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# **SCOPING REPORT FOR THE ENVIRONMENTAL APPLICATIONS FOR CHANGES TO INFRASTRUCTURE AT BAKUBUNG PLATINUM MINE, LEDIG, NORTH WEST PROVINCE**

**SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE  
NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) AND THE  
NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (ACT 59 OF 2008) IN  
RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY AN  
APPLICATION IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES  
DEVELOPMENT ACT (ACT 28 OF 2002) (AS AMENDED)**

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**SAMRAD FILE REF. NO. : To be advised (Existing Mining Right ref. NW 30/5/1/2/2/339 MR)**

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**DOCUMENT INFORMATION**

<b>Title</b>	Scoping report for the environmental applications for changes to infrastructure at Bakubung Platinum Mine, Ledig, North West Province
<b>Status</b>	Draft for public review
<b>Applicant</b>	Wesizwe Platinum Limited
<b>Consultant</b>	SLR Consulting (Africa) (Pty) Ltd
<b>Project Number</b>	710.23001.00007
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<b>Reviewer</b>	Alex Pheiffer
<b>Keywords</b>	Bakubung Wesizwe Scoping
<b>Report Number</b>	1
<b>File Name</b>	2015-10-05 Bakubung Platinum Mine Scoping Report CK SSR.doc
<b>Date last printed</b>	16/09/2015 07:36 AM
<b>Date last saved</b>	05/10/2015 11:30 AM
<b>Issue Date</b>	October 2015

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## **SCOPING REPORT FOR THE ENVIRONMENTAL APPLICATIONS FOR CHANGES TO INFRASTRUCTURE AT BAKUBUNG PLATINUM MINE, LEDIG, NORTH WEST PROVINCE**

### **EXECUTIVE SUMMARY**

#### **INTRODUCTION AND PROJECT DESCRIPTION**

Wesizwe Platinum Limited (Wesizwe) is the owner of Bakubung Platinum Mine, currently shaft sinking on the farm Frischgewaagd 96JQ (Portions 3, 4 and 11). The mine is located near Ledig, just south of the Pilanesberg Game Reserve and Sun City in the North West Province. Two reefs will be mined for Platinum Group Elements - platinum, palladium, rhodium and gold, with copper and nickel as by-products. The project area falls within the Rustenburg and Moses Kotane Local Municipalities of the Bojanala District Municipality. A locality map is provided in Figure 0-1.

In 2008, Wesizwe conducted an Environmental Impact Assessment (EIA) process for the development of the Bakubung Platinum Mine. The Bakubung Platinum Mine received Environmental Authorisation in 2009, in terms of both the National Environmental Management Act (Act 107 of 1998) (NEMA) and Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA). A Water Use Licence (WUL) was issued in terms of the National Water Act (Act 36 of 1998) (NWA) in 2010.

While construction at the Bakubung Platinum Mine has commenced, not all facilities have yet been constructed. Mining has not yet commenced. Wesizwe is now proposing to make several changes to the approved mine. The changes are required in order to cater for an increase in ore processing capacity, as well as additional support infrastructure. The proposed changes will require additional Environmental Authorisations, a Waste Management Licence (WML) and additional water uses requiring an amendment to their existing WUL. Wesizwe also has an existing mining right but now propose to include waste rock into their existing mining right to, in order to sell the waste rock as aggregate. This will require an amendment to their mining right.

The following changes are proposed to the Bakubung Platinum Mine:

- The construction of a larger Tailings Storage Facility (TSF) on the farm Mimosa 81JQ. The area will increase from 142 ha to ~ 166 ha. The height will be ~ 44m;
- A tailings pipeline between the mine and the TSF (which will cross a watercourse);
- An increase in the capacity of the concentrator plant from 230 000 tons per month to approx. 265 000 tons per month;
- Increased capacity of the mine product stockpiles;
- Relocation of the ore crusher circuit from underground to the surface;
- Inclusion of the minerals in the waste rock into the mining licence, as the waste rock may potentially be crushed and sold as aggregate;

- Construction of erosion control measures along watercourses within the mine;
- Storage and handling of dangerous goods such as diesel and reagents on site;
- Various pipeline and road crossings over watercourses, including a bridge crossing;
- New sewage and water pipelines;
- Pollution Control Dams;
- Settling and return water dams;
- New internal mine roads (some of which will cross watercourses);
- Ventilation shafts and raise boreholes;
- Generators or possibly a solar power plant on site, for back up power;
- A salvage yard for temporary storage of general and hazardous waste; and
- The construction of phase 1a of the mine housing and a noise berm (which will cross a watercourse).

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Wesizwe to undertake the environmental assessment process for the proposed project.

#### **ALTERNATIVES CONSIDERED IN THE PROJECT**

As the Bakubung Platinum Mine has already been authorised and is already under construction, the potential alternatives are limited. Many of the proposed changes to infrastructure at the mine are expansions to authorised structures and thus the location will not change. The location of new structures is also based on the location of already approved structures e.g. the additional mine housing is planned to be adjacent to the approved mine housing; and the diesel store will be within the approved mine shaft area. The only feasible locality alternatives relate to the tailings pipeline route.

Three possible alternative locations for the tailings pipeline route (Option 1A - northern route, Option 1B – central route and Option 2 - southern route) have been considered and assessed. These are described below:

##### **Option 1 A - Northern Route**

The pipeline exits the concentrator plant area on the southern boundary, then runs directly westwards along the southern boundary of the plant and crosses under the R565 Rustenburg provincial road. It then passes under Eskom overhead powerlines at an oblique angle, in a south westerly direction towards the tailings storage facility.

Just after the road crossing the pipeline will be located on Bakubung Ba Ratheo tribal land. Here it must cross over two tributaries of the Elands River. These floodplains are very wide, making the crossing of the flood plain approximately 400m long. At the same time it passes under the Eskom overhead powerlines, not at right angles but obliquely.

From here the route is undulating up to the TSF on the farm Mimosa 81 JQ.

#### **Advantages**

- Most of the pipeline route falls within the mining right area, or on land owned by Wesizwe. This means that Wesizwe would only need to negotiate with only one landowner (Bakubung Ba Ratheo) and one mining right holder (Maseve Investments) along the pipeline route.

#### **Disadvantages**

- Very wide 400m flood plain, of two tributaries, to cross.
- Increased cathodic protection measures are required when crossing under the Eskom powerlines obliquely.

#### **Option 1 B - Central Route**

This pipeline route also exits the concentrator plant area on the southern boundary, then runs directly south-westwards from the plant towards the R565 Rustenburg provincial road. The route then crosses under Eskom overhead powerlines at a 90 degree angle, just before passing under the R565. It then continues in a south westerly direction towards the tailings storage facility.

Just after the road crossing the pipeline will be located on Bakubung Ba Ratheo tribal land. Here it must cross over one tributary of the Elands River. The crossing of the flood plain of this tributary is approximately 40 m long.

From here the route is undulating up to the TSF on the farm Mimosa 81 JQ.

#### **Advantages**

- Most of the pipeline route falls within the mining right area, or on land owned by Wesizwe. This means that Wesizwe would only need to negotiate with only one landowner (Bakubung Ba Ratheo) and one mining right holder (Maseve Investments) along the pipeline route.
- This route only crosses one tributary of the Elands River and crosses over a narrower floodplain than Option 1A.
- This route passes under the Eskom powerlines at right angles thus minimising electromagnetic induction and electrolytic corrosion.

#### **Disadvantages**

- There is still one watercourse crossing required for this route.

#### **Option 2 - Southern Route**

This route exits the concentrator area on the southern boundary and travels directly south across the

Elands River at a narrow point, approximately 120m wide. Here it turns south west, crosses over Maseve Investment's property, passes perpendicularly under Eskom overhead powerlines, still on Maseve Investment's property, and then passes under the R565 Rustenburg provincial road.

After the R565 the pipeline traverses Bakubung Ba Ratheo tribal land then crosses the Elands River, for a second time. Here the river crossing is also approximately 120m. From here the route is undulating across the Bakubung Ba Ratheo tribal land up to the TSF on the Mimosa farm property.

### **Advantages**

- Narrow river crossings (no wide floodplains).
- This route also passes under the Eskom powerlines at right angles thus minimising electromagnetic induction and electrolytic corrosion.

### **Disadvantages**

- Negotiate with two landowners (Maseve Investments and Bakubung Ba Ratheo) and two mining rights owners (Royal Bafokeng and Maseve Investments) along the pipeline route.
- Two river crossings of the Elands River.

At the scoping level, the central tailings pipeline route 1 B appears to be the alternative which will result in the lowest environmental impact. However, the final layout of the proposed changes to infrastructure at the Bakubung Platinum Mine will be informed by the outcomes of specialist studies, further consultation with interested and affected parties as well as environmental authorities.

### **No-go option**

In accordance with the NEMA Regulations, the no-go alternative is required to be investigated and assessed. The no-go alternative would mean that the changes to infrastructure at the Bakubung Platinum Mine are not undertaken and therefore the associated negative environmental and social impacts will not occur. This alternative will need to be weighed against the findings of the EIA as well as the potential socio-economic benefits that may result from the project. This will be discussed further in the EIA phase of the project.

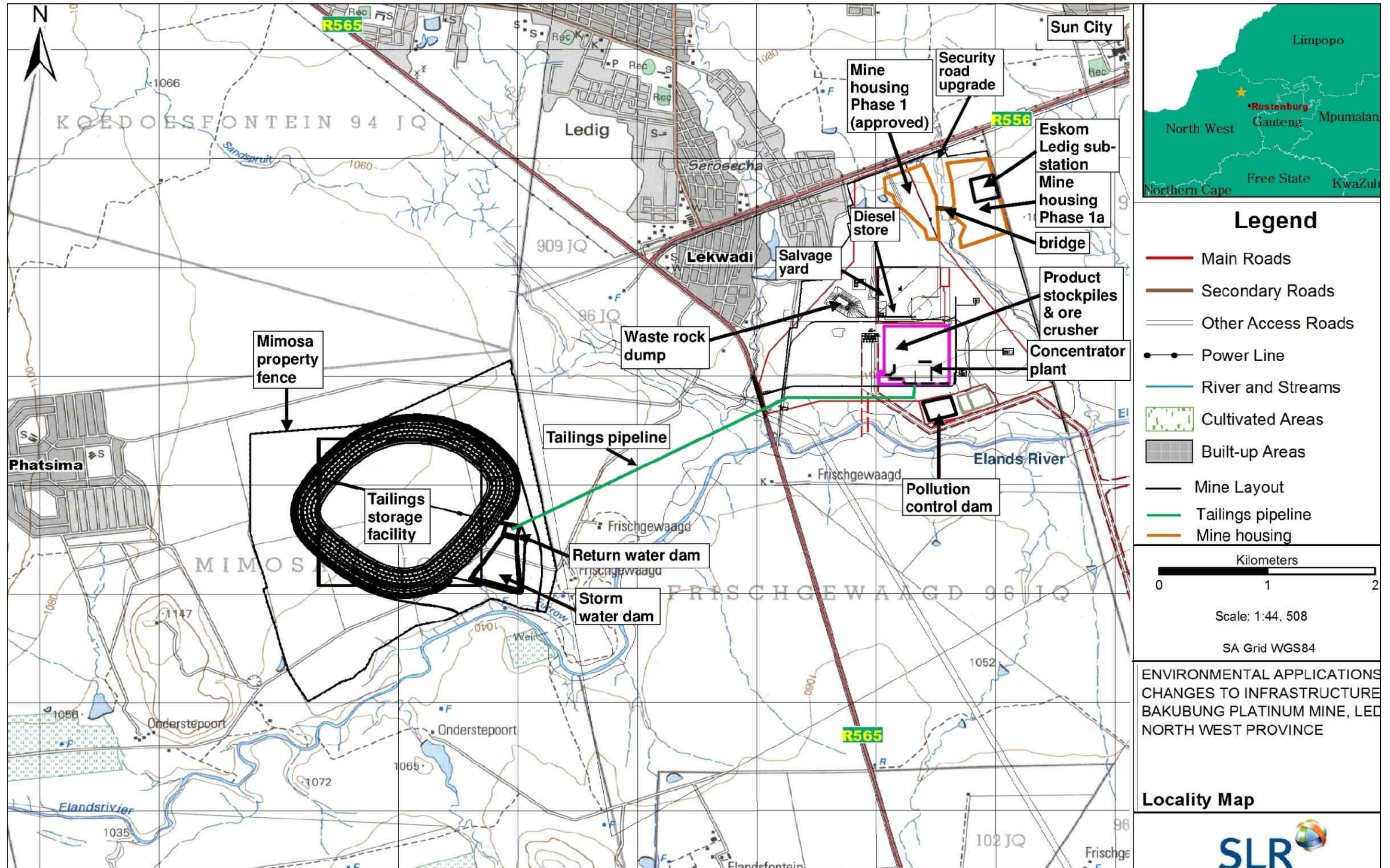


FIGURE 0-1: LOCALITY MAP OF THE PROPOSED PROJECT (SHOWING THE PREFERRED TSF PIPELINE ROUTE)

## **DESCRIPTION OF THE AFFECTED ENVIRONMENT**

In terms of the affected environment around the proposed project, notable areas are the heritage sites which are present within the project area which may be near the new TSF site. There are also Freshwater Ecosystem Priority Areas wetlands near the plant area and the TSF area, which will need to be ground truthed. The Elands River and the infrastructure to be built near the river are also of importance as the Elands River is considered to have high conservation importance.

The affected environment will be studied in detail and the impact of the project on the environment will be fully assessed in the EIA phase of the project. Specialist studies will be conducted to assess the project impact on the following: ground water, surface water, air quality, heritage, noise, social, soils, waste, fauna, flora and wetlands.

## **RESULTS OF CONSULTATION WITH INTERESTED AND AFFECTED PARTIES**

Public consultation was conducted by means of advertisements, site notices, open days and focused authority meetings. Background information documents (BIDs) were circulated to Interested and Affected Parties (IAPs) providing initial project information and also inviting members of the public to register as IAPs and participate in the EIA process.

Some of the main issues raised by IAPs during the scoping phase included: community unemployment and future employment opportunities at the mine, opportunities for learnerships and internships at the mine, ensuring the communities and their leaders are appropriately informed of the project, public consultation should also be done in Zulu going forward, details of the mine housing, the impacts of the project on: dust levels, animals in the Pilanesberg National Park, water pollution, heritage, health, blasting impacts, and grazing land in the tailings dam area.

## **ENVIRONMENTAL LEGAL REQUIREMENTS**

Prior to the commencement of the proposed project, environmental authorisation is required from various government departments. These include:

- A mining right amendment in terms of Section 102 of the MPRDA which is regulated by the DMR. This includes the inclusion of waste rock and amendment of the existing EMP.
- Environmental authorisation from the DMR in terms of NEMA. The proposed project incorporates several listed environmental activities. The EIA regulations being followed for this project are Regulation 983, 984 and 985 (December 2014 EIA Regulations).
- A WML from the DMR in terms of the NEMWA.
- A WUL amendment from the Department of Water and Sanitation in terms of the NWA in terms of Section 21(b), 21 (c), 21(i), 21(g) and 21(j).



Any additional approvals/permits needed for the project will be identified during the course of the environmental assessment process. A detailed list of such requirements will be provided in the EIA and EMP report.

### **ENVIRONMENTAL IMPACTS**

The scoping phase provides a scoping-level identification of potential environmental impacts (physical, biological, social and economic). The table below provides a list of the prominent impacts identified by the EAP or raised by IAPs, as well as the possible management and mitigation measures. The level of residual risk after management or mitigation is also estimated. This will be refined during the EIA phase with specialist input as appropriate.

**TABLE 0-1: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK**

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<b>Changes to infrastructure at the Bakubung Platinum Mine including:</b>  • Larger tailings dam	Loss of mineral resources	Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Infrastructure could potentially be relocated if the location is found to cause the potential sterilisation of mineral resources.</li> </ul>	Low
	Hazardous excavations/ structures	Objective: prevent physical harm to third parties and animals from hazardous excavations and infrastructure. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Access control, barriers and warning signs at hazardous areas</li> <li>• Design, operate and rehabilitate the residue facilities in a manner to address stability related safety risks to third parties and animals</li> <li>• Monitoring and maintenance post closure to observe whether the relevant long-term safety objectives have been achieved and to identify the need for additional intervention where the objectives have not been met</li> <li>• Where Wesizwe has caused injury or death to third parties and/or animals, appropriate compensation will be provided.</li> </ul>	Low
• Increase in the capacity of the concentrator plant	Loss of soil resources and land capability through contamination	Objective: prevent pollution of soils through accidental spills and/or leaks from equipment. Conceptual mitigation measures to prevent pollution include: <ul style="list-style-type: none"> <li>• Basic infrastructure design that is adequate to contain polluting substances</li> <li>• Training of workers to prevent pollution</li> <li>• Equipment and vehicle maintenance</li> <li>• Fast and effective clean-up of spills</li> <li>• Effective waste management.</li> </ul>	Low
• Increased capacity of the	Loss of soil resources and land capability through physical disturbance	Objective: minimise the loss of soil resources and related functionality through physical disturbance, erosion and compaction. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Limit site clearance</li> <li>• Develop and implement a soil management plan that addresses soil stripping, stockpiling and use for rehabilitation.</li> </ul>	Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
mine product stockpiles  • Relocation of the ore crusher from underground to the surface	Physical destruction of biodiversity	Objective: prevent the unacceptable loss of biodiversity and related ecosystem functionality through physical destruction. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Limit site clearance</li> <li>• Develop a site clearance plan which addresses delineation of the area to be cleared, relocation of any protected species or species of concern with relevant approvals and rehabilitation of areas no longer in use</li> <li>• Avoid sensitive areas as far as practically possible</li> <li>• Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> <li>• Consider selecting the tailings pipeline route Option 1B.</li> </ul>	Moderate/Low
• Inclusion of the minerals in the waste rock into the mining licence	General disturbance of biodiversity	Objective: prevent unacceptable disturbance of biodiversity and related ecosystem functionality. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Worker training on the value of biodiversity</li> <li>• Zero tolerance for harming and harvesting fauna and flora</li> <li>• Limit light and noise disturbance as far as practically possible</li> <li>• Effective waste management and pollution prevention</li> <li>• Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> <li>• Consider selecting the tailings pipeline route Option 1B.</li> </ul>	Moderate/Low
• Construction of erosion control measures	Alteration of drainage patterns	Objective: minimise the disturbance of streams and surface drainage patterns and a reduction in flow to downstream users. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Limit activities and infrastructure within wetland and watercourse floodlines.</li> <li>• Construct erosion control measures.</li> <li>• Develop and implement a stormwater management plan to divert clean water away from the site and manage dirty water runoff. Contain all contaminated water in accordance with GN R704</li> </ul>	Moderate/Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>• Storage and handling of dangerous goods</li> <li>• Pipeline and road crossings over watercourses</li> <li>• Sewage and water pipelines</li> <li>• Internal mine roads</li> </ul>	Pollution of surface and groundwater resources	<ul style="list-style-type: none"> <li>• Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> </ul> <p>Objective: prevent pollution of surface water resources and impacts on other surface water users.</p> <p>Conceptual mitigation measures to prevent pollution include:</p> <ul style="list-style-type: none"> <li>• Operate the mine as a zero point source discharge facility i.e. contain and re-use contaminated water</li> <li>• Basic infrastructure design that is adequate to contain polluting substances</li> <li>• Training of workers to prevent pollution</li> <li>• Equipment and vehicle maintenance</li> <li>• Fast and effective clean-up of spills</li> <li>• Effective waste management</li> <li>• Manage clean and dirty water in accordance with GN R704</li> <li>• Conduct water monitoring and implement remedial actions as required</li> <li>• Effective rehabilitation of residue facility and the overall site.</li> <li>• Consider selecting the tailings pipeline route Option 1B.</li> </ul>	Moderate/Low
	Air pollution	<p>Objective: reduce dust and gaseous impacts during all project phases.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>• Limit disturbed areas</li> <li>• Suppress dust effectively on unpaved roads and at material transfer points as required</li> <li>• Monitor dust fallout and implement additional mitigation as required</li> <li>• Maintain vehicles and equipment in good working order.</li> </ul>	Moderate/Low
	Noise pollution	Objective: prevent an unacceptable increase in disturbing noise and limit nuisance noise at sensitive receptors as far as practically possible.	Moderate/Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>Ventilation shafts and raise boreholes</li> </ul>		Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>Maintain vehicles and equipment in good working order.</li> <li>Conduct noise monitoring in the event of receiving a complaint and implement remedial action to reduce impact if necessary.</li> </ul>	
<ul style="list-style-type: none"> <li>Generators or possibly a solar power plant</li> </ul>	Negative landscape and visual impacts	Objective: limit negative visual impact. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>Limit disturbed areas.</li> <li>Suppress dust to prevent a visual dust cloud.</li> <li>Rehabilitate areas no longer in use.</li> <li>Effective waste management.</li> <li>Implement effective use of lighting which reduces light spill.</li> <li>Effective rehabilitation of the overall site and residue facility.</li> </ul>	Moderate/Low
<ul style="list-style-type: none"> <li>Phase 1a of the Mine Housing</li> </ul>	Loss of current land uses	Objective: prevent unacceptable negative impacts on surrounding land uses. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>Effectively manage noise, dust, surface and groundwater quality, social impacts and visual impacts</li> <li>Effective rehabilitation of the overall site and residue facilities for post closure land use.</li> </ul>	Low
<ul style="list-style-type: none"> <li>Salvage yard</li> </ul>	Project-related road use and traffic	Objective: prevent injury to third parties or animals as a result of traffic accidents. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>Educate employees (temporary and permanent) about road safety.</li> <li>Enforce strict vehicle speeds along the linear services corridors.</li> <li>If a person or animal is injured by transport activities this will be handled in accordance with the Wesizwe emergency response procedure to be developed.</li> </ul>	Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>• Pollution Control Dams</li> </ul>	Destruction and disturbance of heritage (including cultural) and paleontological resources	Objective: prevent the loss of heritage (including cultural) resources that may be caused by the proposed mining activities. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Limit the area of disturbance as far as practically possible.</li> <li>• Training of workers about the heritage and cultural sites that may be encountered and about the need to conserve these.</li> <li>• Develop and implement a chance find emergency procedure.</li> </ul>	Moderate/Low
	Economic impact (positive impact)	Objective: enhance positive and minimise negative economic impacts. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Employ local people and procure goods and services locally as far as practically possible.</li> <li>• Ensure that closure planning considerations address the re-skilling of employees for the downscaling, early closure and long-term closure scenarios.</li> </ul>	Moderate/Low
	Inward migration impact	Objective: minimise inward migration and the associated secondary impacts. Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Effective communication with local communities to manage expectations with regard to employment and other opportunities.</li> <li>• Implement mechanisms to ensure workers find formalised accommodation that is adequately serviced.</li> <li>• Worker training on health and safety related issues.</li> </ul>	Moderate/Low

## PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

The main objectives of the EIA phase will be to:

- Assess the potential cultural, heritage, socio-economic and biophysical impacts of the project in detail;
- Identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts;
- Liaise with IAPs including relevant government departments on issues relating to the project to ensure compliance with existing guidelines and regulations;
- Undertake consultations with IAPs and provide them with an opportunity to review and comment on the outcomes of the environmental assessment process and acceptability of mitigation measures;
- Develop an environmental management programme and a conceptual closure/decommissioning plan; and
- Provide measures for ongoing monitoring (including environmental audits) to ensure that the project plan and proposed mitigation measures are implemented as outlined in the detailed EIA and EMPr.

A description of the tasks that will be undertaken during the EIA phase is provided below in Table 9-2.

**TABLE 0-1: EIA TASKS AND TIMING**

Phase	EAP activity	Opportunities for Consultation and Participation		Schedule
		Competent Authorities	IAPs, State Departments and Organs of State	
Scoping	Submit Final scoping report to authority	Authority to Accept scoping report OR Refuse environmental authorisation (43 days of receipt)	IAPs to comment on FSR directly to CA with copy to EAP	September – October 2015
Specialist Assessments and Input	EAP to manage specialist activities and receive inputs for EIA.			June 2015 – January 2016
EIA Phase	Assess environmental impacts. Compile draft EIA and EMP report			January 2016
	Submit draft EIA report to I&APs authorities.	Review of draft EIA report (30 days). Comments to EAP	Review of draft EIA report (30 days). Comments to EAP	February 2016
	Arrange meetings and consultations	Meetings with authorities during EIA if required.	Public Feedback Meeting. Focused consultation with I&APs or commenting authorities if required.	
	Address public comment and finalise EIA and EMPr reports			February - March 2016
Authority review and Authorisation	Final EIA report to Authority (106 days from acceptance of scoping).	Authority Acknowledge Receipt of EIA report (10 days).	Review of final EIA report (30 days). Comments to CA	March 2016 – July 2016
		Environmental Authorisation Granted / Refused (107 days).		

Phase	EAP activity	Opportunities for Consultation and Participation		Schedule
		Competent Authorities	IAPs, State Departments and Organs of State	
			Notifications to I&APs regarding environmental authorisation (granted or refused).	August 2016
<b>Appeal Phase</b>	EAP to provide guidance regarding the appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations	variable



# SCOPING REPORT FOR THE ENVIRONMENTAL APPLICATIONS FOR CHANGES TO INFRASTRUCTURE AT BAKUBUNG PLATINUM MINE, LEDIG, NORTH WEST PROVINCE

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## ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
~	approximately
BID	Background information document
CA	Competent Authority
CBA	Critical biodiversity areas
dBA	A-weighted decibel
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DW&S	Department of Water and Sanitation
EA	Environmental Authorisations
EAP	Environmental Assessment Practitioner
EIA	Environmental impact assessment
EMP(r)	Environmental management programme (report)
GN (R)	General Notice (Regulation)
Ha	Hectares
IWWMP	Integrated Water and Waste Management Plan
I&APs	Interested and/or affected parties
JKA	Jongens Keet Associates
Km	Kilometres
LOM	Life of mine
m	Meters
mamsl	Metres above mean sea level
mm	Millimetres
MR	Mining Right
MPRDA	Mineral and Petroleum Resources Development Act, 2002
NEMAQA	National Environmental Management: Air Quality Act, 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004
NEM:WA	National Environmental Management: Waste Management Act, 2008
NEMA	National Environmental Management Act, 1998
(N)FEPA	(National) Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999
NO <sub>2</sub>	Nitrogen dioxide
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998
NW READ	North West Department of Rural, Environment & Agricultural Development
PGE / PGM	Platinum Group Elements / Metals
PM10	Particulate matter less than 10 micron diameter
ROM	Run-of-mine
SACNSP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAR	Southern access road
SLR	SLR Consulting (Africa) (Pty) Ltd
SO <sub>2</sub>	Sulphur dioxide
TSF	Tailings Storage Facility
TSP	Total suspended particles
WML	Waste Management Licence
WRD	Waste Rock Dump
WUL(A)	Water Use License (Application)

# SCOPING REPORT FOR THE PROPOSED ENVIRONMENTAL APPLICATIONS FOR CHANGES TO INFRASTRUCTURE AT BAKUBUNG PLATINUM MINE, LEDIG, NORTH WEST PROVINCE

## 1 INTRODUCTION

### 1.1 INTRODUCTION TO THE PROPOSED PROJECT

Wesizwe Platinum Limited (Wesizwe) is the owner of Bakubung Platinum Mine, currently shaft sinking on the farm Frischgewaagd 96JQ (Portions 3, 4 and 11). The mine is located near Ledig, just south of the Pilanesberg Game Reserve and Sun City in the North West Province. Two reefs will be mined for Platinum Group Elements - platinum, palladium, rhodium and gold, with copper and nickel as by-products. See Figure 1-1 and Appendix 3 for the regional setting of the project. The project area falls within the Rustenburg and Moses Kotane Local Municipalities of the Bojanala District Municipality.

In 2008, Wesizwe conducted an Environmental Impact Assessment (EIA) process for the development of the Bakubung Platinum Mine. The Bakubung Platinum Mine received Environmental Authorisation in 2008, in terms of both the National Environmental Management Act (Act 107 of 1998) (NEMA) and Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA). A Water Use Licence (WUL) was issued in terms of the National Water Act (Act 36 of 1998) in 2010. A copy of the mining right is included in Appendix 6 (copies of other authorisations are available on request).

While the construction phase of the Bakubung Platinum Mine has commenced, not all facilities have yet been constructed. Wesizwe are now proposing to make several changes to the approved mine which require additional Environmental Authorisations (EA), a Waste Management Licence (WML) and additional water uses requiring an amendment to their existing Water Use Licence (WUL). Wesizwe also has an existing mining right but now propose to include waste rock into their existing mining right to sell waste rock as aggregate. This will require an amendment to their mining right.

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Wesizwe to undertake the environmental assessment process for the proposed project.

The EIA process comprises two phases: a scoping phase and an environmental impact assessment phase. An environmental management programme (EMP) will be developed in the EIA phase. This report describes the scoping phase for the proposed project.

### 1.2 PROJECT BACKGROUND

As discussed in Section 1.1 above, the Bakubung Platinum Mine includes activities and infrastructure authorised during the previous EIA process conducted. Shaft sinking on site has already begun. Two reefs,

the Merensky Reef and the UG2, will be mined for the Platinum Group Elements (PGEs) platinum, palladium, rhodium and gold, with copper and nickel as by-products. Mining will be a combination of conventional breast mining and mechanised mining of the two platinum reefs and will occur at a depth of approximately 650 to 1 050 metres below ground level.

Key infrastructure and activities already authorised in the 2008 EIA include the following (note that some of this approved infrastructure will be modified as part of the current project):

- A Tailings Storage Facility (TSF) (approximately 50m high and covering an area of 130 ha) with associated lining preparations and return water dams;
- Mineral processing plant and associated infrastructure (concentrator plant capacity of 230 000 tons per month);
- A Waste Rock Dump (WRD);
- Roads;
- Surface conveyor belts;
- Water and sewage pipelines;
- Infrastructure for services including potable water and fire water, compressed air and sewage reticulation;
- A sewage treatment plant;
- Salvage yard and waste sorting facility;
- Diesel storage;
- Dirty water settling dams/pollution control dams;
- A helipad;
- Ore stockpiles; and
- Transmission of electricity.

Phase 1 of the mine housing was also approved for development through a separate project.

Layouts of the plant, shaft and TSF areas from the original EIA are included in Appendix 7.



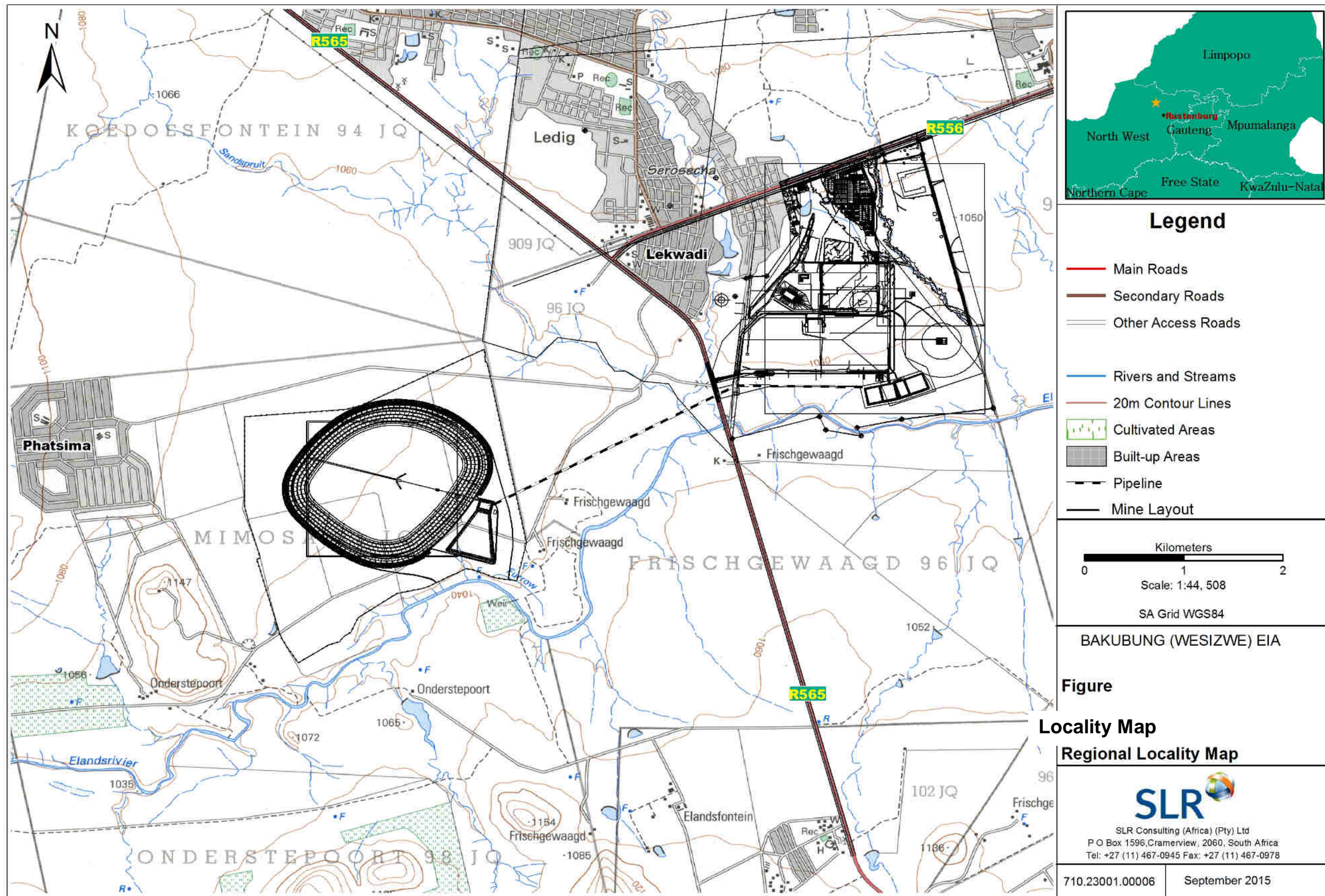


FIGURE 1-1: LOCALITY MAP OF THE PROPOSED PROJECT

### 1.3 SUMMARY OF AUTHORISATION REQUIREMENTS

Prior to the commencement of the proposed project, environmental authorisation is required from various government departments. These include:

- A mining right amendment in terms of Section 102 of the MPRDA which is regulated by the Department of Mineral Resources (DMR). This includes the inclusion of waste rock and amendment of the existing Environmental Management Programme (EMP)
- Environmental authorisation from the DMR in terms of NEMA. The proposed project incorporates several listed environmental activities. The applicable list of activities is provided in Section 4.1 of this report. The EIA regulations being followed for this project are Regulation 983, 984 and 985 (December 2014 EIA Regulations).
- A WML from the DMR in terms of NEM:WA. The applicable list of activities is provided in Section 4.1 of this report.
- A WUL amendment from the Department of Water and Sanitation (DWS) in terms of the NWA in terms of Section 21(a), 21 (c), 21(i), 21(g) and 21(j).

Any additional approvals/permits needed for the project will be identified during the course of the environmental assessment process. A detailed list of such requirements will be provided in the EIA and EMP report if applicable.

### 1.4 STRUCTURE OF THE REPORT

The report has been structured in line with the official DMR scoping report template. Additional sections have been incorporated where appropriate to provide the reader with further context and or information on the proposed project and the project process. All the content requirements of the DMR template have been retained.

The report is structured as follows:

- Section 1 (this section) provides a brief project overview.
- Section 2 provides information on the Environmental Assessment Practitioners (EAP) responsible for the compilation of this report.
- Section 3 provides a description of the project property.
- Section 4 details the project which includes the activities that are to be undertaken and infrastructure to be constructed.
- Section 5 provides the legislative context of the project.
- Section 6 details the need and desirability of the project.
- Section 7 gives details on the period for which the EA is required.
- Section 8 explains the process that was followed to reach the preferred alternative site that is being applied for in this project. This section also details the public participation process that was undertaken, details of the environmental attributes of the project and the alternatives, impacts for each alternative, the

preferred project alternative.

- Section 9 details the plan of study for the future EIA process to be completed as part of the project process, including aspects that are to be assessed, the methods of assessment, the tasks required for the EIA phase and other information required by the Competent Authority (CA).

## **1.5 SCOPING PHASE OBJECTIVES**

The objectives of the scoping phase are to understand the project, identify and describe potential environmental and social impacts, consult with IAPs to understand their issues and concerns and to set out any related terms of reference for further investigations that will enable the meaningful assessment of all relevant environmental and social issues.

## **1.6 ASSUMPTIONS AND LIMITATIONS**

The assumptions and limitations of this scoping report are listed below:

- This scoping report is based on the assumption that SLR has been provided with all relevant project information and that it was correct and valid at the time it was provided;
- Specialist studies from the 2008 EIA have been used for the compilation of the baseline sections of this scoping report. For scoping purposes these are deemed sufficient and will be refined following specialist studies being conducted as part of this project.
- It is assumed that the information provided in the 2008 EIA is correct and valid.

## 2 DETAILS OF THE EAP

### 2.1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

The details of the EAPs that were involved in the preparation of this scoping report are provided in Table 2-1 below.

**TABLE 2-1: DETAILS OF THE EAP**

DETAILS	PROJECT MANAGER	REVIEWER
Name of the practitioners	Shelley Seton-Rogers and Chiara Kotze	Alex Pheiffer
Responsibility on the project	EAPs	EAP & Reviewer
Tel No.:	011 467 0945	011 467 0945
Fax No.:	011 467 0978	011 467 0978
Postal address	P.O.Box 1596, Cramerview 2060	P.O.Box 1596, Cramerview 2060
E-mail address	sholt@slrconsulting.com / ckotze@slrconsulting.com	apheiffer@slrconsulting.com

Neither SLR nor any of the specialists involved in the environmental assessment process have any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

### 2.2 QUALIFICATIONS AND EXPERIENCE OF THE EAPS

Alex Pheiffer is a director at SLR, has a Masters' Degree in Environmental Management and has over 13 years of relevant experience in the assessment of impacts associated with mining operations. Alex Pheiffer is registered as a professional natural scientist (Environmental management) with SACNASP. Shelley Seton-Rogers has an Honour's Degree in Zoology and has over 10 years' experience in the assessment of impacts associated with mining operations. Chiara Kotze has a Masters' Degree in Ecology, Environment and Conservation and has 3.5 years' experience. Alex Pheiffer, Shelley Seton-Rogers and Chiara Kotze have been involved in several impact assessments for large scale mining developments in Southern Africa. Proof of registrations of the relevant practitioners, where applicable, is provided in Appendix 1 and relevant curricula vitae are attached in Appendix 2.

### 3 DESCRIPTION OF THE PROPERTY

#### 3.1 LOCATION OF THE ACTIVITY

A description of the property on which the project is located is provided in Table 3-1 and Figure 3-1.

**TABLE 3-1: DESCRIPTION OF THE PROPERTY**

DESCRIPTOR	DETAIL		
Farm Name	Remaining extent and portions 1, 3, 4, 11 of the farm Frischgewaagd 96 JQ; The remainder of the farm Mimosa 81JQ.		
Application area (Ha)	Frischgewaagd 96 JQ: 792.28 ha Ledig 909 JQ: 709.8 ha Mimosa 81JQ: 964.87 ha		
Magisterial District	Bojanala District Municipality (Moses Kotane Local Municipality and Rustenburg Local Municipality)		
Distance and direction from nearest town	Plant Area: approximately (~) 1.5km south east of Ledig, 150 m from Lekwadi TSF Area: ~ 3km from Ledig, 630m east of Phatsima		
21 digit Surveyor General Code for each farm portion	T0JQ0000000009600001 T0JQ0000000009600003 T0JQ0000000009600004 T0JQ0000000009600011 T0JQ0000000009600000 T0JQ0000000008100000		
Co-ordinates of development (approximate centre of development area)	Plant	25° 22' 50.83" S	27° 04' 55.41" E
	TSF	25° 24' 08.03" S	27° 02' 02.51" E

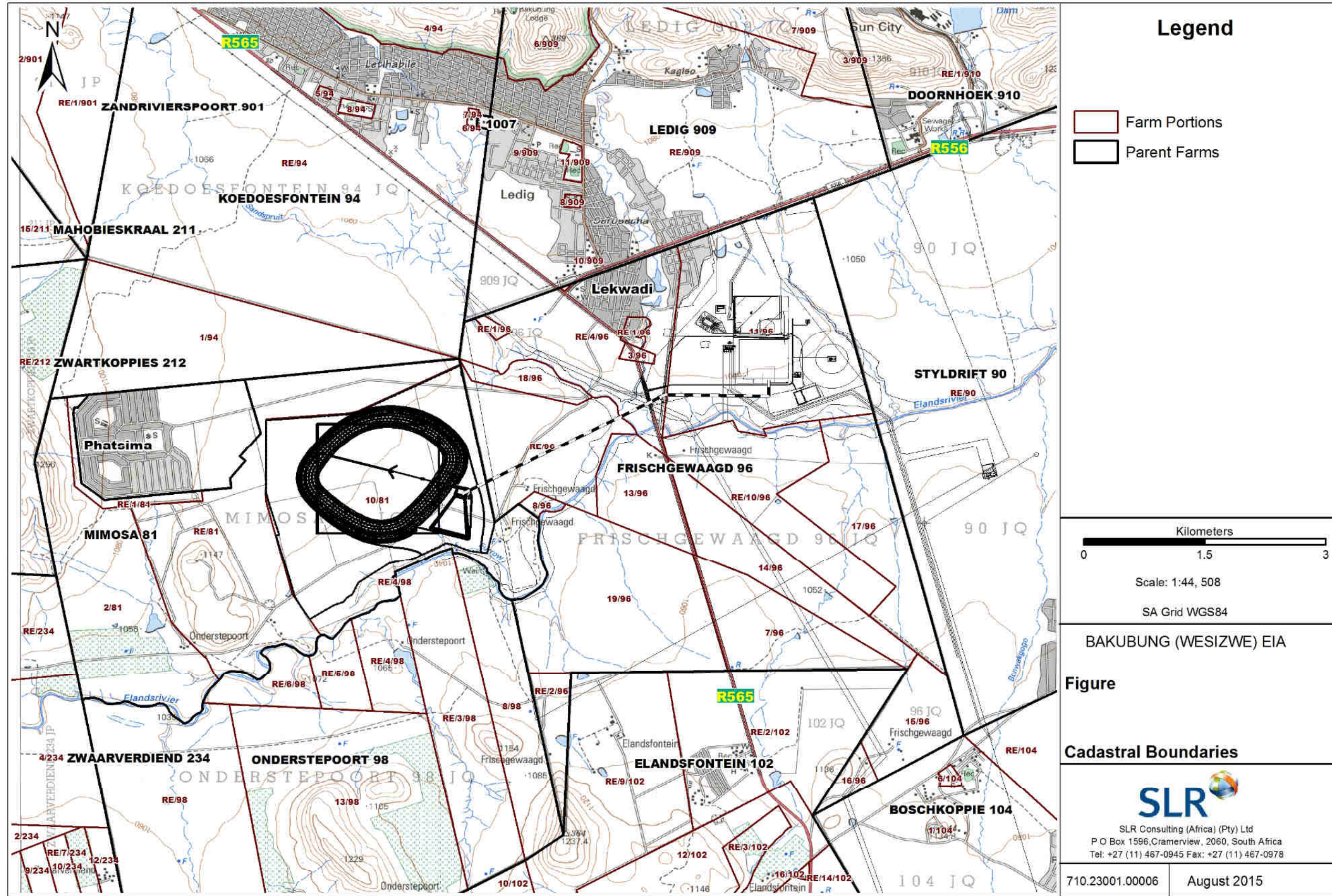


FIGURE 3-1: CADASTRAL BOUNDARIES

### 3.1.1 DETAILS OF MINERAL RIGHT AREA

Wesizwe on behalf of Bakubung Minerals (Pty) Ltd hold a mining right for PGEs on the following farms:

- Portion 3, 4, 11 and RE of portion 1 for of the farm Frischgewaagd 96 JQ;
- Ledig 909 JQ (consolidated farm of former portions 1, 2, 3, 4, 5 and 6 and new subdivision portions 3, 4, 5, 6 and 7); and
- A portion of the remainder of the farm Mimosa 81 JQ.

### 3.2 LOCALITY MAP

A map showing the locality and setting of the project site is provided in Figure 1-1 and Figure 3-1.

## 4 DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY

### 4.1 LISTED AND SPECIFIED ACTIVITIES

The activities and infrastructure associated with the project are listed in Table 4-1 below. In each case the relevant NEMA and/or possible NEM:WA listed activities which will be triggered by the project for the various activities and infrastructure has been identified and fully described in **Error! Reference source not found..** This list comprises the NEMA and NEM: WA activities applied for.



**TABLE 4-1: LISTED ACTIVITIES OF THE PROPOSED PROJECT**

It should be noted that the list below only relates to the project changes and does not discuss activities that form part of the approved project, of which the EIA was conducted in 2008.

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
<b>Site preparation</b>					
Selective clearing of vegetation in areas designated for all surface infrastructure, stockpiles and surface disturbance.	<b>Concentrator Plant = 33.5ha Housing Phase 1a = 23 ha Tailings Pipeline Servitude = 11.4 ha TSF = 170 ha PCD's = 4.2 ha Total = 242.1 ha</b>	<b>X</b>	GN R 983 Activity 27 - The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan .  GN R 984 Activity 15 – The clearance of an area of 20 hectares or more of indigenous vegetation , excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan .  GN R 985 Activity 12 - The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan .		
Stripping and stockpiling topsoil and sub-soil and the establishment of a topsoil stockpile area	<b>Total area = 242.1 ha Stockpile areas 10 ha</b>	<b>X</b>	GN R 983 Activity 27 GN R 984 Activity 15 GN R 985 Activity 12		
Digging of foundations and trenches	<b>4 ha</b>	<b>X</b>	GNR 983 activity 19 - The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from - (i) a watercourse ; (ii) the seashore ; or (iii) the littoral active zone , an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary , whichever distance is the greater but excluding where such		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921) (and GNR 633 of 2015)
			<p>infilling, depositing , dredging, excavation, removal or moving - (a) will occur behind a development setback ; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan ; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p> <p>GNR 983 activity 27</p> <p>GN R 985 Activity 14 – The development of - (i) canals exceeding 10 square metres in size ; (ii) channels exceeding 10 square metres in size; CO bridges exceeding 10 square metres in size;(iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size;(v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size;(vi) bulk storm water outlet structures exceeding 10 square metres in size;(vii) marinas exceeding 10 square metres in size;(viii) jetties exceeding 10 square metres in size;(ix) slipways exceeding 10 square metres in size;(x) buildings exceeding 10 square metres in size;(xi) boardwalks exceeding 10 square metres in size; or(xii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs -(a) within a watercourse ;(b) in front of a development setback ; or(c) if no development setback has been adopted,within 32 metres of a watercourse ,measured from the edge of a watercourse ;excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>GN R 985 Activity 23 - The expansion of- (i) canals where the canal is expanded by 10 square metres or more in size; (ii) channels where the channel is expanded by 10 square metres or more in size;(iii) bridges where the bridge is expanded by 10 square metres or more in size;(iv) dams where the dam is expanded by 10 square metres or more in size;(v) weirs where the weir is expanded by 10 square metres or more in size;(vi) bulk</p>		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
			storm water outlet structures where the structure is expanded by 10 square metres or more in size;(vii) marinas where the marina is expanded by 10 square metres or more in size;(viii) jetties where the jetty is expanded by 10 square metres or more in size;(ix) slipways where the slipway is expanded by 10 square metres or more in size;(x) buildings where the building is expanded by 10 square metres or more in size;(xi) boardwalks where the boardwalk is expanded by 10 square metres or more in size; or (xii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;where such development occurs -(a) within a watercourse ;(b) in front of a development setback adopted in the prescribed manner; or(c) if no development setback has been adopted,within 32 metres of a watercourse ,measured from the edge of a watercourse ;excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.		
<b>Mining and processing</b>					
Mining and associated infrastructure		<b>X</b>	GNR 983 activity 21- Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act , 2002 ( Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act , 2002 ( Act No. 28 of 2002).  GNR 983 activity 28 - Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921) (and GNR 633 of 2015)
			<p>GNR 983 activity 32 - The continuation of any development where the environmental authorisation has lapsed and where the continuation of the development , after the date the environmental authorisation has lapsed will meet the threshold of any activity or activities listed in this Notice, Listing Notice 2 of 2014, or Listing Notice 3 or Listing Notice 4 of 2014.</p> <p>GNR 984 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 associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act , 2002 ( Act No. 28 of 2002).</p> <p>GN R 984 Activity 21 - Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.</p>		
Relocation of ore crusher to be above-ground	0.005 ha	None	Not applicable		
Crushing waste rock for sale as aggregate	5 ha	X	GNR 983 activity 21 GN R 984 Activity 17 GN R 984 Activity 21		
Ventilation shafts and raise boreholes	0.25 ha	None	Not applicable		
Increase in the capacity of the concentrator plant	33.5 ha	X	GN R 983 Activity 27 GN R 984 Activity 15		
<b>Transportation system</b>					
Establishment of internal	6.5 ha	X	GNR 983 activity 19		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
haul roads and access roads (some of which will cross watercourses)			<p>GNR 983 activity 24 - The development of - (i) a road 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 Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding - (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.</p> <p>GN R 985 Activity 4 – The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>GN R 985 Activity 14</p> <p>GN R 985 Activity 18 – The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>GN R 985 Activity 23</p>		
Construction and operation of a tailings pipeline for transfer of tailings from the mine to the Tailings Storage Facility (TSF)	<b>11.4 ha</b>	<b>X</b>	<p>GN R 983 Activity 10 - The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes - (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where - (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.</p> <p>GNR 983 activity 12 - The development of - (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam</p>		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921) (and GNR 633 of 2015)
			, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs - (a) within a watercourse ; (b) in front of a development setback ; or (c) if no development setback exists, within 32 metres of a watercourse , measured from the edge of a watercourse ; - excluding - (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.  GNR 983 activity 19 GNR 983 activity 27 GN R 985 Activity 14 GN R 985 Activity 23		
Construction of a bridge	< 1ha	X	GN R 983 Activity 12 GNR 983 activity 19 GN R 985 Activity 14 GN R 985 Activity 23		
<b>Waste management (Non-mineralised and Mineralised)</b>					
Increased size of the Waste Rock Dump (WRD)	5.7ha	X	GN R 983 Activity 27 GN R 985 Activity 12	X	GNR 921 category A (12) - The construction of a facility for a waste

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
					<p>management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).</p> <p>A(15) - The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p> <p>B(7) - The disposal of any quantity of hazardous waste to land.</p> <p>B(10) - The construction of a facility for a waste management activity listed in Category 8 of this Schedule (not in isolation to associated waste management activity).</p> <p>B(11) - The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>
Increased size of the TSF	170 ha	X	GN R 983 Activity 27 GN R 984 Activity 15 GN R 985 Activity 12 GN R 985 Activity 14	X	GNR 921 category B (7) - The disposal of any quantity of hazardous waste to land.  B(10) - The construction of a facility for a

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921)  (and GNR 633 of 2015)
			GN R 985 Activity 23		waste management activity listed in Category 8 of this Schedule (not in isolation to associated waste management activity).  B(11) - The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Salvage yard for temporary storage of general and hazardous waste	0.62 ha	None	Not applicable	X	Category C(1) – The storage of general waste at a facility that has the capacity to store in excess of 100m <sup>3</sup> of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.  C(2) - The storage of hazardous waste at a facility that has the capacity to store in excess of 80m <sup>3</sup> of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste  C(3) - The storage of waste tyres in a storage area exceeding 500m <sup>2</sup> .
Increased capacity of the mine product stockpiles	4.6 ha	X	GNR 983 activity 34 - The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions or pollution ,		



NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921) (and GNR 633 of 2015)
			<p>excluding - (i) 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 the National Environmental Management: Waste Act , 2008 applies; or (ii) the expansion of or changes to existing facilities for the treatment of effluent, wastewater or sewage where the capacity will be increased by less than 15 000 cubic metres per day.</p> <p>GNR 984 activity 6 – The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding - (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are 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 National Environmental Management: Waste Act , 2008 applies; or (iii) the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.</p> <p>GN R 985 Activity 12</p>		
Establishing a sewage treatment plant	<b>0.44 ha</b>	<b>X</b>	<p>GNR 983 Activity 25 - The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres.</p> <p>GNR 983 activity 34 GNR 984 Activity 6 GN R 984 Activity 25 - The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of 15000 cubic metres or more.</p>		
Storing and handling	<b>0.15 ha</b>	<b>X</b>	GNR 983 Activity 14 - The development of facilities or infrastructure, for the		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
dangerous goods	Volume = 737.5 m <sup>3</sup>		<p>storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</p> <p>GNR 984 Activity 4 - The development 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.</p> <p>GNR 985 Activity 10 - The development 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.</p> <p>GN R 985 Activity 22 - The expansion of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage facilities or infrastructure will be expanded by 30 cubic metres or more but no more than 80 cubic metres.</p>		
<b>Water supply, use and management</b>					
Construction and operation of new sewage and water pipelines, and storm water infrastructure	1200 m	X	<p>GNR 983 Activity 9 - The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water 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; excluding where - (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.</p> <p>GNR 983 activity 10 GNR 983 activity 12 GNR 983 activity 19 GN R 985 Activity 14</p>		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY (Mark with an X where applicable).	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORITY (Mark with an X)	APPLICABLE LISTING NOTICE (GNR 921) (and GNR 633 of 2015)
			GN R 985 Activity 23		
Construction and operation of water storage reservoirs	0.33 ha	X	GNR 983 activity 12  GNR 983 activity 13 - The development 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 16 in Listing Notice 2 of 2014.  GNR 985 Activity 2 – The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.  GN R 985 Activity 14  GN R 985 Activity 16 – The expansion of reservoirs for bulk water supply where the capacity will be increased by more than 250 cubic metres.  GN R 985 Activity 23		
Dewatering of the mine shaft of groundwater	None	None	Not applicable		
Construction and operation of settling and return water dams	0.103ha	X	GNR 983 activity 12 GNR 983 activity 13 GNR 983 activity 34 GNR 984 activity 6 GN R 985 Activity 14 GN R 985 Activity 23		
Construction of erosion control measures along watercourses within the mine area	< 1ha	X	GNR 983 activities 12 GNR 983 activity 19 GN R 985 Activity 14 GN R 985 Activity 23		
<b>Power supply and use</b>					
Installation of generators	< 30 ha	X	GNR 983 Activity 1 - The development of facilities or infrastructure for the		

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable).	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORIZATION  (Mark with an X)	APPLICABLE LISTING NOTICE  (GNR 921)  (and GNR 633 of 2015)
or possibly a solar power plant on site, for back up power			<p>generation of electricity from a renewable resource where - (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare; excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.</p> <p>GNR 983 Activity 2 - The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where - (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.</p> <p>GNR 984 Activity 1 - The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.</p> <p>GNR 984 Activity 2 - The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.</p>		
<b>Support infrastructure</b>					
The construction of additional mine housing	23 ha	X	GN R 983 Activity 27 GN R 984 Activity 15 GN R 985 Activity 12 GN R 985 Activity 14		
Pollution control dams	<b>Total for 2 dams = 4.2 ha</b> <b>Total volume = 78 000 m<sup>3</sup></b>	X	GNR 983 activity 12 GNR 983 activity 13 GNR 983 activity 34 GNR 984 activity 6 GN R 985 Activity 14 GN R 985 Activity 23		

## 4.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

The following changes are proposed to the Bakubung Platinum Mine (note that some of this infrastructure is already approved and is now being modified) (refer to Appendix and Figure 4-4):

- A tailings pipeline between the mine and the TSF which will go through a watercourse;
- An increase in the capacity of the concentrator plant from 230 000 tons per month to approx. 265 000 tons per month;
- Increased capacity of the mine product stockpiles;
- Relocation of the ore crusher circuit from underground to the surface;
- Inclusion of the minerals in the waste rock into the mining licence, as the waste rock may potentially be crushed and sold as aggregate;
- Construction of erosion control measures along watercourses within the mine;
- Construction of a noise reduction berm through a watercourse;
- Storage and handling of dangerous goods such as diesel and reagents on site;
- Various pipeline and road crossings over watercourses, including a bridge crossing;
- New sewage and water pipelines;
- Sewage treatment plant (already authorised);
- New internal mine roads, and construction of an approved mine access road through a watercourse;
- Ventilation shafts and raise boreholes;
- Pollution Control Dams;
- Settling and return water dams;
- Generators or possibly a solar power plant on site, for back up power;
- A salvage yard for temporary storage of general and hazardous waste;
- The construction of phase 1a of the mine housing;
- The construction of a larger TSF (and associated infrastructure) on the farm Mimososa 81JQ. The area will increase from 142 ha to ~ 166 ha. The height will be ~ 44m.

The infrastructure that has already been authorised as part of the previous EIA in 2008 is not discussed, unless specifically applicable to the current application.

The information provided below may be refined during the EIA phase.

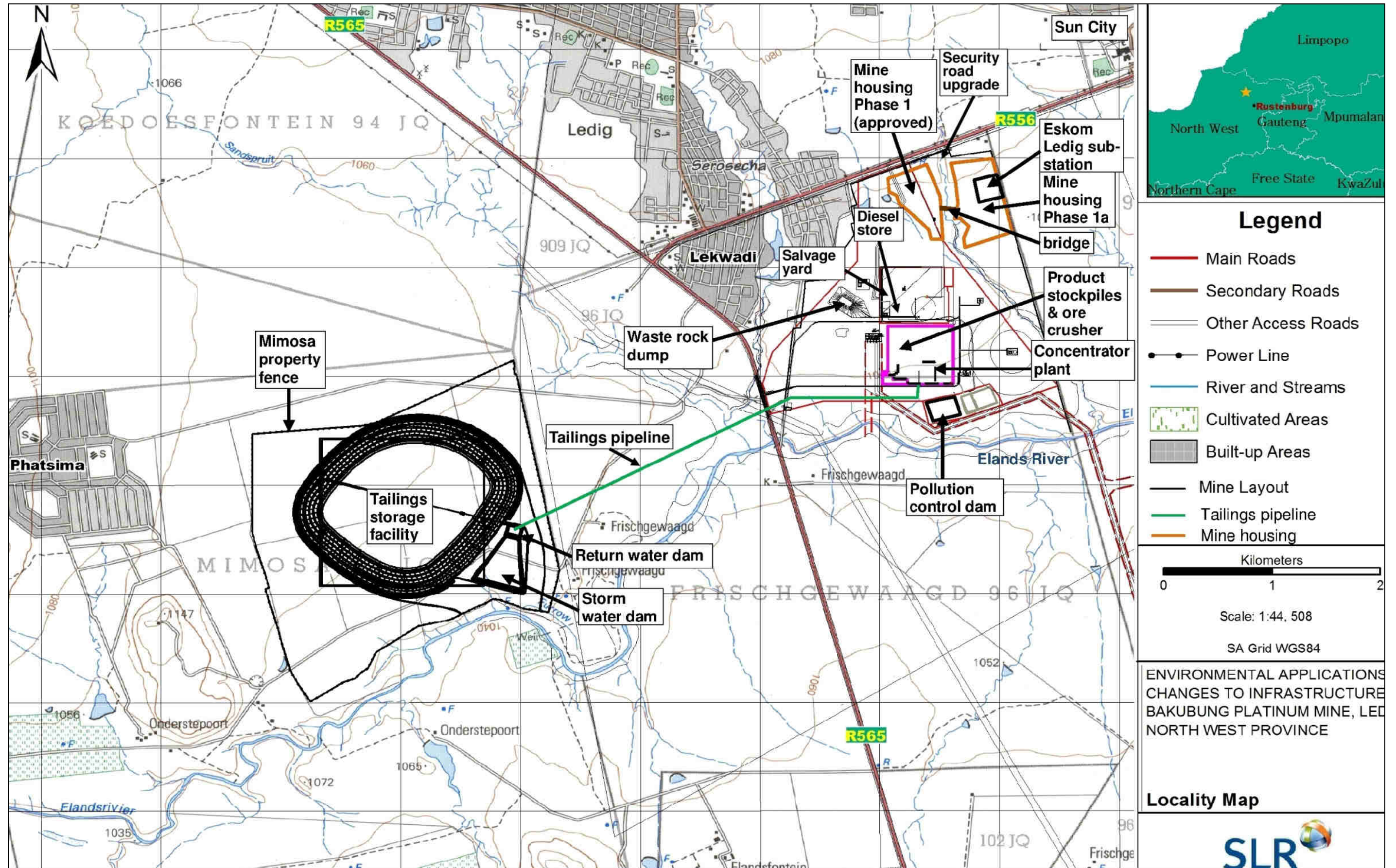


FIGURE 4-1: Proposed site plan for the changes to Bakubung Platinum Mine

#### 4.2.1 CONSTRUCTION PHASE

##### 4.2.1.1 Construction phase surface infrastructure

Temporary construction facilities will be established on site during the initial development of the proposed additional/changed infrastructure on site. The requirements for construction infrastructure will be refined during the EIA phase.

These facilities could include:

- Workshops, stores, washbays, lay-down areas, fuel handling and storage area, offices, ablution facilities
- Handling and storage area for construction materials (paints, solvents, oils, grease) and wastes
- Generator/s for temporary power supply.

These facilities would either be removed at the end of the construction phase or incorporated into the layout of the operational mine.

##### 4.2.1.2 Construction phase activities

For the new project areas to be developed as part of this project, the following construction activities may take place:

- Setting up a contractor's laydown area;
- Clearing of vegetation in areas designated for surface infrastructure;
- Stripping and stockpiling of soil resources in areas designated for surface infrastructure;
- Digging and/or blasting foundations and trenches;
  - Establishing internal mine roads;
- Delivery of materials;
- Excavating process and water storage dams as required;
- Preparing residue disposal areas;
- General building activities including the erection of structures;
- Portable ablution facilities;
- Store for the storing and handling of fuel, lubricants, solvents, paints and construction substances; and
- Temporary waste collection and storage area.

##### 4.2.1.3 Construction phase employment and housing

During the estimated three year construction phase the contractors will provide necessary facilities, including staff accommodation, at a site chosen and managed by the contractors. These facilities will be removed after completion of construction. It is not expected that there will be significant additional jobs created for the project changes. There may be the retention of work for the contractors that build the approved Phase 1 housing who will be used for the construction of the Phase 1a housing proposed in this project. Employment numbers will be confirmed in the EIA phase.

##### 4.2.1.4 Water supply and use

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the

Bakubung Mine. There will not be any changes to water requirements capacities. Potable water will be supplied by Magalies Water. This will be supplied to the mine process plant site via a pipeline from the north-eastern boundary of the mine. For phase 1, this pipeline will be routed to the north-eastern boundary of the mine from where contractors will be able to use the water as required for the various construction and testing activities.

#### **4.2.1.5 Power supply and use**

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine. There will not be any changes for power requirements.

The electrical power will be fed to the process plant site from the existing infrastructure situated on the mine. During construction, the mine feed will be brought into the construction area and stepped down to 400V via a single 630kVA miniature substation. Contractors will make allowances for all equipment required to distribute power from the miniature substation to their required facilities.

#### **4.2.1.6 Waste management**

##### *4.2.1.6.1 General and hazardous waste*

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

General and hazardous waste will be temporarily stored on site in the salvage yard and sent for final disposal at registered waste facilities e.g. municipal landfill for general waste and an H:H landfill site for hazardous waste. Waste that can be recycled will be separated on site for collection by an appropriate recycling company. The identification of the landfill sites is dependent upon transportation costs, disposal costs, capacity of the landfill site and permitting status.

The waste streams include paper and cardboard, scrap metal, general waste, used oil and hazardous waste.

##### *4.2.1.6.2 Waste Rock*

Waste rock is currently being produced from the shaft sinking occurring on site. Waste rock will continue to be produced during construction and will be used to develop the bank areas. Thereafter, it will be transported to the designated waste rock dump area.

Wesizwe are proposing to crush the waste rock and sell it as aggregate. Waste rock will need to be included in the Wesizwe's Mining Right before it can be processed and sold as aggregate. This will occur in both the construction and operational phases.

##### *4.2.1.6.3 Sewage treatment*

During the construction phase of the project, contractors are responsible for the supply of temporary sewage disposal equipment. Wesizwe plans to construct a sewage treatment plant on site, sized correctly to



accommodate all staff and residents in the on-site housing.

#### **4.2.1.7 Transport system**

##### **4.2.1.7.1 Roads**

###### Main Mine Access Road

The site lies approximately 3.5km southwest of Sun City, on the eastern side of the R556 provincial road. The existing southern access road (SAR) intersects the R565 approximately 1.5km south of the intersection with the R556. It runs along the southern boundary of the current mine project area, then turns through 90° towards the north, parallel to the eastern boundary of the site and enters the shaft bank complex in the north eastern corner. It is envisaged in the interim phase of the project that the SAR will serve as the main access route to the mine project area and the process plant.

The SAR will be upgraded to provide access for the construction phase of the process plant.

###### Access road to process plant

A temporary access road will be constructed to link up with the SAR, will continue along the western boundary of the process plant, and will align with the internal process plant roads.

The main asphalt-surfaced road will be constructed to link with the current SAR intersection of the R565 running parallel with the southern boundary of the process plant and will turn through 90° along the eastern boundary to the existing mining shaft entrance.

The main access road to the process plant will feed off this road and will access the process plant via the main security entrance facility.

The process plant access road, including the service roads for the purposes of supplying and delivering reagents to the reagent storage areas, will receive an asphalt-wearing course including edge kerbing. The earthworks, backfilling and compaction of the terraces is considered as adequate for the purposes related to access requirements for the remainder of the plant roads.

###### Access road to TSF

The existing access road to the TSF is considered adequate

##### **4.2.1.7.2 Pipelines**

Additional pipelines not included in the 2008 EIA will need to be constructed. Pipelines will be constructed for water, sewage transport, for tailings delivery and return water delivery.

#### **4.2.1.8 Construction phase timing**

Construction is expected to take three years starting in August 2016 and ending in September 2019. These

dates can change depending on receipt of the relevant authorisations.

#### 4.2.2 OPERATIONS PHASE

##### 4.2.2.1 Surface infrastructure

Note that most of the surface infrastructure required for the mine has already been approved in the 2008 EIA. Approved infrastructure had been indicated as such below.

The final layout catering for both approved and proposed infrastructure will include:

- Two tarred roads to provide access to the shaft and plant from the north and south-western sides respectively (approved);
- Additional internal mine roads (this project);
- Two gatehouses with entry and exit roadways to the shaft and plant. Pedestrian access will be via turnstiles (approved);
- A vertical twin shaft system (man, material and rock shaft and ventilation shaft) with a steel A-frame headgear on the man, material and rock shaft. An additional raise bore shaft will be required at a later stage. This will be within the current mine footprint (approved);
- Additional ventilation shafts and raise boreholes (this project);
- An emergency winder with a cage and a steel A-frame headgear over the ventilation shaft (approved)
- Surface conveyor belts will transport ore to the Merensky and UG2 stockpiles (approved)
- Mineral processing plant and associated infrastructure is approved, however increased capacity is proposed for this project;
- Additional internal roads (this project);
- Box culvert bridges where necessary (approved);
- A topsoil storage area and stockpiles is planned to the north-west of the shaft and plant infrastructure (approved).
- A waste rock dump, with associated footing preparations is approved, however increased footprint;
- Infrastructure for services including potable water and fire water, compressed air and sewage reticulation (approved);
- Potable water storage tanks (approved);
- Sewage treatment plant (approved);
- New sewage and water pipelines (this project);
- Stormwater diversion berms (approved);
- Construction of erosion control measures along watercourses within the mine (this project);
- Dirty water settling dams/pollution control dams (PCDs) (approved) and 2 new PCDs;
- Electrical reticulation (approved);
- TSF, with associated lining preparations and return water dams (increased footprint of the TSF is proposed in this project);
- A tailings pipeline between the mine and the TSF (this project);
- Increased capacity of the mine product stockpiles (this project);

- Bus and taxi offloading area with shelters (approved);
- Parking facility for shaft and plant personnel (approved);
- Security fencing (approved);
- Helipad (approved);
- A bridge near the mine housing (this project);
- Relocation of the ore crusher circuit from underground to the surface (this project);
- Storage and handling of dangerous goods such as diesel and reagents on site (approved, however need additional capacity);
- Generators or possibly a solar power plant on site, for back up ventilation (this project);
- Phase 1 of the mine housing (approved);
- Phase 1a of the mine housing (this project); and
- A salvage yard (temporary storage of general and hazardous waste) (this project).

An infrastructure plan of the project, showing the location and extent of all the infrastructure is provided in Appendix 4.

#### **4.2.2.2 Processing of Waste Rock**

Wesizwe want to include waste rock in their existing mining right in order to sell crushed waste rock as aggregate.

#### **4.2.2.3 Processing plant**

The plant is designed with primary and secondary crushing with Merensky and UG2 ores campaigned through the crusher circuit from Run of Mine (RoM) feed to crushed ore silos. The secondary crusher will be used in the latter years of the life of mine (LOM) when the ore hardness is expected to increase. In the 2008 EIA the ore crusher circuit was to be placed underground. With this project, Wesizwe is proposing to move the crusher circuit to aboveground.

Ore will be delivered to two Run of Mine (ROM) stockpiles, one for each ore type, Merensky and UG2. The whole plant design philosophy will be based on the separate milling and flotation of the two ore types using the Mill-Float – Mill-Float or MF2 circuits and then combining the concentrates produced as a final concentrate.

The intention is to build the concentrator plant in three modules. Module 1 will be for the Merensky ore and will consist of a single RoM mill with a complete flotation circuit, concentrate, spillage and tailings handling system sufficient to cater for the final concentrator circuit. The concentrator plant was approved as part of the 2008 EIA. For this project, the capacity of the plant will be increasing from 230 000 tons per month to~ 265 000 tons per month. Stockpile capacity is also increasing. No other changes are planned.

#### **4.2.2.4 Employment and housing**

Phase 1 mine housing has been approved and Phase 1a mine housing is being proposed as part of this

project. This housing will be available for mine workers working at the Bakubung Platinum Mine. Approximately 910 houses will be constructed; this will be confirmed in the EIA.

It is not expected that there will be significant additional jobs created to cater for the project changes. Employment numbers will be confirmed in the EIA phase.

#### **4.2.2.5 Water supply and use**

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

The anticipated volume of water required is 23.593 MI per day, of which 16.285 MI per day will be in permanent circulation or recycled. The remaining 7.308 MI will be made up from the bulk supply from Magalies Water.

##### *4.2.2.5.1 Potable water:*

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

Municipal water will be supplied by Magalies Water Board. This will be supplied to the mine site via a pipeline from the north-eastern boundary of the mine. As discussed in the construction phase, for phase 1, this pipeline will be routed to the north-eastern boundary of the mine from where contractors will be able to use the water as required for the various construction and testing activities. At a later stage (Phase 2 of the project); the line will be routed to feed the potable water tank and the process water tank at the plant.

##### *4.2.2.5.2 Mine Water Supply System:*

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

Make up water for mining activities will be drawn from the main supply reservoir and all water will, where appropriate, be recycled to minimise demand. Underground mining water will gravitate from surface reservoirs to points of application, and all run-off water will be collected and pumped to underground settlers. The clear water from the settlers will be recycled and reused.

##### *4.2.2.5.3 Process water supply system:*

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

Make up water will be drawn from the main supply reservoir on site and recycled to minimise demand. Tailings will be pumped to the TSF and the clear water will be returned to the plant. Water can also be sourced from the sewage treatment plant (discussed in 4.2.2.7). This will be subject to test work confirming

suitability.

#### **4.2.2.6 Power supply and use**

The capacities and infrastructure included in the 2008 EIA will be applicable for the proposed changes to the Bakubung Mine.

During Phase 1, the main backbone for all reticulation will be installed; namely, the extension to the existing mine 33kV substation. From this substation, power will be routed to the plant via a 33kV overhead line. Power will be stepped down to 11kV via two 40MVA power transformers and fed into the new plant main 11kV substation (503-SGM-001). The phase 1 installation requires power and as such, the motor control centres in this area; as well the reticulation to this area, will be installed.

Phase 2 will see the rest of the electrical reticulation installed to the relevant motor control centres situated in each area.

#### **4.2.2.7 Waste management (non-mineralised waste)**

The waste streams that could be produced at the Bakubung Platinum Mine can include: hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants), general industrial waste (such as scrap metal and building rubble), medical waste (such as swabs, bandages) from the staff medical station, and domestic waste (such as packaging, canteen waste and office waste). These wastes will be temporarily handled and stored separately on site before being removed for recycling by suppliers, reuse by scrap dealers or final disposal at permitted waste disposal facilities. No on-site landfill (waste disposal) facilities are planned.

#### **4.2.2.8 Mine residue (mineralised waste management)**

##### *4.2.2.8.1 Waste Rock*

Waste rock will be transported to the designated waste rock dump area. There will be an increase in the WRD capacity. Wesizwe is proposing to crush the waste rock and sell it as aggregate. Waste rock will need to be included in the Wesizwe's Mining Right before it can be processed and sold as aggregate.

##### *4.2.2.8.2 Tailings*

The proposed TSF has not yet been constructed. The 2008 EIA catered for a TSF of 50m high and approximately 130 ha in extent. The current project is proposing a TSF of 166 ha and 44m high. Tailings produced at the plant will be pumped via a new proposed pipeline (part of this application) to the planned TSF site.

#### **4.2.2.9 Sewage treatment**

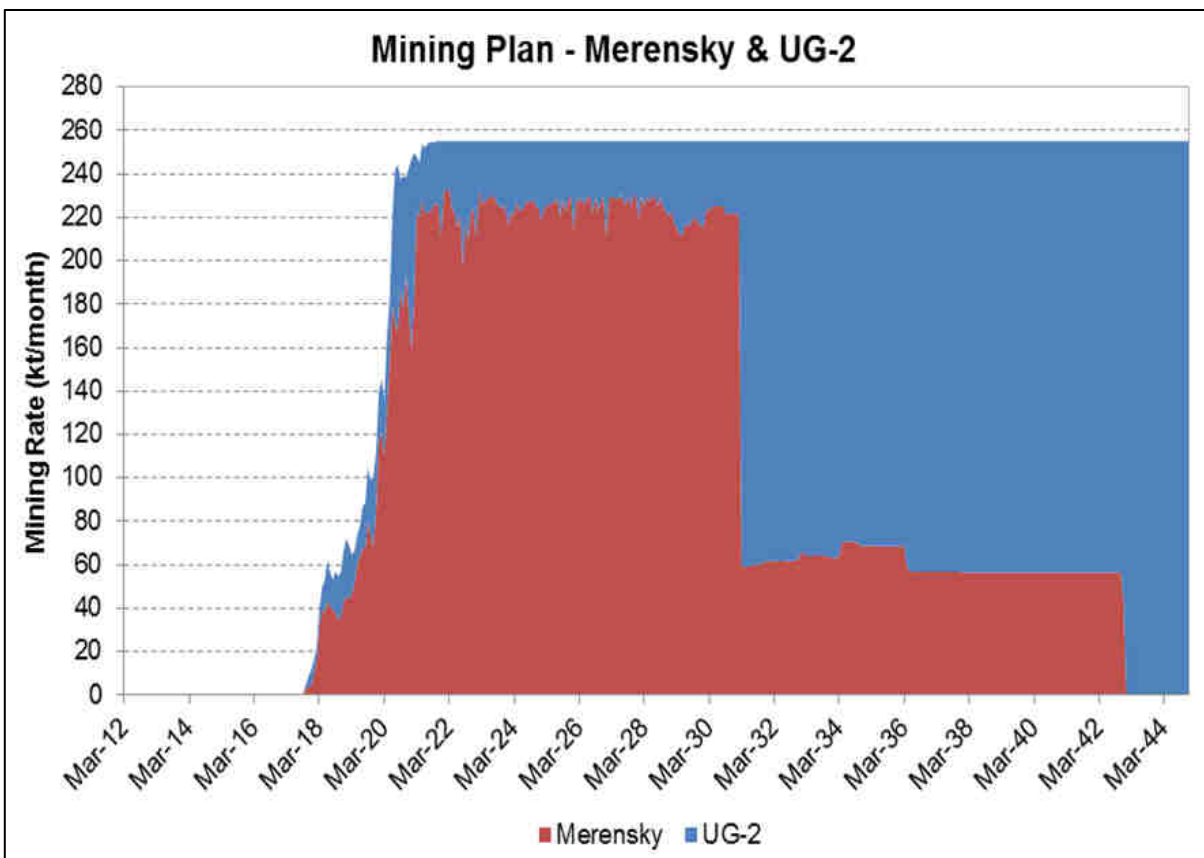
Sewage generated on site will be contained and treated on site by means of a permitted sewage treatment plant.

There are no requirements for sewage disposal from the concentrator plant while the phase 1 equipment is operational. During the operation of phase 2, sewage disposal will gravitate to the sewage treatment system located alongside the pollution control dams.

Sewage from the various process plant buildings will be reticulated via underground PVC pipelines to a sump located at the sewage treatment plant.

**4.2.2.10 Life of mine**

The LOM will end in 2034; thus there are 19 years remaining in the LOM. The mine plan is depicted below.



**FIGURE 4-2: MINE PLAN**

**4.2.3 DECOMMISSIONING AND CLOSURE**

The conceptual plan at this stage is to remove surface infrastructure and rehabilitate the disturbed areas. Waste rock will be crushed and sold. The TSF area will be rehabilitated and revegetated. The closure objective will be to return the land to pre-mining potential.

## 5 POLICY AND LEGISLATIVE CONTEXT

This section outlines the key legislative requirements applicable to the project. The Table below provides a summary of the applicable legislative context and policy.

**TABLE 5-1: LEGAL FRAMEWORK**

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	RELEVANCE OR REFERENCE TO SECTIONS IN THIS REPORT
MPRDA and MPRDA Regulations	Sections 1.1, 1.3, 5.1, 4.2.1.6.2, 4.2.2.2, 4.2.2.8.1 and 6.
NEMA	Sections 1.1, 5.2 and 6.
Regulations 982-985 in terms of NEMA	Sections 4, 8 and 9. Tables 4-1, and 4-2
NEMWA	Sections 5.3, 4.2.1.6, 4.2.2 and 8.2.
Regulation 921 in terms of NEMWA	Sections 4.1 and 4.2.2.2. Tables 4-1, and Table 4-2.
NWA	Sections 1.1, 5.4, 8.4.1.6, 8.4.1.7, 8.7.8, 8.7.9, 9.3.1 and 9.3.3.
Regulation 704 in terms of the NWA	Sections 5.4 and 9.3.3, and Table 8-1.
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA)	Sections 5.5.2, 8.4.1.5, 8.7.7 and 9.3.2.
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Sections 5.5.3, 8.4.1.11, 8.7.13 and 9.3.6.
SANBI Wetland Inventory (2006)	Sections 5.6.1, 8.4.1.5, 8.4.1.6, 8.5, 8-9 and 9.3.2. Figure 8-4 and Table 8-1.
Mining and Biodiversity Guideline (DEA <i>et al</i> , 2013)	Sections 5.6.2 and 8.4.1.5. Figure 8-2
National Freshwater Ecosystem Priority Areas (NFEPA) (2011)	Sections 5.6.3, 8.4.1.5, 8.4.1.6, 8.5, 8-9 and 9.3.2. Table 8-1 and Figure 8-4.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEMAQA)	Sections 5.5.1, 8.4.1.8, 8.7.10 and 9.3.4.

### 5.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002

The MPRDA governs the acquisition, use and disposal of mineral rights. Section 102 of the MPRDA provides for the amendment of existing EMPs and Mining Rights. The process for Section 102 applications is not stipulated in the MPRDA. However, Part 5 of the 2014 EIA Regulations stipulates the process for amendments. Since new listed activities are triggered, a scoping and EIA process will be required. Therefore the scoping and EIA process is to take place in accordance with the NEMA Regulations requirements.

The scoping, EIA and EMP will be submitted to the North West DMR for their decision making.

## 5.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998

NEMA provides for co-operative, environmental governance by establishing principles for decision-making on matters that affect the environment. On the 4<sup>th</sup> December 2014, the 2014 EIA Regulations GN R 982 – GN R 985 were promulgated, which replaced the 2010 EIA Regulations. The EIA Regulations provide the requirements for conducting impact assessments and specify activities that require environmental approval prior to implementation. GN R 983 and GN R 985 specify activities that require a basic assessment process and GN R 984 specifies activities that require a scoping and EIA process. GN R 982 specifies the process that needs to be followed. This project will be conducted in terms of the 2014 EIA regulations. A scoping and EIA process as activities from all three notices are triggered. The specific activities that are applicable in terms of NEMA have been specified in Section 4 above.

## 5.3 NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008

Waste management is regulated under the NEMWA, in order to protect the environment and human health. The Act makes provision for the identification of various waste management activities, which may have a detrimental effect on the environment. A waste management activity identified in terms of the Act may not commence or be undertaken except in accordance with a WML.

On 29 November 2013, the list of waste management activities requiring a WML was amended (GN R 921). Listed waste management activities are divided into three categories, Category A, Category B and Category C in the schedule. Activities identified in Category A require a Basic Assessment process, as stipulated in the EIA Regulations, while activities identified in Category B require a scoping and EIA process, as stipulated in the EIA Regulations of the NEMA, in order to inform an application for a WML. Category C activities must comply with the relevant requirements or norms and standards published by the Minister.

In terms of the National Environmental Management Waste Amendment Act 26 of 2 June 2014 and the National Environmental Management Laws Third Amendment Act (No. 25 of 2014), as of 2 September 2014, mine residue deposits and stockpiles (e.g. waste rock dumps and tailings dams) require a WML in terms of NEMWA. However, while it is legislated that a WML is required, the implications of this are not necessarily fully known. The existing WRD and TSF are approved under 2006 legislation where a WML was not required and where specific lining requirements for WRDs and TSFs were not specified. Therefore the requirements for adding tailings and waste rock to approved facilities are uncertain. This will be further investigated during the EIA phase of the project.

The specific activities that are applicable in terms of NEWMA have been specified in Section 4 above.

## 5.4 NATIONAL WATER ACT, 1998

Section 21 of the National Water Act (No. 36 of 1998) (NWA) lists water uses for which a WUL must be



obtained. In terms of the NWA, the following water uses are applicable for the Bakubung Platinum Mine:

- *Storing of water (not containing waste) (21a)* – storing water in water reservoirs and settling dams;
- *Impeding or diverting the flow of water in a water course, and altering the bed banks, course, or characteristics of a watercourse (21c and i)*– various watercourse crossings including a bridge and tailings pipeline, and erosion control measures;
- *Disposing of waste in a manner which may impact on a water resource (21g)* – tailings dam, return water dams, storm water dams, pollution control dams, waste rock dumps, sewage treatment plant, ore stockpiles, dust suppression with water;
- *Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity, or for the safety of people (21j)* – dewatering the mine shafts.

A WUL and Integrated Water and Waste Management Plan (IWWMP) are in place for the Bakubung Platinum Mine. During the initial WUL application, while some water uses were covered in the EIA process they were not applied for in the WUL. All the applicable water uses that require authorisation will now be applied for with this project and the IWWMP for the mine will be amended. A WUL amendment application will also be submitted to the DW&S for their approval.

Regulation GN 704 of the NWA regulates water use for mining and related activities and is aimed at protecting the water resources.

## **5.5 OTHER RELEVANT LEGISLATION**

### **5.5.1 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004**

The National Environmental Management: Air Quality Act (NEMAQA) provides for the management of atmospheric emissions. NEMAQA provides limits for specific activities that can impact on air quality. An air quality impact assessment will be conducted for this project which will take into consideration the NEMAQA and the impacts the project will have on air quality.

### **5.5.2 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004**

The National Environmental Management: Biodiversity Act (NEMBA) provides for the protection of threatened ecosystems and species, and the management of alien invasive species.

A biodiversity study will be conducted for this project. NEMBA and the regulations state that no person may carry out certain activities involving a specimen of a listed threatened or protected species without a permit. Thus, if threatened or protected species are found on site, a permit will be required prior to their removal. The results of the biodiversity study will confirm whether a permit must be applied for, and under which legislation. The biodiversity study will also consider the presence of alien plants and the management thereof.

### 5.5.3 NATIONAL HERITAGE RESOURCES ACT, 1999

The National Heritage Resources Act (NHRA) provides for the protection of all archaeological and paleontological sites and meteorites. Section 38 of the Act defines the categories of development for which the responsible heritage resources authority must be notified. Under Section 38 (1)(c) “any development or other activity which will change the character of a site - (i) exceeding 5000 m<sup>2</sup> ... must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.”

The footprint of the changes to the Bakubung Platinum Mine will exceed 0.5 ha. Most of the proposed site forms part of the existing Environmental Authorisation, however with the disturbance of some additional undisturbed area there is a possibility of locating artefacts of cultural or heritage significance. A Heritage Impact Assessment will be conducted to determine if there are any artefacts of cultural or heritage significance that may be impacted by the project.

## 5.6 GUIDELINES AND POLICIES

### 5.6.1 SANBI WETLAND INVENTORY

The South African National Biodiversity Institute (SANBI) Wetland Inventory is an inventory dataset that presents information on the extent, location and distribution of wetlands systems in South Africa. A national database, containing the attributes, functions and values of individual wetlands will be linked to this spatial data. The aim of the inventory is to establish a baseline for measuring future change in wetland area, function and values, and permit status, and if possible, trends analyses to be carried out in order to assess the need for, or effectiveness of, specific wetland conservation strategies. There are wetlands present near the proposed project. A wetland study will need to be conducted to ground truth the presence and importance of these wetlands.

### 5.6.2 MINING AND BIODIVERSITY GUIDELINE

The Mining and Biodiversity Guideline was developed as a good practice guideline that focuses on providing practical guidance to the mining sector on how to address biodiversity issues in the South African context through applying the law, using the best available biodiversity information, engaging relevant stakeholders, using best practice in EIAs to identify, assess and evaluate impacts on biodiversity, to apply the mitigation hierarchy when planning any mining-related activities and develop robust EMPs, and ensure effective implementation of EMPs. The Guideline encourages mining companies, regulatory authorities and other mining stakeholders to use the high quality, readily accessible spatial and non-spatial biodiversity information that is available to guide thinking and decision making in respect of the mine planning process. The plant project area falls within the highest and high biodiversity categories, and the TSF site falls within the high

biodiversity areas in terms of the mining and biodiversity guideline maps.

### 5.6.3 NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS

The National Freshwater Ecosystem Priority Areas (NFEPA) project was aimed to identify a national network of freshwater conservation areas and to explore institutional mechanisms for their implementation by:

- Identifying Freshwater Ecosystem Priority Areas to meet national biodiversity goals for freshwater ecosystems; and
- Developing a basis for enabling effective implementation of measures to protect FEPAs, including free flowing rivers.

It provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources. While there is a database of NFEPA's, this needs to be ground truthed with specialist studies.

There are various water resources in the vicinity of the project area that can potentially be impacted by the project and thus specialist studies will need to investigate the presence of NFEPA's.

## 6 NEED AND DESIRABILITY OF THE PROPOSED PROJECT

The Minister of Mineral Resources granted a mining right for platinum group elements, gold, silver, copper, cobalt and chrome on 25 May 2009 authorising the exploitation of these minerals at Bakubung Platinum Mine (Ref: NW 30/5/1/2/2/339 MR). The mining right is valid until 24 May 2034, unless cancelled or suspended. Current operations involve shaft sinking on the farm Frischgewaagd 96 JQ. The concentrator plant has not yet been constructed.

Wesizwe intends to make certain changes to the approved mine infrastructure. The changes are required in order to cater for an increase in ore processing capacity, as well as additional support infrastructure. Consideration has been given to environmental sensitivities identified in the 2008 EIA when designing and locating the new infrastructure, but this will be further revised based on the outcomes of the 2015 specialist studies which may identify additional environmental sensitivities.

The need and desirability of each of the proposed infrastructure changes at the mine has been explained below.

### 6.1 AN INCREASE IN THE CAPACITY OF THE CONCENTRATOR PLANT

Since the initial resource estimates and designs of the Bakubung Platinum Mine were done in 2007, Wesizwe has determined that the resource is larger than initially anticipated. For this reason, Wesizwe would now like to increase the capacity of the planned concentrator plant as there will be more ore to process. The capacity of the concentrator plant will increase from 230 000 tons per month (as authorised) to approximately 265 000 tons per month.

Thus, the need and desirability of increasing the concentrator plant capacity is to:

- Increase the efficiency of the ore processing capabilities at the mine;
- Increase the production of platinum product;
- The increase in production of platinum will support the feasibility of the mine,
- The increase in production will provide additional profit,
- The increase in production will enable the mine to satisfy the requirements of its clients,
- The increase in production will enable the mine to safeguard the employment and economic development opportunities created by an operating mine, and
- The increase in the infrastructure required for the mine will result in some additional employment opportunities during the construction phase of the mine, and potentially also a longer period of construction which will increase the time period for the employment of construction personnel.

### 6.2 THE CONSTRUCTION OF A LARGER TAILINGS DAM ON THE FARM MIMOSA 81JQ

There will be an increase in the volume of tailings produced due to the increased processing of ore.

Increased tailings dam capacity is thus required to store the additional amount of tailings. The area will increase from 142 ha to approximately 166 ha. The height will remain at approximately 44m.

Thus, the need and desirability of increasing the tailings dam area is thus to support the increase in ore processing and the increase in platinum production at the mine. Therefore the increase in tailings capacity will enable the benefits mentioned in section 6.1 to take place.

### **6.3 INCREASED CAPACITY OF THE MINE PRODUCT STOCKPILES**

There will be a larger volume of mine product (ore) stockpiles due to the faster rate of mining of ore and hoisting. The larger mine product stockpiles (larger than those already authorised) are thus required to store an increased amount of product.

Thus, the need and desirability of increasing the mine product stockpiles is thus to support the increase in ore processing and the increase in platinum production at the mine. Therefore the increase in mine product stockpiles will enable the benefits mentioned in 6.1 to take place.

### **6.4 A TAILINGS PIPELINE BETWEEN THE MINE AND THE TAILINGS DAM**

A tailings pipeline is needed to transport the tailings from the mine plant area to the tailings dam for deposition. This is essential infrastructure which is needed for the functioning of the mine. Several options for the location of the tailings pipeline have been considered. Details of the alternatives have been described in detail in section 8.1. The preferred tailings pipeline route has been chosen based on the route which crosses the smallest area of environmentally sensitive land and will have the lowest environmental impact. The outcomes of the planned specialist studies may result in an amendment of the route.

### **6.5 INCLUSION OF THE MINERALS IN THE WASTE ROCK INTO THE MINING RIGHT**

Wesizwe would like to include the waste rock into the mining right as the waste rock may potentially be crushed and sold as aggregate. This change is needed and is desirable for the following reasons:

- This will reduce the size of the WRD and reduce the closure liability,
- The sale of the waste rock will generate additional profit for Wesizwe,
- The additional profit will support the operation of the mine,
- The sale of waste rock will enable the mine to increase its client base as it will be selling a variety of products,
- The production of aggregate will be an additional source of construction materials in the Ledig/Phatsima area which can be used for various infrastructure development projects in the area,
- The additional profit will enable the mine to safeguard the employment and economic development opportunities created by an operating mine, and
- The additional work created by preparing waste rock for sale will result in some additional

employment opportunities during the operation phase of the mine.

## **6.6 CONSTRUCTION OF EROSION CONTROL MEASURES ALONG WATERCOURSES, AND PIPELINE AND ROAD CROSSINGS OVER WATERCOURSES**

The Bakubung Platinum Mine site has a number of watercourses which run through it (refer to section 8.4) and the Elands River is located south of the mine and tailings dam. Erosion control measures will be put in place where required at the mine to ensure that erosion of the banks of the watercourses does not occur. Some of the infrastructure will be constructed in close proximity to watercourses (e.g. mine housing) and some infrastructure will cross watercourses (e.g. pipelines, roads and bridges). (Note that a water use licence will be applied for as required. DWS reference numbers: 16/2/7/A220/C366; 26064730). Full details of the erosion control measures and watercourse crossings will be contained in the EIA report. The locations and designs of the watercourse crossings and erosion control measures will be revised based on the outcomes of the specialist studies. Specialist studies will inform the most appropriate crossings and measures based on environmental sensitivities. Watercourse crossings will be avoided where possible. The alternatives for the watercourse crossings of the tailings pipeline are explained in section 8.1.

The watercourse crossings are not desirable, but are needed as some of the mine's essential infrastructure must cross watercourses. This is due to the location of the watercourses in relation to the ore body and operational areas, making some crossings unavoidable. The unavoidable crossings of watercourses is required for the Bakubung Platinum Mine to function, and thus without these crossings, many of the benefits of the mine mentioned in section 6.1 could not take place.

The erosion control measures are needed and desirable for the following reasons:

- Allow easy access to certain operational areas without having to go a long way around;
- The measures will ensure that the integrity of the watercourses on the site is maintained and that the beds and banks do not erode causing loss of topsoil,
- The measures will protect the biodiversity and ecological functioning of the watercourses as habitat will not be lost through erosion,
- Erosion control will protect the quality of water resources as water quality will not be reduced by excessive silting of the watercourses, and
- Erosion control measures will help to protect the safety of people as the banks of the rivers and streams will be stable.

## **6.7 STORAGE AND HANDLING OF DANGEROUS GOODS**

The project caters for the development of a storage area for dangerous goods such as diesel and reagents on site. These storage areas will be constructed in such a way as to protect the environment as much as possible. The area will have an impervious concrete surface and all storage tanks will have suitable bunds.

Further details about the design of this area will be included in the EIA.

The area for the storage and handling of dangerous goods is needed and desirable as dangerous goods such as diesel are essential for the functioning of the mine.

## **6.8 NEW ROADS, AND SEWAGE AND WATER PIPELINES**

New internal mine roads, sewage and water pipelines are required as part of the changes to infrastructure at the Bakubung Platinum Mine. The roads and pipelines will service some of the additional mine infrastructure such as the mine housing and tailings pipeline. Full details of the design and location of the additional roads and pipelines will be provided in the EIA.

The final location of the new roads and pipelines will be determined based on practicality and the outcomes of the specialist studies which will indicate environmental sensitivities.

The internal mine roads, sewage and water pipelines are needed and desirable as they are essential for the efficient functioning of the mine.

## **6.9 VENTILATION SHAFTS AND RAISE BOREHOLES**

Ventilation shafts and raise boreholes ensure correct air circulation underground. Thus the ventilation shafts and raise boreholes are needed and desirable to ensure the safety of workers and are essential for the functioning of the mine.

## **6.10 GENERATORS AND/OR SOLAR POWER PLANT**

Generators are required for the Bakubung Platinum Mine to provide a backup power supply if there are electrical faults or power cuts. This back up power will ensure that essential mine activities are not hindered and that the safety of mine workers is not put at risk, e.g. power for shaft ventilation. Therefore the generators are needed for the safety of workers and are desirable as the mine can continue operating during power outages.

The solar power plant will also be a source of renewable energy for the mine. This will result in the mine requiring less electricity from the grid and will also save on electricity costs. This results in lowering the carbon footprint of the mine.

## **6.11 THE CONSTRUCTION OF PHASE 1A OF THE MINE HOUSING**

Phase 1 A of the mine housing will provide additional houses for mine workers. The construction of the additional mine housing is needed and desirable for the following reasons:

- Providing some mine workers with quality accommodation close to the mine site.
- The housing will likely remain on site after mining has been completed, and the housing can then be used for community housing.

In addition, the location of the housing is desirable for the following reasons:

- It is close to the site of the Bakubung Platinum Mine and thus the workers will not have to travel far to reach the site.
- There will be no impact on traffic, as the workers will not need to travel through Ledig or Phatsima every day to get to the mine.
- The construction of the housing will enable the use of certain construction materials (e.g. aggregate) from the nearby Bakubung Platinum Mine.
- The housing will utilise the approved services at the Bakubung Platinum Mine (e.g. water, sewage, waste removal etc.) and thus will not increase the demand on municipal services.
- There is an existing entrance and access road to the site – the housing will have its own access road.
- There is an planned electrical substation near to the site for the provision of electricity.

## 6.12 SUMMARY OF PROJECT NEED AND DESIRABILITY

Thus, in summary, the changes to infrastructure at Bakubung Platinum Mine will have some positive outcomes for local communities and society in general. The construction and operations associated with the project are expected to result in some additional employment opportunities. The benefits to local communities will be clearly articulated during the EIA phase of this application once more detailed information is available.

Overall revenue increase at the mine will facilitate increased fund allocation to local economic development through the implementation of projects identified in the Social and Labour Plan. Wesizwe is fully committed to implementing development plans and projects that will facilitate local community and rural development in the surrounding area in line with the provisions of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry.

## 7 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation will be required for the life of the site's operations and the Life of Mine, which is estimated to be 19 years from 2015 (i.e. until 2034).



## 8 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES

### 8.1 DETAILS OF ALL ALTERNATIVES CONSIDERED

As the Bakubung Platinum Mine has already been authorised and is already under construction, the potential alternatives are limited. Many of the proposed changes to infrastructure at the mine are expansions to authorised structures and thus the location will not change. The location of new structures is also based on the location of already approved structures e.g. the additional mine housing is planned to be adjacent to the approved mine housing; and the diesel store will be within the approved mine shaft area. The only feasible locality alternatives relate to the tailings pipeline route.

#### 8.1.1 PROPERTY OR LOCALITY ALTERNATIVES

Applicable alternatives are discussed below. Three possible alternative locations for the tailings pipeline route (Option 1A - northern route, Option 1B – central route and Option 2 - southern route) have been considered and assessed. These are described below:

##### **Option 1 A - Northern Route**

The pipeline exits the concentrator plant area on the southern boundary, then runs directly westwards along the southern boundary of the plant and crosses under the R565 Rustenburg provincial road. It then passes under Eskom overhead powerlines at an oblique angle, in a south westerly direction towards the tailings storage facility.

Just after the road crossing the pipeline will be located on Bakubung Ba Ratheo tribal land. Here it must cross over two tributaries of the Elands River. These floodplains are very wide, making the crossing of the flood plain approximately 400m long. At the same time it passes under the Eskom overhead powerlines, not at right angles but obliquely.

From here the route is undulating up to the TSF on the farm Mimosa 81 JQ.

##### **Advantages**

- Most of the pipeline route falls within the mining right area, or on land owned by Wesizwe. This means that Wesizwe would only need to negotiate with only one landowner (Bakubung Ba Ratheo) and one mining right holder (Maseve Investments) along the pipeline route.

##### **Disadvantages**

- Very wide 400m flood plain, of two tributaries, to cross.
- Increased cathodic protection measures are required when crossing under the Eskom powerlines obliquely.

**Option 1 B - Central Route**

This pipeline route also exits the concentrator plant area on the southern boundary, then runs directly south-westwards from the plant towards the R565 Rustenburg provincial road. The route then crosses under Eskom overhead powerlines at a 90 degree angle, just before passing under the R565. It then continues in a south westerly direction towards the tailings storage facility.

Just after the road crossing the pipeline will be located on Bakubung Ba Ratheo tribal land. Here it must cross over one tributary of the Elands River. The crossing of the flood plain of this tributary is approximately 40 m long.

From here the route is undulating up to the TSF on the farm Mimosa 81 JQ.

***Advantages***

- Most of the pipeline route falls within the mining right area, or on land owned by Wesizwe. This means that Wesizwe would only need to negotiate with only one landowner (Bakubung Ba Ratheo) and one mining right holder (Maseve Investments) along the pipeline route.
- This route only crosses one tributary of the Elands River and crosses over a narrower floodplain than Option 1A.
- This route passes under the Eskom line at right angles thus minimising electromagnetic induction and electrolytic corrosion.

***Disadvantages***

- There is still one watercourse crossing required for this route.

**Option 2 - Southern Route**

This route exits the concentrator area on the southern boundary and travels directly south across the Elands River at a narrow point, approximately 120m wide. Here it turns south west, crosses over Maseve Investment's property, passes perpendicularly under Eskom overhead powerlines, still on Maseve Investment's property, and then passes under the R565 Rustenburg provincial road.

After the R565 the pipeline traverses Bakubung Ba Ratheo tribal land then crosses the Elands River, for a 2nd time. Here the river crossing is also approximately 120m. From here the route is undulating across the Bakubung Ba Ratheo tribal land up to the TSF on the Mimosa farm property.

***Advantages***

- Narrow river crossings (no wide floodplains).
- This route also passes under the Eskom line at right angles thus minimising electromagnetic induction and electrolytic corrosion.

**Disadvantages**

- Negotiate with two landowners (Maseve Investments and Bakubung Ba Ratheo) and two mining rights owners (Royal Bafokeng and Maseve Investments) along the pipeline route.
- Two river crossings of the Elands River.

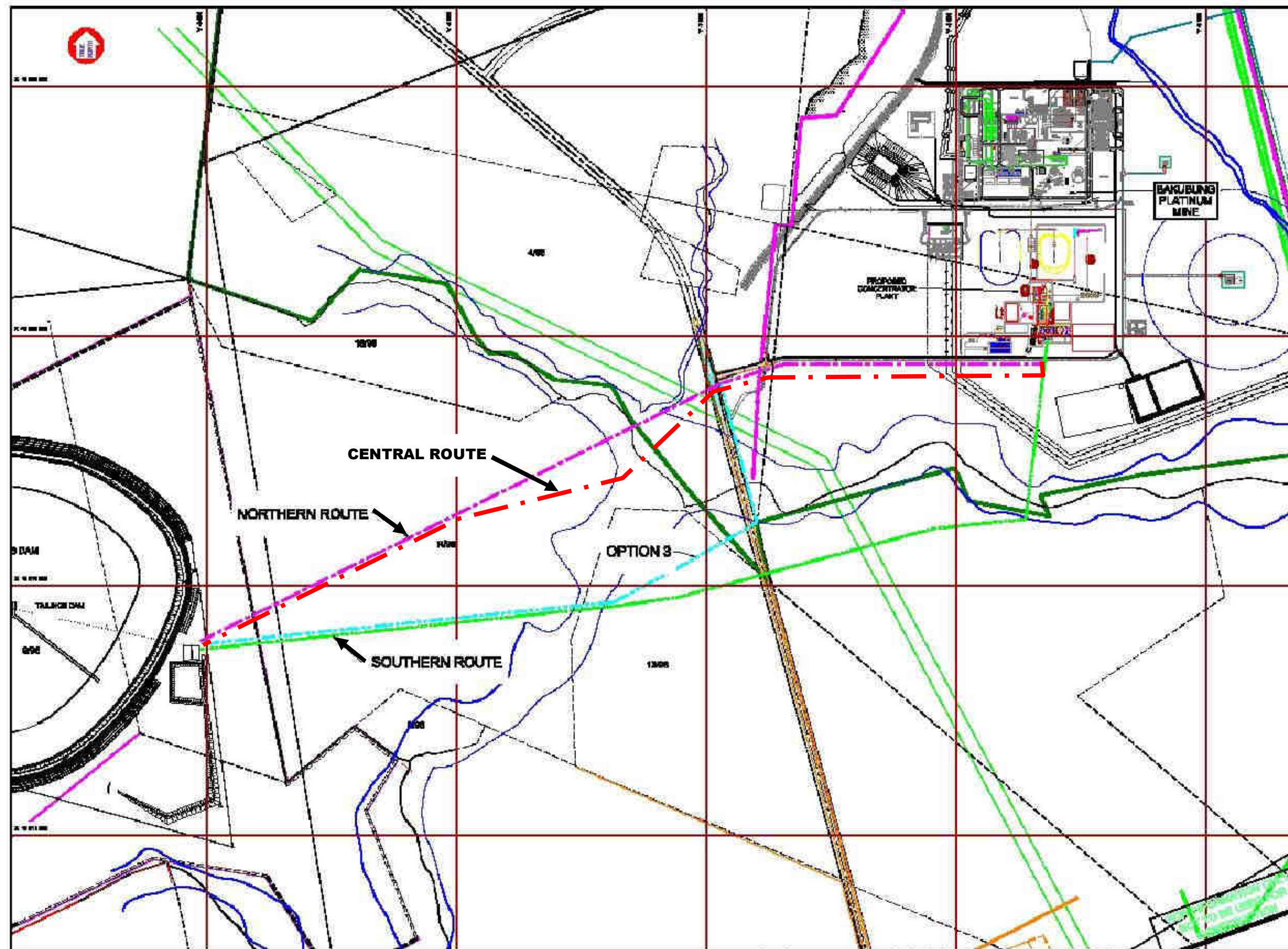


FIGURE 8-1: ALTERNATIVE TAILINGS PIPELINE ROUTES (northern route (pink), central route (red) and southern route (green)) (note that route option 3 is not feasible)

### 8.1.2 TYPE OF ACTIVITY ALTERNATIVES

The type of activity for the project is platinum mining. This is the future activity planned at the site and this activity will not change as a result of the changes to the mine infrastructure. Therefore different activity alternatives were not considered at the site, as there is only one activity option, and that is to continue with the activity of constructing a mine for platinum mining.

### 8.1.3 DESIGN OR LAYOUT ALTERNATIVES

The tailings pipeline layout alternatives are discussed in section 8.1.1 above. For reasons already mentioned, alternative layouts for other infrastructure are not feasible.

### 8.1.4 TECHNOLOGY ALTERNATIVES

There are no technology alternatives which have been considered for the project. This is due to the fact that there are no feasible alternative technologies for the infrastructure changes.

### 8.1.5 OPTION OF NOT IMPLEMENTING THE ACTIVITY

In accordance with the National Environmental Management Act No107 of 1998 (NEMA) Regulations, the no-go alternative is required to be investigated and assessed. The no-go alternative would mean that the changes to infrastructure at the Bakubung Platinum Mine are not undertaken and therefore the associated negative environmental and social impacts will not occur. This alternative will need to be weighed against the findings of the EIA as well as the potential socio-economic benefits that may result from the project.

## 8.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section describes the undertaking of the public participation process and details the information provided to the community, landowners and interested and affected parties (IAPs). The intent was to inform IAPs of what the proposed project will entail, in sufficient detail, in order that they may contribute meaningfully to the identification of impacts and alternatives. The public participation was done in line with the requirements of the NEMA EIA regulations.

### 8.2.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Potential IAPs were identified using existing databases for Bakubung Platinum Mine. The databases included regulatory authorities, traditional tribal authorities, tourist venues and surrounding mines. Additional people and/or organisations were registered as IAPs for the project if they:

- Are landowners or tenants adjacent to or within 100 m of the project,
- Are the local municipality/ ward councillor with jurisdiction in the area,
- Represent the ratepayers association,

- Are an authority or organ of state having jurisdiction in respect of any aspect of the activity,
- Responded to the BID, press advertisements and site posters,
- Attended one of the Bakubung Mine Environmental Forum meetings,
- Attended the Public Open Days,
- Own, operate or administrate infrastructure affected by the project.

A list of all parties that have been identified thus far is included as Appendix 5.1.

### **8.2.2 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPs**

The initial public consultation process for the scoping phase of the project was carried out between 16 July 2015 and 24 August 2015. As part of the consultation process, IAPs were notified of the proposed project and the details of the Scoping and EIA process being undertaken through distribution of a Background Information Document (BID). Notifications to IAPs were provided in English and Setswana.

The BID was circulated via registered post, email and by hand to relevant authorities, IAPs and adjacent landowners between 16 and 22 July 2015. Copies of the BID were also left at shops and public buildings in Phatsima, Ledig and Sun City on 16 July 2015.

The BID provided background information on the Project and provided an explanation of the Scoping and EIA process that is currently being undertaken for the project. The BID also invited members of the public to register as IAPs and participate in the EIA process. A response sheet was attached the BID on which IAPs could provide written comments on the proposed project.

IAPs were given a 30 day period to submit comment on the above in accordance with the EIA Regulations (22 July 2015 to 24 August 2015).

Copies and proof of distribution of the public notifications are contained in Appendix 5.2.

### **8.2.3 NOTIFICATION OF AUTHORITIES**

#### **North West Department of Mineral Resources (DMR)**

The DMR was notified of the project via two project meetings held with the DMR on 8 May 2015 and 6 July 2015. As part of the public participation process, a BID was also sent to the DMR on 22 July 2015.

#### **North West Department of Water & Sanitation (DWS)**

The DWS has been notified of the project through the circulation of the BID on 22 July 2015 and through a meeting held on 12 May 2015. The DWS was also issued with a notice of intent to submit a WULA.

#### **North West Department of Rural, Environment & Agricultural Development (NW READ)**

The NW READ has been notified of the project through the circulation of the BID on 22 July 2015.

### **Rustenburg Local Municipality and Moses Kotane Local Municipality**

Representatives of these municipalities have been notified of the project during the authorities meeting on 13 August 2015 and they have also been sent the BID on 22 July 2015.

### **Other Commenting Authorities**

In addition to the authorities listed above, the BID was circulated to the following commenting authorities on 22 July 2015:

- Bojanala District Municipality
- North West Parks and Tourism Board and Pilanesberg Game Reserve
- Elands Hex River Water Forum
- Department of Health North West
- Department of Transport, Roads and Community Safety: North West
- Department of Rural Development and Land Reform: North West
- Department of Agriculture: North West
- South African Heritage Resources Agency

Copies and proof of distribution of the authority notifications are contained in Appendix 5.2.

#### **8.2.4 MEDIA ADVERTISEMENTS AND SITE NOTICES**

Press adverts were placed in the following newspapers:

- The Rustenburg Herald in English on 17 July 2015;
- The Sowetan in English on 22 July 2015.

Site notices (A2 size) were placed on 16 July 2015 at the following areas:

- Entrance of the Bakubung Platinum Mine on the R565 (English and Setswana);
- On the Bakubung Platinum Mine fence boundary on R556, just outside of Ledig (English and Setswana)
- At 2 places along the road to Phatisma on the tailings dam property fence (on the farm Mimosa 81 JQ) (2 x English and 2 x Setswana)

In addition to the A2 notices, several A3 notices were also placed at areas where the public would see them:

- On the R565 between the mine and Ledig – Ledig supermarket (English and Setswana)
- At the corner of the R565 and R556 – at the general dealer (English and Setswana)
- At 2 other shops on the R556 between Ledig and Sun City (English and Setswana)
- At the Spar at Sun Village shops, Sun City (English and Setswana)
- Phatisma Community Centre and Library (English and Setswana)

- Phatsima Community Hall (English and Setswana)
- At a shop in Phatsima (English and Setswana)

The press and site notification was undertaken to elicit interest from other IAPs that might not have been identified during the stakeholder identification process.

The adverts and site notices, and proof of placement, are included in Appendix 5.3.

#### **8.2.5 PUBLIC OPEN DAYS AND AUTHORITY MEETINGS**

Authorities meetings have been held with the DMR and DWS (see section 8.2.3 for details).

An additional authority meeting was held at the Wesizwe Community (Information) Centre in Ledig (adjacent to the Bakubung Platinum Mine) on 13 August 2015. Several authorities were invited to the meeting, though only representatives from the Rustenburg Local Municipality and Moses Kotane Local Municipality attended. Copies of the attendance register, minutes of the authorities meetings are in Appendix 5.4.

Two public open days were held with IAPs on 11 and 12 August 2015 in Phatsima and Ledig respectively. The Open Days included posters explaining the project, EIA and WULA process. The posters were in English and Setswana and the SLR team explained the posters in English or Setswana to members of the public who were interested in the project. Copies of the attendance registers, posters, notes and photographs of the open days are in Appendix 5.5.

#### **8.2.6 PUBLIC REVIEW OF SCOPING REPORT**

The scoping report and summaries of the report will be made available for public review for 30 calendar days during September and October 2015. The report summary will be available in English, Setswana and Zulu. Copies of the report and summaries will be placed at the Phatsima Library, Bakubung Tribal Hall and the Wesizwe Community (Information) Centre. The report and summaries will also be made available electronically to IAPs on request.

#### **8.2.7 AUTHORITY REVIEW OF DRAFT SCOPING REPORT**

Copies of the scoping report will be distributed to commenting authorities for a 30 calendar day review period during September and October 2015. The reports will be circulated to authorities listed above.

### **8.3 SUMMARY OF ISSUES RAISED BY I&APS**

A summary of the issues and concerns raised by I&APs and regulatory authorities (to date) in relation to the proposed project and the alternatives are provided in Table 8-1 below. Refer to Appendix 5.6 and 5.7 for copies of actual correspondence and EAP responses.



**TABLE 8-1: SUMMARY OF ISSUES RAISED BY I&APS AND REGULATORY AUTHORITIES**

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
<b>Affected Parties</b>				
<b>Land owners</b>				
Kgosigadi of the Bakubung Tribe	Bakubung Tribal Authority	4 August 2015	Public consultation also to be done in Zulu from now on as there are Zulu speaking people in the community.	This will be done.
<b>Lawful occupiers of the land (Wesizwe are lawful land occupiers)</b>				
<b>Land owners and occupiers of adjacent land</b>				
None received to date.				
<b>Municipal councillors and Municipality</b>				
Chonko Monnagotla (Ledig ward 14)	Moses Kotane Local Municipality	13 August 2015 at the Authorities Meeting, Ledig	Please distribute the background information documents to the various schools and community centres	We will do this during the next round of public participation during the EIA phase. SLR will add all of the schools and community centres to the IAP database.
Jafta Masilo (Ledig ward 30)	Moses Kotane Local Municipality	13 August 2015 at the Authorities Meeting, Ledig	I would like to know whether the housing will be for the communities or mine workers?	The housing is intended for the mine workers.
Nokwaka Mmemezi	Rustenburg Local Municipality- IGR Co-ordinator	13 August 2015 at the authorities site visit, Ledig	How many houses are going to be built?	910 houses will be built (approximately). The final number will be confirmed in the EIA.
<b>Organs of State</b>				
Sebenzile Ntshangase	DWS	12 May 2015	DWS provided detailed information regarding what they require for the WUL application process. Please refer to the notes of the meeting in Appendix 5 for the full comments.	These comments will be addressed as part of the IWULA.
Pieter	DWS	24 July 2015	DWS Regional Office will be entry and exit for WUL.	Comment is noted, however all tailings pipeline alternatives require the

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
Ackerman			Options must include the exclusion of watercourses. (i.e. options which will not impact watercourses).	crossing of watercourses, as do some other roads and pipelines.
Oleteng Mokate	Dept of Health	11 August 2015	The receipt of the BID was noted and passed on to a colleague.	Comment is noted.
C. THEUNISSEN	DWS	20 August 2015	Acknowledgement of receipt of Notice of intent to submit WULA	Comment is noted.
Ragna Redelstorff and Colette Scheermeyer	South African Heritage Resources Agency	29 July 2015	<p>Ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.</p> <p>A Palaeontological Assessment is not necessary for the proposed footprint area as it lies within an area of insignificant palaeontological sensitivity according to the Palaeo Sensitivity Map on SAHRIS.</p>	A heritage impact assessment will be done for this project.
<b>Communities</b>				
Mmatshoko Segoi	Phatsima community	11 August 2015 at Phatsima Public Open Day	I am concerned about the health and safety of our community.	The comment is noted. During the EIA, the possible impacts on the community will be considered and assessed. This will include the potential impact on health caused by dust.
Dorah Motlhajo	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>Could we please be given jobs from this particular project. Whenever we take our CV's to Wesizwe, we never receive feedback.</p> <p>This project can bring change to the state of the economy. The construction of building and houses will reduce poverty and crime because there will be employment. I hope that we will not have any more problems with water cuts. If only the dispersion of dust can be decreased as well as the construction of houses in order to improve our living conditions. I think that the land has been degraded and I don't know what the state of the environment the site is in. I don't know what the final state of the environment will be and the physical extent to which it will have an impact (in km's).</p>	<p>Comments are noted.</p> <p>During the EIA, the possible impacts on the community and environment will be considered and assessed. This will include the potential impact on water, employment and health caused by dust.</p>
Rebecca Dipolelo Chaiké	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>The project will help to reduce unemployment and poverty in Phatsima. The environmental assessment needs to ensure that we don't experience any negative impacts.</p> <p>Phatsima is far from the plant therefore I am assuming that the impacts will be minimal.</p>	During the EIA, the possible impacts on the community will be considered and assessed.

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
Veronica Kedibone	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>This project will benefit our community. Our children will be educated and informed about what is happening in our community.</p> <ol style="list-style-type: none"> <li>1. There will be an improvement in the local economy.</li> <li>2. I trust that SLR know their job and they will execute it well. There will be progress and improvement.</li> <li>3. I would like to learn a lot more about how the environment could be potentially impacted and how land is utilised for this particular development.</li> <li>4. The current state of the environment is not good, SLR will need to do whatever is necessary to ensure that the environment is protected.</li> <li>5. I am hoping that jobs will be available; the local economy will grow, schools will be built, there will be sufficient water and the improvement of our roads.</li> <li>6. SLR will need to assess the state of the land and houses before they initiate the construction of facilities required for the mine. I wish for prosperity. May God bless you with wisdom to continue with the project</li> </ol>	<p>Comments are noted.</p> <p>During the EIA, the possible impacts on the environment and community will be considered and assessed.</p>
Sophy Femele	Phatsima community	11 August 2015 at Phatsima Public Open Day	I hope the project grows in order to bring about change in our community by providing employment and reducing crime.	During the EIA, the possible impacts on the community will be considered and assessed. This will include the potential impact on employment and crime.
Petrus Kandile	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>As the grazing land of the Phatsima Community was sold to the mine. We, the owners of the animals made an informal agreement with some of the mine employees to allow us to graze until the time they would decide to use it. We requested grazing land from the municipality as they have also taken the remaining piece of land for another project and left us with no grazing land.</p> <p>We informed the municipality about this and they instructed us to talk to the mine in order for them to allow us to graze until we had found alternative land for grazing. We requested to be informed timeously about any changes that would take place, which we, the mine and municipality had all agreed on.</p> <p>We are very concerned about the tailings dam that is going to be erected so close to our location because it will contain acid water and sand which will dry up and cause dust, causing some illnesses to the kids. Could you please review this process.</p>	<p>The issue of alternative grazing land will be further considered in the EIA, though this is the responsibility of Rustenburg Municipality.</p> <p>During the EIA, the possible impacts on the community will be considered and assessed. This will include the potential impact on health caused by dust and water pollution.</p>

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
Aubrey Botsewe	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>How this information was taken to the people was really not appreciated. Not everyone in the community of Phatsima was aware of this information meeting. This is something which needs to be addressed and taken very seriously. Please respect the community when it comes to matters that will affect them. We all know that to every mining industry there is a lot of corruption in terms of how the jobs are allocated and how the royalties are being given out. This is something that the chairs and executives are aware of but they are not doing anything about it because it benefits them even informing us about the changes that are going to be made is just a formality- the decision has already been made. The authorisation has already been given.</p> <p>If you can only employ the youth and develop them, you will be doing the major thing that is positive to us as youth.</p> <p><i>(Responses by the IAP to the numbered questions are recorded below)</i></p> <p><i>How is this project going to benefit the community?</i></p> <p>1. Please provide information as to how your interests (socio-economic, cultural, heritage or environment) will be affected by the proposed project:</p> <p>As you know mines produce minerals and for those minerals to be reached, chemicals are used, land is taken and graves are going to destroyed-that's how its going to be affected.</p> <p>2. <i>How do you consider that the proposed activities will impact on your socio-economic conditions?</i></p> <p>Hopefully jobs will be created from this project.</p> <p>3. <i>What are your suggestions to mitigate the anticipated impacts on you or your socio-economic conditions?</i></p> <p>This is not going to benefit us in any way. Its going to benefit the mines.</p> <p>4. <i>According to you, what are the current land uses and their location within the project area?</i></p> <p>The land is being used in such a way that the mines benefit, they don't care about people or their assets.</p> <p>5. <i>What are the locations of environmental features on site?</i></p>	<p>Comments are noted. SLR will improve communication methods for future meetings in the Phatsima community. This will include holding a public meeting for future public consultation if required.</p> <p>Authorisation has been given for the existing mine, but the changes to infrastructure still need to be authorised through the EIA process.</p> <p>During the EIA, the possible impacts on the environment and community will be considered and assessed – these will include impacts on graves and employment.</p>

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
			<p>Water dams, farms and air.</p> <p>6. <i>How can the potential environmental impacts be remediated, and to what standard?</i></p> <p>This can be stopped only if you don't put your plans into action. Stop whatever you are trying to do, that's a permanent solution!</p> <p>7. <i>How can the potential impacts on your socio-economic conditions be mitigated (reduced)?</i></p> <p>By paying the royalties to the communities, not dealing under the table and creating jobs. Don't place jobs on sale.</p> <p>8. <i>How can the potential environmental impacts on your infrastructure be managed, avoided or remedied?</i></p> <p>By not doing anything to it.</p>	
Eunice Tladinyana	Phatsima community	12 August 2015 at Ledig Public Open day	<p>I want to see this project going far and I want to see this project be big and to be known throughout South Africa. I really like it. I want to work at Bakubung Platinum Mine. I would be really pleased if SLR could help us with jobs.</p>	<p>During the EIA, the possible impacts on the community will be considered and assessed – these will include impacts on employment.</p>
Gomolemo Molefe	Phatsima community	11 August 2015 at Phatsima Public Open Day	<p>I hereby comment and question how you are going to get information pertaining your learnerships and internships - when and how will Wesizwe be hiring us?</p> <p><i>(Responses by the IAP to the numbered questions are recorded below)</i></p> <p>2. <i>How do you consider that the proposed activities will impact on your socio-economic conditions?</i></p> <p>By providing more jobs to our community</p> <p>3. <i>What are your suggestions to mitigate the anticipated impacts on you or your socio-economic conditions?</i></p> <p>By including all the community members.</p> <p>4. <i>According to you, what are the current land uses and their location within the project area?</i></p> <p>Sports and recreation</p>	<p>During the EIA, the possible impacts on the community will be considered and assessed – these will include impacts on employment.</p>

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
Thabo Tladinyana	Phatsima community	12 August 2015 at Ledig Public Open day	I would like to see the project expand into other areas of South Africa so it can help to combat unemployment.	The comment is noted.
Petronela Molekwa	Phatsima community	11 August 2015 at Phatsima Public Open Day	I do not have a problem with the project but the leaders of the community should have been notified properly - we would have really appreciated that.	Comments are noted. SLR did communicate with the ward councillor and local municipality regarding the Open Day. SLR will improve communication methods for future meetings in the Phatsima community.
Monki Masisi	Phatsima community	11 August 2015 at Phatsima Public Open Day	I am happy that we were notified about this development, especially because it is close to our community. I am hoping there will be some kind of change in our community because we really need jobs.  I am concerned that the blasting impacts will have a negative impact on our community.	During the EIA, the possible impacts on the environment and community will be considered and assessed – these will include impacts of blasting and employment.
Zelda Poee	Phatsima community	11 August 2015 at Phatsima Public Open Day	I have concerns about the project.	During the EIA, the possible impacts on the environment and community will be considered and assessed.
Noli Makhubo	Phatsima community	11 August 2015 at Phatsima Public Open Day	Please email me your word document (BID) so that I can email my feedback to you.	This will be done. The email address has been added to our database and you will be informed of project progress.
Anonymous	Phatsima community	11 August 2015 at Phatsima Public Open Day	What kind of jobs will be available? Will the Phatsima people benefit something from the project of Wesizwe. How will we know if the project is on? Will you come to us to tell us all the details about these projects. Lastly, as a community member, I would like all the people from Wesizwe to arrange a meeting with all the people from Phatsima that we can understand what these documents actually mean and therefore be able to answer questions.	During the EIA, the possible impacts on the environment and community will be considered and assessed – these will include impacts of employment.  The purpose of the Open Day was to explain the information in the BID to the community. This was done for the community members who were interested. Setswana translators were present at both Open Days. The documents were also available in Setswana for ease of understanding.

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
				Further public participation will be conducted during the EIA and this will likely include a public meeting in Phatsima.
Anonymous	Phatsima community	11 August 2015 at Phatsima Public Open Day	Seeing that the project area is close to Phatsima, will preference for hiring be given to the inhabitants of Phatsima? How will our lives be endangered? How are we going to benefit from the project?	During the EIA, the possible impacts on the environment and community will be considered and assessed – these will include impact of employment and other possible benefits.
Lawrence Loeto	Ledig community	12 August 2015 at Ledig Public Open Day	<ol style="list-style-type: none"> <li>1. Please inform the Parks Board and Pilanesberg Game Reserve directors. Ledig farmers and restaurants union must also be informed. Sun City Resort, BnB and Bakubung hotel directors must be informed.</li> <li>2. The government must ensure that air pollution from dust at the mine does not affect the plants growing within the community.</li> <li>3. The animals in the game reserve must not be affected by the dust- they must also be taken care of.</li> <li>4. Water must not be polluted by the mining activities.</li> <li>5. Our youth must not be affected by pollution especially in giving birth?</li> </ol>	<ol style="list-style-type: none"> <li>1. This has been done.</li> <li>2. to 5. During the EIA, the possible impacts on the environment and community will be considered and assessed – these will include impacts of dust, impacts on plants and animals, water pollution and impacts on health.</li> </ol>
Tshireletso Mjala	Phatsima community	12 August 2015 at Ledig Public Open Day	<p>You can inform the community in the following ways:</p> <ul style="list-style-type: none"> <li>-You can explain everything to the ward councillor and ask him to inform the community</li> <li>-You can advertise your meeting details on the radio</li> <li>-You can send out letters to the community members to make them aware</li> </ul>	Noted. The ward councillor was informed of the Open Day and he will also be informed of future meetings. Letters were sent to community members on the existing IAP database and in future will be sent to everyone on the updated IAP database (updated after the public open days). Radio advertising will also be considered.
Magdeline Mogobaladi	Phatsima community	12 August 2015 at Ledig Public Open Day	I'm interested in the project.	You will be kept informed of the project progress.
Elias Mokwena	Ledig	12 August 2015 at	I'm looking for a job.	During the EIA, the possible impacts on

I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
	community	Ledig Public Open Day		the community will be considered and assessed – these will include impact of employment and other possible benefits.
<b>Dept. of Land Affairs (Dept. of Rural Development and Land Reform)</b>				
None received to date.				
<b>Traditional Authorities</b>				
Kgosigadi of the Bakubung Tribe	Bakubung Tribal Authority	Meeting on 4 August 2015 (full notes of the meeting are included in Appendix xx)	Public consultation also to be done in Zulu from now on as there are Zulu speaking people in the community. The Kgosigadi will sign the landowner forms for the EIA and WUL processes. Wesizwe needs community buy-in. The Kgosigadi will arrange the Bakubung Tribal Hall for the open day and will announce the meeting.	Public consultation will also be done in Zulu from now on. Comments are noted.
<b>Dept. Environmental Affairs</b>				
None received to date.				
<b>Other Competent Authority (DMR)</b>				
Lorraine Nobela and Tshilidzi Phalala	DMR	Meeting on 6 July 2015 (full minutes of the meeting are included in Appendix xx)	<ol style="list-style-type: none"> <li>These changes to the EA require a scoping and EIA process and will need to be approved under NEMA by the DMR. To change the MR it will be necessary to get an EA in terms of Section 25 of the MPRDA if the footprint is changing.</li> <li>The Mine Works Programme will need to be updated.</li> <li>The original EA must be attached to the application to the DMR.</li> <li>What is the additional material that Wesizwe want included in the MR. This must be specified in the application, the DMR would then need to confirm if the mining right for this mineral is available in that area.</li> <li>DMR is only the competent authority for activities within the MR area. Anything outside the boundary is to be submitted to the North West Rural, Environment and Agriculture</li> </ol>	<ol style="list-style-type: none"> <li>The capacity of the plant will increase but the footprint will remain the same.</li> <li>This was done in 2014.</li> <li>This will be done.</li> <li>It is aggregate.</li> <li>The pipeline will cross over an area that is not in the MR. However, this area will be registered as a servitude.</li> </ol>



I&AP DETAILS		DATE OF COMMENT	ISSUE RAISED	EAP's RESPONSE
Name	Affiliation			
			<p>Development (READ). The whole pipeline will need be authorised by the DMR and not READ.</p> <p>6. Will more water be required if there is an increase in plant capacity.</p> <p>7. Who is the landowner?</p> <p>8. The Bakubung would need to be consulted separately as the landowner.</p>	<p>6. In the original application 8 mega litres were requested from Magalies Water. The plan is to recirculate water from TSF and sewage treatment plant instead of disposing water, therefore additional water should not be needed.</p> <p>7. The plant area is owned by Bakubung Tribal Authority. TSF area is owned by Wesizwe.</p> <p>8. This has been done.</p>
<b>Interested Parties</b>				
Chris De Bruyn		22/07/2015	<p>A Noise study with specific reference to the additional noise generated by the above ground Crusher plant.</p> <p>A full Air study taking into account the cumulative impacts in the area.</p>	<p>The noise study will take the crusher noise into account.</p> <p>An air quality study will be done.</p>

## 8.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PROJECT AND ALTERNATIVES

The baseline information provided here is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment. More detailed information will be provided in the EIA report once the specialist reports and other research has been concluded.

### 8.4.1 BASELINE ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

#### 8.4.1.1 Geology

The geology of a particular area will determine the following factors:

- The type of soils present since the soils will be derived from the parent rock material
- The presence and quality of groundwater and the movement of the groundwater in the rock strata
- The potential for paleontological resources to exist in the rock strata
- The potential for acid generation.

Soil types are discussed in section 8.4.1.4, groundwater in section 8.4.1.7 and paleontological resources in section 8.4.1.11. A basic description of the local geology is provided below. More detail will be provided in the EIA and EMP report.

The information has been sourced from the 2008 EIA (TWP Environmental Services (2008)).

The project area is underlain by the Rustenburg Layered Suite of the Bushveld Complex in which the PGM bearing Merensky Reef and UG2 Reef occur. The Rustenburg fault line bisects the farm Mimosa, and the Caldera fault line bisect the farms Frischgewaagd and Ledig.

The Merensky Reef is a regular and complete cyclic unit within the Critical Zone and is a persistent magmatic sedimentary entity. It is located 60 m to 100 m below the top of the Critical Zone and grades upward in the cycle to norite, a 'spotted' anorthosite and then into a 'mottled' anorthosite at the top of the cycle.

The Merensky Reef occurs over the project area in three types. These three types are based on the physical appearance, mineralisation and immediate footwall stratigraphy of the Merensky Reef. These are the Normal Merensky (approximately (~) 1.19 m thick), the Single Chromitite Merensky (~ 0.08 m thick) and the Normal Footwall Merensky (~ 0.69 m thick). They vary in mineralogy and thickness but are bounded within the Critical Zone.

The UG2 Chromitite Layer is composed of a chromitite layer and generally has a basal feldspathic pyroxenite pegmatoid and some overlying chromitite layers. The UG2 reef is often underlain by a pegmatoidal feldspathic pyroxenite with the greatest concentration of PGMs occurring at the base of the UG2 chromitite.

#### 8.4.1.2 Topography

The topography of a particular area will determine the following factors:

- The flow of surface water, and in many cases, also groundwater
- The depth of soils and the potential for soil erosion, for example, in the case of steep slopes
- The type of land use, for example flat plains are more conducive to crop farming
- The aesthetic appearance of the area
- Climatic factors such as wind speeds and direction, for example, wind will be channelled in between mountains along the valley.

Changes in the topography caused by the project activities could therefore alter all of the above-mentioned aspects of the environment.

The information has been sourced from the 2008 EIA which was informed by a soil, land use and land capability study conducted for the 2008 EIA by Rehab Green CC (2007).

The project area is a uniform terrain and has wide to gently undulating footslopes, which slope at ~ 1-2%. There are two drainage lines that cut through the north-eastern and north-western corners of the portion of the farm Frischgewaagd, which link to the Elands River. The site elevation is ~ 1040 m above sea level. The elevation on the farm Frischgewaagd varies from 1014 -1062 m above sea level. The elevation on the farm Mimosa where the TSF is planned is approximately 1022 – 1078 m above sea level.

#### 8.4.1.3 Climate

Climate can influence the potential for environmental impacts and related mine design. Specific issues are listed below:

- Rainfall could influence erosion, evaporation, vegetation growth, rehabilitation planning, dust suppression, and surface water management planning;
- Temperature could influence air dispersion through impacts on atmospheric stability and mixing layers, vegetation growth, and evaporation which could influence rehabilitation planning; and
- Wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

The information has been sourced from the 2008 EIA (TWP Environmental Services (2008)) and the Samsam water climate tool.

The North West province has varying climatic conditions across the province. The western region is arid while the central region typically has semi-arid conditions and the eastern region of the province (where the project site is located) is largely temperate. The project area falls within the central bushveld climatic region.

The average temperature is ~ 19°C, with the average maximum in the summer months being 30°C and the

minimum in the winter months being 2°C. The annual rainfall averages 631mm, with the highest rainfall in the summer months. Wind speeds can range from 5 -10 m/s from the west and west-north west.

#### 8.4.1.4 Soil and land capability

Soil is an important natural resource and provides ecosystem services that are critical for life, such as:

- Water filtering
- Providing growth medium for plants, which in turn provide food for plant-eating animals
- Providing habitat for a wide variety of life forms.

Soil forms rather slowly by the breaking down of rock material. Soil determines the type of land use the area is suitable for, for example, soil with low nutrients may not be able to support unassisted crop farming. Soil resources are often vulnerable to pollution, erosion and compaction, which could be caused by project-related activities.

The information has been sourced from the 2008 EIA which was informed by a soil, land use and land capability study conducted for the 2008 EIA by Rehab Green CC (2007).

A soil study is to be conducted for this current project and will confirm if the information below is still applicable to the project area.

The area is characterised by gabbro and norite rock. The soils consist of four basic types. The dominant soil type is red, fine structured sandy clay loam soils of the Shortlands form. This soil type is described as soil unit Sd1, which consists of deep soils on gently sloping foot slopes and has arable land capability with moderate to high agricultural potential. This takes up approximately 49.32% (630 ha) of the area surveyed in the study.

The second dominant type of soil present on site is made up of strongly structured black clay soils dominated by the Arcadia form comprising 37.61% (481.26 ha) of the total area surveyed. The black clay soils tend to shrink and expand during phases of drying and wetting and this causes prominent cracks in the dry state. The dominant phase of this soil type is described as soil unit Ar1 and consists of deep, strongly structured black clay soils of the Arcadia form. It has a grazing land capability and moderate to low agricultural potential.

The third dominant soil type consists of deep alluvial soil deposits along the Elands River and comprises 12.35% (157.8 ha) of the total area surveyed. The dominant phase of this soil type is described as soil unit Oa2 and consists of very deep loamy soils on gentle slopes classified as arable land capability with moderate agricultural potential.

The fourth dominant soil type is composed of soil rock complexes and consists of an association of exposed

surface rock, stones and shallow soils. This comprises 0.49 % (6.15 ha) of the total area surveyed.

#### 8.4.1.5 Biodiversity

Biodiversity refers to both flora (plants) and fauna (animals). Biodiversity is crucial for the functioning of ecosystems which provide us with products and services which sustain human life. Healthy ecosystems provide us with oxygen, food, fresh water, fertile soil, medicines, shelter, protection from storms and floods, stable climate and recreation. Biodiversity therefore can have an indirect impact on human health.

The establishment of project infrastructure as well as project-related activities has the potential to result in a loss of habitat through the destruction/disturbance of vegetation and/or contamination of soil and/or water resources, thereby reducing the occurrence of fauna and flora on site and in the surrounding areas.

The baseline information on biodiversity in the project area will be used to identify sensitive areas, to guide the project planning in order to avoid sensitive areas where possible, to determine how best to conserve the fauna and flora in the area and allow for proper rehabilitation of the site once the project ceases.

The information has been sourced from the 2008 EIA which was informed by a biological report compiled by Golder Associates in 2007.

##### 8.4.1.5.1 National and Regional Guidelines

According to the Mining and Biodiversity Guideline (DEA *et al*, 2013), the plant project area falls within the highest and high biodiversity categories and the TSF site falls within the high biodiversity categories (Figure 8-2). This is described below:

- Highest biodiversity areas are generally areas with critically endangered ecosystems, critical biodiversity areas (CBAs), river and wetland freshwater ecosystem priority areas (FEPAs) and 1km buffer zone around these areas, and RAMSAR sites. The implication for mining proposed projects is that environmental assessments should focus on confirming the presence and significance of the biodiversity features and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision making.
- High biodiversity areas generally comprise protected area buffer zones, transfrontier conservation areas, other identified areas from provincial spatial biodiversity plans, high water yield areas. The implication for mining proposed projects is that environmental assessment should include an assessment of the optimum, sustainable land use and determine the impacts on biodiversity.

There are no SANBI listed National Protected Area Expansion Strategy (NPAES) areas within or surrounding the project area (Figure 8-3).

There are three wetlands listed as FEPAs according to the SANBI Wetland Inventory (2006) and the NFEPA (2011), two near the Mine Housing Phase 1 and one near the edge of the Farm Mimosa. A wetland study will

need to be conducted to ground truth these wetlands being FEPA wetlands (Figure 8-4).

The area is characterised by CBA1 and CBA2 areas, CBA1 is “Irreplaceable Consolidation Sites” and CBA2 is “restorable irreplaceable sites” (Figure 8-5).

#### 8.4.1.5.2 Flora (Natural plant life)

The project site is situated within the Gabbro Thornveld also known as Mixed Bushveld or Other Turf Thornveld. This stretches from Rosslyn in Pretoria to Brits and northwards to the Pilanesberg. Due to very clayey soils that swell when wet and shrink when dry, there is low floristic variation. The area is thus characterised by little floristic variation and low species richness. However there is high grazing capacity, which has been over-utilised in some areas and some areas have been cultivated. The grid square (2527AC) in which the project site is located has an average species diversity and low compared to the total number of species that could occur in the area. A large portion of the species recorded is indigenous with few exotic species. There are no red data species that have been listed and none were identified during the 2007 survey conducted by Golder.

Nine vegetation communities were identified during the survey conducted by Golder (2007) based on physiognomy, moisture regime, rockiness, slope and soil properties. However, there is some variation within these communities from external influences such as grazing, overutilisation and other anthropogenic impacts. These communities are depicted in Figure 8-6 below.

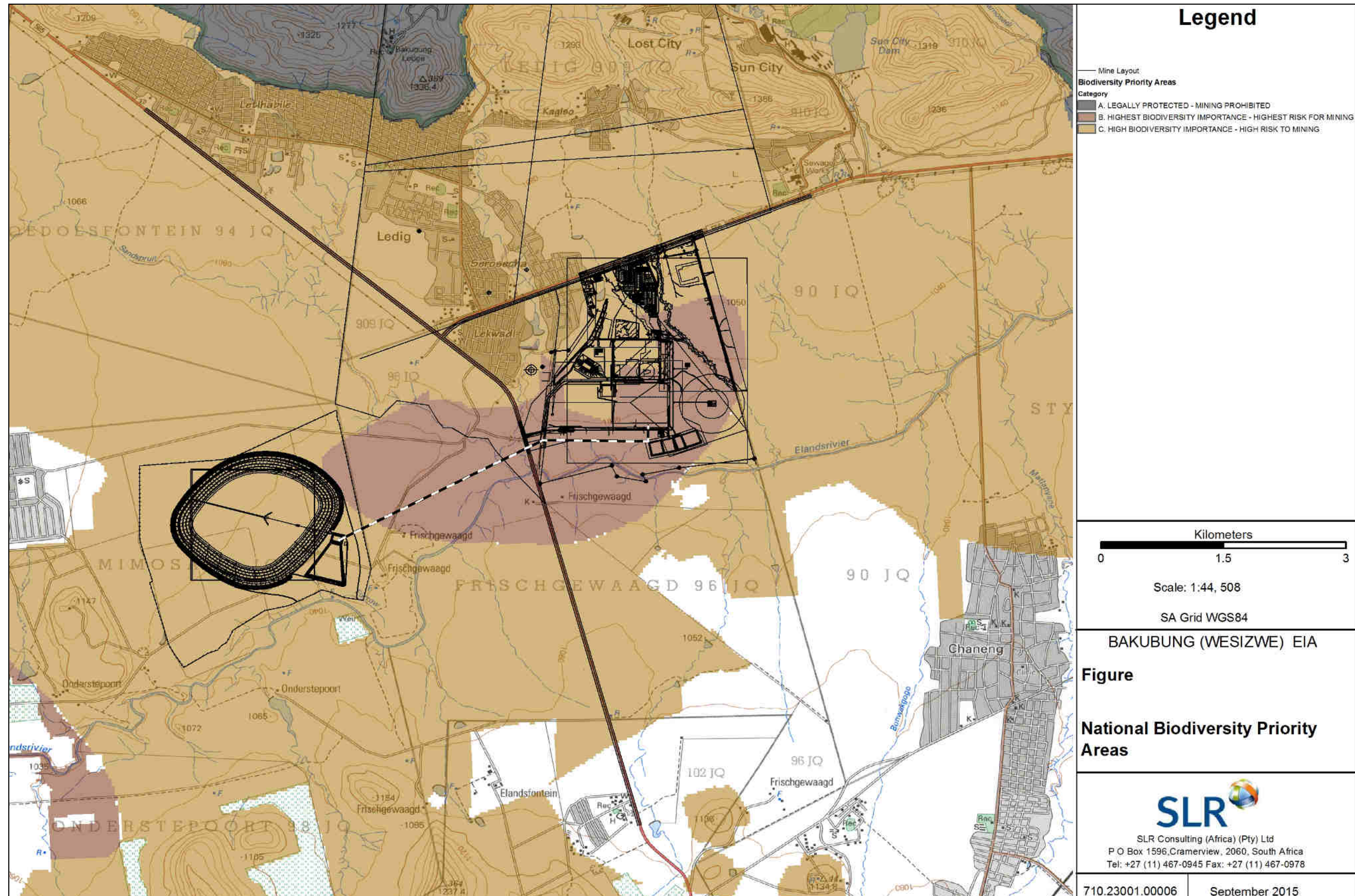
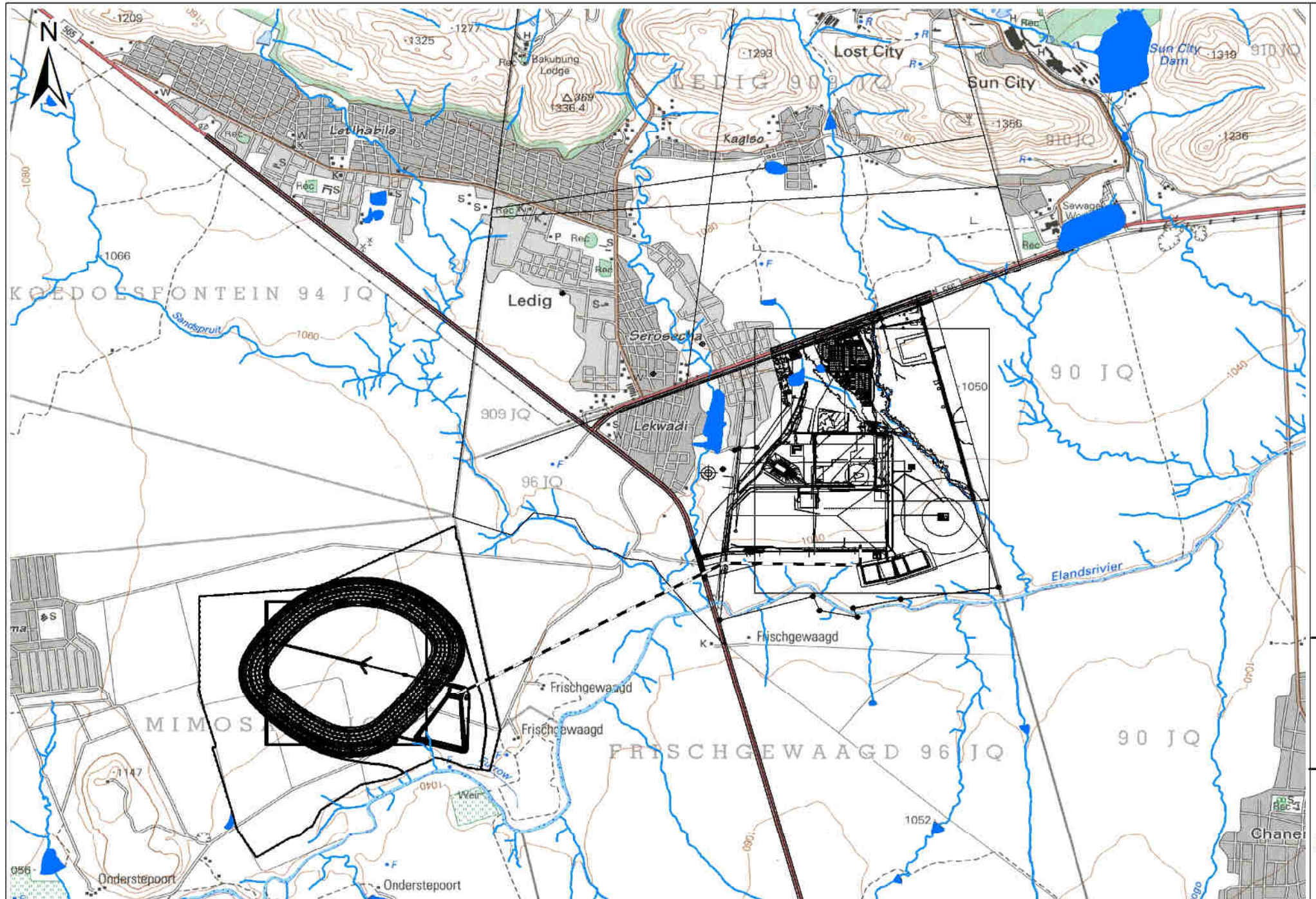
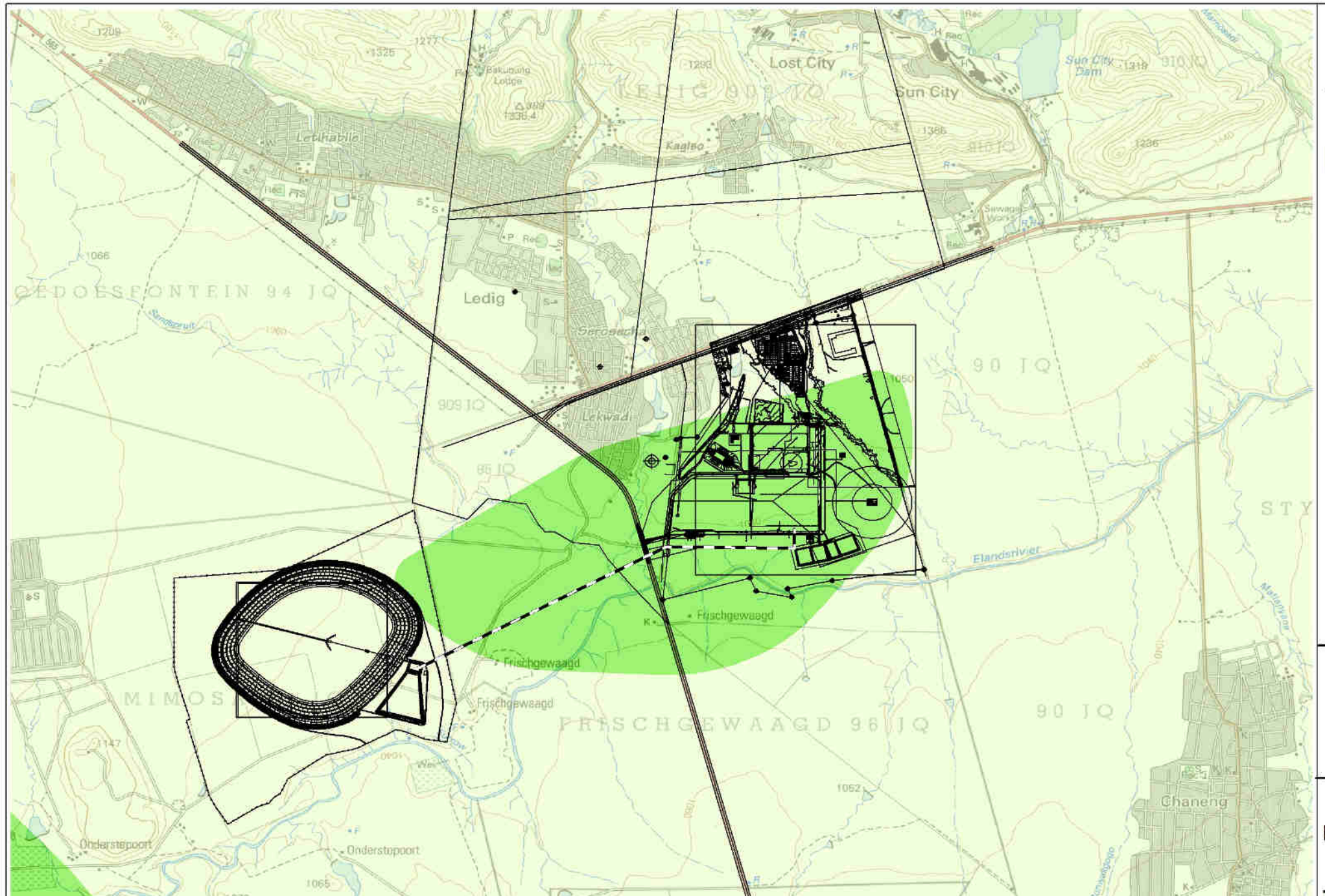


FIGURE 8-2: NATIONAL BIODIVERSITY PRIORITY AREAS ACCORDING TO THE MINING BIODIVERSITY GUIDELINES (SANBI, 2015)

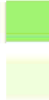








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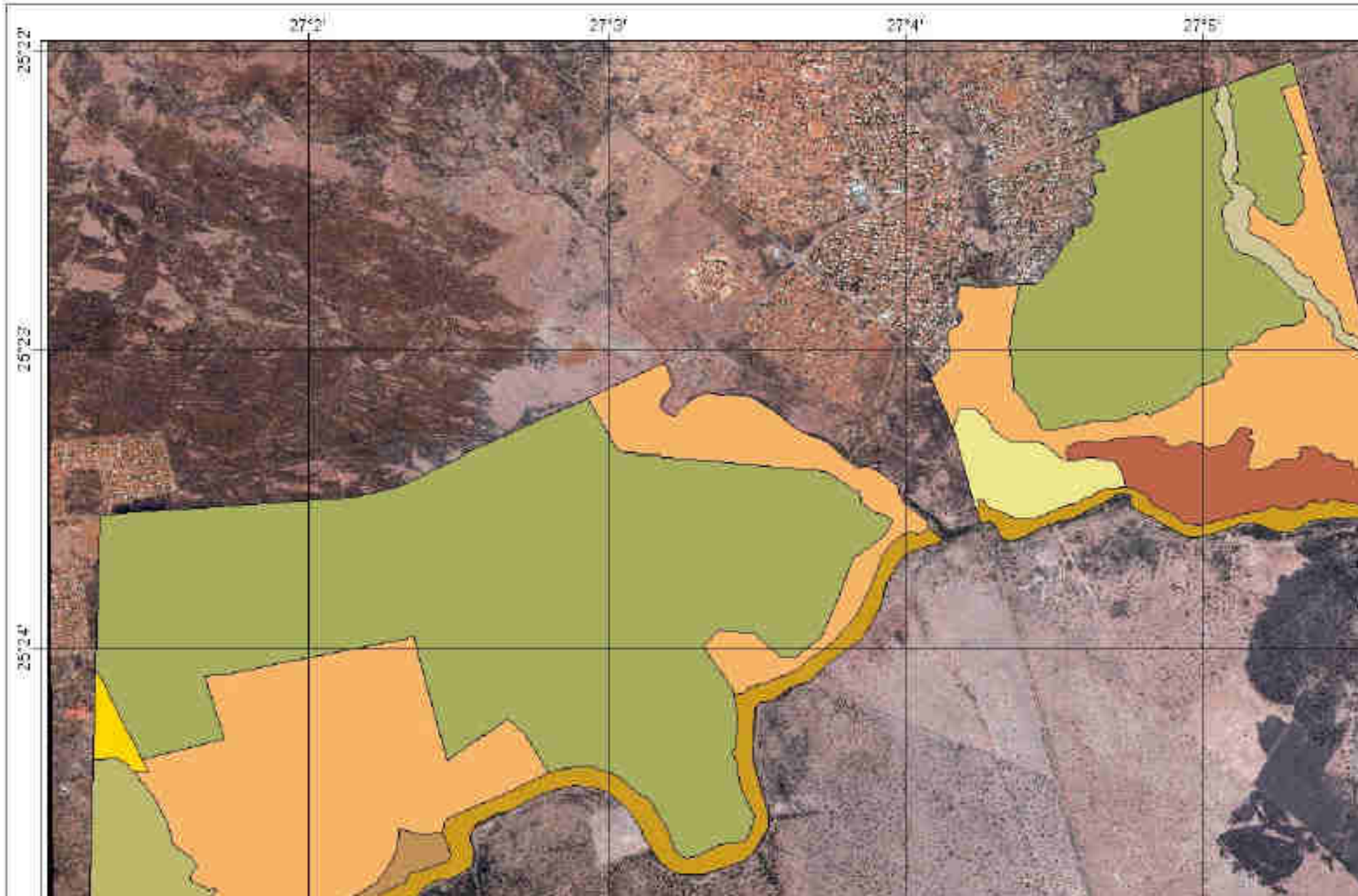


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All nine vegetation communities are currently grazed by cattle from local communities, and tree and plant species are utilised for fuel, crafts or medicinal/traditional purposes. The disturbance to each of the communities varies. The riparian woodland, riparian thicket and rocky outcrop have been considerably impacted by these practices. The *Acacia mellifera* thicket shows severe encroachment and thus has lowest species diversity. The secondary vegetation and previously cultivated lands show severe disturbance. For open bushveld, although considerably impacted from the abovementioned practices, the degree of degradation is lower than the other 5 communities above. The *Aloe-Combretum* hillside vegetation is not significantly impacted as the hillside is steep and difficult to access. The *Dichrostachys* thicket shows severe encroachment and thus has low species diversity. The seasonal wetland has been considerably impacted but is not considered highly impacted.

#### 8.4.1.5.3 Fauna (Natural animal life)

The potential diversity and number of animal species that could possibly occur on the project area has been affected as there has been disturbance from overgrazing and informal cropping practises. Current activities occurring on site as part of the approved 2008 project may have also been impacted from vegetation clearing activities.

#### Red Data Faunal species

Within the study area there is the possibility of 61 Red Data faunal species occurring. No Red Data species were identified during the 2007 survey conducted.

#### Arthropods

During the 2007 survey a total of 72 arthropods were recorded, 37 species of Lepidoptera and 35 other arthropod species. All the species recorded were common savannah species and are not restricted in terms of habitat or distribution. The species identified have low to medium conservation status.

#### Reptiles

The area is considered to be of low importance for reptile species. 16 reptilian species were identified and none of the species recorded are restricted in terms of habitat or distribution. The species identified have low to medium conservation status.

#### Amphibians

Six amphibian species were recorded during the survey and none recorded are restricted in terms of habitat or distribution or classified as Red Data Species. The study did take place during an unusually dry summer thus the study to be conducted for this project can verify the presence of amphibian species.

#### Birds

120 bird species were found to occur in the study area. This is less than half the species expected to occur in the grid square where the project is situated. Of the known bird species in the area 31 are considered to have high conservation priority, 452 have medium conservation priority and three have low conservation

priority.

### Mammals

Mammal species diversity in the study area was very low with only 11 of the expected 164 species recorded. The reason for this may be the degradation of habitat due to anthropogenic activities e.g. grazing, overutilisation of natural resources and hunting. All the species identified are common species and occur in a wide range of habitats and none of the species are considered Red Data species. The species identified had low and medium conservation status.

### Aquatic macroinvertebrates

Monitoring of benthic macro-invertebrates (bottom dwellers) forms an important part of monitoring the health of an aquatic ecosystem as they are relatively sedentary and enable the detection of localised disturbances. The South African Scoring System, Version 5 (SASS5), was used to provide an indication of the quality of the aquatic environment at four sites sampled (Figure 8-7).

Following the SASS5 scoring, the biotic integrity of the sites can be classified as follows (the location of points is in Figure 8-7):

- WZ1 and WZ2 were dry at the time of the survey conducted.
- WZ3 had fair biotic integrity with a Present Ecological State (PES) of Class D. Thus, the site is considered to be largely impaired; having fewer families present than expected due to the loss of most intolerant forms and a large loss of basic ecosystem function having occurred.
- WZ4 had a good biotic integrity with a PES of Class C. Thus, the site is moderately impaired with the community structure and function less than the reference condition. Community composition was also lower than expected from loss of some sensitive forms. Basic ecosystem functions are still predominantly unchanged.

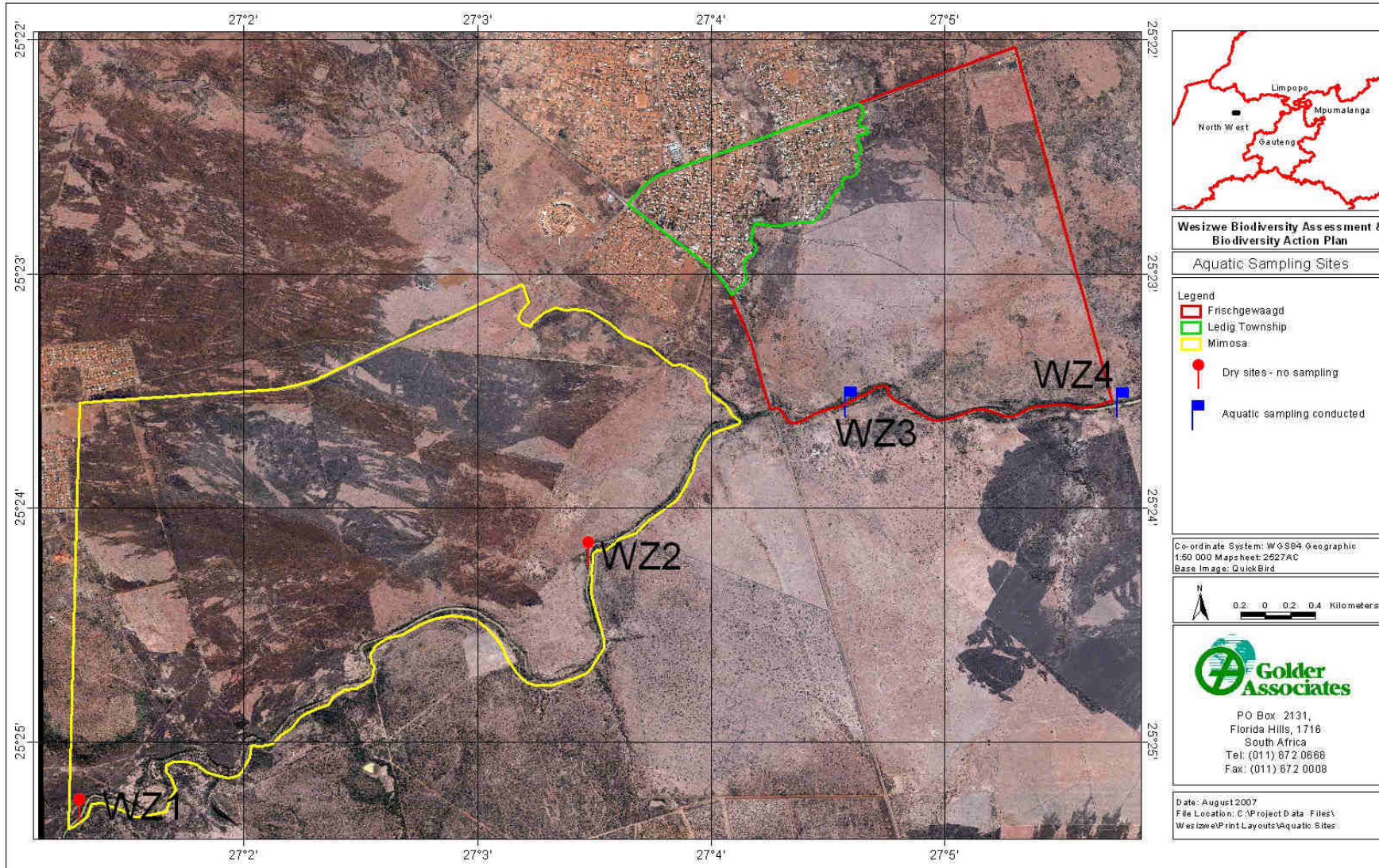


FIGURE 8-7: AQUATIC SAMPLING SITES INVESTIGATED WITHIN THE STUDY AREA (GOLDER, 2007).

While invertebrate communities are good indicators of localised conditions in a river over the short-term, fish, which are relatively long lived and mobile, are good indicators of long-term influences and general habitat conditions. 16 indigenous fish species are expected to occur in the Elands River, eight are of low conservation importance, seven have medium conservation importance and one has high conservation importance. Nine were recorded in the sample area, six fish species were recorded at WZ3 and nine at WZ4. The species identified had low and medium conservation importance.

#### Ecological Function and conservation importance

The ecological function of the area was found to range from low in the transformed areas to high in the more inaccessible areas (Figure 8-8). The conservation importance of the different vegetation communities was considered to be low to moderate, and the main concern is the impact on the Elands river system (Figure 8-9).

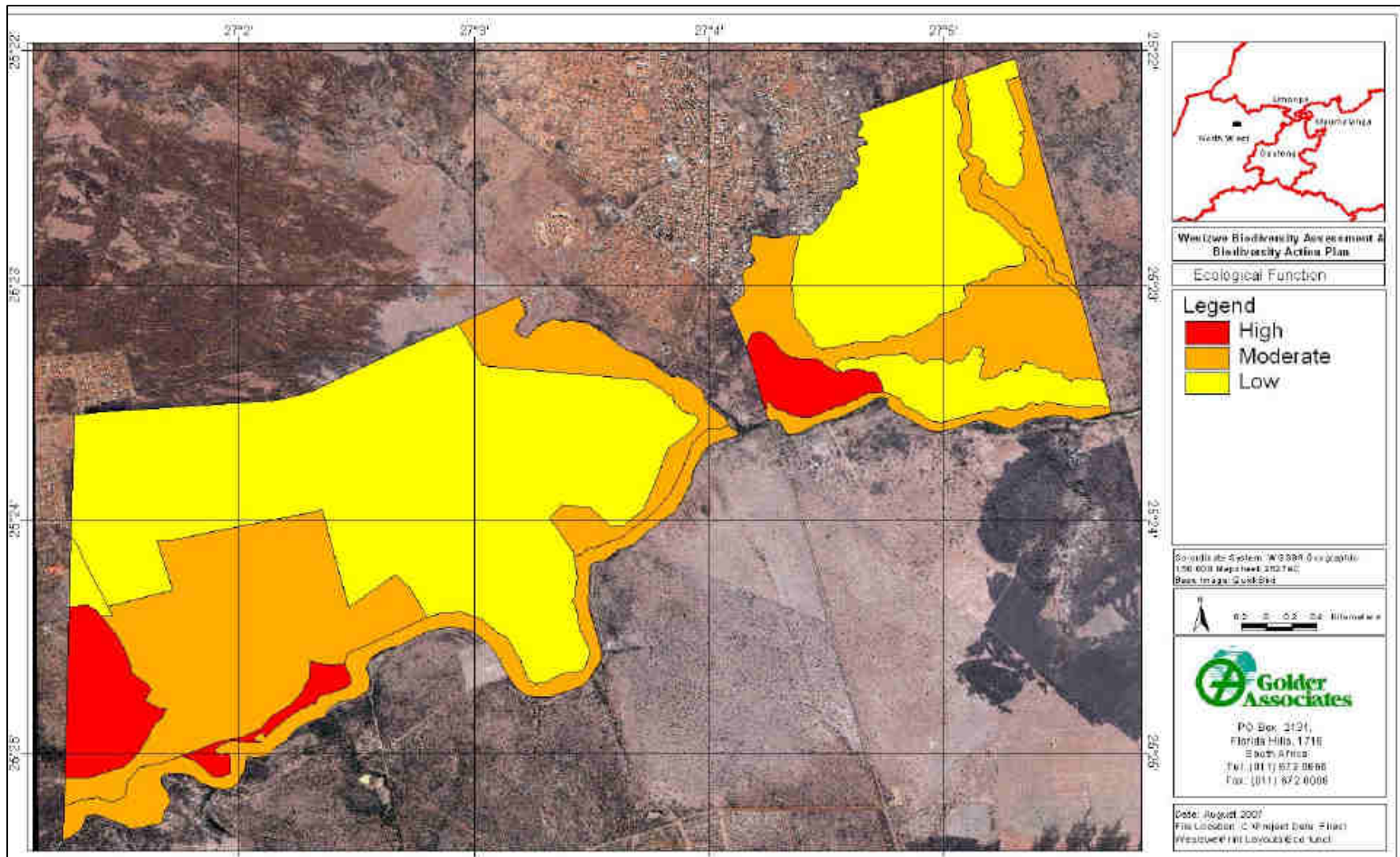


FIGURE 8-8: ECOLOGICAL FUNCTION OF THE STUDY AREA (GOLDER, 2007)



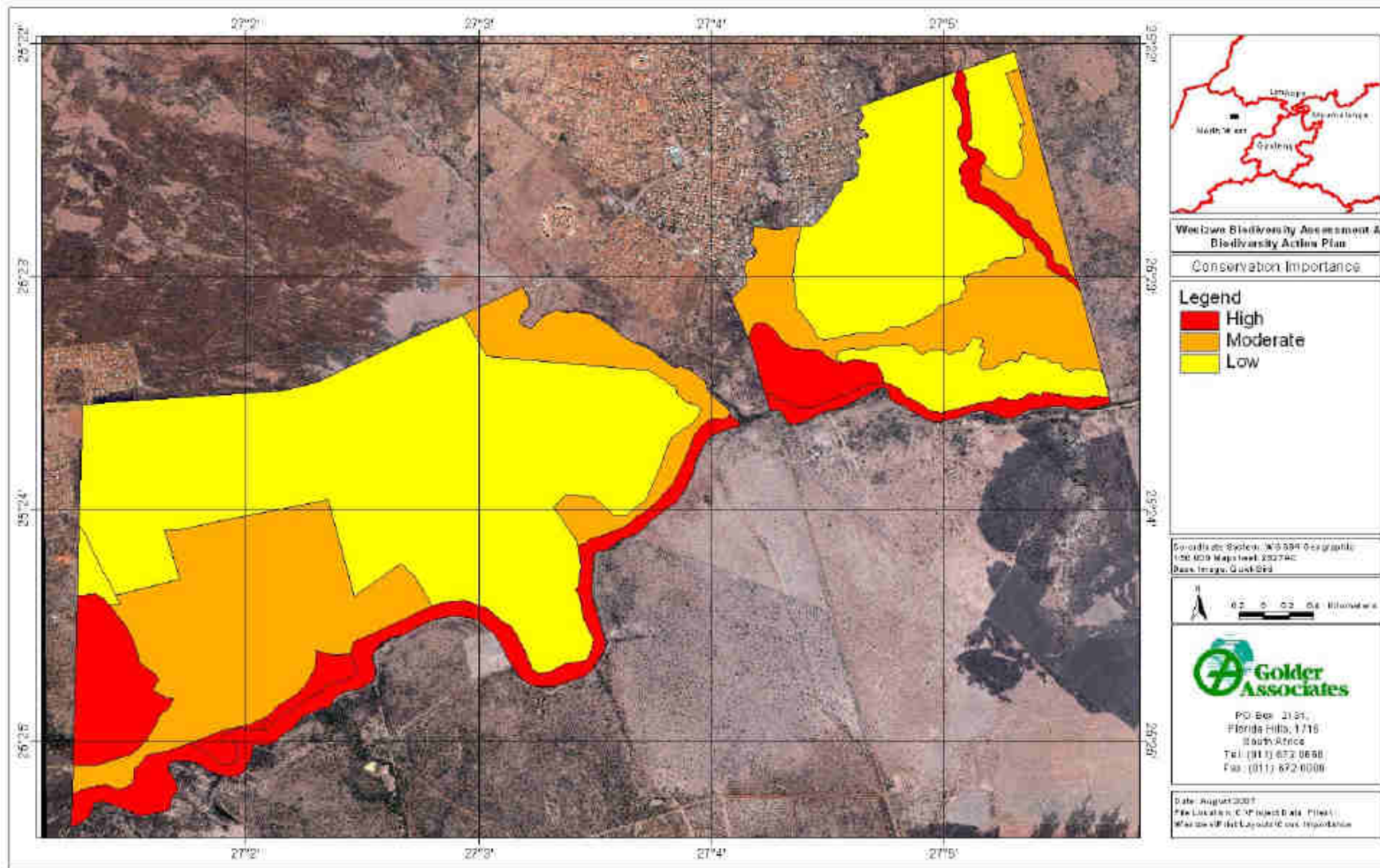


FIGURE 8-9: CONSERVATION IMPORTANCE OF THE STUDY AREA (GOLDER, 2007)

#### 8.4.1.6 Hydrology

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Project-related activities have the potential to alter the drainage of surface water through the establishment of infrastructure and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste (general and hazardous) and mineralised wastes.

As a baseline, this section provides a brief description of surface water resources in the project area in order to facilitate an understanding of the hydrological catchments that could be affected by the project and the status of surface water resources in the project area. More detailed information will be provided in the EIA.

The information has been sourced from the 2008 EIA which was informed by a surface water study conducted by Inprocon Consultants CC (2008) and a biological report compiled by Golder Associates in 2007.

##### 8.4.1.6.1 Watercourses (Inprocon, 2008)

The Elands catchment area is a tributary of the Crocodile drainage system, which forms part of the Limpopo drainage region. The Limpopo drainage region is classified as primary catchment A with the Crocodile catchment as secondary region A2 and the Elands as tertiary region A22. The project area falls within quaternary catchment A22F. The project area is north and adjacent of the Elands River, which is the receiving water body. The hydrology of the project area is shown in Figure 8-4 above.

##### 8.4.1.6.2 Wetlands (Golder, 2007)

A seasonal wetland occurs in the south-western area of the farm Mimosa along the Eland's River. The area consists of small areas of wetland soils formed by seasonal inundation and the substrate of the vegetation type is characterised by less clayey, sandier soil. This has been classified as a FEPA wetland. Two more wetlands are present near Phase 1 Mine housing, these are also listed as FEPAs (refer to Figure 8-4 above). A wetland study will need to be conducted to ground truth these wetlands being FEPA wetlands.

##### 8.4.1.6.3 Surface water quality (Inprocon, 2008)

Surface water quality was sampled over two sampling runs in 2007 and 2008 for the previous EIA. The chemical results were compared with the SANS Drinking Water Standards (SANS 241:2006, edition 6.1). Water is classified according to suitability for human consumption:

- Class I: Recommended operational limit.
- Class II: The maximum allowable concentration for short term use only

All the tributaries were dry at and immediately upstream of their respective confluence with the Elands River. There were a number of stagnant pools within the Elands River. This can have an impact on the results by having elevated concentrations. Six samples were taken for sampling run 1 and 11 were taken for sampling run 2.

The samples from the first and second sampling runs all exceeded the Class II maximum allowable value for turbidity. Elevated turbidities are often associated with the possibility of microbiological contamination.

For sampling run 1, the other measured requirements, namely pH, EC and TDS, were all within the SANS 241 Class I ranges. Class II values were higher than recommended but were seen as acceptable.

The chemical requirements for the macro-determinants of all of the measured concentrations fell within the SANS 241 Class I (recommended operational limit) range except for fluoride. According to the SANS 241, Class I (recommended operational limit) ranges were met for most of the measured micro-determinants except for aluminium and iron.

For sampling run 2, the chemical requirements for the macro-determinants of all of the measured concentrations fell within the SANS 241 Class I (recommended operational limit) range except for fluoride. According to the SANS 241, Class I (recommended operational limit) ranges were met for most of the measured micro-determinants except for aluminium, iron and manganese. The other measured physical requirements, namely pH, EC and TDS, all fell within the SANS 241 Class I (recommended operational limit) range.

Surface water monitoring has been taking place on site since 2009. Further sampling will be conducted as part of this project and will be available in the EIA.

#### *8.4.1.6.4 Surface water users (Inprocon, 2008)*

According to the 2008 surface water report there are various water users for the Elands sub-area of the Crocodile (West) Water Management Area, which include mainly agricultural irrigation, followed by mining, industrial (urban) and industrial (non-urban) purposes. The total authorised abstraction volume of approximately 100 858 054 m<sup>3</sup>/annum was allocated with the majority coming from water schemes. There were 46 registered uses from the Elands River having a total authorised abstraction volume of 2 767 003 m<sup>3</sup>/annum. There were 201 registered abstractions from rivers and streams and 56 from dams. These values are very likely to have changed with the likelihood of additional water users having been registered and still being processed since 2008.

#### **8.4.1.7 Geohydrology**

Groundwater is a valuable resource and is defined as water which is located beneath the surface in rock pore spaces and in the fractures of lithologic formations. Understanding the geology of the area provides a basis from which to understand the occurrence of groundwater resources. Project-related activities such as the development of the larger TSF, the handling, storage and disposal of mineralised and non-mineralised wastes have the potential to impact on groundwater resources, both to the environment and third party users, through dewatering and pollution.

The information has been sourced from the geohydrological study conducted by Africon Engineering International (2008) for the 2008 EIA.

#### 8.4.1.7.1 Presence of groundwater

The area under investigation is underlain by the Rustenburg Layered Suite of the Bushveld Complex. Numerous faults and north-south striking dykes cut through and across the area. Groundwater occurs in secondary aquifers and is mainly associated with deeply weathered and fractured mafic rocks. This characteristic, in association with north-south striking dykes that cut through and across the norite, has formed groundwater compartments.

The aquifer is classified as a "minor aquifer system" which can have fractured or potentially fractured rocks which do not have a high permeability, or other formations of variable permeability. Aquifer extent may be limited and water quality may be variable. While these aquifers seldom produce large quantities of water they are important for local supplies and in supplying base flow for rivers. The aquifer was found to be important for supplying base flow to the Elands River.

#### 8.4.1.7.2 Groundwater quality and levels

Groundwater samples were collected for chemical analysis and the chemical results were compared with the SANS Drinking Water Standards (SANS 241:2006, edition 6.1).

Water is classified according to suitability for human consumption:

- Class I: Recommended operational limit.
- Class II: The maximum allowable concentration for short term use only

Of the 26 boreholes sampled, 16 fell into Class I. Information on elevated concentrations and pollution indicators normally associated with platinum mining is indicated below:

- Nitrate: Nitrate concentrations exceeding the Class 1 concentration were present in 3 boreholes. These boreholes were all located within 40 m of a pit latrine, which is a potential source of nitrate pollution.
- Fluoride: Fluorides were high in 6 boreholes. The study indicated that high fluoride occurrences in the Pilanesberg area and the Rustenburg Layered Suite as confirmed by McCaffrey (1993 *In Africon Engineering International*) and Barnard (2000 *In Africon Engineering International*). According to McCaffrey (1993 *In Africon Engineering International*) the fluoride can be associated with the Red Foyaite in the Pilanesberg Complex and high values are encountered on the margins of the Pilanesberg, at or near the contact with the country rocks.
- Iron: Iron concentrations in 3 boreholes exceeded the Class 1 limit. The concentrations in 2 of the boreholes would only have aesthetic (taste) effects but no health effects. The concentration in the third borehole could have had slight health effects in children and sensitive individuals and pronounced aesthetic effects.
- Magnesium: The magnesium concentration in 1 borehole exceeded the Class 1 limit. The magnesium gives water a slight bitter taste and diarrhoea may occur in sensitive users.
- Electrical Conductivity: Electrical conductivity is an indicator of the total amount of dissolved solids in water, and thus serves as a useful indicator of groundwater pollution. The electrical conductivity of all

the samples was low compared to the Class 1 drinking water standard.

- pH: The normal pH range of groundwater tends to be between 6 and 8, depending on the specific soil and rock composition through which it has percolated. All of the samples fell within this range and had a pH of greater than 7. The water had an alkaline character that is typical of water present in the occurring geology in the area.
- Sulphate: All the samples had sulphate concentrations that were within the Class 1 drinking water standards.

The study indicated that as part of the social survey that was conducted in August 2007 in Ledig, Phatsima, and Mahobieskraal, more than 95% of respondents indicated that they had access to in-yard pit latrines. The study concluded that the reliance on pit latrines could result in a high potential for groundwater contamination in the area.

Water levels were measured in all the accessible boreholes during the hydrocensus. The levels varied between 1.43 m and 65.18 m below ground level. The majority of the water levels are between 20 m to 30 m below ground level. Some water levels were measured at depths greater than 40 m, however, from the hydrocensus information it was deduced that these represent boreholes from which water is pumped, and thus do not represent static conditions.

#### 8.4.1.7.3 Groundwater use

The hydrocensus found that the local population were not solely dependent on groundwater and the borehole yields were generally low. A total of 81 boreholes, including the 15 newly drilled holes, were identified during the hydrocensus. From the hydrocensus it was found that the groundwater was mainly used for domestic and irrigation purposes.

With 81 % of the boreholes on record producing less than 2 l/s, the groundwater yield potential is classed as poor. The mafic rocks tend to weather to a clay-rich soil that is represented by the well-known black turf. The very low permeability of this soil (0.08 m/day) is considered to reduce recharge to underlying aquifers. The depth to the static groundwater level typically occurs between 5 m and 40 m below surface.

#### 8.4.1.8 Air quality

Identification of existing sources of emissions in the region and the characterisation of existing ambient pollution concentrations is fundamental to the assessment of cumulative air impacts. A change in ambient air quality can result in a range of impacts, which in turn, may cause a disturbance to nearby receptors.

The information has been sourced from the 2008 EIA which was informed by a baseline air quality study conducted by Ecoserv (Pty) Ltd for the 2008 EIA and modelling by Airshed.

The main receptors around the site include Ledig Village with the closest residential area being 800 m north west of the outer edges of the project area. The other receptors include the residential areas of Chaneng 3.6

km southeast of the site and the Pilanesberg National Park situated 3 km north of the site. Emission sources in the surrounding area include emissions from Ledig and Phatsima (e.g. coal stoves, fires), mining, vehicle exhausts, dust from vehicles on dirt roads, and agriculture with numerous communities that use land for informal cultivation and grazing.

Various sites were selected to characterise the conditions in all the major residential areas surrounding the proposed project site. Baseline air quality was measured at and around the proposed site between in 2007 for 2 months by Ecoserv. The following parameters were measured as part of the study:

- Particulate matter less than 10 micron diameter (PM10);
- Nitrogen dioxide (NO<sub>2</sub>);
- Sulphur dioxide (SO<sub>2</sub>);
- Total suspended particles (TSP); and
- Dust fallout.

The table below provides the sampling sites and the pollutants measured at each site.

**TABLE 8-2: AIR QUALITY SAMPLING SITES AND THE POLLUTANTS MEASURED AT EACH SITE (ECOSERV, 2007)**

	Site Name	Pollutant Measured	GPS Coordinates
1	Water tower	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 26.244 E27 06.180
2	Chaneng	Total dust, PM <sub>10</sub> , dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 24.224 E27 07.157
3	Sun City	SO <sub>2</sub> and NO <sub>2</sub>	S25 21.695 E27 07.143
4	Ledig East	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 22.366 E27 04.419
5	House 1492	Dust fallout	S25 21.331 E27 03.246
6	Amtel	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 25.686 E27 04.820
7	Ledwadi Section	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub> and total dust	S25 22.837 E27 03.833
8	Ledig North West	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 21.782 E27 02.475
9	Sekunjalo	Dust fallout, SO <sub>2</sub> and NO <sub>2</sub>	S25 23.960 E27 01.141
10	Phatsima, Maria	Dust fallout	S25 23.404 E27 00.635
11	WPL Core Yard	Dust fallout, SO <sub>2</sub> ,NO <sub>2</sub> and PM <sub>10</sub>	S25 28.509 E27 03.684

#### 8.4.1.8.1 PM10

The SANS 1929:2005 daily average limit is 75 µg/m<sup>3</sup>. Two exceedances of this limit were observed. The NEMAQA also contains ambient limits for PM<sub>10</sub> with a 24 hour average of 180 µg/m<sup>3</sup> and an annual average of 60 µg/m<sup>3</sup>. Within a 24 hour average there were no exceedances in terms of the NEMAQA limits.

#### 8.4.1.8.2 NO<sub>2</sub> and SO<sub>2</sub>

The average concentrations of NO<sub>2</sub> and SO<sub>2</sub> were measured at each air quality sampling site in parts per billion (ppb) during two sampling periods.

The average annual guideline for NO<sub>2</sub> is 21 ppb and for SO<sub>2</sub> it is 19 ppb according to SANS 1929:2005

Edition 1.1. The NO<sub>2</sub> concentrations for the first sampling run ranged between 2 ppb and 7ppb and for the second sampling run it varied between 6ppb and 9ppb. The SO<sub>2</sub> for the first sampling run ranged between 1 ppb and 10 ppb and for the second sampling run it varied between 1 ppb and 12 ppb. Therefore, all the NO<sub>2</sub> and SO<sub>2</sub> results fell below the national standard.

#### 8.4.1.8.3 TSP

The TSP was sampled at two locations where the highest exposures were expected (Chaneng and Lekwadi). The maximum allowable TSP by the Department of Environmental Affairs (DEA) is 300 µg/m<sup>3</sup> and all TSP results fell below this limit, with only one slight exceedance on one day in Chaneng of 309.67 µg/m<sup>3</sup>.

#### 8.4.1.8.4 Dust Fallout

The classification averages for dust fallout issued by the DEA are as follows:

- Slight: Less than 250 mg/m<sup>2</sup>/day.
- Moderate: 250 to 500 mg/m<sup>2</sup>/day.
- Heavy: 500 to 1 200 mg/m<sup>2</sup>/day.
- Very heavy: More than 1 200 mg/m<sup>2</sup>/day.

Using this classification it was found that the majority of the baseline dust fallout in the project area fell into the **slight** category. Four points fell into the medium category (Water Tower, House 1492, Lekwadi Section and Phatsima Maria) and two points fell into the heavy category (Ledig East and Sekunjalo). The 2008 EIA indicated that this is probably as a result of the wind erosion off the large number of unpaved roads and lack of sufficient ground cover on the majority of the residential properties in the area.

Air quality monitoring has been taking place on site since 2009. Additional air quality studies will be conducted as part of this project to establish the current air quality in the area.

#### 8.4.1.9 Noise

Some of the noise generating activities associated with the project may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby receptors. As a baseline, this section provides a brief description of current conditions in the area from which to measure changes as a result of project-related noise. More detailed information will be provided in the EIA.

The information for this section has been sourced from the noise study conducted in 2007 by Jongens Keet Associates (JKA) for the 2008 EIA.

As part of the noise study, noise monitoring was conducted at 12 sites around the project area. This included a quantitative and qualitative analysis. The qualitative analysis was done at the same time as each measurement. The sites that formed part of the noise survey are shown in Table 8-3 below. The study findings showed that it was appropriate to assess the noise impact in the communities using the suburban residential standard of 50 dBA for daytime and that for the night-time period should not exceed 40 dBA in

terms of SANS 10103:2004.

**TABLE 8-3. NOISE MONITORING SITES (JKA, 2007)**

Site	Site Description	GPS Coordinates
1	Close to the proposed shaft position	S25°22.846' - E27°04.923'
2	On the central southern border of Frischgewaagd	S25°23.407' - E27°04.814'
3	In the south eastern sector of Ledig village (Kagiso Ext. 2)	S25°22.752' - E27°04.387'
4	In the north eastern sector of Ledig village (Kagiso Ext. 2)	S25°22.393' - E27°04.532'
5	On the eastern boundary of Frischgewaagd	S25°22.567' - E27°05.447'
6	In the north western sector of Chaneng	S25°24.205' - E27°07.158'
7	At the school in the north western sector of Ledig (Lekwadi sector)	S25°22.633' - E27°03.739'
8	In the south eastern sector of Ledig (Lekwadi sector)	S25°22.923' - E27°04.147'
9	In the north western sector of Reagile informal settlement	S25°22.919' - E27°03.615'
10	In the south eastern sector of Phatsima township	S25°23.930' - E27°01.225'
11	At the southern boundary of Melani Game Ranch	S25°25.342' - E27°03.678'
12	At the Sundown Ranch Hotel	S25°25.848' - E27°04.861'

The noise study found the following:

- The main sources of noise in the area are from traffic on the R565 and the R556, as well as from the Pilanesberg Airport.
- The existing noise climate alongside the main roads is degraded with regard to suburban residential living. Traffic noise (particularly at night) had an impact on residences for up to the following distances from these roads:
  - Road R565 (north of R556) - 500 m
  - Road R565 (south of R556) - 850 m
  - Road R556 (east of R565) - 700 m
  - Phatsima Road -150 m
- The existing ambient noise levels were relatively low (quiet) in the areas of Ledig village that were not close to and relatively shielded from the main roads
- Daytime ambient conditions on the mine and TSF sites ranged from 44 dBA to 49 dBA.
- Evening conditions on the site ranged from 37 dBA to 41 dBA.
- The residual noise levels in the undeveloped areas south and south-east of Lekwadi and Kagiso (east of the R565) and areas to the south of Phatsima and Reagile (west of the R565) were generally low (very quiet). The noise levels found were typically representative of a rural farming area, where the average daytime noise levels generally do not exceed 45 dBA and the night-time levels do not exceed 35 dBA. Actual measured night-time noise levels fell to 30 dBA and less.
- The noise levels at the school in the south-eastern quadrant of the intersection of the R556 and R565 were significantly higher than those desirable for educational facilities.



#### 8.4.1.10 Visual aspects

Project-related activities have the potential to alter the landscape character of the site and surrounding area through the establishment of both temporary and permanent infrastructure. As a baseline, this section provides an understanding of the current visual character of the project area against which to measure potential change as a result of project infrastructure and activities.

The information has been sourced from the 2008 EIA which was informed by a visual impact assessment conducted by MetroGIS (Pty) Ltd for the 2008 EIA.

The area around the project site consists of varied landscape types. The visual character of the project area within a 5 km radius varies from low to very high from the diversity of land use activities. The following was noted:

- The mountains and ridges were rated as having a very high visual quality due to the steep slopes and isolated ridges that dominate the skyline.
- The river channels were rated as having a high visual quality due to moderate steep slopes and trees.
- The visual quality of the undulating slopes was rated medium.
- The vegetation, although it has been degraded provides the opportunity to rehabilitate the vegetation cover and was rated as having a medium visual quality.
- The main land uses on site and within the general area that were identified as part of the visual impact assessment included:
  - Farming: This is mainly of grazing of cattle for non-commercial use and game farming. There was also evidence of citrus farming. Game farms are associated with wilderness and could be considered to be scenic resources with a very high visual quality. Previously cultivated and grazed land indicated a change in the visual character of the area and thus was rated as having a moderate visual quality.
  - Township development: The village of Ledig and the township of Phatsima are in very close proximity to the proposed project activities. These settlements are typical of a developing community with few landscaped features within the town boundaries. The visual quality rating of the urban areas was rated as low.
  - Tourism: There are various tourist attractions in the surrounding area which include Sun City and the lion camp and game farm at Sundown Ranch Hotel. These are facilities that were considered to be highly sensitive to visual disturbance of the natural environment. The visual quality of these areas was thus considered high.
  - Mining activities: Mining activities further to the south and east can be seen from vantage points within the study area indicating that visual exposure can be expected from the proposed mine. It is expected that the visual quality of mining activities would be rated as very low, though this was unspecified in the study.

Even though the visual quality of the surrounding communities is considered low, the views of mountains and

surrounding open space creates a sense of peace. There are views of mining and associated industries on the periphery of the site to the south and east. The visual quality of these views was rated as low due to the distance from the site and the screening effects of buildings and trees. The changing topography and relief also needs to be noted. The average rating for the visual quality for the area was given as medium-high.

#### **8.4.1.11 Heritage/cultural and paleontological resources**

This section describes the existing status of the heritage and cultural environment that may be affected by the proposed project. The various natural and cultural assets collectively form the heritage. These assets are known as cultural and natural resources. Heritage (and cultural) resources include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

Paleontological resources are fossils, the remains or traces of prehistoric life preserved in the geological (rock stratigraphy) record. They range from the well-known and well publicised (such as dinosaur and mammoth bones) to the more obscure but nevertheless scientifically important fossils (such as palaeobotanical remains, trace fossils, and microfossils). Paleontological resources include the casts or impressions of ancient animals and plants, their trace remains (for example, burrows and trackways), microfossils (for example, fossil pollen, ostracodes, and diatoms), and unmineralised remains (for example, bones of Ice Age mammals).

The information has been sourced from the 2008 EIA which was informed by a heritage impact assessment conducted by Matakoma-ARM (Heritage Contracts Unit for Wits Commercial Enterprise (Pty) Ltd).

A site survey was undertaken during April 2007 for the proposed project area. The area was found to be characterised by old agricultural fields and few bushes and shrubs exist on site making ground visibility high. Large parts of the study area consist of heavy turf soil. It should be noted that due to the nature of heritage resources, in many cases they occur below surface and thus there is the possibility that some heritage resources were not identified during the survey.

Twenty four sites of heritage significance were identified within the study area, of which four fell within the conceptual footprint of the proposed mining area included in the 2008 EIA. The sites were predominantly Iron Age sites, with four stone cairns being identified and two modern cemeteries. The majority of the sites identified were deemed to have a medium to low heritage significance. Sites identified with high heritage significance included four stone cairns and two cemeteries. The location of the sites identified in 2007 for the previous project layout is contained in Figure 8-10 below. The study area (outlined in red) for the current project is similar, though the TSF size and location is different to the one shown in the figure below. The TSF pipeline route will also be included in the current heritage study.

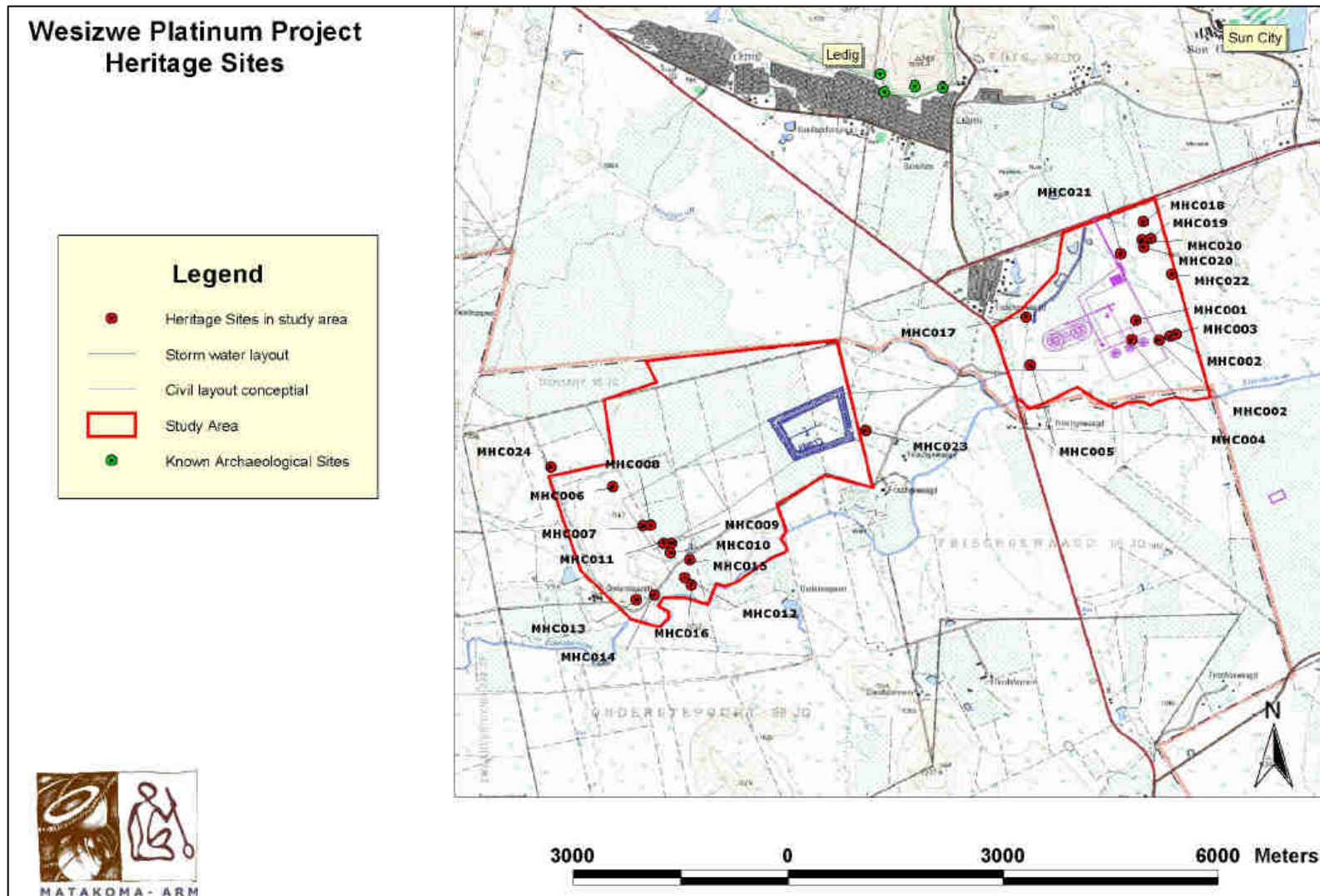


FIGURE 8-10: IDENTIFIED HERITAGE SITES (MAKOMA-ARM, 2007)

#### 8.4.1.12 Traffic

Project related activities can alter the traffic at the site and the surrounds by having increased vehicles travelling to and from the project site, particularly during the construction phase as equipment and infrastructure is brought on site. As a baseline, this section provides information on the current status of traffic in the area from which changes to traffic as a result of the changes to the Bakubung Mine can be determined. More detailed information will be available in the EIA following specialist studies being conducted.

The information has been sourced from the 2008 EIA which was informed by a traffic study conducted by Trafftrans (Pty) Ltd. The proposed project is situated to the south east of the R565/R556 intersection. These two roads are 2-lane roads with one lane per direction.

- The R556 road is between Brits and Mimosa, functioning as a Class 2 road. To the west, the road to Phatsima village, becomes gravel several kilometres from the intersection functioning as a Class ¾ road. The road was in good condition at the time of the 2008 study. This road has subsequently been tarred.
- The R565 is between Rustenburg and Derdepoort. The road was in good condition at the time of the 2008 study and also functions as a Class 2 road, apart from some isolated patches where the surface was deteriorating.

The mine has an access road that intersects the R565 approximately 1.5km south of the intersection with the R556. It runs along the southern boundary of the current mine project area, then turns through 90° towards the north, parallel to the eastern boundary of the site and enters the shaft bank complex in the north eastern corner.

The traffic survey conducted found that the roads in the immediate vicinity of the proposed project area carry typical commuter traffic with its associated peak periods during the early morning and late afternoon. The busiest traffic conditions occur on a Friday and Saturday with the higher occurrence of night traffic on these days than the rest of the week. The occurrence of heavy vehicles is highest during the week and at an average of 26% of the daily traffic. This is considered very high, compared with other provincial roads.

#### 8.4.1.13 Socio-economic

The proposed project can have an impact on the socio-economic condition of the area through job-creation, income revenue and skill development. It can also impact the socio-economic condition through affecting livelihoods of people, in-migration of people, affecting tourism, adding nuisance factors, contributing to health risks, property damage and impacts on property value. It is thus necessary to look at the existing socio-economic condition of the area and look at the impacts that the project can have on this.

The information in this section is sourced from the socio-economic study that was conducted by Perisseuo Consulting in 2008 for the 2008 EIA. It should be noted that the information is based on 2001 and 2007 census data which will be updated with 2011 census data by the socio-economic study being conducted for

the project. The project area is situated within the Rustenburg and Moses Kotane Local Municipalities of the Bojanala District Municipality.

Population: Within the wards most likely to be affected by the proposed project (Wards 14, 28 and 30 of the Moses Kotane Local Municipality and Ward 1 of the Rustenburg Local Municipality), there were 33972 people living within the affected wards. Setswana is the dominant language spoken by more than 70% of the inhabitants in the four wards. isiZulu is also spoken by a significant number of people in Ward 30.

- Employment: in 2001 there was an average of 33.63% of the population being employed with 63.7% of the population being economically inactive or unemployed. The 2007 survey indicated that 73.4% of the households in Ledig and Phatsima earned a monthly salary of R2500 or less, based on an average household of four. 48.7% of income earners gained income from formal employment with 37.1% of income earners gaining from social grants.
- Age: 28.9% of the inhabitants fall within the age group of 0-14 years of age, 66.1% falling within 15-65 years of age and 5% falling in the age group above 65 years of age.
- Schooling: On average 62.5% of the population of the four wards attended school with 52.7% of the population achieving up to Grade 10 (2007 survey). Only 0.3% of the population achieved a form of post school qualification (2001 census). There is low skills level due to relatively low levels of education.
- Economics: Mining contributes more than a third of the North West Province's Gross Domestic Product (GDP). The North West Province is known as the Platinum province and is responsible for 94% of South Africa's platinum, 46% of the granite and 25% of the gold produced in the country. The contribution of mining to the Bojanala District is very high in comparison to other industry sections.
- Housing: According to the 2007 survey the number of people per dwelling in Ledig averaged 3.71 with a minimum of one and a maximum of 16. In Phatsima the average number of people per dwelling was 3.97 with a minimum of 1 and a maximum of 8. 1% of the population have access to traditional dwellings, 1% to backyard shacks, 72% formal dwellings and 26% to informal dwellings.

#### 8.4.2 CURRENT LAND USES

The project area currently has different land uses. The area where the approved plant is located has mining related use and shaft sinking activities taking place. The Mimosa farm is currently being used for non-commercial cattle farming. Small portions are occupied by a residential area, sports grounds and 2 domestic waste dumping sites. The portion of Mimosa that Wesizwe has bought (for the TSF) has been zoned for mining and fenced. Wesizwe is currently allowing cattle to graze on the land until such time as construction on the TSF commences. The surrounding land uses include grazing, cultivation, residential (formal and informal).

The land tenure of the project area and surrounds is provided in Figure 8-11 below.

The land use map is in Figure 8-12 of Section 8.4.4.

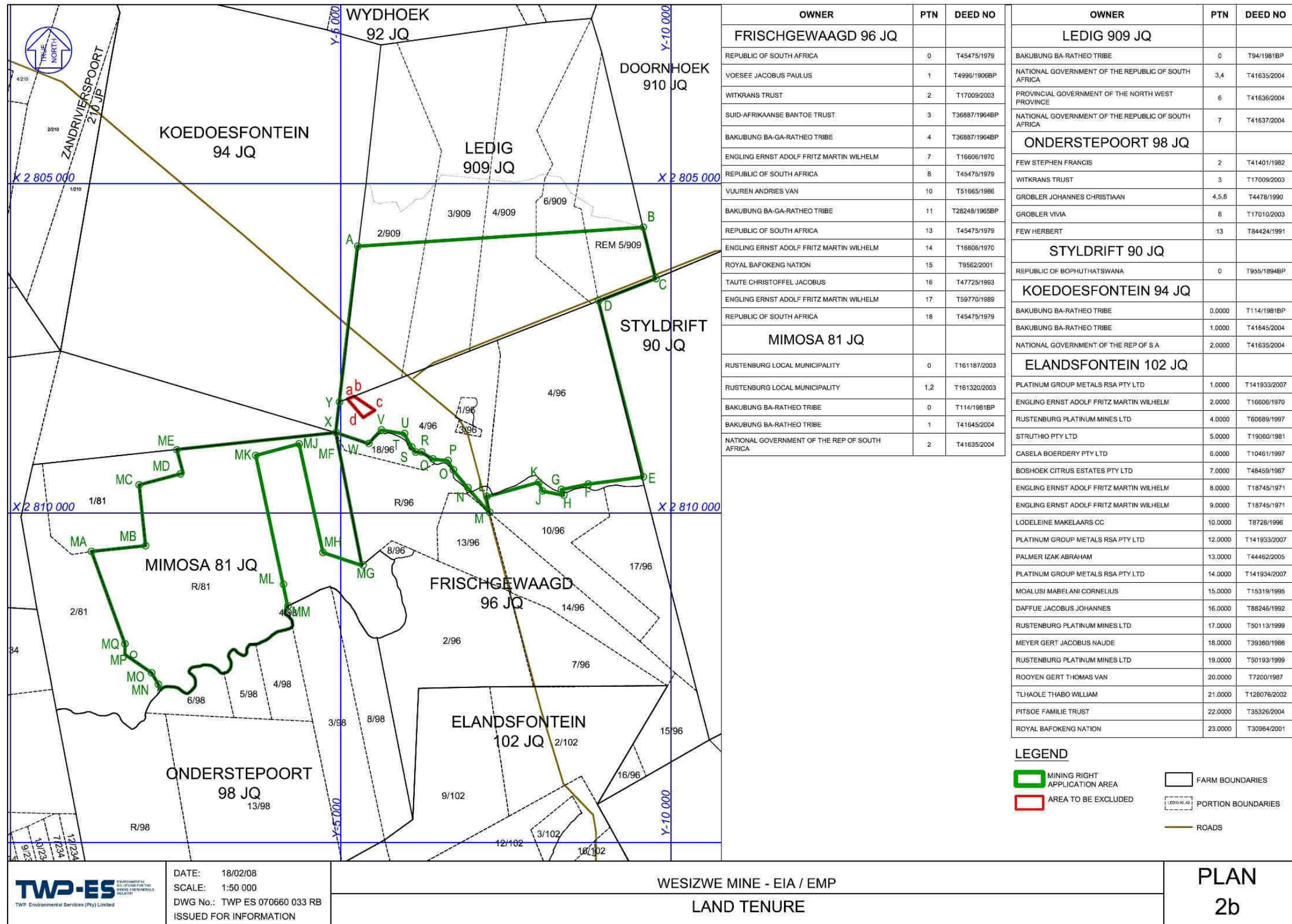


FIGURE 8-11: LAND TENURE (SOURCE: TWP ENVIRONMENTAL SERVICES. 2008)

#### **8.4.3 SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE**

The environmental features in the project area are described in Section 8.4.1 above. Notable are the heritage sites which are present within the project area which may be near the new TSF site. There are FEPA wetlands near the plant area and the TSF area, which will need to be ground truthed. The Elands River and the infrastructure to be built near the River are also of importance as the Elands River is considered to have high conservation importance.

#### **8.4.4 ENVIRONMENTAL AND CURRENT LAND USE MAP(S)**

A conceptual map showing topographical information as well as land uses on and immediately surrounding the project area is provided in Figure 8-12. This may be refined during the EIA Phase.

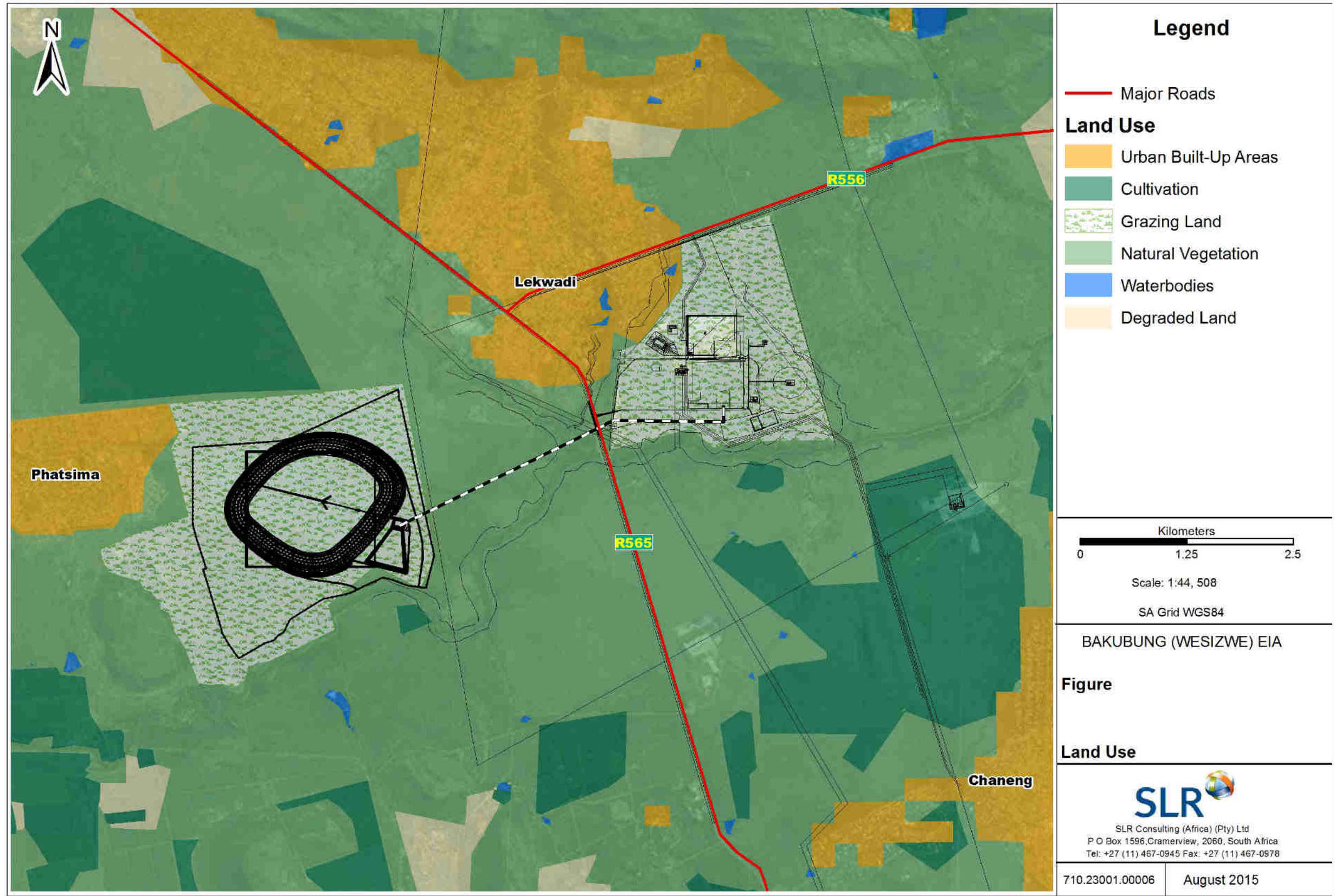


FIGURE 8-12: LAND USE MAP (Source: 1:50 000 topographical map and Google Earth satellite imagery)



## 8.5 IMPACTS IDENTIFIED FOR EACH ALTERNATIVE

The alternatives have been discussed in section 8.1. Three possible alternative routes for the tailings pipeline (1A - northern route, 1 B – central route and 2 - southern route) have been considered. This section provides the scoping-level impact assessment which has been used to make an initial determination of the alternative which has the least environmental impact.

### **Option 1 A - Northern Route**

Crosses a 400m wide section of wetland/floodplain and two tributaries of the Elands River.

### **Option 1 B – Central Route**

Crosses a 40m wide section of wetland/floodplain and one tributary of the Elands River.

### **Southern Route**

Crosses the Elands River twice, involving two 120m crossings.

Table 8-4 identifies the potential impacts of the proposed project, and the alternatives, in relation to the local environment.

**TABLE 8-4: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS IDENTIFIED FOR THE PROPOSED PROJECT ALTERNATIVES**

IMPACT	ALTERNATIVE	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT:		
		INTENSITY	EXTENT	DURATION			can be reversed	Causes irreplaceable loss	can be avoided/ managed/ mitigated
<b>Biodiversity</b>									
	Option 1 A Northern Tailings Pipeline Route	HIGH	HIGH	MODERATE	MODERATE	HIGH	MODERATE	LOW	HIGH
	Option 1 B Central Tailings Pipeline Route	HIGH	MEDIUM	MODERATE	MODERATE	MODERATE	MODERATE	LOW	HIGH
	Option 2 Southern Tailings Pipeline Route	HIGH	MEDIUM	MODERATE	MODERATE	MODERATE	MODERATE	LOW	HIGH
<b>Contamination of Surface Water</b>									
	Option 1 A Northern Tailings Pipeline Route	HIGH	HIGH	MODERATE	MODERATE	HIGH	MODERATE	LOW	HIGH
	Option 1 B Central Tailings Pipeline Route	HIGH	MEDIUM	MODERATE	MODERATE	MODERATE	MODERATE	LOW	HIGH
	Option 2 Southern Tailings Pipeline Route	HIGH	MEDIUM	MODERATE	MODERATE	MODERATE	MODERATE	LOW	HIGH

## 8.6 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The proposed method for the assessment of environmental issues is set out in the Table 8-5. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

**TABLE 8-5: CRITERIA FOR ASSESSING IMPACTS**

Note: Part A provides the definition for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.

<b>PART A: DEFINITION AND CRITERIA*</b>		
<b>Definition of SIGNIFICANCE</b>		<b>Significance = consequence x probability</b>
<b>Definition of CONSEQUENCE</b>		<b>Consequence is a function of severity, spatial extent and duration</b>
<b>Criteria for ranking of the SEVERITY of environmental impacts</b>	<b>H</b>	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	<b>M</b>	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	<b>L</b>	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>L+</b>	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>M+</b>	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	<b>H+</b>	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
<b>Criteria for ranking the DURATION of impacts</b>	<b>L</b>	Quickly reversible. Less than the project life. Short term
	<b>M</b>	Reversible over time. Life of the project. Medium term
	<b>H</b>	Permanent. Beyond closure. Long term.
<b>Criteria for ranking the SPATIAL SCALE of impacts</b>	<b>L</b>	Localised - Within the site boundary.
	<b>M</b>	Fairly widespread – Beyond the site boundary. Local
	<b>H</b>	Widespread – Far beyond site boundary. Regional/ national
<b>PART B: DETERMINING CONSEQUENCE</b>		

### SEVERITY = L

DURATION		H	Medium	Medium	Medium
	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium

### SEVERITY = M

DURATION		H	Medium	High	High
	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium

### SEVERITY = H

DURATION		H	High	High	High
	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High
			L	M	H

			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
<b>SPATIAL SCALE</b>					
<b>PART C: DETERMINING SIGNIFICANCE</b>					
<b>PROBABILITY (of exposure to impacts)</b>	Definite/ Continuous	<b>H</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Possible/ frequent	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Unlikely/ seldom	<b>L</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
			<b>L</b>	<b>M</b>	<b>H</b>
<b>CONSEQUENCE</b>					

<b>PART D: INTERPRETATION OF SIGNIFICANCE</b>	
<b>Significance</b>	<b>Decision guideline</b>
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M= medium and L= low and + denotes a positive impact.

## 8.7 POSITIVE AND NEGATIVE IMPACTS OF THE PROPOSED ACTIVITY AND ALTERNATIVES

Potential impacts that were identified during the scoping process, in consultation with IAPs, are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in Section 8.4 of the scoping report.

The potential impacts associated with all the phases (construction, operations, decommissioning and closure) have been conceptually identified and described. This includes a discussion on alternatives, where appropriate. The feasible alternatives which have been considered are the 3 tailings pipeline route options which are described in Section 8.1. The project impacts are also discussed taking into consideration that mining has already been approved within the project area in accordance with the mining right. Where applicable, the proposed expansion of these approved activities therefore will be assessed incrementally.

It must be noted that the conceptual discussion and characterisation of the potential impacts has been completed within the context of available information. These assessments will be adjusted if needed in the EIA Phase with specialist input, as appropriate. The additional work required to address each of the issues discussed is described in section 9.

### 8.7.1 GEOLOGY

#### Issue: Loss of mineral resources

Project phase/s in which impact could occur

<b>Construction</b>	<b>Operational</b>	<b>Decommissioning</b>	<b>Closure</b>

Discussion

The impact of the proposed project on the sterilisation of the minerals in the target ore body will be minimal, as any ore in the rock below the project components could still be extracted via underground mining.

The “mining” of the aggregate in the waste rock will also have a minimal negative effect on geology as the economic value of the minerals within the waste rock will be lost if the waste rock is not used as aggregate. The incremental increase as a result of the infrastructure changes is expected to be of long-term duration and low spatial scale, the probability is low and the severity is also expected to be low because mining has already been approved on the property. This assessment will not be affected by the choice of any of the three tailings pipeline alternatives.

**8.7.2 TOPOGRAPHY****Issue: Changes in topography**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The topography in the project area will be changed by project related activities, though the topographical changes will be minimal. The topography of the site could be altered through:

- The establishment of waste rock dumps and product stockpiles and the dangers they present to animals and humans;
- The enlargement of the TSF;
- Alteration of drainage patterns due to establishment of additional infrastructure;
- The presence of additional infrastructure.

The construction of additional surface infrastructure and increased size of the dumps and stockpiles will pose a danger to humans and animals. During the construction phase this could include foundations and trenching, as well as the establishment of scaffolding and cranes.

The actual process of additional infrastructure removal during decommissioning could also require temporary hazardous structures such as scaffolding, and some excavations.

In the event of injury to third parties or humans, the potential health impact could be severe and long-term in nature. The incremental increase as a result of the infrastructure changes to the spatial scale may extend beyond the project site to the communities to which the injured people or animals belong. The overall severity in the unmitigated scenario is expected to be moderate and reduce to low in the mitigated scenario by a reduction in probability. This assessment applies to all three tailings pipeline route alternatives.

### 8.7.3 SOILS AND LAND CAPABILITY

#### Issue: Loss of Soil and Change in Land Capability through Sterilisation, Erosion and Contamination

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

Topsoil is generally a resource of high value containing a gene bank of seeds of indigenous species. A loss of topsoil (through sterilisation, erosion or contamination) would generally result in a decrease in the rehabilitation and future land use potential of any land that is disturbed by the construction of the proposed infrastructure. Topsoil and subsoil will be disturbed during the construction phase when the footprint areas for project infrastructure will be stripped. The topsoil and subsoil will be stockpiled for use during rehabilitation upon closure of the mine. This topsoil stripping and stockpiling will need to be carefully managed. In addition, improper management of topsoil stockpiles during this phase and accidental spills could also result in a loss of topsoil through contamination, erosion and compaction.

The construction of erosion control measures along the banks of certain watercourses in the project area will further ensure that topsoil loss is kept to a minimum.

At decommissioning, the topsoil and subsoil will be used to rehabilitate the various sites after the infrastructure has been removed. However, the actual process of infrastructure removal during decommissioning could cause soil erosion and contamination.

No residual impacts are expected after closure if the rehabilitation is well managed and implemented correctly.

The mining right has already approved mining and the changes to mine infrastructure are expected to have a low incremental impact with respect to severity. The potential impact is expected to be of medium-term duration and reversible with proper management of topsoil stockpiles, erosion control measures and rehabilitation. The potential impact on soil and land use is expected to be moderate in the unmitigated scenario and reduced to low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

### 8.7.4 LAND USE

#### Issue: Impact on existing land uses

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The land use and capability is already mining over much of the area for the changes to the infrastructure at Bakubung Platinum Mine. This will not change during the construction, operational and decommissioning phases of the proposed project. Adjacent land uses, such as agriculture could potentially be affected by the new tailings pipeline during all project phases.

At this stage it is anticipated that the surface infrastructure would be removed upon decommissioning, with the possible exception of any waste rock that cannot be sold as aggregate. The remaining material will be appropriately rehabilitated and vegetated. Most of the project area would be returned to an agricultural land use after mine closure.

The incremental impact of changing land use of the tailings pipeline route to mining for the medium-term is expected to be moderate and reversible with proper rehabilitation. The significance of the impact is expected to be moderate in the unmitigated scenario and reduce to low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

**8.7.5 TRAFFIC****Issue: Disturbance of roads by project-related traffic**Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

There is likely to be an increase in traffic on local roads during the construction, operation and decommissioning phases of the project to change the infrastructure at the mine. The incremental increase as a result of the infrastructure changes to severity is therefore rated as low and the spatial scale limited. The traffic impact is fully reversible and will cease upon closure of the mine. The site access road has already been approved as part of the mining right and therefore no alternatives are considered. The significance of the impact is expected to be moderate in the unmitigated scenario and reduce to low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

**8.7.6 BLASTING****Issue: Blasting-related impacts**Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

### Discussion

Blasting may be required for the changes to the mine infrastructure, but this is unlikely. Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the operation. Blast hazards include ground vibration, airblast, fly rock, blast fumes and dust. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. Airblasts result from the pressure released during the blast resulting in an air pressure pulse (wave), which travels away from the source and has the potential to damage surrounding structures. Fly rock is the release of pieces of rock over a distance and can be harmful to people and animals and damage structures and property. Blast fumes and dust, caused by the explosion, can be considered significant nuisance factors. Ground vibrations and airblasts have the potential to cause nuisance to people and animals even if blasts occur within legal limits.

The potential impact is unlikely to occur, but could have a high severity in the case of serious injury or death and this would be long-term or permanent. The spatial scale may extend beyond the mine boundaries. The probability of injury to third party or damage to third party infrastructure is considered to be low in the unmitigated scenario. The overall significance is expected to be low in the unmitigated scenario and remain low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

#### 8.7.7 BIODIVERSITY

##### **Issue: Loss or disturbance of natural vegetation and animal life**

##### Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

### Discussion

The proposed activities associated with the project will damage or disturb natural flora, fauna and related ecosystem functionality. According to the Mining and Biodiversity Guideline (DEA *et al*, 2013), the mine plant project area falls within the highest and high biodiversity categories and the TSF site falls within the high biodiversity categories. These are described below:

- Highest biodiversity areas are generally areas with critically endangered ecosystems, critical biodiversity areas (CBAs), river and wetland freshwater ecosystem priority areas (FEPAs) and 1km buffer zone around these areas, and RAMSAR sites. The implication for mining proposed projects is that environmental assessments should focus on confirming the presence and significance of the biodiversity features and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision making.
- High biodiversity areas generally comprise protected area buffer zones, transfrontier conservation areas, other identified areas from provincial spatial biodiversity plans, high water yield areas. The



implication for mining proposed projects is that environmental assessment should include an assessment of the optimum, sustainable land use and determine the impacts on biodiversity.

There are three wetlands listed as freshwater ecosystem priority areas (FEPAs) according to the SANBI Wetland Inventory (2006) and the National Freshwater Ecosystem Priority Areas (NFEPA) (2011), two near the Mine Housing Phase 1 and one near the edge of the Farm Mimosa. A wetland study will need to be conducted to ground truth these wetlands being FEPA wetlands.

There are no SANBI listed National Protected Area Expansion Strategy (NPAES) areas within or surrounding the project area.

Based on the findings of the specialist studies in the previous EIA, the site can thus be considered to be of medium biodiversity conservation importance. However, it should be noted that mining has already been approved on site. The expansion of the infrastructure as proposed has the potential to further impact biodiversity. The selection of a tailings pipeline route will also change the biodiversity impact of the project.

As the tailings pipeline will cross watercourses and wetland areas, it is considered to have the largest potential impact on biodiversity. The other changes to the mine infrastructure will impact biodiversity to a lesser extent as they will avoid watercourses and other environmentally sensitive areas.

#### Option 1 A - Northern Tailings Pipeline Route

This route crosses over two tributaries of the Elands River. These crossings are very wide, making this crossing of the flood plain approximately 400m wide. Thus there would be an approximately 400m long section of tailings pipeline which could pollute water and affect biodiversity if a leak occurred. The construction of the pipeline through the width of the floodplain will also disturb the biodiversity of this sensitive area. The potential impact is therefore rated as having a high severity, high spatial scale and moderate probability. Impacts on biodiversity should be largely reversible with proper rehabilitation. The overall significance of the potential impact is rated as high in the unmitigated scenario and moderate in the mitigated scenario.

#### Option 1 B - Central Tailings Pipeline Route

This route crosses over one tributary of the Elands River with a narrower floodplain than Option 1 A. This crossing of the flood plain is approximately 40m wide. Thus there would be an approximately 40m long section of tailings pipeline which could pollute water and affect biodiversity if a leak occurred. The construction of the pipeline through the width of the floodplain will also disturb the biodiversity of this sensitive area. The potential impact is therefore rated as having a high severity, medium spatial scale and moderate probability. Impacts on biodiversity should be largely reversible with proper rehabilitation. The overall significance of the potential impact is rated as moderate in the unmitigated scenario and moderate/low in the mitigated scenario.

Option 2 - Southern Tailings Pipeline Route

This route crosses over the Elands River at two separate points. Each river crossing is approximately 120m wide. Thus there would be an approximately 240m long section of tailings pipeline which would damage biodiversity during construction and could pollute water and affect biodiversity if a leak occurred. The potential impact is therefore rated as also having a high severity, medium spatial scale and moderate probability. Impacts on biodiversity should be largely reversible with proper rehabilitation. The overall significance of the potential impact is rated as moderate in the unmitigated scenario and moderate/low in the mitigated scenario.

Thus the northern tailings pipeline route Option 1 A will have the highest level of biodiversity impact.

8.7.8 HYDROLOGY (SURFACE WATER)

**Issue: Altering drainage patterns**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Some of the changes to infrastructure will encroach into watercourses. The potential impacts are expected to include possible erosion, diversion of watercourses and increased runoff through the placement of infrastructure. The severity of the impact could be high/moderate. Mining has already been approved at the site, though the spatial scale of the impact will increase with the changes to infrastructure. The spatial scale would extend beyond the mine area and probability is definite. The impact would be for the life of the mine and proper rehabilitation should reverse most drainage pattern impacts. The incremental increase as a result of the infrastructure changes is expected to have an overall significance of high/moderate in the unmitigated phase and moderate/low with mitigation such as the construction of the planned erosion control measures. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives as they are all likely to impact on drainage patterns in a similar way.

**Issue: Contamination of Surface Water**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Projects of this nature will generally present a number of pollution sources that can have a negative impact on surface water quality if unmanaged. The following pollution sources may exist: fuel and lubricants, sewage, mine residue (waste rock, tailings, screenings, stockpiles), dirty water circuit, chemicals, non-mineralised waste (hazardous, general), and erosion of particles from exposed soils in the form of suspended solids. Mining has however already been approved. The incremental impact of the infrastructure

changes are expected to have a high severity, medium spatial scale in the event pollution leaves the mine boundaries and the probability is moderate. The overall significance is expected to be high/moderate in the unmitigated scenario and reduce to moderate/low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure. The selection of a tailings pipeline route will also change the surface water contamination impact of the project.

#### Option 1 A - Northern Tailings Pipeline Route

This route crosses over the wide flood plain of two tributaries of the Elands River - approximately 400m long. Thus there would be an approximately 400m long section of tailings pipeline which could pollute water resources if a leak occurred, and siltation of the watercourses could occur during construction. The potential impact is therefore rated as having a high severity, high spatial scale and moderate probability. The overall significance of the potential impact is rated as high in the unmitigated scenario and moderate in the mitigated scenario.

#### Option 1 B - Central Tailings Pipeline Route

This route crosses over the flood plain of one tributary of the Elands River - approximately 40m long. Thus there would be an approximately 40m long section of tailings pipeline which could pollute water resources if a leak occurred, and siltation of the watercourses could occur during construction. The potential impact is therefore rated as having a high severity, medium spatial scale and moderate probability. The overall significance of the potential impact is rated as medium in the unmitigated scenario and moderate/low in the mitigated scenario.

#### Option 2 - Southern Tailings Pipeline Route

This route crosses over the Elands River at two separate points, each approximately 120m wide. Thus there would be an approximately 240m long section of tailings pipeline which could pollute water resources if a leak occurred, and siltation of the watercourses could occur during construction. The potential impact is therefore rated as having a high severity, medium spatial scale and moderate probability. The overall significance of the potential impact is rated as moderate in the unmitigated scenario and moderate/low in the mitigated scenario.

Thus the northern tailings pipeline route Option 1 A will have the highest level of surface water impact.

### 8.7.9 GROUNDWATER

#### **Issue: Reducing groundwater levels and availability**

##### Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining has already been approved and the changes to infrastructure are unlikely to change the existing groundwater level impacts. The overall significance of this potential impact for the changes to the infrastructure is expected to be low in the unmitigated scenario and remain low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

**Issue: Contamination of groundwater**Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Groundwater could become contaminated through the incorrect stockpiling of potentially polluting waste materials on the site during the construction and decommissioning of infrastructure. Possible sources of groundwater contamination during the operational phase of the additional infrastructure include seepage from an incorrectly designed TSF, accidental spills and leaks, seepage from blasting residues and exposure of groundwater to exposed rock, and seepage from the waste rock dump. After site rehabilitation, seepage from the waste rock dump may impact on groundwater quality, which may remain for an extended period. However mining has already been approved. The incremental impact of the changes to infrastructure on severity is expected to be moderate with a medium spatial scale and moderate probability. The overall significance of the impact is expected to be moderate in the unmitigated scenario and low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

**8.7.10 AIR QUALITY****Issue: Pollution from emissions to air**Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining and mineral processing projects present a number of air pollution sources that can have a negative impact on ambient air quality and surrounding land uses. Site establishment of the infrastructure changes with the removal of vegetation and topsoil may generate dust (both nuisance dust and inhalable dust) and construction vehicles and equipment will emit exhaust fumes. The construction of a larger TSF could increase the potential dust impacts of the TSF. This could have a negative impact on ambient air quality and downwind communities/land uses and could result in down-stream health impacts for nearby receptors if unmanaged. Mining has however already been approved. The changes in infrastructure (particularly the increased TSF) are likely to increase the level of dust and could result in an impact of high severity, medium

duration and medium spatial scale. The incremental increase as a result of the infrastructure changes is expected to have an overall significance of high/moderate as the nearest human receptors are close to the dust source, and moderate/low in the mitigated scenario if dust is effectively suppressed. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

#### 8.7.11 NOISE

##### **Issue: Increase in disturbing noise levels**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

##### Discussion

Site clearing activities and vehicle movements on site will increase the ambient noise levels in the immediate vicinity during the construction phase. Approved mining activities are however already expected to generate noise and the incremental increase as a result of the infrastructure changes are also expected to be high/moderate. This is mainly due to the change in the location of the ore crusher which is now planned to be above ground instead of below ground as was originally planned. The duration will be limited to the life of mine and the impact is fully reversible. The incremental increase as a result of the infrastructure changes is expected to have an overall significance of high/moderate in the unmitigated scenario and moderate/low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

#### 8.7.12 VISUAL ASPECTS

##### **Issue: Negative visual impacts**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

##### Discussion

The construction, operation and decommissioning of the mine and associated surface infrastructure will alter the visual character of the project area. The waste rock dumps and TSF will remain in perpetuity and will therefore result in visual intrusion after mine closure. The area is considered to have high scenic value due to the presence of the Pilanesberg Game Reserve and Sun City, and has eco-tourism value which is sensitive to visual intrusion. It must however be noted that mining has already been approved and will result in visual impacts. The incremental increase as a result of the infrastructure changes is expected to be high/moderate. The duration will be long term however with proper mitigation (rehabilitation of the waste rock dump) the visual impacts can be minimised. The overall significance is expected to be moderate/low in the unmitigated scenario and moderate/low in the mitigated scenario. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

### 8.7.13 HERITAGE RESOURCES

#### Issue: Loss of or damage to heritage and/or paleontological resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

The heritage study for the approved mining permit application found some heritage resources on site. A specialist study will be conducted on the wider project area to locate additional heritage resources and assess the impact of the infrastructure changes. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives as the heritage study has not yet been conducted on the routes.

### 8.7.14 SOCIO-ECONOMIC ISSUES

#### Issue: Positive and negative impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

The proposed project could have positive and/or negative impacts on the following:

- Some additional employment for local communities,
- Some stimulation of the local economy,
- Increase in traffic on the local roads,
- Influx of people into the area in search of work, leading to informal settlements and associated problems of crime, disease, and social disruption,
- Increased pressure on housing and related services (water, power, sanitation, rubbish removal, schooling),
- Reduced quality of life for surrounding landowners,
- Possible reduced property values.

Mining has already been approved. The incremental positive and negative impacts may therefore be of limited severity and spatial scale and moderate probability. The overall significance is expected to be moderate in the unmitigated scenario and low in the mitigated scenario for negative impacts. The positive economic impacts may remain moderate with mitigation measures designed to enhance these positive impacts. This assessment applies to the changes to the mine infrastructure and all three tailings pipeline route alternatives.

### 8.8 POSSIBLE MITIGATION MEASURES AND THE LEVEL OF RESIDUAL RISK

The table below provides a list of the prominent impacts identified by the EAP or raised by interested and affected parties, as well as the possible management and mitigation measures. The level of residual risk after management or mitigation is also estimated. This will be refined during the EIA phase with specialist input as appropriate.

**TABLE 8-1: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK**

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<b>Changes to infrastructure at the Bakubung Platinum Mine including:</b>  • Larger tailings dam	Loss of mineral resources	Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Infrastructure could potentially be relocated if the location is found to cause the potential sterilisation of mineral resources.</li> </ul>	Low
	Hazardous excavations/ structures	Objective: prevent physical harm to third parties and animals from hazardous excavations and infrastructure.  Conceptual mitigation measures include: <ul style="list-style-type: none"> <li>• Access control, barriers and warning signs at hazardous areas</li> <li>• Design, operate and rehabilitate the residue facilities in a manner to address stability related safety risks to third parties and animals</li> <li>• Monitoring and maintenance post closure to observe whether the relevant long-term safety objectives have been achieved and to identify the need for additional intervention where the objectives have not been met</li> <li>• Where Wesizwe has caused injury or death to third parties and/or animals, appropriate compensation will be provided.</li> </ul>	Low
	Loss of soil resources and land capability	Objective: prevent pollution of soils through accidental spills and/or leaks from equipment.  Conceptual mitigation measures to prevent pollution include: <ul style="list-style-type: none"> <li>• Basic infrastructure design that is adequate to contain polluting substances</li> </ul>	Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>Increase in the capacity of the concentrator plant</li> </ul>	through contamination	<ul style="list-style-type: none"> <li>Training of workers to prevent pollution</li> <li>Equipment and vehicle maintenance</li> <li>Fast and effective clean-up of spills</li> <li>Effective waste management.</li> </ul>	
<ul style="list-style-type: none"> <li>Increased capacity of the mine product stockpiles</li> </ul>	Loss of soil resources and land capability through physical disturbance	<p>Objective: minimise the loss of soil resources and related functionality through physical disturbance, erosion and compaction.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit site clearance</li> <li>Develop and implement a soil management plan that addresses soil stripping, stockpiling and use for rehabilitation.</li> </ul>	Low
<ul style="list-style-type: none"> <li>Relocation of the ore crusher from underground to the surface</li> </ul>	Physical destruction of biodiversity	<p>Objective: prevent the unacceptable loss of biodiversity and related ecosystem functionality through physical destruction.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit site clearance</li> <li>Develop a site clearance plan which addresses delineation of the area to be cleared, relocation of any protected species or species of concern with relevant approvals and rehabilitation of areas no longer in use</li> <li>Avoid sensitive areas as far as practically possible</li> <li>Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> <li>Consider selecting the tailings pipeline route Option 1 B or 2.</li> </ul>	Moderate/Low
	General disturbance of biodiversity	<p>Objective: prevent unacceptable disturbance of biodiversity and related ecosystem functionality.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Worker training on the value of biodiversity</li> </ul>	Moderate/Low



ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>Inclusion of the minerals in the waste rock into the mining licence</li> </ul>		<ul style="list-style-type: none"> <li>Zero tolerance for harming and harvesting fauna and flora</li> <li>Limit light and noise disturbance as far as practically possible</li> <li>Effective waste management and pollution prevention</li> <li>Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> <li>Consider selecting the tailings pipeline route Option 1 B or 2.</li> </ul>	
<ul style="list-style-type: none"> <li>Construction of erosion control measures</li> </ul>	Alteration of drainage patterns	<p>Objective: minimise the disturbance of streams and surface drainage patterns and a reduction in flow to downstream users.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit activities and infrastructure within wetland and watercourse floodlines.</li> <li>Construct erosion control measures.</li> <li>Develop and implement a stormwater management plan to divert clean water away from the site and manage dirty water runoff. Contain all contaminated water in accordance with GN R704</li> <li>Effective rehabilitation to as close to pre-mining conditions as practically possible.</li> </ul>	Moderate/Low
<ul style="list-style-type: none"> <li>Storage and handling of dangerous goods</li> </ul>	Pollution of surface and groundwater resources	<p>Objective: prevent pollution of surface water resources and impacts on other surface water users.</p> <p>Conceptual mitigation measures to prevent pollution include:</p> <ul style="list-style-type: none"> <li>Operate the mine as a zero point source discharge facility i.e. contain and re-use contaminated water</li> <li>Basic infrastructure design that is adequate to contain polluting substances</li> <li>Training of workers to prevent pollution</li> <li>Equipment and vehicle maintenance</li> <li>Fast and effective clean-up of spills</li> <li>Effective waste management</li> </ul>	Moderate/Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
<ul style="list-style-type: none"> <li>Pipeline and road crossings over watercourses</li> </ul>		<ul style="list-style-type: none"> <li>Manage clean and dirty water in accordance with GN R704</li> <li>Conduct water monitoring and implement remedial actions as required</li> <li>Effective rehabilitation of residue facility and the overall site.</li> <li>Select the southern tailings pipeline route.</li> </ul>	
<ul style="list-style-type: none"> <li>Sewage and water pipelines</li> </ul>	Air pollution	<p>Objective: reduce dust and gaseous impacts during all project phases.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit disturbed areas</li> <li>Suppress dust effectively on unpaved roads and at material transfer points as required</li> <li>Monitor dust fallout and implement additional mitigation as required</li> <li>Maintain vehicles and equipment in good working order.</li> </ul>	Moderate/Low
<ul style="list-style-type: none"> <li>Internal mine roads</li> </ul>	Noise pollution	<p>Objective: prevent an unacceptable increase in disturbing noise and limit nuisance noise at sensitive receptors as far as practically possible.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Maintain vehicles and equipment in good working order.</li> <li>Conduct noise monitoring in the event of receiving a complaint and implement remedial action to reduce impact if necessary.</li> </ul>	Moderate/Low
<ul style="list-style-type: none"> <li>Ventilation</li> </ul>	Negative landscape and visual impacts	<p>Objective: limit negative visual impact.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit disturbed areas.</li> <li>Suppress dust to prevent a visual dust cloud.</li> <li>Rehabilitate areas no longer in use.</li> <li>Effective waste management.</li> </ul>	Moderate/Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
shafts and raise boreholes		<ul style="list-style-type: none"> <li>Implement effective use of lighting which reduces light spill.</li> <li>Effective rehabilitation of the overall site and residue facility.</li> </ul>	
• Generators or possibly a solar power plant	Loss of current land uses	<p>Objective: prevent unacceptable negative impacts on surrounding land uses.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Effectively manage noise, dust, surface and groundwater quality, social impacts and visual impacts</li> <li>Effective rehabilitation of the overall site and residue facilities for post closure land use.</li> </ul>	Low
	Project-related road use and traffic	<p>Objective: prevent injury to third parties or animals as a result of traffic accidents.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Educate employees (temporary and permanent) about road safety.</li> <li>Enforce strict vehicle speeds along the linear services corridors.</li> <li>If a person or animal is injured by transport activities this will be handled in accordance with the Wesizwe emergency response procedure to be developed.</li> </ul>	Low
• Phase 1a of the Mine Housing	Destruction and disturbance of heritage (including cultural) and paleontological resources	<p>Objective: prevent the loss of heritage (including cultural) resources that may be caused by the proposed mining activities.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Limit the area of disturbance as far as practically possible.</li> <li>Training of workers about the heritage and cultural sites that may be encountered and about the need to conserve these.</li> <li>Develop and implement a chance find emergency procedure.</li> </ul>	Moderate/Low
• Salvage yard • Pollution	Economic impact (positive impact)	<p>Objective: enhance positive and minimise negative economic impacts.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>Employ local people and procure goods and services locally as far as practically possible.</li> <li>Ensure that closure planning considerations address the re-skilling of employees for the</li> </ul>	Moderate/Low

ACTIVITY	POTENTIAL IMPACT	POSSIBLE MITIGATION OR ALTERNATIVES	IMPACT SIGNIFICANCE After Mitigation or Alternative (Residual Risk)
control dams		downscaling, early closure and long-term closure scenarios.	
	Inward migration impact	<p>Objective: minimise inward migration and the associated secondary impacts.</p> <p>Conceptual mitigation measures include:</p> <ul style="list-style-type: none"> <li>• Effective communication with local communities to manage expectations with regard to employment and other opportunities.</li> <li>• Implement mechanisms to ensure workers find formalised accommodation that is adequately serviced.</li> <li>• Worker training on health and safety related issues.</li> </ul>	Moderate/Low

## 8.9 OUTCOME OF THE SITE SELECTION

As discussed in section 8, three tailings pipeline route options were considered (refer to Figure 8.1). All three of the route alternatives aim to minimise the overall length of the pipeline and limit river and stream crossings. Most environmental conditions are expected to be similar for all three route alternatives. However, the central (option 1 B) and southern (option 2) routes are preferred because they cross 40m and 240m of river/stream area respectively, whereas the northern route crosses 400m of stream/wetland area. The northern route thus has the greatest potential to negatively impact biodiversity and cause surface water pollution.

## 8.10 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

As the Bakubung Platinum Mine has already been authorised and is already under construction, the potential alternatives are limited. Many of the proposed changes to infrastructure at the mine are expansions to authorised structures and thus the location will not change. The location of new structures is also based on the location of already approved structures e.g. the additional mine housing is planned to be adjacent to the approved mine housing; and the diesel store will be within the approved mine shaft and crusher area. The only feasible locality alternatives relate to the tailings pipeline route and these were considered above.

## 8.11 THE PREFERRED ALTERNATIVES

At the scoping level, the central (option 1 B) and southern (option 2) tailings pipeline routes appear to be the alternatives which will result in the lowest environmental impact. However, the final layout of the proposed changes to infrastructure at the Bakubung Platinum Mine will be informed by the outcomes of specialist studies, further consultation with interested and affected parties as well as environmental authorities. One of the landowners along route option 2 has denied Wesizwe access, making this option unfeasible.

Technical issues, land ownership and cost implications will also need to be taken into consideration when assessing the alternatives in greater detail during the EIA phase.

## 9 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

The main objectives of the EIA phase will be to:

- Assess the potential cultural, heritage, socio-economic and biophysical impacts of the project
- Identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts
- Liaise with IAPs including relevant government departments on issues relating to the project to ensure compliance with existing guidelines and regulations
- Undertake consultations with IAPs and provide them with an opportunity to review and comment on the outcomes of the environmental assessment process and acceptability of mitigation measures
- Develop an environmental management programme and a conceptual closure/decommissioning plan
- Provide measures for ongoing monitoring (including environmental audits) to ensure that the project plan and proposed mitigation measures are implemented as outlined in the detailed EIA and EMPr.

This chapter describes the nature and extent of further investigations to be conducted by SLR in the Environmental Impact Assessment, and sets out the proposed approach to the EIA and EMPr phase.

### 9.1 ALTERNATIVES TO BE CONSIDERED

The project location is already set for the plant area and the TSF as it has already been approved as part of the 2008 EIA that was conducted. Therefore no location alternatives can be considered. The only alternative that can be considered is the location of the TSF pipeline which forms part of this project. This will be assessed in detail as part of the EIA.

The no-go option of not implementing the proposed changes will also be assessed in the EIA and will be evaluated against the option to go ahead with the proposed changes.

### 9.2 ASPECTS TO BE ASSESSED

This section lists the environmental aspects that will be considered and investigated in the Environmental Impact Assessment phase.

#### 9.2.1 GEOLOGY

It is proposed that no specialist investigations are required. The assessment and detailed management measures will be provided in the EIA and EMPr by SLR.

#### 9.2.2 TOPOGRAPHY

It is proposed that no specialist investigations are required. The assessment and detailed management

measures will be provided in the EIA and EMP report by SLR.

### **9.2.3 PALEONTOLOGICAL RESOURCES**

It is proposed that no further investigations are required. The assessment and detailed management measures will be provided in the EIA and EMPr by SLR.

### **9.2.4 VISUAL**

It is proposed that no further investigations are required. The assessment and detailed management measures will be provided in the EIA and EMPr by SLR.

### **9.2.5 ECONOMIC ASSESSMENT**

It is proposed that no further investigations are required. The assessment and detailed management measures will be provided in the EIA and EMPr by SLR.

## **9.3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS**

This section describes the nature and extent of specialist investigations required in the Environmental Impact Assessment, and sets out the proposed approach to the EIA and EMP phase.

### **9.3.1 HYDROGEOLOGY**

The groundwater detailed investigation will address dewatering and pollution aspects. The investigation will include the following tasks:

- Representative samples will be taken of the overburden (waste rock) and the tailings for geochemical assessment and waste characterisation. This assessment will determine if the samples have the potential to generate acid when exposed to water and oxygen and the leaching of salts and metals;
- Update the hydrocensus information and conduct surface and groundwater quality sampling;
- Develop a conceptual model;
- Model the potential pollution dispersions of the project changes;
- Assess the significance of dewatering and contamination impacts; and
- Provide input, together with SLR and the technical project team into groundwater management measures going forward.

### **9.3.2 BIODIVERSITY**

This study will include the following tasks:

- Identify and map terrestrial and aquatic habitat types in the project area in the wet season and compare to the survey conducted in 2007;

- Rank each habitat type based on conservation importance and ecological sensitivity;
- Assess the significance of biodiversity impacts; and
- Provide input, together with SLR and the technical project team into biodiversity management measures going forward.

### 9.3.3 HYDROLOGY

This study will include the following tasks:

- Conducting a flood study on the four watercourses in the vicinity of the project, namely the Elands River and its three tributaries (Sandspruit, Matlhogaabone and an unnamed tributary which flows from north to south along the east of the shaft and plant area);
- Peak flows and flood volumes will be calculated;
- Flood levels will be estimated and floodlines mapped for 1:50 and 1:100 year flood events.

### 9.3.4 AIR QUALITY

This study will include the following tasks:

- Establish an air emissions inventory for the new/changed emission sources;
- Modelling dispersions;
- Assess the significance of air quality impacts;
- Provide input, together with SLR and the technical project team into air quality management; measures going forward; and
- Re-assess the potential impacts on air quality, taking into account the relevant management and mitigation measures.

### 9.3.5 NOISE

This study will include the following tasks:

- Conduct measurements to determine updated baseline ambient noise levels at selected reference points;
- Develop a model to simulate the emission and atmospheric propagation of noise from the proposed operation;
- Evaluate the noise impact of the project changes in terms of the criteria and guidelines of SANS 10103 and the applicable noise regulations; and
- Provide input, together with SLR and the technical project team into noise management measures going forward.

### 9.3.6 HERITAGE

This study will include the following tasks:



- Identify and map (through literature review and field work) all archaeological, cultural and heritage resources in the proposed project area
- Determine the significance of the identified resources
- Assess the impact of the proposed project on the heritage resources
- Provide input, together with SLR and the technical project team into heritage resources management measures going forward
- Re-assess the potential impacts on heritage resources, taking into account the relevant management and mitigation measures.

### **9.3.7 SOIL, LAND USE AND LAND CAPABILITY**

This study will include the following tasks:

- Identify and map (through literature review and field work) soil types in the proposed project area;
- Describe key properties of the representative soil forms must be in terms of the Taxonomical Soil Classification System of South Africa;
- Define the land use of the project area;
- Determine the land capability;
- Assess the impact of the proposed project on soils and land capability;
- Provide input, together with SLR and the technical project team into soil resources management measures going forward; and
- Re-assess the potential impacts on soil and land capability, taking into account the relevant management and mitigation measures.

### **9.3.8 SOCIAL IMPACT ASSESSMENT**

This study will include the following tasks:

- Characterisation of the baseline environment through census data and identification of receptors;
- Identify the existing social issues in the vicinity of the project;
- Assess the impact of the proposed project on the social environment;
- Provide input, together with SLR and the technical project team into social management measures going forward; and
- Re-assess the potential social impacts, taking into account the relevant management and mitigation measures.

## **9.4 METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS**

A description of the method that will be used during the EIA phase to assess the environmental aspects including project alternatives is provided in Section 8-6.

## 9.5 METHOD OF ASSESSING IMPACT SIGNIFICANCE

The proposed method for the assessment of environmental issues is set out in the Table below. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

**TABLE 9-1: CRITERIA FOR ASSESSING IMPACTS**

*Note: Part A provides the definition for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.*

<b>PART A: DEFINITION AND CRITERIA*</b>		
<b>Definition of SIGNIFICANCE</b>	<b>Significance = consequence x probability</b>	
<b>Definition of CONSEQUENCE</b>	<b>Consequence is a function of severity, spatial extent and duration</b>	
<b>Criteria for ranking of the SEVERITY of environmental impacts</b>	<b>H</b>	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	<b>M</b>	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	<b>L</b>	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>L+</b>	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>M+</b>	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	<b>H+</b>	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
<b>Criteria for ranking the DURATION of impacts</b>	<b>L</b>	Quickly reversible. Less than the project life. Short term
	<b>M</b>	Reversible over time. Life of the project. Medium term
	<b>H</b>	Permanent. Beyond closure. Long term.
<b>Criteria for ranking the SPATIAL SCALE of impacts</b>	<b>L</b>	Localised - Within the site boundary.
	<b>M</b>	Fairly widespread – Beyond the site boundary. Local
	<b>H</b>	Widespread – Far beyond site boundary. Regional/ national
<b>PART B: DETERMINING CONSEQUENCE</b>		

### SEVERITY = L

<b>DURATION</b>		<b>H</b>	<b>Medium</b>	<b>Medium</b>	<b>Medium</b>
	Long term				
	Medium term	<b>M</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
	Short term	<b>L</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>

**SEVERITY = M**

<b>DURATION</b>	Long term	<b>H</b>	<b>Medium</b>	<b>High</b>	<b>High</b>
	Medium term	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Short term	<b>L</b>	<b>Low</b>	<b>Medium</b>	<b>Medium</b>

**SEVERITY = H**

<b>DURATION</b>	Long term	<b>H</b>	<b>High</b>	<b>High</b>	<b>High</b>
	Medium term	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Short term	<b>L</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
			<b>L</b>	<b>M</b>	<b>H</b>

Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
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**SPATIAL SCALE****PART C: DETERMINING SIGNIFICANCE**

<b>PROBABILITY</b>	Definite/ Continuous	<b>H</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
<b>(of exposure to impacts)</b>	Possible/ frequent	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Unlikely/ seldom	<b>L</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
			<b>L</b>	<b>M</b>	<b>H</b>

**CONSEQUENCE****PART D: INTERPRETATION OF SIGNIFICANCE**

<b>Significance</b>	<b>Decision guideline</b>
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M= medium and L= low and + denotes a positive impact.

**9.6 CONSULTATION WITH THE COMPETENT AUTHORITY**

The draft and final EIA and EMP reports will be submitted to the DMR for review. A site visit and meeting shall be held, if requested.

**9.7 THE PUBLIC PARTICIPATION PROCESS IN THE EIA****9.7.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES**

IAPs on the project database will be provided with information in the form of summary documents and will be notified when the Scoping Report and EIA and EMP reports are available for public review via electronic

mail, post and bulk SMS. IAPs will similarly be invited to attend a public feedback meeting during the EIA phase.

### 9.7.2 DETAILS OF THE ENGAGEMENT PROCESS TO BE FOLLOWED

The stakeholder engagement process in the EIA Phase will include the following:

- Public and/or stakeholder meeting/s to give feedback on the findings of the EIA
- Collation of issues and concerns into a report for submission to the DMR
- Circulation of the EIA and EMP report (draft and final if there are material changes made to the draft report) for public review and collation of comments
- Notification of IAPs on the database on the relevant DMR decisions.

### 9.7.3 INFORMATION TO BE PROVIDED TO INTERESTED AND AFFECTED PARTIES

During the EIA Phase a summary of the findings of the EIA will be provided in English, Setswana and Zulu. In addition, the EIA and EMP report will be subjected to public review. Once the DMR has issued decisions on the applications, IAPs on the project database will be informed accordingly.

### 9.8 TASKS TO BE UNDERTAKEN DURING THE EIA

A description of the tasks that will be undertaken during the EIA phase is provided below in Table 9-2.

**TABLE 9-2: EIA TASKS AND TIMING**

Phase	EAP activity	Opportunities for Consultation and Participation		SCHEDULE
		Competent Authorities	IAPs, State Departments and Organs of State	
Scoping	Submit Final scoping report to authority	Authority to Accept scoping report OR Refuse environmental authorisation (43 days of receipt)	IAPs to comment on FSR directly to CA with copy to EAP	September – October 2015
Specialist Assessments and Input	EAP to manage specialist activities and receive inputs for EIA.			June 2015 – January 2016
EIA Phase	Assess environmental impacts. Compile draft EIA and EMP report			January 2016
	Submit draft EIA report to I&APs authorities.	Review of draft EIA report (30 days). Comments to EAP	Review of draft EIA report (30 days). Comments to EAP	February 2016
	Arrange meetings and consultations	Meetings with authorities during EIA if required.	Public Feedback Meeting. Focused consultation with I&APs or commenting authorities if required.	

Phase	EAP activity	Opportunities for Consultation and Participation		SCHEDULE
		Competent Authorities	IAPs, State Departments and Organs of State	
	Address public comment and finalise EIA and EMPr reports			February - March 2016
Authority review and Authorisation Phase	Final EIA report to Authority (106 days from acceptance of scoping).	Authority Acknowledge Receipt of EIA report (10 days).	Review of final EIA report (30 days). Comments to CA	March 2016 – July 2016
		Environmental Authorisation Granted / Refused (107 days).		
				Notifications to I&APs regarding environmental authorisation (granted or refused).
Appeal Phase	EAP to provide guidance regarding the appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations	variable

## 9.9 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS

See Table 8-6. It should be noted that this table has been compiled with the information in hand and will be refined during the EIA phase.

## 9.10 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional requests for information have been received to date.

### 9.10.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

The potential socio-economic impacts are discussed in Section 9.3.7 and will be investigated further during the EIA Phase.

### 9.10.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT

A heritage impact assessment will be conducted as outlined in Section 9.3.5.

### 9.10.3 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

None.

## 10 UNDERTAKINGS BY THE EAP

We, Shelley Seton-Rogers and Chiara D'Egidio Kotze, the Environmental Assessment Practitioners responsible for compiling this report, undertake that:

- the information provided herein is correct;
- the comments and inputs from stakeholders and I&APs has been correctly recorded;
- information and responses provided to stakeholders and I&APs by the EAP is correct; and
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.

\_\_\_\_\_  
Signatures of the EAPs

Date: 9 October 2015

\_\_\_\_\_  
Signature of Commissioner

Date: 9 October 2015

STAMP

## 11 REFERENCES

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