints,	Implement Biodiversity Action Plan and Management Measures	maintain flora species of conservation importance	Environmental Manager
Change in ecological connectivity & ecosystem functioning	2, 3, 4, 5	Maintain ecological corridors and linkages	Exclude areas of high sensitivity where possible. Minimising operational footprints,	Implement Biodiversity Action Plan and Management Measures	Minimal impact to natural environment with effective ecological corridors.	Environmental Manager
Indirect impacts (loss/ degradation/ pollution) on surrounding habitat	2, 3, 4, 5	To minimise the loss or disturbance of vegetation cover and to reduce the ingress of invader species.	Ensure proper rehabilitation of affected areas	Implement Biodiversity Action Plan and Management Measures	Rehabilitated areas with groundcover similar to pre-mining status.	Environmental Manager
Loss or degradation of natural vegetation/ sensitive habitat types	2, 3, 4, 5	To minimise the loss or disturbance of vegetation cover and to reduce the ingress of invader species.	Ensure proper rehabilitation of affected areas. minimise construction footprint at new 1 shaft	Implement Biodiversity Action Plan and Management Measures. Ensure optimal operation of all infrastructure and proper maintenance and management of the clean and dirty water separation system and the	Rehabilitated areas with groundcover similar to pre-mining status.	Environmental Manager

POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	OBJECTIVE	RECOMMENDED MITIGATION MEASURES	ACTION PLAN	OUTCOME	RESPONSIBLE PERSON
AREAS: 1) UNDERGROUND MINE AREA 2) SURFACE AREA ABOVE STOOPING 3) INFRASTRUCTURE AREAS MINE 1, 2, 3 4) WTP 5) MINE 1 NEW SHAFT						
				erosion control measures. Fence of no go areas during construction at new 1 shaft, and prevent construction vehicles and machinery entering no-go areas.		
Direct impacts on fauna species and species of conservation importance	2, 3, 4, 5	To conserve and protect biodiversity and reduce the loss of important taxa present within the proposed mining area.	Exclude areas of high sensitivity where possible. Minimising operational footprints, Allow for faunal movement	Implement Biodiversity Action Plan and Management Measures No poaching, hunting, killing or trapping of any animals in the area will be allowed. Should any red data animals be discovered, they should be recorded during and relocated to a safe place outside the construction area.	Minimal impacts on fauna species and species of conservation importance	Environmental Manager
Loss or degradation of natural and sensitive faunal habitats	2, 3, 4, 5	To ensure that the quality and diversity of the pre-mining grassland is represented in the post-mining rehabilitated land.	Exclude areas of high sensitivity where possible. Minimising operational footprints, Allow for faunal movement	Implement Biodiversity Action Plan and Management Measures	Rehabilitated areas with groundcover similar to pre-mining status.	Environmental Manager
Disruption of ecological connectivity and local/regional migration routes	2, 3, 4, 5	Maintain ecological corridors and linkages	Exclude areas of high sensitivity where possible. Minimising operational footprints, Allow for faunal movement	Implement Biodiversity Action Plan and Management Measures	Minimal impact to natural environment with effective ecological corridors.	Environmental Manager
Invasion of Weeds and Alien Plants	2, 3, 4, 5	To minimise the invasion of weeds and the ingress of invader species.	Eradicate the weeds, particularly the Declared Weeds, from the mining area using appropriate removal methods.	Weed and invasive species eradication as per the specified eradication plan		Environmental Manager
Faunal fatalities	2, 3, 4, 5	Prevent animal fatalities	Drivers will receive induction and awareness training informing them of the rules related to travelling in designated areas and the importance of conserving the local fauna and flora.	Conduct regular induction and awareness training for workers. Implement a strict penalty fine system for speeding incidents	Minimal increase in animal fatalities.	Environmental Manager
Deterioration in bird health	4	Prevent deterioration in avifaunal health	Prevent access to brine ponds for avifaunal species	Cover entire brine ponds with wire mesh or net to prevent birds accessing the brine ponds.	maintained species diversity	Environmental Manager
Wetlands and aquatics						
Degradation and alteration of wetland habitat	2, 3, 4, 5	To maintain/improve wetland ecological function and status	Consideration should be given to, as a minimum, exclude the pans and their catchments from stoooping activities. Close cracks formed by subsidence. Recreate and maintain flow paths minimise construction footprint at new 1 shaft	Implement wetland rehabilitation plan Fence of no go areas during construction at new 1 shaft, and prevent construction vehicles and machinery entering no-go areas.	the effective maintenance of wetlands within the study area	Environmental Manager
Decreased flow in downstream wetlands	2	Maintain flow to downstream wetlands	Recreate and maintain flow paths. Reinstate drainage to impounded areas	Implement wetland rehabilitation plan	minimal impact on catchment yield	Environmental Manager
Increase in alien vegetation	2, 3, 4, 5	to have no alien and invasive vegetation on site	Control and minimise alien vegetation minimise construction footprint at new 1 shaft	Implement wetland rehabilitation plan Fence of no go areas during construction at new 1 shaft, and prevent construction vehicles and machinery entering no-go areas.	maintained natural vegetation	Environmental Manager
Increased sediment movement into wetlands	2, 3, 4, 5	minimise sediment input into wetlands	All sediment moving activities within wetlands should be undertaken during low flow periods Rapid revegetation of disturbed soils is vital and must be insured. Limit movement of sediment away from the disturbed area.	Implement wetland rehabilitation plan Fence of no go areas during construction at new 1 shaft, and prevent construction vehicles and machinery entering no-go areas.	effective sediment control with minimal impact on wetlands	Environmental Manager
Change in biotic composition	2, 3, 4, 5	retain natural hydrological regime where possible	Limit impact on natural hydrological regime of streams Limit movement of sediment away from the disturbed area.	Where possible, return clean water to natural aquatic ecosystems Fence of no go areas during construction at new 1 shaft, and prevent construction vehicles and machinery entering no-go areas.	Limited change to natural hydrological regime and biotic composition	Environmental Manager
Loss of species due to decline in water quality.	2, 3, 4, 5	prevent decline in aquatic species	Stormwater management measures should ensure that no dirty runoff reaches any wetland or pan.	Implement SWMP, Regular maintenance of machinery is essential to minimise the chance of leaks or spills. Regular inspections of the WTP operations should be conducted to detect potential problems that may later lead to leaks. Where leaks or spills occur, they should be immediately contained and addressed according to an Emergency Preparedness Plan	maintained species diversity	Environmental Manager
Hydrology						
Catchment reduction	2, 3, 4, 5	Reduce impact of reduction in catchment yield	Effective diversion of clean storm water, by implementation of the proposed storm water management plan should reduce the impacts of reduced catchment runoff.	Adhere to Storm Water Management Plan. Adhere to Rehabilitation plan to implement a free flowing landscape. Excess water from Water Treatment Plant should be released back into the stream once treated.	Catchment yield increase	Environmental Manager
Erosion and sediment accumulation in the surface depressions (subsided areas)	2	avoid sedimentation and erosion in subsided areas	Rehabilitate open areas as soon as practically possible. Vegetate open areas as soon as practically possible. Manage storm water systems and runoff.	Adhere to Storm Water Management Plan. Adhere to Rehabilitation plan to implement a free flowing landscape.	no erosion and sedimentation at subsided areas	Environmental Manager
Pollution and sedimentation of surface water resources	2, 3, 4, 5	To effectively separate clean and dirty water areas, and prevent pollution of water resources.	Manage storm water systems and runoff. Separation of clean and dirty water areas.	Adhere to Storm Water Management Plan. Implement monitoring programme All chemicals and hazardous waste areas should be banded. Implement the waste management plan	No pollution of surface water resources	Environmental Manager
Alteration of drainage patterns	2,3	To limit the impact of the mining operation on the	Ensure maximum runoff and minimum filtration of water on the rehabilitated areas.	All backfilled box cut areas are to be contoured and shaped to be sympathetic with the surrounding landscape.	minimal ponding and drainage similar to the natural environment	Environmental Manager



POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	OBJECTIVE	RECOMMENDED MITIGATION MEASURES	ACTION PLAN	OUTCOME	RESPONSIBLE PERSON
<b>AREAS: 1) UNDERGROUND MINE AREA 2) SURFACE AREA ABOVE STOOPIING 3) INFRASTRUCTURE AREAS MINE 1, 2, 3 4) WTP 5) MINE 1 NEW SHAFT</b>						
		drainage patterns of the area		Contour drains will be constructed where erosion as a result of drainage poses a problem.		
increased velocity and erosion	4	avoid scouring and erosion at discharge points	Stormwater discharge points should be protected against erosion and should aim to mimic the hydrology of the receiving water resource	Install flow dissipaters at the discharge point.	effective flow dissipation	Environmental Manager
Downstream water contamination	3, 4, 5	To effectively separate clean and dirty water areas, and prevent pollution of water resources.	Manage storm water systems and runoff. Separation of clean and dirty water areas.	Adhere to Storm Water Management Plan. Implement monitoring programme All chemicals and hazardous waste areas should be bunded. Brine ponds, and new PCD's and evaporation ponds should be lined. Conveyor belts should be maintained and enclosed at stream crossings.	No pollution of surface water resources	Environmental Manager
Acid Mine Drainage from Decant	2	avoid AMD entering the environment	Avoid drainage into surface water courses	Treat water to acceptable levels before release into the environment.	no AMP pollution	Environmental Manager
<b>Hydrogeology</b>						
Ingress of water into underground workings, and reduction of available water from the overlying aquifer.	1	prevent water ingress into underground workings	Stoooping should not be conducted below surface water courses, wetlands or any other surface water features where possible.	No specific action plans are proposed for the stoooping areas	Minimised ingress into underground workings.	Environmental Manager
Groundwater pollution	1, 3, 4, 5	Avoid ingress of dirty or polluted water into the underground aquifers	Prevent of dirty or polluted water into the underground aquifers	Ensure all storage areas are bunded, concurrent rehabilitation to ensure free flowing surface topography. Conduct monitoring as per monitoring plan Comply with GN704 of the NWA Implement the waste management plan	No groundwater pollution	Environmental Manager
Lowering of Groundwater Levels due to Dewatering	1	To monitor the groundwater levels and dewatering volumes within the mining rights area.	Monitoring of ground water levels and quality will be implemented	Boreholes will be monitored for groundwater level and quality to assess the impacts on the groundwater. Should it be indicated through monitoring and investigation by an independent qualified person that any legitimate groundwater users are impacted upon in terms of quantity or quality of borehole water (based on monitoring data), alternative water sources will be made available within the capabilities of the mine and mutually agreed to by the parties.	Avoid significant negative impact to surrounding water users	Environmental Manager
<b>Heritage</b>						
Destruction of or damage to graves	2	avoid damage to/destruction of graves	Avoid damage to graves	Fencing and keeping track of location whiles stoooping in close proximity. Exhumation and relocation if above stoooping area.	Effective protection of grave sites.	Environmental Manager and Mine Manager
<b>Air Quality</b>						
Dust Deposition	3, 4, 5	To reduce the potential of PM 10 deposition in and around Matla	implement dust control measures	Control techniques for fugitive dust sources generally involve watering, chemical stabilisation, and the reduction of surface wind speed through the use of windbreaks and source enclosures. Implement traffic speed control on especially unpaved roads. Revegetate bare areas timeously.	minimal impact on air quality	Environmental Manager
<b>noise</b>						
Increased Noise Levels	3, 4, 5	To minimise the noise impact on surrounding land users.	Keep a complaints register, and conduct noise monitoring limit construction of New 1 shaft to daytime hours. Fit silencers to all diesel engines	In the event of complaint by neighbours, undertake monitoring of ambient sound (according to SABS Code 0103) at the closest receiver points when active mining is underway.	minimal noise disturbance	Environmental Manager
<b>Socio-economic</b>						
Impact on Adjacent Properties	2, 3, 4, 5	To ensure that safe conditions are implemented at Matla	Restrict access to unauthorised persons on mining areas	Matla will fence off all mining areas to ensure that the mining does not unnecessarily impact on the adjacent land. Strict security measures will be in place to ensure that non-mine employees are not allowed access to the mining area. An open channel of communication will be established between Matla Colliery and the adjacent land owners which will enable surrounding land owners to raise concerns. Adhere to the Social and labour plan	Lowered social impact on landowners.	Environmental Manager

## 6 MONITORING PLAN

The key to the success of environmental management lies in the effective implementation of the proposed mitigation and management measures. Monitoring provides qualitative and quantitative information pertaining to the possible impacts of the development on the environment, and enables the measurement of the effectiveness of environmental management measures.

This monitoring programme will allow Matla to monitor its compliance in terms of the NEMA and MPRDA for its entire operations. The monitoring programme will incorporate monitoring of the following components:

- Hydrological (Surface water);
- Hydrogeological (Groundwater); and
- Biomonitoring and wetland surveys.

Record keeping and the disclosure of information to the relevant personnel is key to the success of the monitoring programme. The following are key to the successful implementation of monitoring for Matla:

- The water user must ensure that the establishment of monitoring programmes to monitor the quantity and quality of the wastewater prior to storage or disposal, as follows:
  - For the storage of wastewater, the quantity must be recorded monthly; or
  - For the disposal of wastewater, the quantity must be gauged or metered and recorded monthly.
- Upon the written request of the responsible authority, the water user must:
  - Ensure the establishment of any additional monitoring programmes; and
  - Appoint a competent person to assess the water use measurements made in terms of this authorisation, and to submit the findings to the responsible authority for evaluation.
- The water user must keep a written record of the following wastewater storage or wastewater disposal and related activities:
  - The quantity of wastewater stored or disposed of or re-used;
  - The quality of wastewater stored or disposed of;
  - Details of the monitoring programme; and
  - Details of failures and malfunctions of any wastewater disposal system or wastewater storage dam that the registered user is responsible for, and such information must be made available upon written request to the responsible authority.

- Any information on the occurrence of any incident that has or is likely to have a detrimental impact on the water resource quality must be reported to the responsible authority.

The water monitoring that is conducted on site undergoes analysis at a SANAS accredited laboratory. The laboratory analysis results are compared to the following guidelines:

- SANS 241:2011 Standard limit (operational);
- Class II (Max Allowance for Limited Duration) \*2006;
- Class II: Water Consumption Period, a max \*2006;
- Sewage Limit General Limit;
- Sewage Limit Special Limit; and
- Target Water Quality Guidelines.

It is recommended, that the Licensee make reference to the consolidated IWUL, provided the IWUL is authorised; and the limits that will be provided therein. Currently limits have been specified in the IWULs issued to Matla, however these have not been made reference to in the various reports for the water monitoring.

The issuing of a consolidated IWUL, will aid in the prevention of duplicating limit requirements and also streamline these requirements to provide for a more precise and easily understandable assessment process going forward.

According to the Wetland Monitoring and Management Plan compile by Golder in 2010, the monitoring in **Table 6.1** is recommended to be undertaken for Matla.

**Table 6.1: Monitoring frequencies for the Matla Mine**

Monitoring Type	Monitoring Activity	Monitoring Frequency	Report to be submitted to	Submission frequency
In-stream monitoring	Aquatic biomonitoring (includes <i>in situ</i> water quality, WET-Testing); SASS5; FRAI and Diatoms	Bi-annually	Matla & Exxaro	Bi-annually
			Eskom	
			DWS - Regional Director (Wetland forum)	Annually
Out of stream monitoring	Remote sensing, Ground trothing surveys for vegetation, birds, mammals. Arthropods, amphibians and reptiles	Annually	Matla & Exxaro	Annually
	Monitoring of subsistence due to mining activities.		DWS - Regional Director (Wetland forum)	
Surface Water Monitoring	Surface water quality analysis	Monthly	Matla & Exxaro	Quarterly
	Surface water flow analysis	Monthly	DWS	
			DMR	
Monitoring of water release through the controlled inlet structures	Monthly	Monthly	Matla & Exxaro	Quarterly
			DWS	
Groundwater Monitoring	Groundwater quality analysis	Monthly	Matla & Exxaro	Quarterly
			DWS	
			DMR	
Ground and surface water	Ground and surface water quality monitoring audit report.	Annually	Matla & Exxaro	Annually
			DWS	
			DMR	

\*DME = Department of Minerals and Energy

### 6.1.1 Surface Water Monitoring

Monitoring of surface water quality should be done in accordance with the commitments and guidelines as stated in the EMP and the relevant IWULs issued to Matla. A surface water monitoring programme is currently being implemented by the mine. This programme provides for the required monitoring points as directed by each IWUL previously issued to the Mine. Further to this, the monitoring programme has additional points that are sampled for various parameters. The parameters which should be analysed on a monthly basis, for the surface water monitoring points are indicated in **Table 6.2**.

**Table 6.2: Surface Water Monitoring Parameters**

Parameters to be Analysed	
Acidity (mg CaCO <sub>3</sub> /L)	Magnesium (mg Mg/L)
Total Alkalinity (mg CaCO <sub>3</sub> /L)	Nitrate and Nitrite (TON) (mg N/L)
Bicarbonate Alkalinity (mg CaCO <sub>3</sub> /L)	Ortho Phosphate (mg P/L)
Carbonate Alkalinity (mg CaCO <sub>3</sub> /L)	Potassium (mg K/L)
M Alkalinity (mg CaCO <sub>3</sub> /L)	Sodium (mg Na/L)
P Alkalinity (mg CaCO <sub>3</sub> /L)	Silicon (mg Si/L)
Colour (mg/l as Pt)	Sulphate (mg SO <sub>4</sub> /L)
Conductivity (Laboratory) (mS/m)	Aluminium (mg Al/L)
pH (Laboratory) (pH Units)	Boron (mg B/L)
Total Hardness (mg CaCO <sub>3</sub> /L)	Fluoride (mg F/L)
Calcium Hardness (mg CaCO <sub>3</sub> /L)	Iron (mg Fe/L)
Magnesium Hardness (mg CaCO <sub>3</sub> /L)	Manganese (mg Mn/L)
Total Dissolved Solids (TDS) (mg/L)	Langelier Index (indicative, not SANS) (Calculation)
Suspended Solids (TSS) (mg/L)	pHs (indicative, not SANS) (Calculation)
Temperature (°C)	Sodium Absorption Ratio (indicative) (Calculation)
Turbidity (NTU)	TDS to EC Ratio (indicative, not SANS) (Calculation)
Ammonia (mg N/L)	Corrosion Ratio (indicative, not SANS) (Calculation)
Calcium mg (Ca/L)	Ryznar Index (indicative, not SANS) (Calculation)
Total Chlorine (Laboratory) (mg Cl <sub>2</sub> /L)	Standard Plate Count (count/mL) - certain sample points only;
Soluble Chlorine (Laboratory) (mg Cl <sub>2</sub> /L)	Total coliforms (CFU/100mL) - certain sample points only;
Chloride (mg Cl/L)	Faecal Coliforms (CFU/100mL) - certain sample points only

The surface water monitoring points that are monitored at Matla, are provided in **Table 6.3**. As previously discussed in Section 3.5, the limits for the discharge of the treated effluent from the sewage works at Mine 2 and Mine 3 have been requested to be amended. The localities of the monitoring points are presented in **Error! Reference source not found.** The localities presented in the table are a combination of the various monitoring points as provided in the four IWULs issued to Matla. These monitoring points already form part of the monitoring programme for Matla.

**Table 6.3: Surface Water Monitoring Points of Matla**

SITE ID	SAMPLE DESCRIPTION	SITE TYPE	Location_type_code	CO-ORDINATES
MSW01	1 Mine settling pond 1	PCD	PCD	S26° 15.838' E029° 07.254'
MSW02	1 Mine settling pond 2	PCD	PCD	S26° 15.616' E029° 06.948'

SITE ID	SAMPLE DESCRIPTION	SITE TYPE	Location_type_code	CO-ORDINATES
MSW03	Rietspruit dam	Dam	RIVER	S26° 10.168' E029° 13.726'
MSW04	2 Mine dam	PCD	PCD	S26° 13.141' E029° 06.171'
MSW05	2 Mine U/S	Stream	RIVER	S26° 13.354' E029° 06.181'
MSW06	2 Mine effl. into river	Effluent	STP	S26° 13.315' E029° 06.272'
MSW07	2 Mine D/S	Stream	RIVER	S26° 13.409' E029° 07.221'
MSW08	Box cut dam	Mining pit	MINE	S26° 13.117' E029° 04.673'
MSW09	Kriel Ogies Road	Stream	RIVER	S26° 11.514' E029° 10.947'
MSW10	2 Mine pan	Pan	WETLAND	S26° 12.480' E029° 06.990'
MSW11	3 Mine settling pond	PCD	PCD	S26° 14.665' E029° 04.039'
MSW12	3 Mine final dam @ shaft	PCD	PCD	S26° 14.631' E029° 04.059'
MSW13	3 Mine silo dam	PCD	PCD	S26° 14.523' E029° 04.589'
MSW14	3 Mine U/S	Stream	RIVER	S26° 16.371' E029° 02.408'
MSW15	1 Mine drinking water	Potable water	TAP	S26° 15.500' E029° 07.025'
MSW16	2 Mine drinking water	Potable water	TAP	S26° 12.804' E029° 06.322'
MSW17	3 Mine drinking water	Potable water	TAP	S26° 14.816' E029° 04.212'
MSW18	Pan 1	Pan	WETLAND	S26° 15.113' E029° 07.846'
MSW19	Pan 2	Pan	WETLAND	S26° 14.913' E029° 07.632'
MSW20	Rietspruit 6	Stream	RIVER	S26° 13.326' E029° 05.738'
MSW21	Discharge 8 - RO release	Stream	RO	S26° 13.345' E029° 06.181'
MSW22	Pan 3	Pan	WETLAND	S26° 15.814' E029° 08.107'
MSW23	Rietspruit 7	Stream	RIVER	S26° 13.378' E029° 06.785'
MSW24	Tributary 4 Up Stream	Stream	RIVER	S26° 14.582' E029° 06.532'
MSW25	Tributary 5 Down Stream	Stream	RIVER	S26° 14.005' E029° 06.903'
MSW26	Matla Product Water	Potable water	TAP	S26° 15.366' E029° 07.531'
MSW27	Matla Feed Sample	RO feed water	MINE	S26° 15.366' E029° 07.531'
MSW28	Brine pond 1	PCD	PCD	S26° 15.231' E029° 07.667'
MSW29	Brine pond 2	PCD	PCD	S26° 15.303' E029° 07.740'
MSW30	OS1 - tributary	Stream	RIVER	S26° 18'2,92" E029° 08'57,25"
MSW31	OS2 - farm dam	Dam	RIVER	S26° 17'45,97" E029° 09'36,66"
MSW32	OS3 - tributary	Stream	RIVER	S26° 17'38,46" E029° 09'53,12"

SITE ID	SAMPLE DESCRIPTION	SITE TYPE	Location_type_code	CO-ORDINATES
MSW33	OS4 - tributary	Stream	RIVER	S26° 17'35,19" E029° 09'35,84"
MSW34	Mine 1 new shaft PCD	PCD	PCD	TBC
MSW35	Mine 1 new shaft Effluent release	Effluent	STP	TBC
MSW36	Mine 3 Effluent release	Effluent	STP	S26° 13.444' E029° 3.660'
MSW37	WTP PCD	PCD	PCD	S 26° 15'16.56" E 29° 7'31.66"
MSW38	Central Mine Potable	Potable water	TAP	S26° 15.500' E029° 07.025'
Code	2010 Licence	Main		
	2015 Licence	New Mine 1 shaft		
	2014 Licence	RO Plant		

Water samples taken should continue to be tested by an accredited laboratory and results compared with water quality standards promulgated by the DWS and the DEA.

An annual report on water quality monitoring activities and the results of water quality tests shall be submitted to the Olifants River Catchment Management Agency (once operational) or the DWS, and the DMR and DARDLEA.

According to condition 3.3.1 of the River Diversion IWUL (issued 2017), water quality parameters at upstream and downstream monitoring points should be monitored as presented in **Table 6.4**. It is recommended that all upstream and downstream monitoring locations of the monitoring programme be assessed according to the criteria set out in **Table 6.4**.

**Table 6.4: River Diversion Instream Water Quality Parameters and Limits (River Diversion IWUL, 2017)**

Variable	Limit
Temperature (°C)	<10% variation
pH	6.0-8.5
Electrical Conductivity (mS/m)	<50
Suspended Solids (mg/l)	<25
Dissolved Oxygen (mg/l)	≥6
Turbidity (NTU)	<50

The requested parameter limits for the discharge of the treated effluent from the WWTWs at Mine 2 and Mine 3 are provided in **Error! Reference source not found.** It is important to note that the limits provided refer to sewage (i.e. domestic wastewater) only and it must therefore be remembered that the limits are not referring to the mine process wastewater, instream water quality or discharge from the WTP.

### 6.1.2 Groundwater Monitoring

Monitoring of groundwater quality should be done in accordance with the commitments and guidelines as stated in the EMP and the relevant IWULs issued to Matla. The main purpose of a monitoring system concerned with the control of pollution and the groundwater resource, are to:

- Provide reliable and irrefutable data on the quality and chemical composition of the groundwater;
- Detect and quantify the presence and seriousness of any polluting substances in the groundwater at the very earliest stage possible; and
- Detect any severe decrease in water levels in aquifers being exploited.

As with the surface water monitoring, a groundwater monitoring programme is currently being implemented by the mine. This programme provides for the required monitoring points as directed by each IWUL previously issued to the Mine. Further to this, the monitoring programme provides for additional points that are sampled for various parameters. The parameters which should be analysed on a quarterly basis, for the groundwater monitoring points are indicated in **Table 6.5**.

**Table 6.5: Groundwater Monitoring Parameters**

Parameters to be Analysed	
Acidity (mg CaCO <sub>3</sub> /L)	Magnesium (mg Mg/L)
Total Alkalinity (mg CaCO <sub>3</sub> /L)	Nitrate and Nitrite (TON) (mg N/L)
Bicarbonate Alkalinity (mg CaCO <sub>3</sub> /L)	Ortho Phosphate (mg P/L)
Carbonate Alkalinity (mg CaCO <sub>3</sub> /L)	Potassium (mg K/L)
M Alkalinity (mg CaCO <sub>3</sub> /L)	Sodium (mg Na/L)
P Alkalinity (mg CaCO <sub>3</sub> /L)	Silicon (mg Si/L)
Colour (mg/l as Pt)	Sulphate (mg SO <sub>4</sub> /L)
Conductivity (Laboratory) (mS/m)	Total Aluminium (mg Al/L)
Conductivity (Field) (mS/m)	Aluminium (mg Al/L)
pH ( Laboratory) (pH Units)	Boron (mg B/L)
Total Hardness (mg CaCO <sub>3</sub> /L)	Fluoride (mg F/L)
Calcium Hardness (mg CaCO <sub>3</sub> /L)	Iron (mg Fe/L)
Magnesium Hardness (mg CaCO <sub>3</sub> /L)	Manganese (mg Mn/L)
Total Dissolved Solids (TDS) (mg/L)	Langelier Index (indicative, not SANS) (Calculation)
Suspended Solids (TSS) (mg/L)	pHs (indicative, not SANS) (Calculation)
Temperature (°C)	Sodium Absorption Ratio (indicative) (Calculation)
Ammonia (mg N/L)	TDS to EC Ratio (indicative, not SANS) (Calculation)
Calcium (mg Ca/L)	Corrosion Ratio (indicative, not SANS) (Calculation)
Chloride (mg Cl/L)	Ryznar Index (indicative, not SANS) (Calculation)

Groundwater levels are monitored on a monthly basis. The monitoring points for the groundwater monitoring programme are provided in **Table 6.6**. The localities of the monitoring points are presented in Figure 6.1. The localities presented in the table are a combination of the various monitoring points as provided in the four IWULs issued to Matla. These monitoring points already form part of the monitoring programme for Matla.



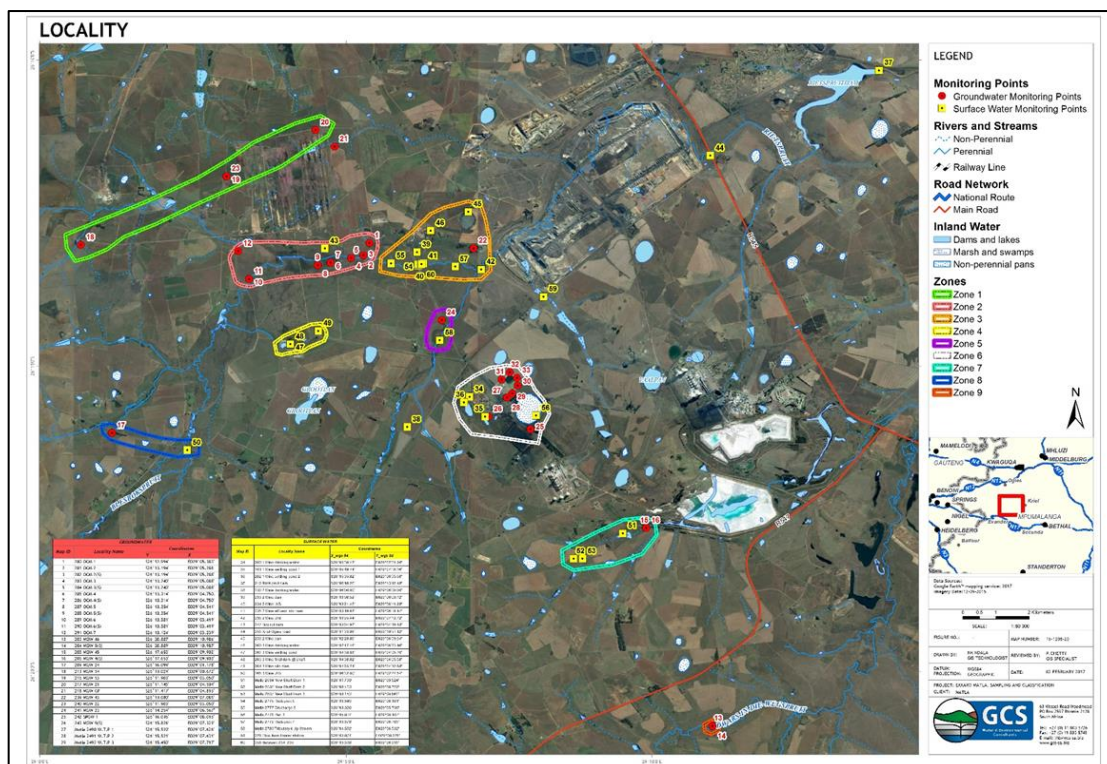


Figure 6.1: Surface and groundwater monitoring localities zones

Table 6.6: Matla Groundwater Monitoring Points

Monitoring Point	Coordinates	Frequency of Monitoring
MGW01 / OCM 1	S26° 12.994' E29° 05.383'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW02 / OCM 2	S26° 13.194' E29° 05.288'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW03 / OCM 2 (S)	S26° 13.194' E29° 05.288'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW04 / OCM 3	S26° 13.240' E29° 05.088'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW05 / OCM 3 (S)	S26° 13.240' E29° 05.088'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW06 / OCM 4	S26° 13.314' E29° 04.750'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW07 / OCM 4 (S)	S26° 13.314' E29° 04.750'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW08 / OCM 5	S26° 13.354' E29° 04.541'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW09 / OCM 5 (S)	S26° 13.354' E29° 04.541'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW10 / OCM 6	S26° 13.581' E29° 03.419'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW11 / OCM 6 (S)	S26° 13.581' E29° 03.419'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW12 / OCM 7	S26° 13.124' E29° 03.239'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW13 / MGW 46	S26° 20.887' E29° 10.986'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW14 / MGW 5 (S)	S26° 20.889' E29° 10.987'	Chemical analysis: Quarterly Groundwater levels: Monthly

Monitoring Point	Coordinates	Frequency of Monitoring
MGW15 / MGW 45	S26° 17.653' E29° 09.902'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW16 / MGW 4 (S)	S26° 17.653' E29° 09.903'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW17 / MGW 44	S26° 16.259' E29° 02.756'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW18 / MGW 3 (S)	S26° 16.254' E29° 02.756'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW19 / MGW 24	S26° 16.099' E29° 01.178'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW20 / MGW (S)	S26° 12.758' E28° 58.985'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 55 / MGW 55	S26° 12.759' E28° 58.985'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW21 / MGW 54	S26° 13.024' E29° 00.672'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 7(S)	S26° 13.023' E29° 00.673'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW22 / MGW 6 (S)	S26° 11.903' E29° 03.050'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 53	S26° 11.903' E29° 03.050'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 21(S) / MGW 21	S26° 11.145' E29° 04.504'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW GF	S26° 11.417' E29° 04.816'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW RHB	S26° 11.416' E29° 05.599'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW23 / MGW 43	S26° 13.080' E29° 07.085'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 22(S) / MGW 22	S26° 13.080' E29° 07.085'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW 23(S) / MGW 23	S26° 14.254' E29° 06.567'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW25 / SPGW 1	S26° 16.036' E29° 08.016'	Chemical analysis: Quarterly Groundwater levels: Monthly
MGW26 / MGW 9 (S)	S26° 15.826' E29° 07.329'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 1	S26° 15.520' E29° 07.626'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 2	S26° 15.521' E29° 07.631'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 3	S26° 15.450' E29° 07.717'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 4	S26° 15.324' E29° 07.805'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 5	S26° 15.182' E29° 07.684'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 6	S26° 15.193' E29° 07.687'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 7	S26° 15.223' E29° 07.545'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 8	S26° 15.106' E29° 07.677'	Chemical analysis: Quarterly Groundwater levels: Monthly
W.T.P 9	S26° 15.200' E29° 07.794'	Chemical analysis: Quarterly Groundwater levels: Monthly

### 6.1.3 *Biomonitoring and Wetland Monitoring*

The following factors should be assessed during biomonitoring and wetland monitoring surveys.

- Stressor indicators with the in-stream and permanent wetland areas:
  - *In situ* water quality;
  - Ex-situ water quality analysis; and
  - Sediment composition analysis
- Habitat indicators:
  - General habitat assessment (i.e. Integrated Habitat Assessment System, Version 2.2);
  - Integrated Habitat Assessment (i.e. Index for Habitat Integrity, Version 2); and
  - Wetland IHI/Wet-Health, as applicable.
- Response indicators:
  - Aquatic macroinvertebrate assessment, including the determination of ecological condition through Version 5 of the South African Scoring System (SASS5) and the Macro-Invertebrate Response Assessment Index (MIRAI);
  - Ichthyological assessment, including the evaluation of reference conditions and determination ecological condition through the Fish Response Assessment Index (FRAI);
  - Diatom assessment, including the determination of ecological condition through the Specific Pollution-sensitivity Index (SPI);
  - Screening-level ecotoxicological assessment (Water & Sediment), using three levels of biological hierarchy;
  - Wetland flora; and
  - Wetland fauna.
- Wetland Socio-economic assessment:
  - Wetland EcoServices; and
  - Wetland Ecological Importance and Sensitivity.

Biomonitoring is currently being undertaken on a quarterly basis for the Matla Mine. A full aquatic biomonitoring assessment was conducted by Digby in 2016/2017 for the Matla Operations. Two surveys were completed during the course of the aquatic assessment, these included surveys during the low flow period (October 2016), and the high flow period (March 2017).

The selection of sites was based on the approved IWUL conditions which stipulate the location of various sites. In addition, sites were selected based on the previous studies which have

taken place in the project area (e.g. No 3 Mine River diversion sampling sites). It is further noted that sites were selected around certain infrastructures and activities such as discharge points and conveyor crossings. The site surveyed are presented in **Figure 6.2**. Based on the layout of the applicable IWULs the waterbodies were divided into relevant sections namely:

- The Conveyor Tributary;
- The New Shaft Tributary;
- The Rietspruit; and
- The Pans and Impoundments.

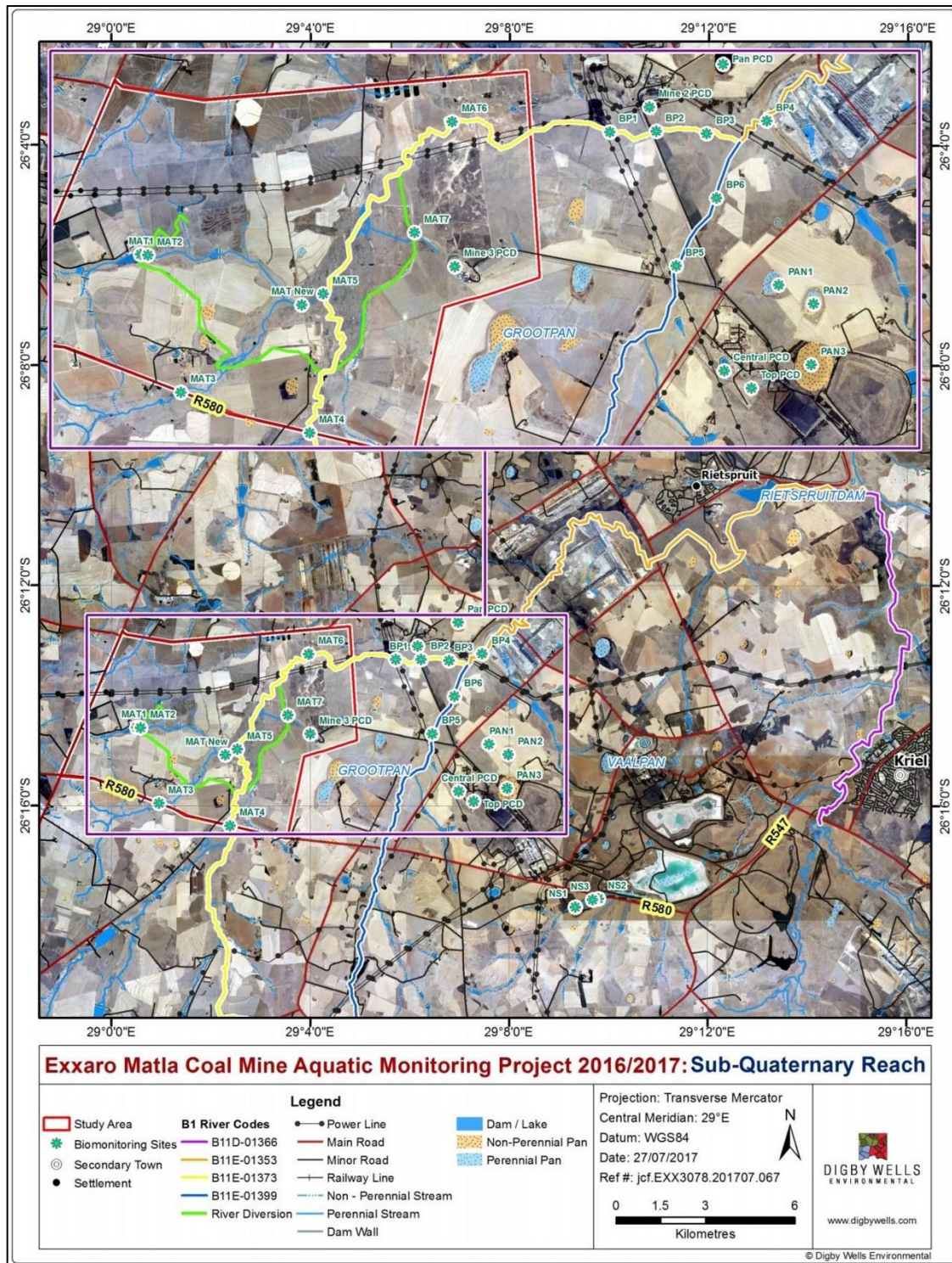


Figure 6.2: Points surveyed during Aquatic Biomonitoring Survey (Digby, 2017)

6.1.3.1 Recommendations

Based on the outcomes of the 2016/2017 study the following recommendations can be made:

- Additional sites, at least one, should be selected immediately downstream of the various PCD's at the Exxaro Matla Coal Mine. The selection of these sites would allow

for the determination of potential seepage emanating from the polluted water bodies;

- A change was made in the two upper river diversion sites (MAT1 and MAT2) where the newly selected sites monitor the water entering the river diversion. These sites should be monitored in future studies instead of the previously selected sites which were dry during both the high and low flow surveys;
- Based on the assessment of the river diversion and illustrated in the remote sensing monitoring of vegetation study, the banks of the river diversion should be vegetated and erosion issues must be addressed to ensure long-term stability. In addition, connectivity between the upper and lower Rietspruit requires confirmation and should be further surveyed; and
- The presence of livestock agriculture within the Rietspruit channel should be limited, by increasing the numbers of “no-go areas”, as per the approved Wetland Management Plan. In addition, cracks/fractures on the banks of the upper Rietspruit, caused as a result of subsidence should be rehabilitated.

Based on the outcomes of the previous study (Digby Wells 2015/2016) and the 2016/2017 study the following monitoring programme will be completed for the duration of the remaining study periods of the Matla Biomonitoring Project

**Table 6.7: Monitoring Program**

Key Performance Indicator	Threshold of Concern	Target
SASS5	-20%	No significant deterioration of SASS5 scores.
ASPT	-10%	No significant differences between upstream, and downstream regions
<i>Beatidae</i>	None present	All sites
<i>Pseudocrenilabrus philander</i> or <i>Tilapia sparmanni</i>	Absence	Presence

#### 6.1.4 Waste Monitoring

The run of mine product is beneficiated in a crushing and screening plant only. Rocks removed from the run of mine product are put onto a rock dump and the product is sent directly to Eskom. The residue is comprised of sandstone and shale.

The waste management policy has been attached in Appendix H of the main document.

## 7 ENVIRONMENTAL AWARENESS PLAN

### 7.1 Communication sectors

The communication of the environmental risks for each phase of the project will take place for the management, administrative and worker sectors of the project, as well as contractors.

#### 7.1.1 Management Sector

A workshop will be conducted to inform all mine management of the risks associated with the mining operation. The risks for all aspects will be explained and the appropriate management options discussed. The workshop will also elaborate on the monitoring programmes that will be implemented to identify and monitor the mines level of impact on the environment and discuss various remediation actions, should there be deterioration.

The evaluation process is integral in the assurance that the mine reduces any possible environmental risks associated with the operation.

The workshop will be conducted twice a year to ensure that all risks are discussed before there is any chance of the impacts occurring. The workshop may be repeated at certain stages during the life of the project, in the case of new employees.

#### 7.1.2 Administrative Sector

The communication of the environmental risks to the administrative sector will occur through a workshop/half day course. This workshop will seek to explain the following necessary actions:

- Firstly, each aspect will be described as shown in Table 7.1. Risk associated with each aspect will be discussed to ensure that there is an understanding of how each action of the project may impact on the environment.
- The mitigation of the environmental risk will be elaborated on. It is important that each person understand these management strategies as it ensures that the impact on the environment is kept to a minimum. Data collection regarding each aspect will also be explained to ensure that each aspect is monitored according to those protocols specified by the mine and the DMR. Along with data collection the reporting of findings will be discussed.
- This workshop will take twice a year and the material will be integrated in the induction for new personnel.

- The following communication channels and media will / can be used to communicate environmental issues within Mine:
  - HOD Meetings: The Mine Manager communicates information to senior management on environmental issues and the information is minuted.
  - HSEC Meetings: 'Environmental issues' should be an agenda item on plant and section monthly safety, health & environmental meeting agendas.
  - Publications: Leaflets, posters etc are produced by the relevant department or other designated persons, for use on notice boards, and distribution. Quarterly newsletter will also be made available. Email notifications and or relevant articles are also distributed.
  - EMS Database (if established): Feedback from line management on objectives, targets and actions.
  - Weekly Safety Meeting: All meetings are scheduled to commence with a discussion on safety, health & environmental topics.



**Table 7.1: Environmental Awareness Plan**

ENVIRONMENTAL PARAMETER	RISK	COMMUNICATION STRATEGY				MITIGATION ACTIVITY
		MANAGEMENT	ADMINISTRATION	MINE WORKERS	CONTRACTORS	
Flora	Invader Species	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	Report any rare or endangered species; Vegetation clearing will be done in phases; and A weed control programme will be implemented.
Surface Water	Surface Water Consumption	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	All contaminated water to be stored - zero discharge policy; and Refer to waste management procedures, and SWMP.
Groundwater	Groundwater Contamination	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	Water ingress into the underground mining sections will be prevented to limit acid mine drainage; Precautions will be implemented to prevent acid mine drainage; and Refer to waste management procedures, and SWMP

ENVIRONMENTAL PARAMETER	RISK	COMMUNICATION STRATEGY				MITIGATION ACTIVITY
		MANAGEMENT	ADMINISTRATION	MINE WORKERS	CONTRACTORS	
Soil	Increase in soil erosion	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	Rehabilitate area as soon as possible; and Stockpile soil in the correct manner and vegetate. Refer to rehabilitation strategy.
	Contamination of soil	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	All hydrocarbons should be stored in designated, bunded areas with a capacity of at least 110% of the volume stored; Spill kits should be readily available and all employees must be trained in the utilization thereof; Should a spill take place the area should be cleaned immediately and the contaminated area will be rehabilitated as appropriate; Prevent spillages by the implementation of good housekeeping practices; The management of chemicals and hydrocarbons will form part of the emergency preparedness and response programme; In the event of a major spill that could result in major soil and water contamination the DWA should be informed immediately and a remediation strategy should be enforced; No activities associated with hydrocarbons and or chemicals (i.e. wash bays etc.) may be undertaken outside of an effectively designed contained area.

ENVIRONMENTAL PARAMETER	RISK	COMMUNICATION STRATEGY				MITIGATION ACTIVITY
		MANAGEMENT	ADMINISTRATION	MINE WORKERS	CONTRACTORS	
	Fertility	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	Topsoil will be stripped to at least 250mm or until hard rock is reached; Stockpile soils separately from rocks and or spoil material; Erosion control measures will be implemented; and The mine will ensure that equipment movement over the stockpiles is limited to reduce soil compaction, soil structure or the associated sandbank.
Air Quality	Generation of Dust	Workshop	Induction	Induction & Monthly Meeting	Induction & Monthly Meeting	Dust Suppression methods will be implemented.

### **7.1.3 Mine Workers Sector**

The mine workers associated with construction and mining activities will attend a half day induction course to ensure that each person is aware of the environmental risks associated with the project. This induction will form part of the health and safety induction. This induction course will explain and describe the relevant phases of the project as well as those environmental risks that may occur during these phases. The environmental risks of each aspect as well as the mitigation will be elaborated on.

### **7.1.4 Contractors**

An environmental awareness section will be added to the contractors health and safety induction programme. The environmental induction will focus on activities that carry an environmental risk, actions to be taken to reduce these risks, and procedures to be followed in the event of an incident.

## **7.2 Method of communication**

### **7.2.1 Induction**

All full time staff and contractors are required to attend an induction session. Employees are inducted when they start at the mine and when they return from leave. Any contractor, who works on the mine for a period of 24 hours or more, is required to undergo the respective head of department (H.O.D.) induction training. These workshops will be conducted in English, as well as one of the local languages. This induction will form part of the health and safety induction.

Environmental issues and aspects related to the operation phase and other relevant phases will be addressed in the induction sessions. All environmental impacts and aspects and their mitigatory measures will be discussed, explained and communicated to employees. The induction sessions will be modified according to the level of employee attending the induction session, so that all employees gain a suitable understanding of environmental issues and pollution.

### **7.2.2 In-house Training**

In-house training sessions will be held with relevant employees. The training sessions will be determined by the relevant department, and will allow for employees to participate in determining what the environmental issues and concerns are with regard to their specific

occupation. Education with regard to environmental incident reporting will be detailed at these sessions.

### *7.2.3 On the Job Training*

On the job training is an essential tool in environmental awareness. Employees will be given details of the expected environmental issues and concerns specifically related to their occupation. Employees will be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

#### *7.2.3.1 Hazardous substances*

Individuals dealing with potential hazardous situations and risks that could lead to hazardous spills, pollution incidents, excessive dust or other forms of environmental damage to receive appropriate job specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. All these actions will be done in accordance to Exxaro Matla Coal procedures on management of hazardous substances

#### *7.2.3.2 Delivery of hazardous substances*

All hazardous substances is delivered directly to the Supply Chain management stores. Personnel responsible for the supervision of delivery, collection and transport of hazardous substances to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. This all makes part of competency declaration for use. Material Safety Data Sheets of each hazardous substance delivered must be kept at the Supply Chain management stores as well as point of distribution. Prior to any use of a new chemical, the Material Safety Data Sheet of each substance must be delivered to the SHEC department of Matla for approval of use by the Environmental Specialist.

#### *7.2.3.3 Dust mitigation*

Individuals dealing with potential situations and risks that could lead to excessive dust to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation

#### *7.2.3.4 Fire incidents*

Individuals dealing with potential hazardous situations and risks that could lead to fire incidents or emergencies to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

#### *7.2.3.5 Waste management*

Mining personnel and contractors responsible for the operation and safe handling of the various waste streams will receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. Ensure that training and awareness programmes cover the safe transportation, handling, storage, transfer, handling, use and disposal of all waste streams, and the location of waste receptacles for each waste stream. All waste management activities must be done in accordance to Matla procedures and in terms with registers dealing with storage of waste in specific areas.

Staff awareness training programme will accommodate training, on which bin to use for organic waste and on sealing the lid on the bin once organic waste has been discarded.

#### *7.2.3.6 Water Management*

All persons responsible for active water management will receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

### **7.3 Environmental Communication Strategies**

Matla Operations management shall continue to establish and maintain procedures for the internal communication between the various levels and functions of the organisation, and receiving, documenting and responding to relevant communication from external interested & affected parties. The communication of the environmental risks for each phase of the project will take place for the management, administrative and mine worker sectors of the

mine, as well as contractors. The organisation shall consider processes for external communication on its significant environmental aspects and record its decision.

Communication is a management responsibility. All supervisors are responsible for effective communication within their own sections. Environmental communication can be divided into two categories: internal communication and external communication.

### ***7.3.1 Internal Communication***

Internal communication is done within the Administrative Sector.

### ***7.3.2 External Communication Strategies***

The following communication channels and media will / can be used to communicate environmental issues to individuals who are not employed by Matla Operations:

- **Environmental Committee:** An Environmental Committee should be established and used as a forum to keep interested and affected parties informed of the significant environmental aspects identified through the Environmental Impact Assessments and Management Plans. This should also be the forum where interested and affected parties get the opportunity to raise environmental concerns. Records must be kept of all decisions and concerns. The Environmental Committee should be chaired by the Mine Manager, or another appropriately appointed competent individual.
- **Publications:** Selected publications should be produced and used to communicate environmental issues to outside parties. Examples include newsletters and Annual Reports.
- **Communication from External Parties and Employees:** A clear communication point should be established within the company that will be responsible for liaison with the media in respect of any crisis that may arise within Matla. A complete procedure for media liaison must be made available to all employees. Communication from external interested and affected parties may be received by e-mail, fax, telephonically or by mail. Where required, a written response will be sent, on receiving such communication, by the appropriately appointed individual under signature of the Mine Manager, to the respective interested and / or affected party. All telephonic or facsimile correspondence received on the mine must be forwarded to the relevant department for action. All events or concerns will be captured and actioned on an existing and / or future database.

- E-mail: E-mail communication received must be stored, with replies, in an appropriate folder on a server. E-mail messages, relevant to environmental management, should be kept for a minimum of two years before deletion.
- Mail: Correspondence received by mail must be filed, along with the response (where relevant), within the relevant department's filing system for a minimum period of two (2) years. Paper correspondence will be archived in this department.
- Telephone: A register of telephonic environmental queries should be kept by the relevant department detailing caller, contact details, date, query, action taken and response. Furthermore, the person answering the call will be responsible for logging their particulars against the call, as well as ensuring that all communication that leads to an aspect or an impact, is entered on the database.
- Storage of Correspondence: All original correspondence must be retained by the Matla Mine Manager for a minimum period of two years.
- Environmental Reports: Copies of relevant specialist study reports and Environmental Impact Assessments will be available on request from an external party by the Mine Manager.
- Queries from Interested and Affected Parties: Response to queries about environmental impacts and aspects will be addressed by the relevant department, and approved by the Mine Manager.
- Queries and Requests from the Media: Requests for articles from the media on environmental issues at Matla will be co-ordinated by the HR Manager, with input from the relevant department, as approved by the General Manager, in line with the Matla Operations Communication Strategy. The Communication Strategy must be based on a behavioural approach. Due to the environmental awareness generated by induction, on the job training etc, employees are able to identify environmental problems, issues, concerns and pollution timeously.

#### **7.4 Evaluation of the Environmental Awareness Plan**

The evaluation of the environmental awareness plan will be conducted by the management of the mine. This evaluation will entail the auditing of the operation annually.

The environmental awareness plan described above is sufficient to make all those involved in the project aware of those risks that may occur as well as the necessary mitigation required to minimize these risks. The awareness plan indicates that Matla Operations is serious about



the environments wellbeing, empowerment of the local people and returning the land to the appropriate us in the future. Environmental issue will be highlighted at monthly meetings scheduled at the mine.

### **7.5 Emergency Incident Reporting**

Environmental incident reporting is a vital part of communication at the Matla operations. Employees are required to report any and all environmentally related problems, incidents and pollution, so that the appropriate litigator action can be implemented timeously. In the event of an Environmental Incident, the incident must be reported according to the Incident Reporting Procedure.

**Table 7.2: Incident reporting procedure**

ENVIRONMENTAL INCIDENT REPORTING STRUCTURE	ACTION REQUIRED
PERSON CAUSING OR OBSERVING THE INCIDENT	SHALL REPORT THE INCIDENT TO AN IMMEDIATE SUPERVISOR IN THE AREA/SECTION WHERE THE ENVIRONMENTAL INCIDENT IS OBSERVED.
Line Management in relevant area of responsibility where the incident occurred	<p>Shall investigate the incident and record the following information:</p> <ul style="list-style-type: none"> <li>○ How the incident happened;</li> <li>○ The reasons the incident happened;</li> <li>○ How rehabilitation or clean up needs to take place;</li> <li>○ The nature of the impact that occurred;</li> <li>○ The type of work, process or equipment involved; and</li> <li>○ Recommendations to avoid future such incidents and/or occurrences.</li> </ul> <p>Shall inform the Environmental Manager and the Mine Manager on a daily basis of all incidents that were reported in the area/section.                      Shall consult with the relevant department / person for recommendations on actions to be taken or implemented where appropriate (e.g. clean-ups).                      Shall assist the Environmental Manager and/or Mine Manager with applicable data in order to accurately capture the incident into the reporting database.</p>
Area / Line Managers	<p>Shall forward a copy of the incident form to other line managers.                      Shall forward a copy of the incident form to the Environmental Manager and the Mine Manager.                      Shall inform the relevant department / person on a weekly basis of the incident by e-mail or by submitting a copy of the incident report. Once a High Risk Incident (<i>any incident which results from a significant aspect and has the potential to cause a significant impact on the environment</i>) occurred it must be reported immediately to the Environmental Manager and the Mine Manager by telephone or email to ensure immediate response / action.                      Shall forward a copy of the completed Incident Reporting Form (and where applicable a copy of the incident investigation) to the relevant department / person.</p>
Environmental Manager / Mine Manager	<p>Shall complete an incident assessment form to assess what level of incident occurred.                      Shall make recommendations for clean-up and / or appropriate alternate actions.                      Shall enter actions necessary to remediate environmental impacts into the database in conjunction with the responsible line manager.                      Shall enter the incident onto the database in order to monitor the root causes of incidents.                      Shall include the reported incidents in an appropriate monthly / quarterly report.                      Shall highlight all incidents for discussion at HSEC meetings.</p>

## **8 ENVIRONMENTAL EMERGENCY PREPAREDNESS AND RESPONSE PLAN**

Refer to Matla policies and procedures in Appendix H of the Main Document for the Environmental Emergency Preparedness and Response Plan.

