

# SCOPING REPORT FOR THE PROPOSED WEST WITS MINING PROJECT

Various portions of farms Glenlea 228IQ, Randglen 229IQ, Vogelstruisfontein 231IQ & 233IQ, Roodepoort 236IQ & 237IQ, Vlakfontein 238IQ, Doornkop 239IQ, Witpoortjie 245IQ, Dobsonville 386IQ, Soweto 387IQ, 641IQ, 649IQ, 663IQ, 677IQ, 710IQ, Gauteng

**MAY 2018**

**SUBMITTED AS PART OF AN APPLICATION PROCESS 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 APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002) (AS AMENDED)**

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DMR Reference No: GP30/5/1/2/2 (10068) MR

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## DOCUMENT INFORMATION

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SLR Project No	720.13087.00001

## BASIS OF REPORT

This document has been prepared by an SLR Group company with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it in accordance with the appointment from the applicant.

This document has been prepared in accordance with the Department of Mineral Resources (DMR) Scoping Report template format, and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA). Given this, SLR has included additional information in the Introduction section of the report that it deems necessary and relevant to setting the scene for the environmental impact assessment (EIA) process. In addition, this report has been compiled in line with the requirements of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and EIA regulations (2014), as amended.

The information contained in this report is relevant only to the specific project area and plan. It cannot be relied on for any other purpose or by any other person.

This report does not deal with the existing Solplaatjie mining operation as it does not form part of the EIA. The Solplaatjie operation is as a consequence of a Directive issued by the Department of Mineral Resources (DMR) and under the National Environmental Management Act (NEMA) (No 107 of 1998), for the landowner to clean up and rehabilitate the Solplaatjies area to rid it of illegal mining. In order to give effect to this NEMA Directive, the landowner appointed West Wits MLI (Proprietary) Limited to remove the easily accessible opencast ore on the land which the illegal miners exploit, removing this ore will contribute to stopping illegal mining. The Solplaatjies project has been operational under its directive since October 2016.

Information reported herein may be based on the interpretation of public domain data collected by SLR Consulting (South Africa) Pty Ltd (SLR), and/or information supplied by the applicant and/or its other advisors and associates. The data has been accepted in good faith as being accurate and valid.

This document may contain information of a specialised and/or highly technical nature and the reader is advised to seek clarification on any elements which may be unclear to it.

Due to the limited time available following the review of this report, prior to submission to the DMR, to fully analyse the comments received, only a high level analysis of the review comments will be included in the final Scoping Report with all comments attached as an appendix.

A key aspect of public consultation is the notification of landowners, occupier and users within and adjacent to the application area. It was a condition of appointment that the relevant contact information will be provided to SLR by the applicant given related time constraints. This information has not yet been provided to SLR which has related limitations. However, effort has been made to notify all stakeholders via a host of other standard industry measures.

## EXECUTIVE SUMMARY

### Introduction

West Wits MLI (Proprietary) Limited (West Wits), the applicant, is proposing to establish a mining operation in an area located south of Roodepoort and to the north of Soweto in the City of Johannesburg Metropolitan Municipality, Gauteng.

West Wits has applied for a mining right in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) for gold, uranium and silver over various portions of farms. The northern section of the project area would be crossed by the R41 (Mainreef/Randfontein) provincial road, with the R24 (Albertina Sisulu/Hamberg) provincial road running along the northern boundary of the project area.

West Wits is the South African subsidiary of West Wits Mining Limited, which is an Australian listed exploration and development company. The directors of West Wits Mining Limited include the Executive Chairman (Michael Quinert) and Non-executive Directors Hulme Scholes, Daniel Pretorius, Vincent Savage, Dr Andrew Tunks). Through its listing it is owned by a number of shareholders across the globe. West Wits is 26% empowered. The empowerment company is Lilitha Resources Proprietary Limited, previously referred to as Witpoortjie Resources Investments Proprietary Limited.

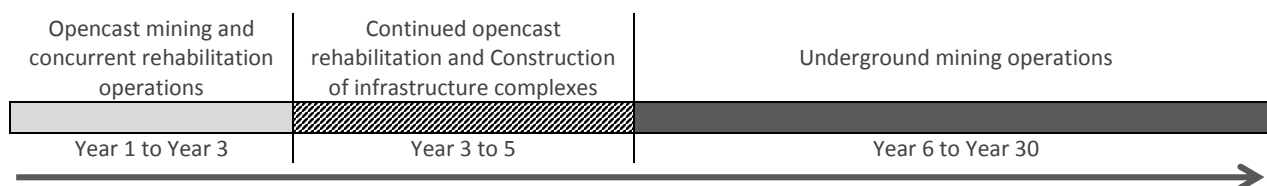
### Proposed Development

In broad terms the proposed project would involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit) and refurbishment of three existing infrastructure complexes (referred to as the Main/South Reef West Infrastructure Complex, Bird Reef Central Infrastructure Complex, Kimberley Reef East Infrastructure Complex) to access the existing underground mine workings.

The project would also include the establishment of run of mine (ROM) ore stockpiles, topsoil stockpiles and waste rock dumps as well as supporting infrastructure including material storage and handling facilities (for fuel, lubricants, general and hazardous substances), general and hazardous waste management facilities, sewage management facilities, water management infrastructure, communication and lighting facilities, centralised and satellite offices, workshops, washbays, stores, change houses, lamprooms, vent fans and security facilities.

No mineral processing will take place on site. All run-of mine material will be transported to an existing processing plant off-site.

The expected life of mine is three (3) to five (5) years for the open pit operations (inclusive of rehabilitation) and 25 years for the underground operations (see diagram below). The pits would be mined in a phased approach with each pit taking between six and 16 months to be mined and rehabilitated.



In consultation with landowners the final post closure land use will be identified during the Environmental Impact Assessment (EIA) process.

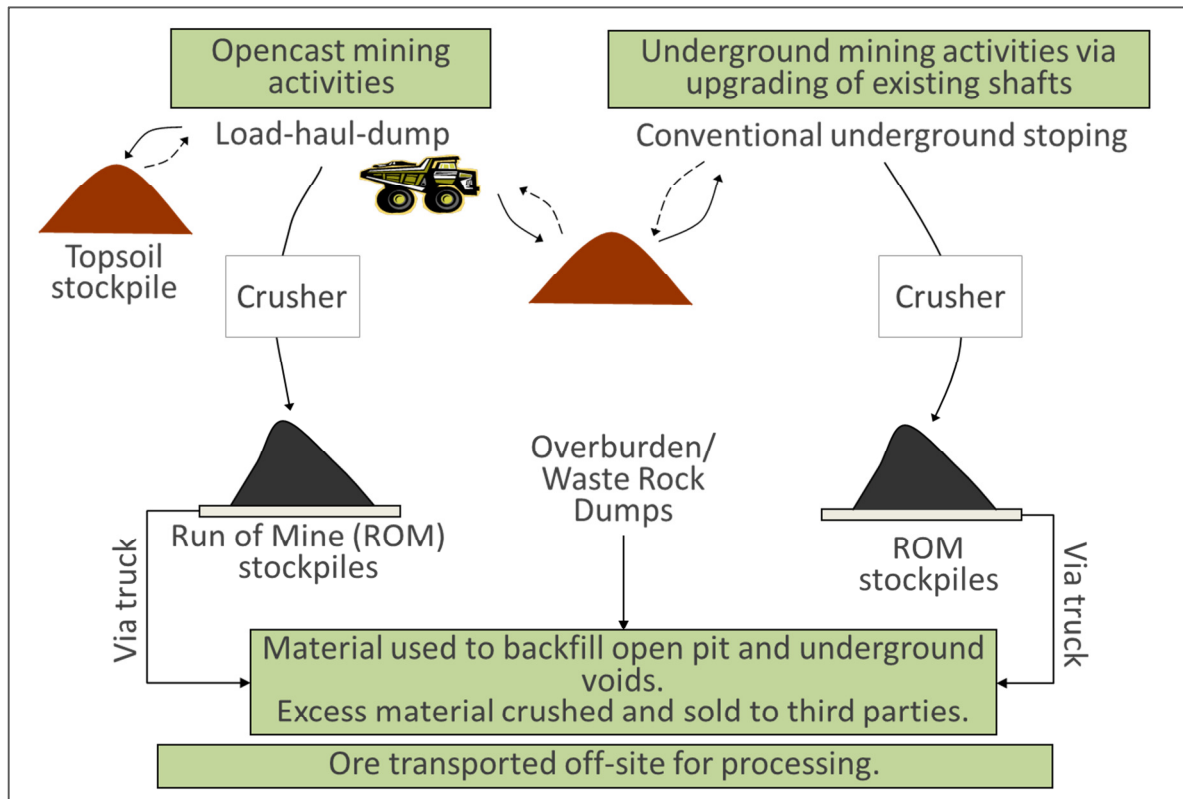


Data on the proposed opencast and underground mining operations is included in the table below.

<b>DATA ON THE PROPOSED MINING OPERATIONS</b>					
<b>Features</b>	<b>Details</b>				
Target commodities	Gold, uranium and silver				
Estimated depth of resource	0 to 1 500 m				
Mineable resource	~ 9 000 000 tonnes				
Employment	<ul style="list-style-type: none"> <li>- Opencast mining operations: Contractor would require between 40 and 50 employees.</li> <li>- Construction of surface infrastructure for underground mining operations: contractor would require between 50 and 100 staff.</li> <li>- Underground mining: ~ 500 full-time employees (at peak production)</li> </ul>				
Operating hours	<ul style="list-style-type: none"> <li>- Opencast mining activities: 5.5-day working week, one shift system per day between 06:00 to 18:00 Monday to Friday and between 06:00 to 14:00 on Saturday</li> <li>- Construction of surface infrastructure for the underground operations: 5.5-day working week, one shift per day from 07:00 to 17:00 Monday to Friday and from 07:00 to 14:00 on Saturdays.</li> <li>- Underground mining: 7-day week, three 8-hour shifts per day.</li> </ul>				
<b>Opencast mining</b>					
Open pits	<b>Kimberley East</b>	<b>11 Shaft</b>	<b>Rugby Club</b>	<b>Mona Lisa</b>	<b>Roodepoort</b>
Location	See Figure 5	See Figure 5	See Figure 5	See Figure 3	See Figure 4
Size of mining area	~ 8.2 ha	~ 20.7 ha	~ 1.6 ha	~ 3 ha	~ 23.2 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes
Pit depth	20 to 30 m	20 to 30 m	7 to 10 m	20 to 30 m	7 to 10 m
Mineable resource (tonnes)	62 917	117 631	30 212	34 351	179 290
Mining duration (including concurrent rehabilitation, season dependent)	~ 5 months	~ 8 months	~ 3 months	~ 3 months	~ 12 months
Final rehabilitation duration	~ 3 months	~ 3 months	~ 3 months	~ 3 months	~ 4 months
Waste rock dump volume	503 336 m <sup>3</sup>	1 013 436 m <sup>3</sup>	260 288 m <sup>3</sup>	295 947 m <sup>3</sup>	1 103 323 m <sup>3</sup>
Waste rock dump height	20 to 30 m	20 to 30 m	10 m	20 to 30 m	10 m
<b>Underground mining</b>					
Infrastructure complexes	<b>Main/South Reef West</b>		<b>Bird Reef Central</b>	<b>Kimberley Reef East</b>	
Location	See Figure 3		See Figure 4	See Figure 5	
Infrastructure complex size	5.3 ha		0.9 ha	3.5 ha	
Size of mining area	~ 40 ha		-	~ 100 ha	
Mining rate (per month)	30 000 tonnes		-	30 000 tonnes	
Workings depth	100 m to interception of reef (up 4 km below surface)		-	100 m to interception of reef (up 4 km below surface)	
Waste rock	All waste rock will remain in the underground workings.				



**EXAMPLE OF THE OPENCAST MINING OPERATIONS**



**CONCEPTUAL PROCESS FLOW DIAGRAM OF THE MINING OPERATIONS**

**EIA Process and Public participation Process**

Prior to the commencement of the project, an EIA regulatory process must be conducted in terms of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA), National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA).

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the EIA for the project.

The public participation process to date has included notification of interested and affected parties (I&APs) through distribution of a Background Information Document (BID), placement of newspaper advertisements, placement of site notices, distribution of flyers, radio announcements, focussed engagement and meetings with community structures and public scoping meetings.

### Potential impacts

Potential impacts that were identified during the scoping process are listed below.

Potential impact	Specialist study planned
Surface subsidence	No study planned.
Negative visual impacts	Visual specialist study
Loss of soil and land capability through removal, erosion and compaction	Soil and land capability specialist study
Loss of soil and land capability through contamination	
Physical loss and/or general disturbance of terrestrial biodiversity	Biodiversity specialist study
Loss or disturbance of aquatic ecosystems	
Reduction in surface water quantity and quality affecting third party users (radiation and non-radiation)	Surface water specialist study
Reduction in groundwater quantity and quality affecting third party users (radiation and non-radiation)	Groundwater specialist study
Decrease in air quality from project emissions (radiation and non-radiation)	Air quality specialist study
Ionising radiation	Radiation specialist study
Increase in noise levels	Noise specialist study
Blasting and vibration related impacts (air blasts, ground vibration and fly rock)	Blasting and vibration specialist study
Effect on roads due to project related traffic	Traffic specialist study
Loss of or damage to heritage and/or paleontological resources	Heritage specialist study
Positive and negative socio-economic impacts (including health)	Socio-economic specialist study
Impact on surrounding land uses	

In addition to the above, a closure cost estimate will be calculated for the project in line with the DMR's requirements.

### Conclusions

The EIA process is currently in the scoping phase. The project has the potential to impact on the biophysical, cultural and socio-economic both within and surrounding the project area. Input received during the scoping phase will allow for the meaningful assessment of all relevant biophysical, cultural and socio-economic issues. Potential impacts will be investigated by various studies to be conducted by appropriately qualified specialists. Stakeholder engagement will continue throughout the EIA process.

**Existing Solplaatjie mining operation**

A project is currently being undertaken, as a consequence of a Directive received from the Department of Mineral Resources (DMR) and under the National Environmental Management Act (NEMA) (No 107 of 1998), for the landowner to clean up and rehabilitate the Solplaatjies area to rid it of illegal mining. In order to give effect to this NEMA Directive, the landowner appointed West Wits to remove the easily accessible opencast ore on the land which the illegal miners exploit, removing this ore will stop the illegal mining. As part of this process, West Wits is obliged to concrete over access adits to the old underground workings, to also prevent access by illegal miners. This rehabilitation operation is supported by the DMR and the South African Police services (SAPS). This rehabilitation project is short term and the rehabilitated land will be used after removal of the ore which attracts the illegal miners, for a housing property development. Rehabilitation of this area pursuant to the NEMA Directive is therefore an essential requirement for the property development.

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## ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
BID	Background Information Document
DAFF	Department of Agriculture, Forestry and Fisheries
GDARD	Gauteng Department of Agriculture and Rural Development
DMR	Department of Mineral Resources
DPM	Diesel Particulate Matter
DPRT	Department of Police, Roads and Transport
DRDLR	Department of Rural Development and Land Reform
DRT	Department of Roads and Transport
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme Report
COJ	City of Johannesburg Metropolitan Municipality
GN	General Notice
GNR	General Notice Regulation
ha	Hectares
I&APs	Interested and/or affected parties
IWWMP	Integrated water and waste management plan
km	Kilometre
kV	Kilovolt
m	Meter
mamsl	Metres above mean sea level
mm	Millimetres
MPRDA	Mineral and Petroleum Resources Development Act, 2002
NEM:AQA	National Environmental Management: Air Quality Act, 2004
NEMA	National Environmental Management Act, 1998
NEM:WA	National Environmental Management: Waste Management Act, 2008
NWA	National Water Act, 1998
NGO	Non-government organisation
RoM	Run-of-mine
SACNASP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SLR	SLR Consulting (South Africa) (Pty) Ltd
SMS	Short Message Service
WML	Waste Management Licence
WULA	Water Use License Application

## A. INTRODUCTION

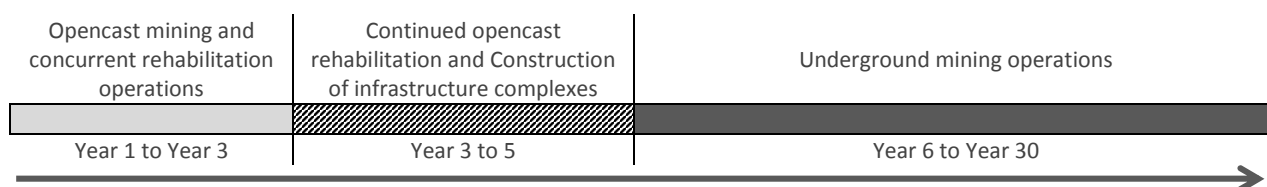
### INTRODUCTION TO THE PROPOSED PROJECT

West Wits MLI (Proprietary) Limited (West Wits) is proposing to establish a mining operation in an area located south of Roodepoort and to the north of Soweto in the City of Johannesburg Metropolitan Municipality, Gauteng. West Wits has applied for a mining right in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) for gold, uranium and silver over various portions of the farms Glen Lea 228 IQ, Perdekraal 226 IQ, Rand Glen 229 IQ, Dobsonville 386 IQ, Doornkop 239 IQ, Fleurhof Township, Roodepoort 236 IQ, Roodepoort 237 IQ, Uitval 677 IQ, Vlakfontein 233 IQ, Vlakfontein 238 IQ, Witpoortjie 245 IQ, Vogelstruisfontein 231 IQ, Vogelstruisfontein 233 IQ, Soweto 387 IQ, Klipspruit 298 IQ, Klipriviersoog 299 IQ, Durban Roodepoort Deep 641 IQ, Bram Fischerville 663 IQ, Bram Fischerville 649 IQ and Tshekisho 710 IQ. The northern section of the project area would be crossed by the R41 (Mainreef/Randfontein) provincial road, with the R24 (Albertina Sisulu/Hamberg) provincial road running along the northern boundary of the project area. The regional and local settings are illustrated in Figure 1 and Figure 2, respectively.

West Wits currently holds a prospecting right (GP 30/5/1/1/2/10035 PR) over the above farms. The prospecting right (MPT No. 29/2016) was ceded from Mintails SA Soweto Cluster (Proprietary) Limited to West Wits. Consent for the transfer of the prospecting right in terms of Section 11(2) of the MPRDA was granted by the DMR in 2018.

In broad terms the proposed project would involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit on Figure 2) and refurbishment of three existing infrastructure complexes (referred to as the Main/South Reef West Infrastructure Complex, Bird Reef Central Infrastructure Complex, Kimberley Reef East Infrastructure Complex on Figure 2) to access the existing underground mine workings. The project would also include the establishment of run of mine (ROM) ore stockpiles, topsoil stockpiles and waste rock dumps as well as supporting infrastructure including material storage and handling facilities (for fuel, lubricants, general and hazardous substances), general and hazardous waste management facilities, sewage management facilities, water management infrastructure, communication and lighting facilities, centralised and satellite offices, workshops, washbays, stores, change houses, lamprooms, vent fans and security facilities.

The expected life of mine is three (3) to five (5) years for the open pit operations (inclusive of rehabilitation) and 25 years for the underground operations (see diagram below). The pits would be mined in a phased approach with each pit taking between six and 16 months to be mined and rehabilitated.



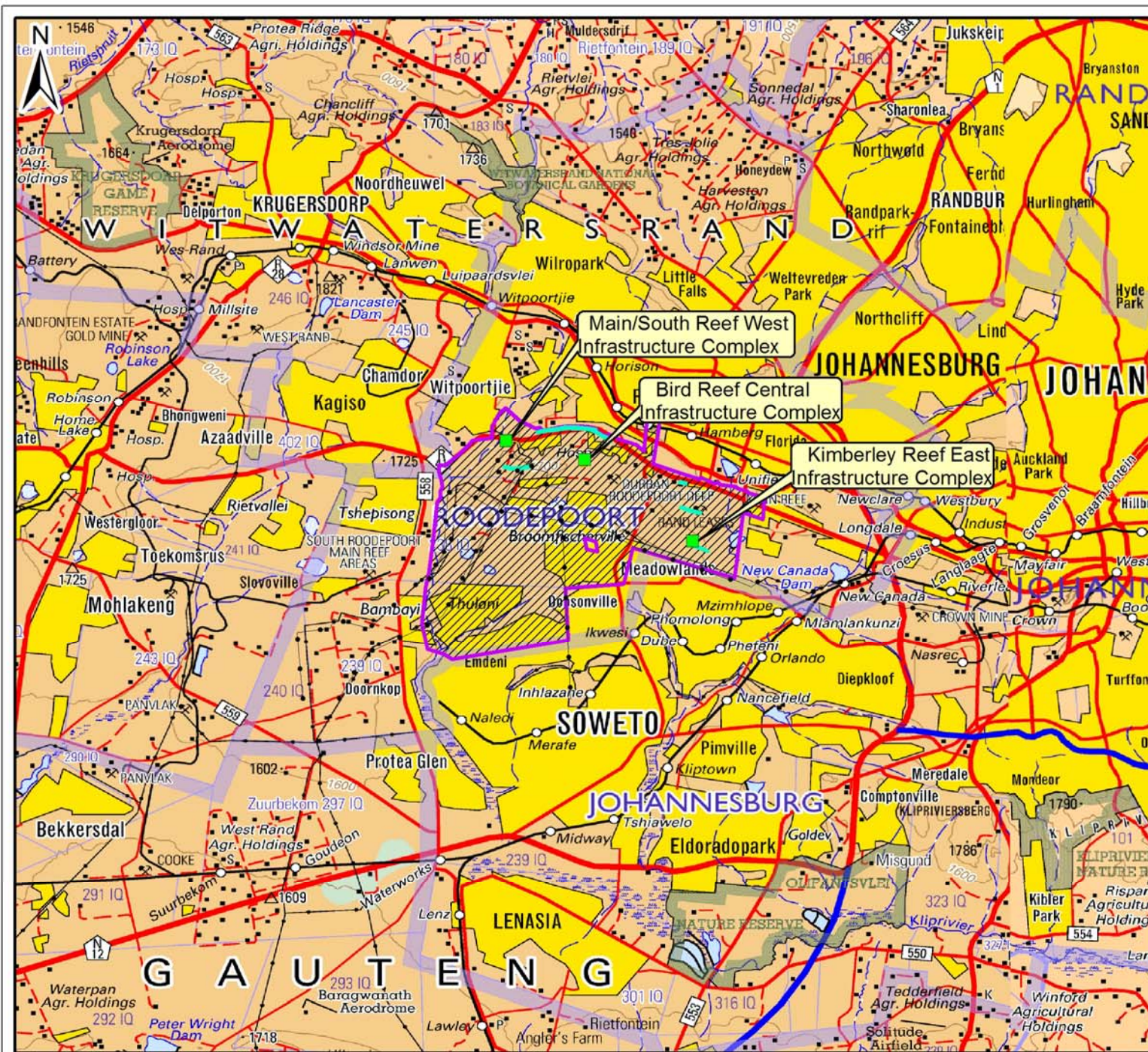
In consultation with landowners the final post closure land use will be identified during the Environmental Impact Assessment (EIA) process.

Prior to the commencement of the project, an EIA regulatory process must be conducted in terms of the MPRDA, National Environmental management Act (Act No. 107 of 1998) (NEMA) and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA).



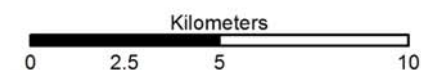
SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the EIA for the project.





## Legend

- Main Roads
- National Freeway
- Powerlines
- Railways
- Proposed Infrastructure Complexes
- Built-up Areas
- Proposed Opencast Mining Areas
- Proposed Mining Right Application Area



Scale: 1:200 000

Projection: Transverse Mercator  
Datum: WGS84

## WEST WITS MINING RIGHT

Figure 1:

## Regional Setting

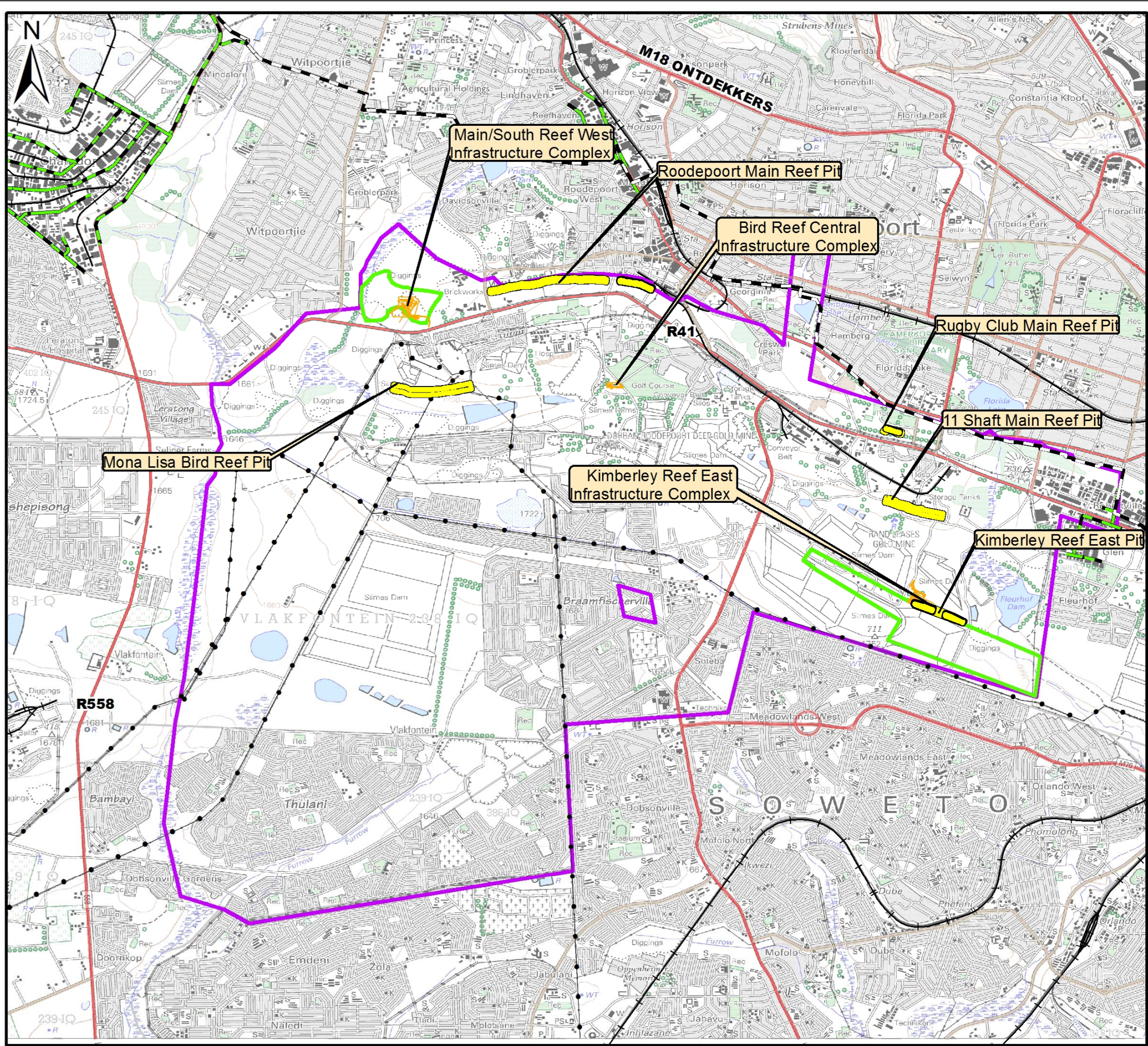


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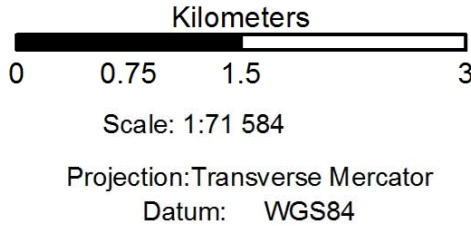
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### Legend

- Main Roads
- Secondary Road
- Powerlines
- +— Railways
- |— Transmission Pipelines
- |— Distribution Pipelines
- Proposed Infrastructure**
- Proposed Infrastructure Complexes
- Proposed Opencast Mining Areas
- Proposed Mining Right Application Area
- Extent of Proposed Underground Workings



### WEST WITS MINING RIGHT

Figure 2 / Appendix B

### Local Setting



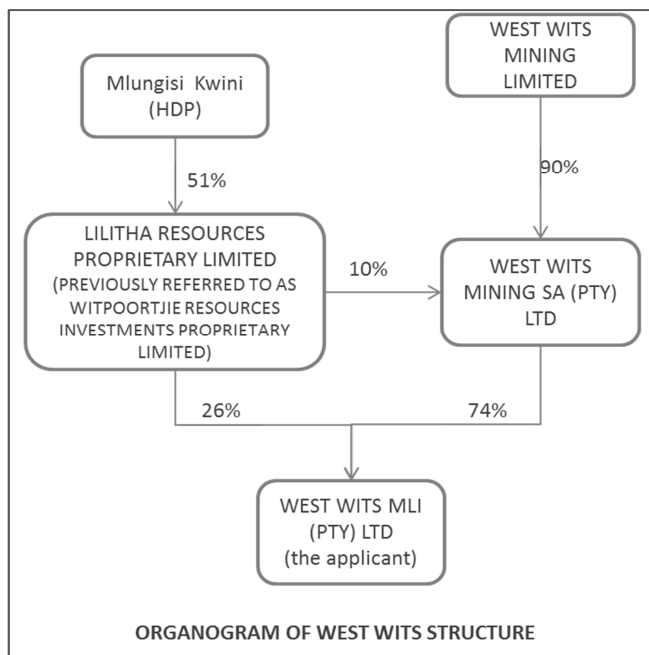
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## INTRODUCTION TO WEST WITS

West Wits Mining Limited is an Australian listed exploration and development company. The directors include the Executive Chairman (Michael Quinert) and Non-executive Directors Hulme Scholes, Daniel Pretorius, Vincent Savage, Dr Andrew Tunks). Through its listing it is owned by a number of shareholders across the globe.

The South African subsidiary of the company is West Wits MLI (Pty) Ltd (West Wits). West Wits is 26% empowered. The empowerment company is Lilitha Resources Proprietary Limited, previously referred to as Witpoortjie Resources Investments Proprietary Limited.



## SUMMARY OF ENVIRONMENTAL AUTHORISATION REQUIREMENTS

Prior to the commencement of the proposed project environmental authorisations are required from the following competent authorities:

- Environmental authorisation from the DMR in terms of the NEMA. The proposed project incorporates several activities listed in Government Notice Regulation (GNR) 983, 984 and 985 of 4 December 2014, as amended. The EIA regulations being followed in this study are GNR 982 of 4 December 2014, as amended (EIA Regulations).
- A waste management license (WML) from the DMR in terms of the NEM:WA. The proposed project incorporates waste management activities listed in GNR 921 of 29 November 2013, as amended.
- A water use license (WUL) from the Department of Water and Sanitation (DWS) in terms of the National Water Act (No. 36 of 1998) (NWA). The proposed project incorporates water uses in terms of Section 21 of the NWA.

The applicable listed activities and water uses are listed in Section 2.3 (Table 4) of this report. A mining right application and integrated NEMA and NEM:WA application were lodged by West Wits with the DMR on 9 April 2018. The WUL application will be submitted to the DWS towards the end of the EIA process.

Additional permits or licenses that may be required for the project include:

- registration of dams with a wall greater than 5 m and a capacity of 50 000 m<sup>3</sup> as safety risk dams in terms of the NWA
- registration of the sewage treatment plant and the required personnel in terms of Regulation 2834 of 27 December 1965
- approval from the relevant Department of Roads and Transport for upgrading any roads or intersections
- permit in terms of the National Heritage Act, 25 of 1999, the Ordinance on Exhumations, 12 of 1980, and/or the Human Tissues Act, 65 of 1983 if any heritage sites (including graves) are damaged or removed
- permit in terms of the National Forests Act, 84 of 1998 if any protected plant species are removed or damaged

- certificate of registration in terms of the National Nuclear Regulator Act (No. 47 of 1999) (NNR) for the handling and management of gold and uranium containing material.

This list will be refined, as may be necessary, during the course of the EIA process.

Permits or approvals in terms of health and safety regulations by West Wits fall outside the scope of the EIA process.

## INTRODUCTION TO THE ENVIRONMENTAL ASSESSMENT PROCESS

An EIA is conducted in two phases. The first is the Scoping phase and the second is the EIA phase. The objectives of the Scoping phase are in line with Chapter 4, Part 3 of the EIA Regulations (2014) as listed below. Details on the EIA phase are provided in Section 7.8 of the scoping report.

In the context of the proposed project the Scoping phase aims to:

- Identify relevant policies and legislation
- Motivate the need and desirability of the proposed project
- Identify and confirm the preferred activity, technology and site
- Identify the key issues to be addressed in the EIA phase
- Determine the level of assessment (including specialist investigations) and public participation required
- Identify suitable measures to enhance positive impacts and avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The terms of reference generated for the EIA phase will enable the meaningful assessment of all relevant biophysical and socioeconomic issues.

## STRUCTURE OF THE REPORT

This document has been prepared in accordance with the DMR Scoping Report template format, and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the MPRDA. In addition, this report complies with the requirements of the NEMA and EIA regulations (2014), as amended. The table below provides a summary of the requirements, with cross references to the report sections where these requirements have been addressed.

**TABLE 1: STRUCTURING OF THE SCOPING REPORT**

Legal and Regulatory Requirement		Section of Report
As per the DMR template	As per the GNR 982, Appendix 2 (as amended)	
-	A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process:	-
The EAP who prepared the report; Expertise of the EAP.	(a) details of: (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1, Appendix A
Description of the property.	(b) the location of the activity, including: (i) The 21 digit surveyor general code of each cadastral land parcel;	Section 2, Table 3

Legal and Regulatory Requirement		Section of Report
As per the DMR template	As per the GNR 982, Appendix 2 (as amended)	
	(ii) Where available, the physical address and farm name; (iii) Where the requirement information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	
Locality plan.	(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.2, Appendix B
Description of the scope of the proposed overall activity, including listed and specified activities; Description of the activities to be undertaken.	(d) a description of the scope of the proposed activity: (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	Section 2.3
Policy and legislative context.	(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning framework and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 3
Need and desirability of the proposed activity.	(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 4
Period for which the environmental authorisation is required.	-	Section 5
Description of the process followed to reach the proposed preferred site.	(g) a full description of the process followed to reach the proposed preferred activity, , site and location of the development footprint within the site, including -	Section 6
Details of the alternatives considered.	(i) details of all the alternatives considered;	Section 6.1
Details of the public participation process followed.	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 6.2
Summary of issues raised by IAPs.	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 6.3
Environmental attributes associated with the sites.	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6.4
Impacts identified.	(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts	Section 6.5

Legal and Regulatory Requirement		Section of Report
As per the DMR template	As per the GNR 982, Appendix 2 (as amended)	
	(aa) can be reversed; (ab) may cause irreplaceable loss of resources; and (ac) can be avoided, managed or mitigated;	
Methodology used in determining the significance of environmental impacts.	(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 6.6
The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternative will have on the environment and the community that may be affected.	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6.7
The possible mitigation measures that could be applied and the level of risk.	(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 6.8
The outcome of the site selection matrix. Final site layout plan.	(ix) the outcome of the site selection matrix;	Section 6.9
Motivation where no alternative sites were considered.	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Section 6.10
Statement motivating the preferred site.	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 6.10
Plan of study for the environmental impact assess process;	(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including:	Section 6.9
Description of alternatives to be considered including the option of not going ahead with the activity	(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 7.1
A description of the aspects to be assessed as part of the environmental impact assessment process	(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 7.2
Description of aspects to be assessed by specialists.	(iii) aspects to be assessed by specialists;	Section 7.3
Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives.	(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Section 7.4
Proposed method of assessing duration significance.	(v) a description of the proposed method of assessing duration and significance;	Section 7.5
The stages at which the competent authority will be consulted.	(vi) an indication of the stages at which the competent authority will be consulted;	Section 7.6
Particulars of the public participation process with regard to the impact assessment process that will be conducted.	(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 7.7
Description of the tasks that will be undertaken during the environmental impact assessment	(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 7.8

Legal and Regulatory Requirement		Section of Report
As per the DMR template	As per the GNR 982, Appendix 2 (as amended)	
process.		
Measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 7.9
Undertaking regarding correctness of information;	(i) An undertaking under oath or affirmation by the EAP in relation to: (i) The correctness of the information provided in the report; (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 9
Undertaking regarding level of agreement.	(j) An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Section 9
Other information required by the competent authority.	(k) Where applicable, any specific information required by the competent authority; and	No request received to date.
Other matter required in terms of section 24(4)(a) and (b) of the Act.	(l) Any other matter required in terms of section 24(4)(a) and (b) of the Act.	None identified.



## 1 DETAILS OF THE EAP

### 1.1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

SLR has been appointed as the environmental assessment practitioner (EAP) in line with Part 2, Regulation 12 and 13 of the EIA Regulations (2014). The details of the EAPs that were involved in the preparation of this scoping report are provided in Table 2 below.

**TABLE 2: DETAILS OF THE EAP**

Details	Reviewer	Project Manager	Project Support
Name of practitioner	Jonathan Crowther	Marline Medallie	Alex Pheiffer, JC Pretorius and Clive Phashe
Responsibility on project	Review	EAP	Support to EAP
Tel No.:	011 467 0945		
Fax No.:	011 467 0975		
Postal address	PO Box 1596, Cramerview, 2060		
E-mail address	-	mmedallie@slrconsulting.com	apheiffer@slrconsulting.com jcpretorius@slrconsulting.com cphashe@slrconsulting.com

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

### 1.2 QUALIFICATIONS AND EXPERIENCE OF THE EAP

Jonathan Crowther has an MSc in Environmental Science, is registered professional natural scientist (Environmental Science) with the South African Council for Natural Scientific Professions (SACNASP) and is Certified EAP. He has 30 years of EIA experience. Alex Pheiffer holds an MSc degree in Environmental Management and is registered as a professional natural scientist (Environmental Science) with the SACNASP and has 15 years of relevant experience. Marline Medallie holds an MSc degree in Botany and has over 10 years of relevant experience. JC Pretorius holds an Honours Degree in Environmental Management and has over 12 years of relevant experience. Alex, Marline and JC have been involved in several impact assessments for mining developments in South Africa. Proof of registration and relevant curricula vitae of the relevant practitioners is provided in Appendix A.

## 2 PROJECT DESCRIPTION

### 2.1 PROJECT LOCALITY

A description of the property on which the proposed project would be located is provided in Table 3.

**TABLE 3: DESCRIPTION OF THE PROPERTY**

Description	Detail	
Farm Name	Glenlea 228 IQ Portion 000 Randglen 229 IQ Portion 000 Vogelstruisfontein 231 IQ Portions 004, 010, 013, 015, 017, 018, 043, 084, 107, 115, 118, 131, 137, 140, 145, 146, 149, 151, 152, 154, 157, 161, 163, 166, 168, 170, 173, 175, 177, 178, 179, 182, 184, 185, 186, 187, 188, 189, 193, 194, 195, 196, 201, 203, 204, 205, 206, 209, 210, 211, 212, 213, 214, 216, 222, 223, 224, 009, 018, 019, 020, 021, 036, 037, 038 Vogelstruisfontein 233 IQ Portions 039, 040, 041, 042, 045, 046, 051 Roodepoort 236 IQ Portion 000, 001 Roodepoort 237 IQ Portion 001, 005, 014, 019, 022, 026, 027, 037, 038, 043, 044, 087, 120, 135, 136, 137, 138, 182, 193, 196, 280, 281, 297, 389, 393, 400, 401, 403, 404, 407, 408, 409, 410, 416, 429, 473 Vlakfontein 238 IQ Portion 001, 088, 092, 093, 096 Doornkop 239 IQ Portion 001, 089, 135, 140, 141, 142, 143, 144, 145, 148, Witpoortje 245 IQ Portion 001 Dobsonville 386 IQ Portion 000, 004, 006, 013, 015, 016, 019, 020, 022 Soweto 387 IQ Portion 000, 031 Farm 641 IQ Portion 000, 001 Farm 649 IQ Portion 001, 002, 003 Farm 663 IQ Portion 000 Farm 677 IQ Portion 000 Farm 710 IQ Portion 000	
Application area (ha)	A surface disturbance area of approximately (~) 66 ha comprising opencast pit areas of ~ 56 ha and infrastructure complex areas of ~ 10 ha. Proposed mining right application area: 6 149.75 ha	
Magisterial district	City of Johannesburg Metropolitan Municipality Roodepoort Magisterial District Krugersdorp Magisterial District	
Distance and direction from nearest town	Located immediately south of Roodepoort and north of Soweto in Gauteng.	
21 digit Surveyor General Code for each farm portion	Glenlea 228 IQ Portion 000	TOIQ0000000002280000
	Randglen 229 IQ Portion 000	TOIQ0000000002290000
	Vogelstruisfontein 231 IQ Portion 004	TOIQ0000000002310004
	Vogelstruisfontein 231 IQ Portion 010	TOIQ0000000002310010
	Vogelstruisfontein 231 IQ Portion 013	TOIQ0000000002310013
	Vogelstruisfontein 231 IQ Portion 015	TOIQ0000000002310015
	Vogelstruisfontein 231 IQ Portion 017	TOIQ0000000002310017
	Vogelstruisfontein 231 IQ Portion 018	TOIQ0000000002310018
	Vogelstruisfontein 231 IQ Portion 043	TOIQ0000000002310043
	Vogelstruisfontein 231 IQ Portion 084	TOIQ0000000002310084
	Vogelstruisfontein 231 IQ Portion 107	TOIQ00000000023100107
	Vogelstruisfontein 231 IQ Portion 115	TOIQ00000000023100115
	Vogelstruisfontein 231 IQ Portion 118	TOIQ00000000023100118
	Vogelstruisfontein 231 IQ Portion 131	TOIQ00000000023100131
Vogelstruisfontein 231 IQ Portion 137	TOIQ00000000023100137	
Vogelstruisfontein 231 IQ Portion 140	TOIQ00000000023100140	

Description	Detail	
	Vogelstruisfontein 231 IQ Portion 145	TOIQ0000000023100145
	Vogelstruisfontein 231 IQ Portion 146	TOIQ0000000023100146
	Vogelstruisfontein 231 IQ Portion 149	TOIQ0000000023100149
	Vogelstruisfontein 231 IQ Portion 151	TOIQ0000000023100151
	Vogelstruisfontein 231 IQ Portion 152	TOIQ0000000023100152
	Vogelstruisfontein 231 IQ Portion 154	TOIQ0000000023100154
	Vogelstruisfontein 231 IQ Portion 157	TOIQ0000000023100157
	Vogelstruisfontein 231 IQ Portion 161	TOIQ0000000023100161
	Vogelstruisfontein 231 IQ Portion 163	TOIQ0000000023100163
	Vogelstruisfontein 231 IQ Portion 166	TOIQ0000000023100166
	Vogelstruisfontein 231 IQ Portion 168	TOIQ0000000023100168
	Vogelstruisfontein 231 IQ Portion 170	TOIQ0000000023100170
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	Vogelstruisfontein 231 IQ Portion 187	TOIQ0000000023100187
	Vogelstruisfontein 231 IQ Portion 188	TOIQ0000000023100188
	Vogelstruisfontein 231 IQ Portion 189	TOIQ0000000023100189
	Vogelstruisfontein 231 IQ Portion 193	TOIQ0000000023100193
	Vogelstruisfontein 231 IQ Portion 194	TOIQ0000000023100194
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	Vogelstruisfontein 231 IQ Portion 203	TOIQ0000000023100203
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	Vogelstruisfontein 231 IQ Portion 211	TOIQ0000000023100211
	Vogelstruisfontein 231 IQ Portion 212	TOIQ0000000023100212
	Vogelstruisfontein 231 IQ Portion 213	TOIQ0000000023100213
	Vogelstruisfontein 231 IQ Portion 214	TOIQ0000000023100214
	Vogelstruisfontein 231 IQ Portion 216	TOIQ0000000023100216
	Vogelstruisfontein 231 IQ Portion 222	TOIQ0000000023100222
	Vogelstruisfontein 231 IQ Portion 223	TOIQ0000000023100223
	Vogelstruisfontein 231 IQ Portion 224	TOIQ0000000023100224
	Vogelstruisfontein 233 IQ Portion 009	TOIQ0000000023300009
	Vogelstruisfontein 233 IQ Portion 018	TOIQ0000000023300018
	Vogelstruisfontein 233 IQ Portion 019	TOIQ0000000023300019
	Vogelstruisfontein 233 IQ Portion 020	TOIQ0000000023300020
	Vogelstruisfontein 233 IQ Portion 021	TOIQ0000000023300021
	Vogelstruisfontein 233 IQ Portion 036	TOIQ0000000023300036
	Vogelstruisfontein 233 IQ Portion 037	TOIQ0000000023300037
	Vogelstruisfontein 233 IQ Portion 038	TOIQ0000000023300038
	Vogelstruisfontein 233 IQ Portion 039	TOIQ0000000023300039
	Vogelstruisfontein 233 IQ Portion 040	TOIQ0000000023300040
	Vogelstruisfontein 233 IQ Portion 041	TOIQ0000000023300041
	Vogelstruisfontein 233 IQ Portion 042	TOIQ0000000023300042

Description	Detail	
	Vogelstruisfontein 233 IQ Portion 045	TOIQ0000000023300045
	Vogelstruisfontein 233 IQ Portion 046	TOIQ0000000023300046
	Vogelstruisfontein 233 IQ Portion 051	TOIQ0000000023300051
	Roodepoort 236 IQ Portion 000	TOIQ0000000023600000
	Roodepoort 236 IQ Portion 001	TOIQ0000000023600001
	Roodepoort 237 IQ Portion 001	TOIQ0000000023700001
	Roodepoort 237 IQ Portion 005	TOIQ0000000023700005
	Roodepoort 237 IQ Portion 014	TOIQ0000000023700014
	Roodepoort 237 IQ Portion 019	TOIQ0000000023700019
	Roodepoort 237 IQ Portion 022	TOIQ0000000023700022
	Roodepoort 237 IQ Portion 026	TOIQ0000000023700026
	Roodepoort 237 IQ Portion 027	TOIQ0000000023700027
	Roodepoort 237 IQ Portion 037	TOIQ0000000023700037
	Roodepoort 237 IQ Portion 038	TOIQ0000000023700038
	Roodepoort 237 IQ Portion 043	TOIQ0000000023700043
	Roodepoort 237 IQ Portion 044	TOIQ0000000023700044
	Roodepoort 237 IQ Portion 087	TOIQ0000000023700087
	Roodepoort 237 IQ Portion 120	TOIQ0000000023700120
	Roodepoort 237 IQ Portion 135	TOIQ0000000023700135
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	Roodepoort 237 IQ Portion 196	TOIQ0000000023700196
	Roodepoort 237 IQ Portion 280	TOIQ0000000023700280
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	Roodepoort 237 IQ Portion 297	TOIQ0000000023700297
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	Roodepoort 237 IQ Portion 400	TOIQ0000000023700400
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	Roodepoort 237 IQ Portion 410	TOIQ0000000023700410
	Roodepoort 237 IQ Portion 416	TOIQ0000000023700416
	Roodepoort 237 IQ Portion 429	TOIQ0000000023700429
	Roodepoort 237 IQ Portion 473	TOIQ0000000023700473
	Vlakfontein 238 IQ Portion 001	TOIQ0000000023800001
	Vlakfontein 238 IQ Portion 088	TOIQ0000000023800088
	Vlakfontein 238 IQ Portion 092	TOIQ0000000023800092
	Vlakfontein 238 IQ Portion 093	TOIQ0000000023800093
	Vlakfontein 238 IQ Portion 096	TOIQ0000000023800096
	Doornkop 239 IQ Portion 001	TOIQ0000000023900001
	Doornkop 239 IQ Portion 089	TOIQ0000000023900089
	Doornkop 239 IQ Portion 135	TOIQ0000000023900135
	Doornkop 239 IQ Portion 140	TOIQ0000000023900140
	Doornkop 239 IQ Portion 141	TOIQ0000000023900141
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	Doornkop 239 IQ Portion 143	TOIQ0000000023900143
	Doornkop 239 IQ Portion 144	TOIQ0000000023900144
	Doornkop 239 IQ Portion 145	TOIQ0000000023900145

Description	Detail	
	Doornkop 239 IQ Portion 148	TOIQ00000000023900148
	Witpoortje 245 IQ Portion 001	TOIQ00000000024500001
	Dobsonville 386 IQ Portion 000	TOIQ00000000038600000
	Dobsonville 386 IQ Portion 004	TOIQ00000000038600004
	Dobsonville 386 IQ Portion 006	TOIQ00000000038600006
	Dobsonville 386 IQ Portion 013	TOIQ00000000038600013
	Dobsonville 386 IQ Portion 015	TOIQ00000000038600015
	Dobsonville 386 IQ Portion 016	TOIQ00000000038600016
	Dobsonville 386 IQ Portion 019	TOIQ00000000038600019
	Dobsonville 386 IQ Portion 020	TOIQ00000000038600020
	Dobsonville 386 IQ Portion 022	TOIQ00000000038600022
	Soweto 387 IQ Portion 000	TOIQ00000000038700000
	Soweto 387 IQ Portion 031	TOIQ00000000038700031
	Farm 641 IQ Portion 000	TOIQ00000000064100000
	Farm 641 IQ Portion 001	TOIQ00000000064100001
	Farm 649 IQ Portion 001	TOIQ00000000064900001
	Farm 649 IQ Portion 002	TOIQ00000000064900002
	Farm 649 IQ Portion 003	TOIQ00000000064900003
	Farm 663 IQ Portion 000	TOIQ00000000066300000
	Farm 677 IQ Portion 000	TOIQ00000000067700000
	Farm 710 IQ Portion 000	TOIQ00000000071000000

## 2.2 LOCALITY MAP

A map showing the locality and setting of the proposed project area is included in Appendix B.

## 2.3 DESCRIPTION OF THE SCOPE OF THE PROJECT

In broad terms the proposed project would involve the development of five open pit mining areas and refurbishment of three existing infrastructure complexes, including additional infrastructure, in order to access and mine the existing underground workings.

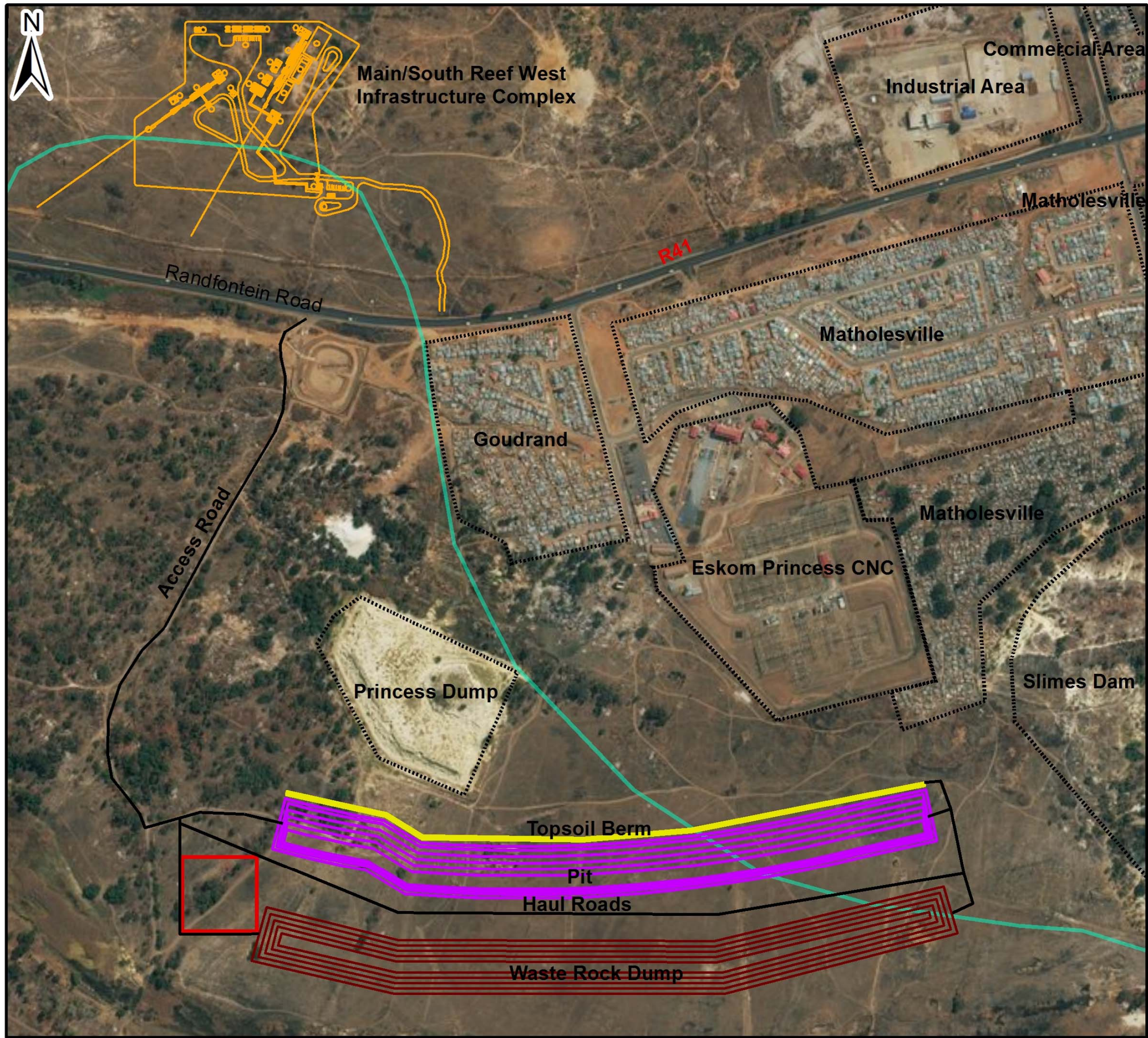
Further detail on the proposed operations is provided in the sections below. Conceptual design layout plans of the project are provided in Figure 3, Figure 4 and Figure 5.

### 2.3.1 Listed and specified activities

The activities associated with the proposed project are listed in Table 4 and Table 5. In each case the relevant listed activity is identified and includes the NEMA and NEM:WA activities for which application is being made. Water uses identified at this stage of the project have also been included in Table 4 and Table 5.

An infrastructure plan of the project, showing the location and extent of all activities detailed in the table, is provided in Appendix D.





### Legend

- Main/South Reef West Infrastructure Complex
- Mona Lisa Bird Reef Pit
- Ore Stockpile Crusher (1ha)
- Earmarked for Housing Development

Kilometers

0      0.125      0.25      0.5

Scale: 1:14 584

Projection: Transverse Mercator  
Datum: WGS84

WEST WITS MINING RIGHT

**Figure 3**  
**Conceptual Design Layout of the Proposed Mona Lisa Bird Reef Pit, Main/South Reef West Infrastructure Complex and Associated Underground Workings**

**SLR**

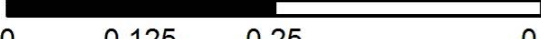
Johannesburg Office  
 METAGO HOUSE  
 FOURWAYS MAN OR OFFICE PARK  
 CORNER ROOS AND MACBETH STREETS  
 FOURWAYS  
 JOHANNESBURG SOUTH AFRICA  
 T: +27 (11) 467-0945  
 F: +27 (11) 467-0978  
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### Legend

-  Bird Reef Central Infrastructure Complex
-  Roodepoort Main Reef Pit
-  Ore Stockpile Crusher
-  Proposed Mining Right Application Area

Kilometers  
  
 0 0.125 0.25 0.5  
 Scale: 1:14 584  
 Projection: Transverse Mercator  
 Datum: WGS84

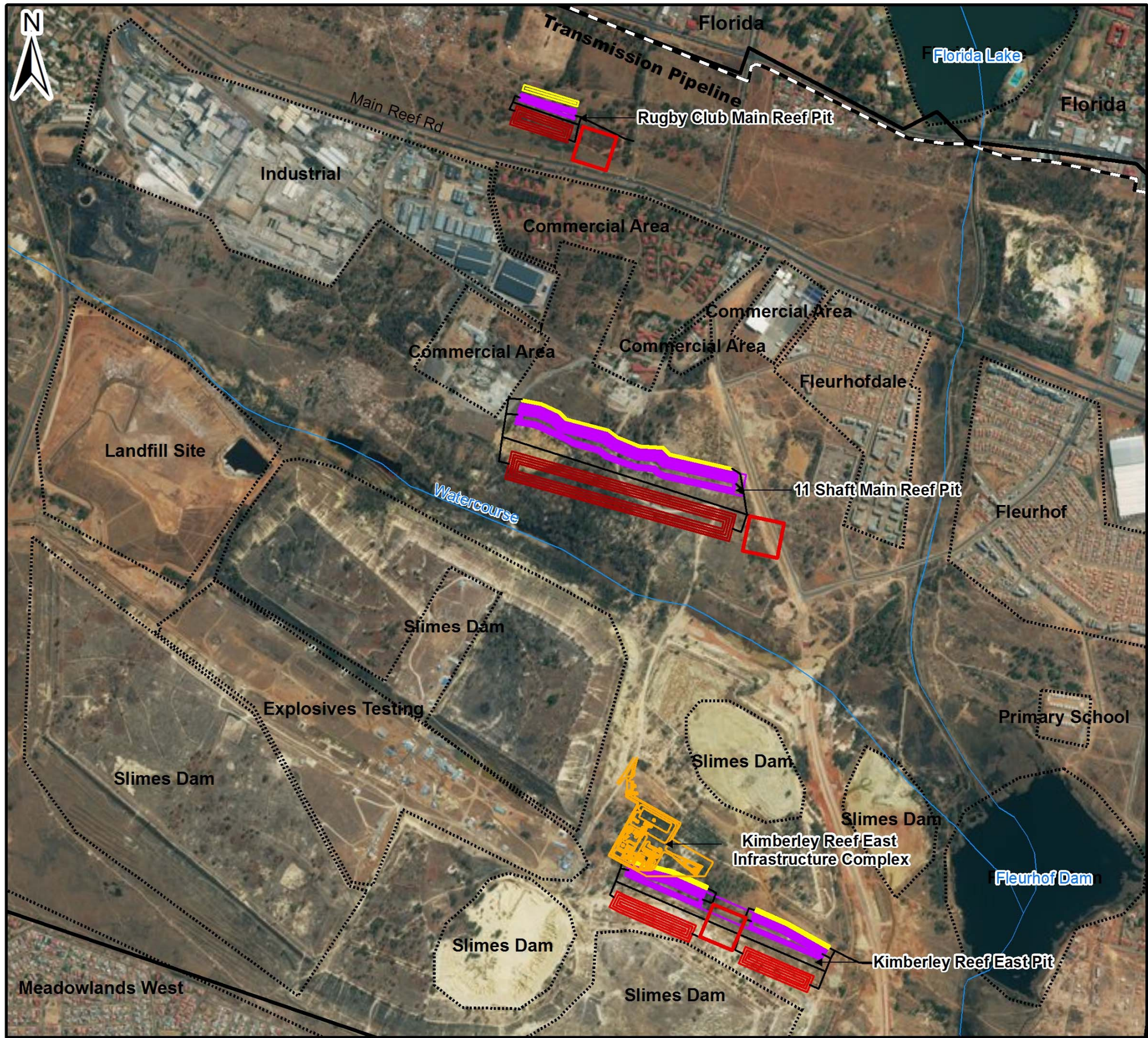
WEST WITS MINING RIGHT

**Figure 4**  
**Conceptual Design Layout of the Proposed Roodepoort Main Reef Pit and the Bird Reef Central Infrastructure Complex**



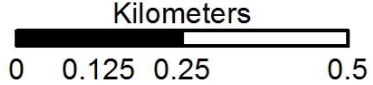
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**Legend**

- Kimberley Reef East Infrastructure Complex
- Waste Rock Dump
- Pit
- Access Roads
- Topsoil Berm
- Ore Stockpile Crusher
- Proposed Mining Right Application Area



Scale: 1:14 584

Projection: Transverse Mercator  
Datum: WGS84

**WEST WITS MINING RIGHT**

**Figure 5**

**Conceptual Design Layout of the Proposed Rugby Club Main Reef, 11 Shaft Pit, Main Reef Pit, Kimberly Reef East Pit and the Kimberly Reef East Infrastructure Complex**



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**TABLE 4: ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT**

Description of activity	Approximate aerial extent of activity (ha)	Listed activity and/or water use
Site preparation and construction activities (for underground mining operations only)		
Selective clearing of vegetation (in line with a biodiversity management plan to be developed for the project).	Within infrastructure complexes of ~ 10 ha comprising: <ul style="list-style-type: none"> <li>• Main/South Reef West Shaft of ~ 5.3 ha;</li> <li>• Bird Reef Central Shaft of ~ 0.9 ha;</li> <li>• Kimberley Reef East Shaft of ~ 3.5 ha.</li> </ul>	NEMA GNR 983 (27) or GNR 984 (15) or GNR 985 (12). NEMA GNR 983 (30). NEMA GNR 985 (15).
Establishing a construction contractors' area.		Not applicable.
Stripping, handling and stockpiling of topsoil (in line with a soil management plan to be developed for the project).		
Cleaning, grubbing and bulldozing activities.		
Decommissioning of old mining infrastructure to allow for refurbishing of existing infrastructure complexes		NEMA GNR 983 (22) and (31).
Establishing storm water controls (in line with a Regulation 704 compliant storm water management plan to be developed for the project).		NEMA GNR 983 (13) and (48). NEMA GNR 984 (6), (11) and (16). NEMA GNR 985 (14) and (16). NWA 21(b) and 21(g).
Excavations and establishing dam(s).		Not applicable.
Bulk earthworks including foundations, trenches, berms.		
Establishing and using mine access roads mainly from the R41 and existing road networks.	Within overall application area of ~ 6 149.75 ha.	NEMA GNR 983 (24) and (56). NEMA GNR 984 (27). NEMA GNR 985 (4) and (18). NEM:WA GNR 921 A (9) or B (9). NEMA:WA A (12) or B (10) and A (14).
General building activities, erection of structures and concrete and steel work associated with infrastructure complexes and the related support facilities (including road development and power supply).	Within infrastructure complexes of ~ 10 ha.	NEMA GNR 983 (9), (10), (14), (28), (45) and (46). NEMA GNR 984 (4) and (25). NEMA GNR 985 (1), (2), (3), (10) and (22).
Open pit mining		
Mining comprising: <ul style="list-style-type: none"> <li>- Establishing storm water controls (in line with a GN704 compliant storm water management plan to be developed for the project) ahead of mining</li> <li>- Clearing of vegetation (in line with a biodiversity management plan to be developed for the project) ahead of mining</li> <li>- Stripping, handling and stockpiling of topsoil (in line with a soil management plan to be developed for the project) ahead of mining</li> <li>- Bulldozing of illegally dumped general and hazardous waste material</li> </ul>	Within opencast pit areas of ~ 56 ha comprising: <ul style="list-style-type: none"> <li>• Kimberley Reef East of ~ 8.2 ha;</li> <li>• 11 Shaft Main Reef of ~ 20.7 ha;</li> <li>• Rugby Club Main</li> </ul>	NEMA GNR 983 (27) or GNR 984 (15) or GNR 985 (12). NEMA GNR 983 (19), (24), (28), (30) and (56). NEMA GNR 984 (6), (11), (16), (17), (24) and (27). NEMA GNR 985 (1), (4), (15) and (18). NEM:WA GNR 921 A (9) or B (9); A (12) or B (10); A (14), B (4) and B (10). NWA 21(c) and (i), 21(g) and 21(j).

Description of activity	Approximate aerial extent of activity (ha)	Listed activity and/or water use
<ul style="list-style-type: none"> <li>- Establishing access and internal haul roads ahead of mining</li> <li>- Excavating waste rock</li> <li>- Excavating mineral resource</li> <li>- Stockpiling of run-of-mine (RoM)</li> <li>- Crushing</li> <li>- Loading RoM onto tipper trucks</li> </ul>	Reef of ~ 1.6 ha; <ul style="list-style-type: none"> <li>• Mona Lisa Bird Reef of ~ 3.0 ha;</li> <li>• Roodepoort Main Reef of ~ 23.2 ha.</li> </ul>	
<b>Underground mining</b>		
Mining comprising: <ul style="list-style-type: none"> <li>- Dewatering</li> <li>- Excavating waste rock</li> <li>- Excavating mineral resource</li> <li>- Stockpiling/storing of run-of-mine (RoM)</li> <li>- Crushing</li> <li>- Loading RoM onto tipper trucks</li> <li>- Backfilling waste rock material into the underground workings.</li> </ul>	Within overall application area of ~ 6 149.75 ha.	NEMA GNR 983 (9), (45) and (46). NEMA GNR 984 6 and 17. NEM:WA GNR 921 A(9) or B(9); A(12) and/or B(10); A(14) and B(7), (10) and (11) NWA 21(j).
<b>Transportation</b>		
Vehicle, machinery and/or material movement within the site boundary.	~ 0.69 ha	Not applicable.
Use of access road and public roads for transporting staff, consumables, general/industrial waste and RoM.	Within overall application area of ~ 6 149.75 ha.	
<b>Water supply and management</b>		
Potable water supply from local municipality.	Within overall application area of ~ 6 149.75 ha.	Not applicable.
Process/make-up water supply from local municipality.		NWA 21(a).
Service water supply using recycled underground dewatering water.		NEM:WA GNR 921 B (1) and (10).
Treatment and storage of dewatering water, brine and related solids.		NEMA GNR 983 (12) and (13). NWA 21(b).
Clean water storage.		NEMA GNR 983 12, 13 NWA 21(g).
Dirty water storage and management.		NWA 21 (b) and 21 (g).
Storm water management.		NWA 21(e).
Dust suppression using recycled dewatering water.		
<b>Power supply</b>		
Use of Eskom power via overhead powerline (for underground mining operations only).	-	Not applicable.
Use of emergency diesel generators.	Within overall	Not applicable – below threshold of listed

Description of activity	Approximate aerial extent of activity (ha)	Listed activity and/or water use
	infrastructure and opencast pit areas of ~ 66 ha.	activity.
<b>Waste rock management</b>		
Temporary storage/stockpiling of waste rock material (to be used to backfill pits and underground workings).	Within overall infrastructure and opencast pit areas of ~ 66 ha.	NEM:WA GNR 921 B(11) and (10) NWA 21(g).
<b>General and hazardous waste management</b>		
Bulldozing, sorting, handling and disposal of illegally dumped general and hazardous waste found within open pit mining areas	Within overall infrastructure and opencast pit areas of ~ 66 ha.	NEM:WA GNR 921 A (10), (12) and (14) and B (4), (7) and (10).
In-situ treatment or bioremediation of hydrocarbon contaminated soils (where required).	Within overall infrastructure and opencast pit areas of ~ 66 ha.	NEM:WA GNR 921 B (4) and (10).
Use of portable toilets.		Not applicable.
Temporary storage and sorting of general and hazardous waste at a waste/salvage yard for re-use or recycling.	Within infrastructure complexes of ~ 10 ha.	Not applicable.
Treatment of sewage (and possibly domestic grey water) in sewage treatment plants.		NEMA GNR 983 (25) or NEMA GNR 984 (25).
Management of brine and solids produced by the waste water treatment plant.		NEM:WA GNR 921 Category B (1) and (10).
Removal of waste by contractor for recycling, re-use or final disposal at permitted waste disposal facilities.		Not applicable.
<b>Support facilities</b>		
Main/South Reef West Infrastructure Complex <ul style="list-style-type: none"> <li>- Parking</li> <li>- Security office at main gate and drop off zone</li> <li>- Change house and walkway</li> <li>- Lamp room</li> <li>- Medical centre</li> <li>- Headgear, Winder house and Banksmans cabins</li> <li>- Ore storage</li> <li>- Conveyors</li> <li>- Laydown area and yard store</li> </ul>	Within Main/South Reef West infrastructure complex of ~ 5.3 ha	NEMA GNR 983 (9), (10), (14), (22) and (24). NEMA GNR 985 (10).

Description of activity	Approximate aerial extent of activity (ha)	Listed activity and/or water use
<ul style="list-style-type: none"> <li>- Stores, Workshop, Store yards</li> <li>- Satellite Offices and communication facilities</li> <li>- Potable water tanks</li> <li>- Explosives handling facilities</li> <li>- Access, Internal and Haul roads</li> <li>- Perimeter fencing and lighting</li> </ul>		
<p>Bird Reef Central Infrastructure Complex:</p> <ul style="list-style-type: none"> <li>- Security Office at main gate and drop off zone</li> <li>- Parking</li> <li>- Laydown area and yard store</li> <li>- Stores and offices</li> <li>- Main centralised office complex and communication facilities</li> <li>- Refurbished circular shaft</li> <li>- Ore storage</li> <li>- Change house and walkway</li> <li>- Laundry</li> <li>- Medical centre</li> <li>- Potable water tanks</li> <li>- Perimeter fencing and lighting</li> <li>- Access and haul roads</li> </ul>	<p>Within Bird Reef Central infrastructure complex of ~ 0.9 ha</p>	<p>NEMA GNR 983 (9), (10), (14), (22) and (24). NEMA GNR 985 (10).</p>
<p>Kimberley Reef East Infrastructure Complex</p> <ul style="list-style-type: none"> <li>- Parking</li> <li>- Security office at main gate and drop off zone</li> <li>- Change house and walkway</li> <li>- Lamp room</li> <li>- Medical centre</li> <li>- Headgear, Winder house and Banksmans cabins</li> <li>- Ore storage</li> <li>- Conveyors</li> <li>- Donkey adit and Pump station</li> <li>- Laydown area and yard store</li> <li>- Stores, Workshop, Store yards</li> <li>- Satellite Offices and communication facilities</li> <li>- Potable water tanks</li> <li>- Explosives handling facilities</li> <li>- Access, Internal and Haul roads</li> </ul>	<p>Within Kimberley Reef East infrastructure complex of ~ 3.5 ha.</p>	<p>NEMA GNR 983 (9), (10), (14), (22) and (24). NEMA GNR 985 (10).</p>



Description of activity	Approximate aerial extent of activity (ha)	Listed activity and/or water use
- Perimeter fencing and lighting		
Ventilation shafts and fans.	Within overall application area of ~ 6 149.75 ha.	Not applicable.
<b>General site management</b>		
Appointment of contractors.	Not applicable.	Not applicable.
Site management (monitoring, inspections, maintenance, security, access control).		
Environmental awareness training and emergency response.		
Implementing and maintaining management plans.		
<b>Demolition</b>		
Dismantling and demolition of infrastructure and equipment.	Within infrastructure complexes of ~ 10 ha.	NEMA GNR 983 (22) and (31).
<b>Rehabilitation</b>		
Backfilling waste rock material into open pits (as part of rehabilitation)	Within overall infrastructure and opencast pit areas of ~ 66 ha.	NEM:WA GNR 921 Category A(9) or B(9); A(12) and/or B(10); A(14) and B(7), (10) and (11).
Ripping compacted areas and replacing soil resources.		Not applicable.
Slope stabilisation and erosion control.		
Landscaping.		
Alien invasive management.		
Restoration of natural drainage patterns as far as practically possible.		
Re-vegetation of disturbed areas.		NWA 21(e).
<b>Maintenance and aftercare</b>		
Maintenance and aftercare of rehabilitated areas.	Within overall infrastructure and opencast pit areas of ~ 66 ha.	Not applicable.

**TABLE 5: DESCRIPTION OF THE EIA REGULATIONS LISTED ACTIVITIES BEING APPLIED FOR AS PART OF THE PROPOSED PROJECT**

Activity No.	Listed activity	Applicability of the activity
NEMA Listing Notice 1 (GNR 983)		
9	The development of infrastructure exceeding 1 000 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.	Pipelines would be required for transporting water and storm water within the infrastructure complexes. The internal diameter and/or peak throughput could trigger this activity
10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, waste 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.	Pipelines would be required for transporting sewage or process water. The length of the pipeline, internal diameter and/or peak throughput could trigger this activity.
12	The development of – (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs - (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Water storage dams will be required for the project. Due to some mining and infrastructure areas being in close proximity to watercourses the final positioning of these could trigger this activity.
13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	The project would require the storage of water in dam(s). The combined capacity of the dam(s) is expected to exceed 50 000 cubic metres.
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The project would require the storage and handling of diesel and fuel oil with a combined capacity exceeding 80 m <sup>3</sup> .
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, pebbles or rock of more than 10 cubic metres from a watercourse	Non-perennial watercourses occur within the area. Watercourse crossings could be required.
22	The decommissioning of any activity requiring- (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure	Historical mining infrastructure occurs within the project footprints. This infrastructure has not been in use for over 50 years. Some of this infrastructure will need to be demolished to make way for new project-related infrastructure. Decommissioning of infrastructure would be required during the decommissioning phase of the project.

Activity No.	Listed activity	Applicability of the activity
24	The development of a road - (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.	Existing roads will be used as far as possible, however new access and internal haul roads would also be required. The final road network plan and related dimensions could trigger this 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 2 000 cubic metres but less than 15 000 cubic metres.	Sewage and wastewater treatment facilities would be required for the project. The throughput capacity will be confirmed during the EIA process.
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	Mining activities may require clearance of indigenous vegetation. The project footprint could trigger this activity.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes 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;	Some areas are used for small scale agriculture would form part of the project footprint.
30	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	The removal of protected plants and trees may be required.
31	The decommissioning of existing facilities, structures or infrastructure for— (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (ii) any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (iv) any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or (v) any activity regardless the time the activity was commenced with, where such activity: (a) is similarly listed to an activity in (i) or (ii) above; and (b) is still in operation or development is still in progress; excluding where— (aa) activity 22 of this notice applies; or (bb) the decommissioning is covered by part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies.	Historical surface infrastructure occurs within the various project footprints. This infrastructure has not been in use for over 50 years. Some of this infrastructure will need to be demolished to make way for new project-related infrastructure.



Activity No.	Listed activity	Applicability of the activity
45	<p>The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure—</p> <ul style="list-style-type: none"> <li>(i) has an internal diameter of 0,36 metres or more; or</li> <li>(ii) has a peak throughput of 120 litres per second or more; and</li> </ul> <p>(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or</p> <p>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;</p> <p>excluding where such expansion—</p> <ul style="list-style-type: none"> <li>(aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or</li> <li>(bb) will occur within an urban area.</li> </ul>	Dewatering of the underground workings could trigger this activity.
46	<p>The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure—</p> <ul style="list-style-type: none"> <li>(i) has an internal diameter of 0,36 metres or more; or</li> <li>(ii) has a peak throughput of 120 litres per second or more; and</li> </ul> <p>(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or</p> <p>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;</p> <p>excluding where such expansion—</p> <ul style="list-style-type: none"> <li>(aa) relates to the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve or railway line reserve; or</li> <li>(bb) will occur within an urban area.</li> </ul>	Dewatering of the underground workings could trigger this activity.

Activity No.	Listed activity	Applicability of the activity
48	<p>The expansion of—</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</p> <p>(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;</p> <p>where such expansion occurs—</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding—</p> <p>(cc) activities listed in activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p>	<p>Water storage dams and infrastructure will be required for the project. The final extent and positioning of these could trigger this activity.</p>
56	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—</p> <p>(i) where the existing reserve is wider than 13,5 meters; or</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres;</p> <p>excluding where widening or lengthening occur inside urban areas.</p>	<p>Existing roads would be used for the project where possible. These may need to be lengthened or widened. The final road network plan and related dimensions could trigger this activity.</p>
NEMA Listing Notice 2 (GNR 984)		
4	<p>The development and related operation 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>The project would require the storage and handling of diesel and fuel oil with a combined capacity exceeding 500 m<sup>3</sup>.</p>
6	<p>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:</p> <p>excluding -</p> <p>(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;</p> <p>(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less.</p>	<p>The project would require a water use license.</p>

Activity No.	Listed activity	Applicability of the activity
11	The development of facilities or infrastructure for the transfer of 50 000 cubic metres or more water per day, from and to or between any combination of the following - (i) water catchments; (ii) water treatment works; or (iii) impoundments; excluding treatment works where water is to be treated for drinking purposes.	Water management on site may require the transfer of water between facilities.
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	Mining activities may require clearance of indigenous vegetation. The project footprint could trigger this activity.
16	The development of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high water mark of the dam covers an area of 10 hectares or more.	Water storage dams will be required for the project. The final dimensions of the dam(s) could trigger this activity.
17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including crushing.	A mining right is required for the project.
24	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan .	Peat soils may occur within the project footprints.
25	The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of 15 000 cubic metres or more.	Sewage and wastewater treatment facilities would be required for the project. The throughput capacity will be confirmed during the EIA process.
27	The development of a road - (iii) with a reserve wider than 30 metres; or (iv) catering for more than one lane of traffic in both directions; but excluding a road - (b) which is 1 kilometre or shorter; or (c) where the entire road falls within an urban area.	Existing roads will be used as far as possible, however new access and internal haul roads would also be required. The final road network plan and related dimensions could trigger this activity.



Activity No.	Listed activity	Applicability of the activity
NEMA Listing Notice 3 (GNR 985)		
1	<p>The development of billboards exceeding 18 square metres in size outside urban areas, mining areas or industrial complexes.</p> <p>(c) Gauteng</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</p> <p>vii. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority</p>	<p>Notice boards would be required for the project. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.</p>
2	<p>The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.</p> <p>c. Gauteng</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority</p>	<p>Water reservoirs and dams would be required for the project. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.</p>
3	<p>The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower -</p> <p>(a) is to be placed on a site not previously used for this purpose; and</p> <p>(b) will exceed 15 metres in height but excluding attachments to existing buildings and masts on rooftops.</p> <p>c. Gauteng</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority</p>	<p>Communication structures would be required for the project. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.</p>

Activity No.	Listed activity	Applicability of the activity
4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>c. Gauteng</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;</p> <p>vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas</p>	<p>Existing roads will be used as far as possible, however new access and internal haul roads would also be required. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.</p>
10	<p>The development and related operation 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>c. Gauteng</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;</p> <p>vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas</p>	<p>The storage and handling of dangerous goods would be required for the project. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.</p>
12	<p>The clearance of an area of 300 square metres or more of indigenous vegetation. In the:</p> <p>c. Gauteng</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or</p>	<p>Mining activities may require clearance of indigenous vegetation. These could fall within or be located in close proximity to CBAs, ESAs and critically endangered ecosystems.</p>

Activity No.	Listed activity	Applicability of the activity
14	<p>The development of -</p> <ul style="list-style-type: none"> <li>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</li> <li>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</li> </ul> <p>where such development occurs -</p> <ul style="list-style-type: none"> <li>(a) within a watercourse ;</li> <li>(c) if no development setback has been adopted, within 32 metres of a watercourse , measured from the edge of a watercourse ;</li> </ul> <ul style="list-style-type: none"> <li>c. Gauteng</li> <li>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</li> <li>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</li> <li>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority</li> </ul>	<p>Water storage dams and infrastructure will be required for the project. Due to some mining and infrastructure areas being in close proximity to watercourses and areas zoned as sensitive to development activities in the Gauteng EMF the final positioning of these could trigger this activity.</p>
15	<p>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.</p> <ul style="list-style-type: none"> <li>b. Gauteng</li> <li>i. All areas.</li> </ul>	<p>The project footprint will exceed 1000 m<sup>2</sup>. This activity may be triggered by the project development.</p>
16	<p>The expansion of reservoirs, excluding dams, where the capacity will be increased by more than 250 cubic metres.</p> <ul style="list-style-type: none"> <li>c. Gauteng</li> <li>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</li> <li>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004);</li> <li>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;</li> <li>vii. Sites or areas identified in terms of an international convention;</li> </ul>	<p>Existing reservoirs may be used and would require expansion.</p>



Activity No.	Listed activity	Applicability of the activity
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. c. Gauteng iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas	Existing roads will be used as far as possible, however widening or lengthen of roads may be required. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.
22	The expansion and related operation 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. c. Gauteng iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act : Biodiversity Act ( Act No. 10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas	The storage and handling of dangerous goods would be required for the project. These could fall within or be located in close proximity to CBAs, ESAs, threatened ecosystems or areas zoned as sensitive to development activities in the Gauteng EMF. This will be confirmed in the final positioning and extent of activities.
NEM:WA Listed Activities (GNR 921)		
Category A (9)	The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purpose of levelling and building which has been authorised by or under other legislation.	Inert rock material and construction rubble will be used on site for fill and levelling of roads in and around the mine (suitable roadbed material). The material would remain if it supported the post-closure land use, would be stored until final disposal in the open pits or underground mine voids or stored until it is reused.
Category A (10)	The disposal of general waste to land covering an area of more than 50 m <sup>2</sup> but less than 200 m <sup>2</sup> and with a total capacity not exceeding 25 000 tons.	Illegally dumped general waste exists within the project footprint. The proposed project may require the disposal of this waste and may trigger these thresholds.
Category A (12)	The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).	Included due to activities above and below.

Activity No.	Listed activity	Applicability of the activity
Category A (13)	The expansion of a waste management activity listed in Category A or 8 of this schedule which does not trigger an additional waste management activity in terms of this Schedule.	To cater for removal of existing waste on site.
Category A (14)	The decommissioning of a facility for a waste management activity listed in Category A or 8 of this schedule.	To cater for removal of existing waste on site.
Category B (1)	The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.	A wastewater treatment plant would be required for the project to treat dewatering water from the underground mine. Brine and gypsum would need to be stored (depending on treatment technology) until it can be removed by a waste contractor for disposal at a licensed facility.
Category B (4)	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.	Treatment of hazardous waste may be required and may trigger this threshold. The establishment of a bioremediation facility would trigger this activity.
Category B (7)	The disposal of any quantity of hazardous waste to land.	Illegally dumped hazardous waste exists within the project footprint. The proposed project may require the disposal of this waste on site. Waste rock will be used to backfill the open pits and underground workings as part of rehabilitation.
Category B (9)	The disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.	Inert rock material and construction rubble will be used on site for fill and levelling of roads in and around the mine (suitable roadbed material). The material would remain if it supported the post-closure land use, would be stored until final disposal in the open pits or underground mine voids or stored until it is reused.
Category B (10)	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).	Included due to activities above and below.
Category B (11)	The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	The project will require the establishment of waste rock dumps and re-use of waste rock to backfill open pits and underground mining voids.

**TABLE 6: SECTION 21 WATER USES THAT APPLY TO THE PROPOSED PROJECT**

NWA Section 21 Water uses		Applicability of the water use
21 (a)	Taking water from a water resource	Dewatering of the open pits may be required. Dewatering of the underground mine would be required.
21 (b)	Storing water	Water would be stored in water tank(s) and/or water dam(s).
21 (c)	Impeding or diverting the flow of water in a watercourse	Mining activities may occur within regulated zones of a watercourse.
21 (i)	Altering the bed, banks, course or characteristics of a watercourse	Watercourse crossings may be required.

NWA Section 21 Water uses		Applicability of the water use
21 (e)	Engaging in a controlled activity identified as such in Section 37(1): (a) irrigation of any land with waste or water containing waste generated through any industrial activity or by a waterworks (d) intentional recharging of an aquifer with any waste or water containing waste	Recycled process/service/dewatering water would be used for dust suppression and irrigation of rehabilitated land (if the quality is deemed suitable). An option could include using the water to recharge aquifers (if suitable).
21 (g)	Disposing of waste in a manner which may detrimentally impact on a water resource	The project would require dirty water storage, waste rock storage/stockpiling facilities and backfilling of open pits and underground voids with waste rock.
21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people	Dewatering of the open pits may be required. Dewatering of the underground mine would be required.

### 2.3.2 Description of the activities to be undertaken

An overview of the project activities is included in Table 4 above. Further detail, where required, is provided in the sections below.

#### a. Timing

The timing associated with the implementation of the project is outlined below.

Activity	Timeline							
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 - 30	1 year	2 to 3 years
Opencast mining and concurrent rehabilitation	■	■	■					
Continued opencast rehabilitation and Construction of infrastructure complexes			■	■				
Underground mining operations				■	■	■		
Steady state production achieved					■			
Decommissioning and closure							■	
Aftercare and maintenance								■

#### b. Construction (required only when the underground mining operations commence)

Construction contractor’s site camp areas would be established at the start of the construction phase for the underground mining. The facilities could include one or more of the following:

- workshops, stores, washbay and lay-down areas
- handling and storage area for construction materials (paints, solvents, oils, grease) and wastes
- fuel handling and storage area
- mobile site offices
- portable change houses and ablution facilities
- generators for temporary power supply
- water storage and management infrastructure
- main access road and internal roads
- parking area
- security and access control.

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

#### c. Mining operations

The proposed project would include:

- five open pit mining areas and associated topsoil stockpiles, run-of-mine ore stockpiles, waste rock dumps and haul roads; and
- an underground mine comprised of surface infrastructure complexes, underground mine workings and access roads.

No mineral processing will take place on site. All run-of mine material will be transported to an existing processing plant off-site.



Initially, near surface resources will be targeted for mining through means of open pit methods. The resources at the open pit targets are generally outcropping and production would commence at the onset of mining activities. No construction activities would take place at the open pit sites. Upon near depletion of resources at the open pit targets, underground resources will be targeted. The activities required to enable extraction of these resources include re-establishment of existing incline and circular shafts and related infrastructure as well as rehabilitation of the existing workings.

Data on the proposed opencast and underground mining operations with specific reference to their location, duration of operation and rehabilitation is provided in Table 7 below and illustrated conceptually in Figure 3, Figure 4 and Figure 5. The opencast and underground mining schedule will be provided in the EIA. The conceptual process flow diagram provides an overview of each potential component of the operation and highlights inputs to and outputs from each component (Figure 8).

**TABLE 7: DATA ON THE PROPOSED MINING OPERATIONS**

Features	Details				
Target commodities	Gold, uranium and silver				
Estimated depth of resource	0 to 1 500 m				
Mineable resource	~ 9 000 000 tonnes				
<b>Opencast mining</b>					
Open pits	<b>Kimberley East</b>	<b>11 Shaft</b>	<b>Rugby Club</b>	<b>Mona Lisa</b>	<b>Roodepoort</b>
Location	See Figure 5	See Figure 5	See Figure 5	See Figure 3	See Figure 4
Size of mining area	~ 8.2 ha	~ 20.7 ha	~ 1.6 ha	~ 3 ha	~ 23.2 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes
Pit depth	20 to 30 m	20 to 30 m	7 to 10 m	20 to 30 m	7 to 10 m
Mineable resource (tonnes)	62 917	117 631	30 212	34 351	179 290
Mining duration (including concurrent rehabilitation, season dependent)	~ 5 months	~ 8 months	~ 3 months	~ 3 months	~ 12 months
Final rehabilitation duration	~ 3 months	~ 3 months	~ 3 months	~ 3 months	~ 4 months
Waste rock dump volume	503 336 m <sup>3</sup>	1 013 436 m <sup>3</sup>	260 288 m <sup>3</sup>	295 947 m <sup>3</sup>	1 103 323 m <sup>3</sup>
Waste rock dump height	20 to 30 m	20 to 30 m	10 m	20 to 30 m	10 m
<b>Underground mining</b>					
Infrastructure complexes	<b>Main/South Reef West</b>		<b>Bird Reef Central</b>	<b>Kimberley Reef East</b>	
Location	See Figure 3		See Figure 4	See Figure 5	
Infrastructure complex size	5.3 ha		0.9 ha	3.5 ha	
Size of mining area	~ 40 ha		-	~ 100 ha	
Mining rate (per month)	30 000 tonnes		-	30 000 tonnes	
Workings depth	100 m to interception of reef (up 4 km below surface)		-	100 m to interception of reef (up 4 km below surface)	
Waste rock	All waste rock will remain in the underground workings.				

### Opencast mining

Opencast mining activities would include a conventional excavate, load and haul mining cycle. Once the topsoil and waste rock have been removed and stockpiled, an Xcentric ripper would be used to break the ground (see Photo Plate 1). This equipment replaces the need to conduct regular blasting. This is both from a safety perspective and to minimise impacts on the surrounding environment. In the event that exceptionally hard rock is encountered, although this is considered unlikely, the option to blast may be required. Ore would then be excavated and hauled to an ore stockpile for crushing before transportation off-site. The five proposed opencast mining areas would be developed in a phased approach. In this regard, once an opencast area has been mined, backfilled using waste rock and rehabilitated, the next opencast area would be targeted. Following final rehabilitation and adequate stabilisation, each of the

areas would be made available in line with post-closure land use objectives. No waste rock dumps would remain. It is anticipated that up to 180 000 tonnes of ore would be mined per annum from the opencast resources.

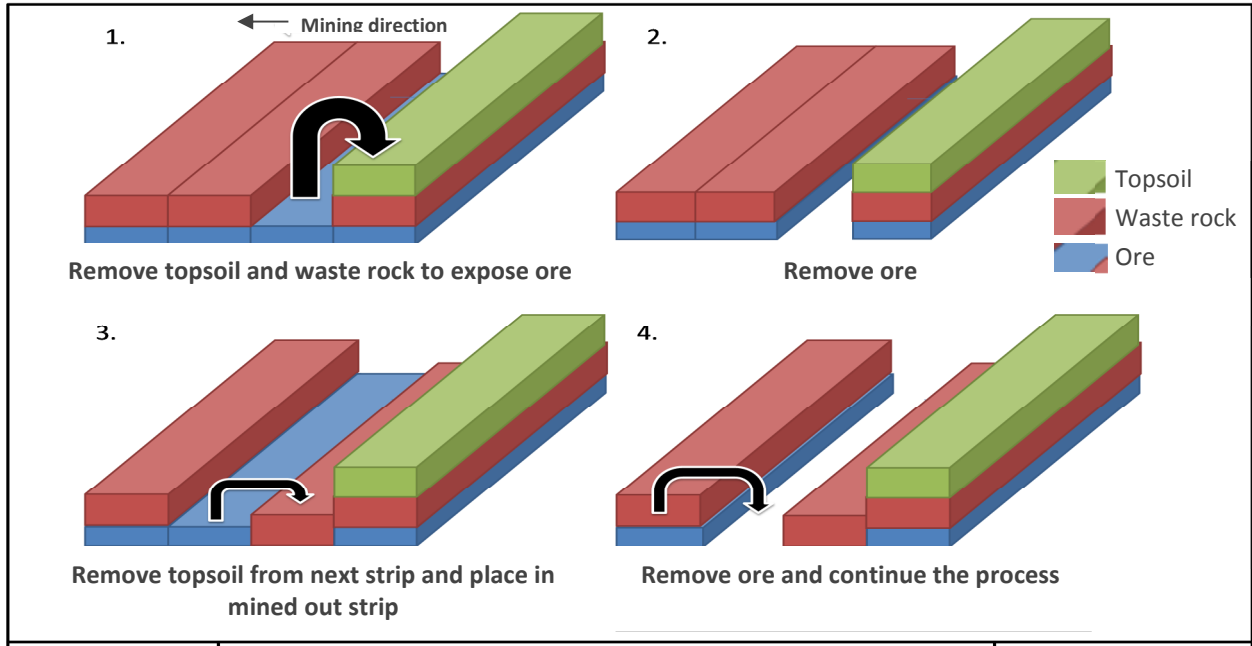


FIGURE 6: SCHEMATIC OF CONCURRENT REHABILITATION IN THE OPEN PITS



Underground mining

The underground mining method would be conventional drill and blast breast mining methods. The incline shafts, equipped with a winder house, would provide means for movement of men, material and rock to and from the underground workings. Ore drives would be developed on reef with raises developed from the drives. Loading boxes would be constructed and winches would be installed on the down-dip side of the raise to remove the broken rock from the stopes. Ore would be transported to the incline shafts by means of conventional track bound equipment. Ore would be stored for initial crushing before transportation off-site. Any waste rock produced by the underground mining operations would

remain underground. It is anticipated that up to 360 000 tonnes of ore would be mined per annum from the underground resources.

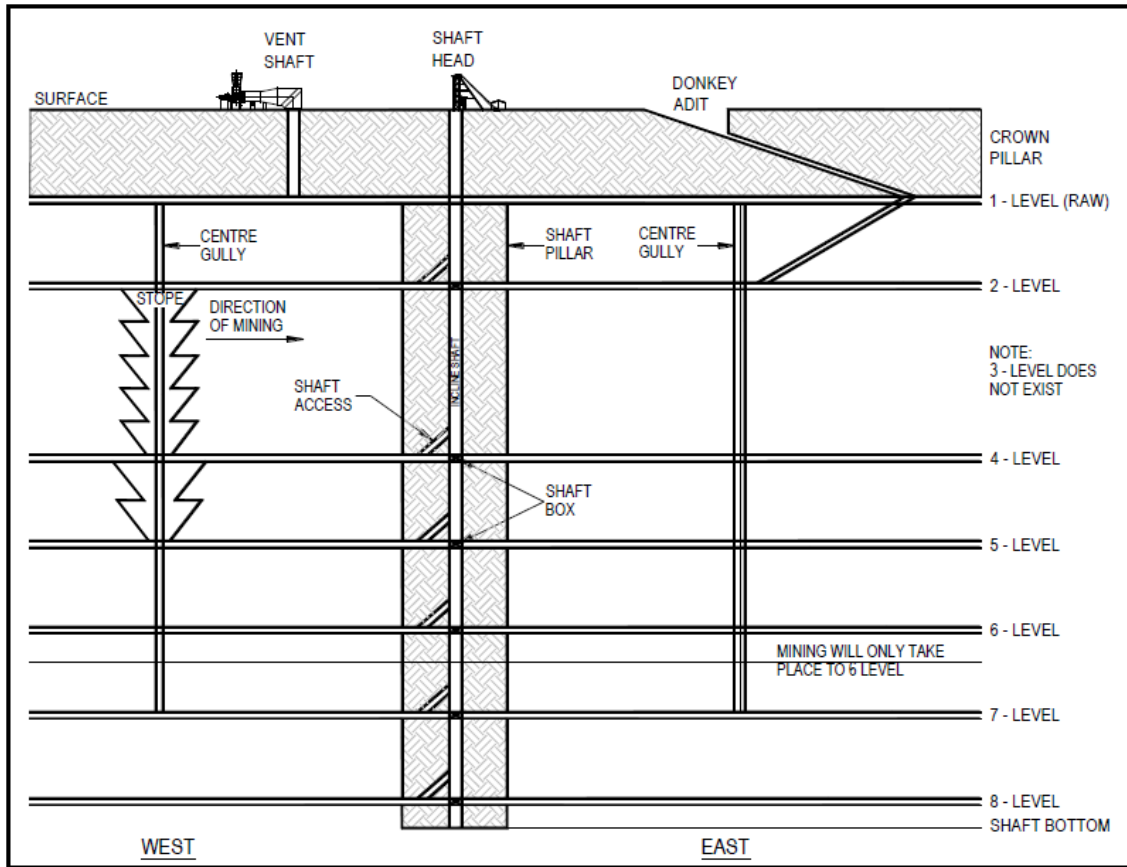


FIGURE 7: SCHEMATIC OF UNDERGROUND MINING METHOD

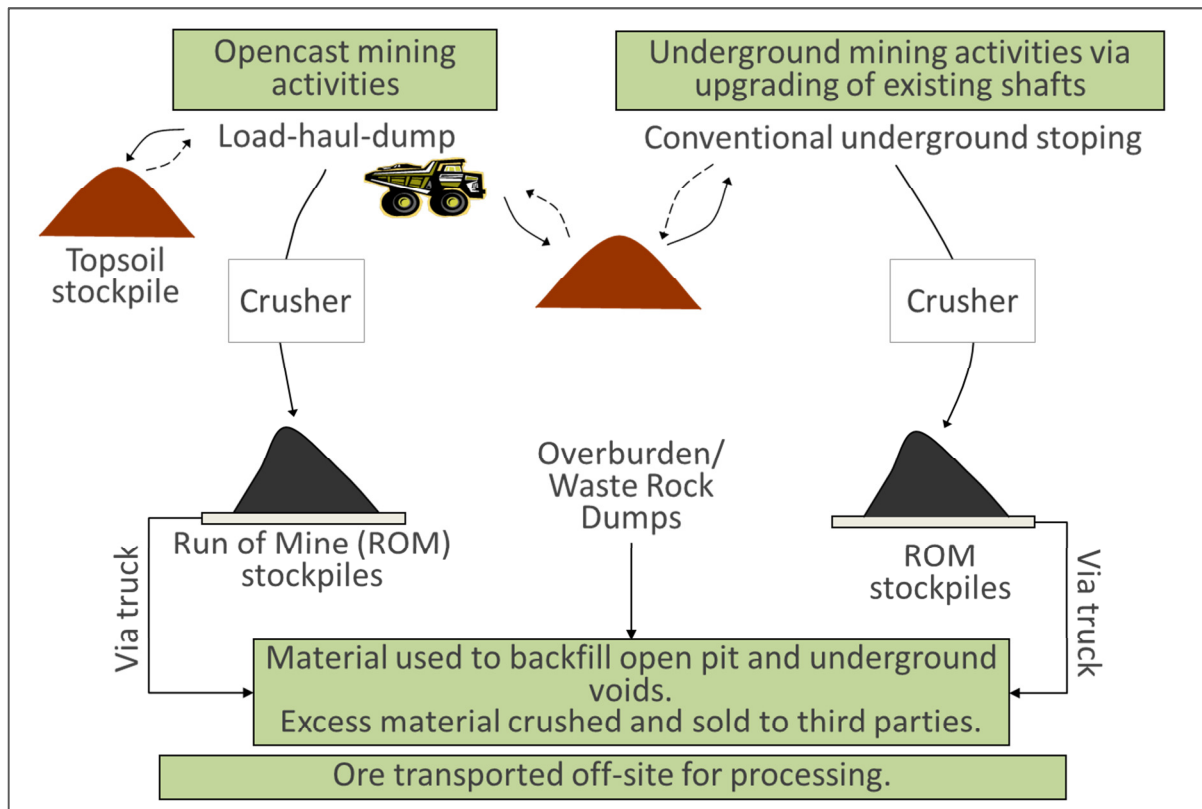


FIGURE 8: CONCEPTUAL PROCESS FLOW DIAGRAM OF THE MINING OPERATIONS

#### **d. Access and Transport**

A network of public roads exist in the project area. These comprise both surfaced and gravel roads. The northern section of the project area would be crossed by the R41 (Mainreef/Randfontein) provincial road; Cemetery Road feeds off Mainreef road to the south and runs through the project area linking Roodepoort in the north to Soweto in the south.

Existing surfaced and gravel roads would be used for the project as far as possible. Where site specific access is required to access a pit or infrastructure complex, this would be done with input from the traffic engineering study (see Section 7.4.10).

For the opencast mining operations, based on a mining rate of 15 000 tonnes per month, it is estimated that 18 36-ton trucks would be required to transport ore off-site. For the underground mining operations with a proposed mining rate of 30 000 tonnes per month, this number would double.

Ore would be transported via the R41 and R558 to an existing processing plant in the Gauteng region.

#### **e. Water Supply and Management**

Water would be required during the construction phase for domestic use, dust suppression, for washing vehicles and equipment and earthworks. During the operational phase additional requirements to those used during construction would include irrigation. During decommissioning and closure, water would be required for dust suppression, washing vehicles and irrigating rehabilitated areas.

Potable and service water would be sourced from the local municipality during all phases and stored in above-ground potable and service water tank(s) respectively. Service water supply would also be sourced from the treated dewatering water from the underground workings. The use of water from these sources would be informed through the development of a climatic water balance and the suitability of the water quality for the specific application.

Water requirements would be confirmed during the next phase of the EIA process through the development of a climatic water balance.

A network of pipelines would be required to transport potable water and the various service waters within the site.

Water management facilities would be required for the control of storm water. A storm water management plan would be developed for the project in line with requirements of Regulation 704 (of 4 June 1999) of the NWA. In this regard, the key principles include:

- diversion of clean storm water around dirty water generating areas and back into natural drainage lines
- storm water from dirty areas would be managed in a dirty water management system comprising channels, berms and a storm water dam.

Dewatering of the underground workings would be required. Further details on the volume and management of the dewatered water will be informed by the Hydrological and Geohydrological studies undertaken for the EIA.

A water use and management plan would be developed for the project and included in the EIA.



## **f. Power Supply and Use**

Power would be required for the underground mining operations during all project phases prior to closure. The operations are expected to require approximately 5.14 MVA of power. It is planned to source this power from Eskom. Backup diesel generators would be available for emergency supply.

## **g. Waste Management**

### Residue waste

Waste rock would be produced by the mining operations. This would comprise material excavated to expose the targeted reefs of the opencast and underground reserves. For the opencast mining operations these materials would need to be temporarily stored and/or stockpiled on site before being used as backfill material in the open pits during rehabilitation. For the underground mining operations, these materials would remain underground and used to backfill the mine workings.

### General and hazardous waste

General and hazardous wastes would be generated during construction and operation phases. The types of waste could include: hazardous industrial waste (such as packaging for hazardous materials, used oils and lubricants, used liquid fuels, hydrocarbon contaminated soils), general industrial waste (such as scrap metal, building rubble and demolition waste), medical waste (such as swabs, bandages) from the staff medical centre and domestic waste (such as packaging, food waste and office waste). Any hydrocarbon contaminated soils would be treated in-situ, bio-remediated in a facility or removed and dealt with as hazardous waste. These wastes would be handled, sorted and temporarily stored on site in a waste/salvage yard. Where wastes can be re-used or recycled this would be undertaken, or alternatively the wastes would be removed by waste handling companies for recycling, re-use or final disposal at permitted waste disposal facilities.

Estimated volumes of waste will be confirmed during the next phase of the EIA process.

Illegally dumped general and hazardous waste exists within the project footprint. The proposed project would require the bulldozing, sorting and disposal of this waste.

A waste management procedure will be developed for the project. The nearest permitted waste disposal sites will be identified in the next phase of the process and included in the EIA.

### Sewage

Portable toilets and temporary ablution facilities would be utilised until such time as the change houses and sewage treatment plants are operational. Portable toilets would continue to be used at active mining areas. Portable toilets would be serviced by external service providers on a regular basis.

Sewage treatment plants would be established to treat sewage and possibly domestic grey water at each of the infrastructure complexes. The sewage treatment plants would be modular plants capable of handling a peak throughput capacity that aligns with the estimated peak workforce. The treatment method and design capacity will be included in the EIA. Treated sewage effluent would be recycled for re-use. Sewage sludge would either be removed on a regular basis by a waste contractor for disposal at approved licensed facility.

## **h. Security and Access Control**

Perimeter fencing is planned around the three infrastructure complexes. These fences would be maintained for the duration of the project. Access control and a security office would be established at the entrance to each of the infrastructure complexes.

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**i. Employment and Housing**

For the opencast mining operations it is expected that a contractor would require between 40 and 50 employees.

During the construction phase for the underground mining operations it is expected that a contractor would require between 50 and 100 staff. Approximately 500 full-time employees (at peak production) would be required during the operational phase. Local labour would be sourced where possible. No project or mine housing would be provided during construction and operational phases. As housing areas are situated within close proximity to the areas of operation employees would be sourced from the local communities and the greater Johannesburg area.

**j. Operating Hours**

The operational phase for the opencast mining activities would comprise a 5.5-day working week with a one shift system per day between 06:00 to 18:00 Monday to Friday and between 06:00 to 14:00 on Saturday.

The construction of surface infrastructure for the underground operations would be a 5.5-day working week with one shift per day from 07:00 to 17:00 Monday to Friday and from 07:00 to 14:00 on Saturdays. The operational phase for the underground mining activities would comprise a 7-day week, three 8-hour shifts per day.

In the instance where emergency or critical activities are required as part of either the construction or operational phases, these hours may be extended but would be temporary in nature and for a specific time period.

**k. Decommissioning and Closure**

Broadly speaking, the decommissioning phase would include the removal of infrastructure from site and the final rehabilitation of areas. In consultation with landowners the final post closure land use will be identified during the Environmental Impact Assessment (EIA) process. The conceptual closure plan objectives would be aligned with a rehabilitation plan that supports a post-closure land use of a residential and/or agriculture.

A rehabilitation and closure plan will be included in the EIA in line with the requirements of the NEMA EIA Regulations, 2014 (as amended) and Financial Provisioning Regulations, 2015 (GNR.1147 of 2015).

### 3 POLICY AND LEGISLATIVE CONTEXT

This section outlines the key legislative requirements being considered for the project (Table 8).

**TABLE 8: POLICY AND LEGISLATIVE FRAMEWORK**

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) and Regulations	Introduction	West Wits has applied to the DMR for a mining right in terms of the MPRDA.
National Environmental Management Act No. 107 of 1998 (NEMA)	Introduction and Section 2.3.1	An integrated NEMA and NEM:WA application has been submitted to the DMR.
Regulation 982, 983, 984 and 985 of 4 December 2014 (EIA Regulations) in terms of NEMA		
National Environmental Management: Waste Act (No 59 of 2008) (NEM:WA)		
Regulation 921 of 29 November 2013 in terms of NEM:WA		
Waste Classification and Management Regulations, Regulation 634 of 2013	Sections 2.3.1, 0 and 6.9	These regulations have informed project planning and will be taken into account in the assessment and management of waste for the project.
Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation, Regulation 632 of 2015		
National Norms and Standards for the Storage of Waste, Regulation 926 of 2013		
Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, Regulation 1147 of 2015	Section 2.3.2 and 6.9	These regulations will inform the financial provisioning for the project.
Guideline on the need and desirability in terms of the Impact Assessment (EIA) Regulations, 2010, Notice 891 of 2014	Section 4.	This guideline has been taken into account as part of project planning.
Public Participation 2010, Integrated Environmental Management Guideline Series 7, DEA	Sections 6.2 and 7.7.	This guideline has informed the public participation process for the project.
National Water Act (No. 36 of 1998) (NWA)	Introduction and Sections 2.3.1 and 2.3.2.	A water use license would be required for the project. This would be applied for towards the end of the EIA process. Regulation 704 has informed project planning and will be taken into account in the assessment and management of impacts.
Regulation 704 of 1999 in terms of the NWA		
National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004)	Sections 2.3.2, 6.4 and 6.9	These regulations have informed project planning and will be taken into account in the assessment and management of emissions from the project.
National Dust Control Regulations, Regulation 827 of 2013		
National Atmospheric Emission Reporting Regulations, Regulation 283 of 2015		
National Nuclear Regulator Act (NNRA) (Act No. 47 of 1999)	Sections 6.4 and 6.9	This Act will inform the planning, assessment and handling of gold and uranium ore for the project.
Hazardous Substances Act (Act No. 15 of 1973)	Sections 6.4 and 6.9	This Act will inform the planning, assessment and management of hazardous substances from the project.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
National Forest Act (NFA) (Act No. 84 of 1998)	Sections 6.4 and 6.9	Permit(s) will be required if any protected species are cut, removed and/or translocated from the project footprints.
Transvaal Nature Conservation Ordinance 12 of 1983		
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Sections 6.7.5, 6.4 and 6.9	The Act, regulation and guideline have informed project planning and will be taken into account in the assessment and mitigation of impacts.
Alien Invasive Species Regulations, Regulation 598 of 2014		
Mining and Biodiversity Guideline (2013)		
National Veld and Forest Fire Act (Act No. 101 of 1998)	Section 6.4 and 6.9	These Acts have informed project planning and will be taken into account in the assessment and management of impacts.
Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1993)		
National Heritage Resource Act (No. 25 of 1999)	Section 6.7.13, 6.4 and 6.9	



## 4 NEED AND DESIRABILITY OF THE PROJECT

Mines across the West Wits mining right application area (namely Durban Roodepoort Deep and Rand Leases) closed prematurely in early 2000. Despite these closures, significant mineable resources remain.

Over the last few years West Wits has focussed on establishing code compliant and exploration target resources using relevant historical data, in addition to exploration activities. Based on this work, West Wits has identified a feasible ore body that it believes is worth developing further. The mining operation would produce run-of-mine ore containing gold, uranium and silver. This ore would be sold to downstream existing beneficiation operations in Gauteng. The anticipated market prices in the medium and long-term are considered by West Wits to be favourable for project development.

The further development of the project would allow for the rehabilitation of historically impacted land within the project footprints that was abandoned and not fully completed by previous mining companies. A number of housing development applications have been submitted to the municipality for approval. Where there is a mineral resource the DMR does not allow development that could result in sterilization of a mineral. Therefore if the mineral is mined it allows for the opportunity for development to take place. Mining and rehabilitation of the proposed open pit areas would take between three and five years to complete. The availability of land for future housing would help to address the housing backlog experienced by the City of Johannesburg, while at the same time creating socio-economic benefit for the communities and economy. The project would also result in the closure of access points to dangerous historical workings within the project footprints often targeted by informal miners (Zama Zamas), which pose health and safety risks to surrounding communities.

On the 20 October 2014, the Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014. The key components are listed and discussed below:

- Securing ecological sustainable development and use of natural resources
- Promoting justifiable economic and social development.

### 4.1.1 Ecological sustainable development and use of natural resources

Due to the nature of mining projects, impacts on biodiversity areas including aquatic ecosystems, linkages between biodiversity areas and related species and the role that they play in the ecosystem are probable.

The project area has been selected on the basis of the presence of economically mineable resources. Most of the proposed mining areas and infrastructure complexes would be located on land that has been impacted by historical and current mining activities, overgrazing and urbanisation. Sensitive ecological areas are associated with watercourses and more specifically the Klip River which runs along the western boundary of the mining right application area (considered by the biodiversity specialist to be of moderate sensitivity). All other tributaries within the mining right application boundary are considered to be of low sensitivity. The project plan and site layout avoids the more sensitive watercourse areas where possible, while still ensuring engineering feasibility and financial viability.

The biophysical impacts of the proposed project will be further investigated in the EIA phase by the appointment of relevant specialist. The results of these studies will be included in the EIA. Measures to mitigate the impacts to these resources will be included in the EIA.

#### **4.1.2 Promoting justifiable economic and social development**

Community/society priorities are officially expressed through public documents including the provincial growth and development strategy and spatial development framework documents. In this regard the West Wits mining right application falls within an area defined in the City of Johannesburg spatial development framework (SDF) 2040 as a Transformation Zone. The SDF lists the unlocking of the mining belt as a strategic mechanism for addressing historical spatial discontinuity between the northern and southern parts of Johannesburg. This would be achieved by identifying opportunities and interventions that allow for road linkages, mixed use redevelopments and rehabilitation of degraded and damaged land.

The proposed project will benefit society and the surrounding communities both directly and indirectly by generating additional employment at the proposed operation and through the extraction of mineral resources and beneficiation of mineral resources within Gauteng. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees. Through employment, persons at the mine will also gain skills involved in the construction and operation of a mine. The proposed development will also ensure local economic development through the implementation of projects identified in the Social and Labour Plan. West Wits is fully committed to implementing development plans and projects that will facilitate local community and rural development in the area surrounding its project in line with the provisions of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry.

The socio-economic impacts of the proposed project will also be assessed in the EIA phase following the completion of the social and economic specialist studies. The results of these studies will be included in the EIA. Measures to mitigate the impacts to these resources will be included in the EIA.

## **5 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED**

Environmental authorisation is required for a total life of mine of 30 years comprising five years for the open pit operations followed by 25 years for the underground mining operation.

## 6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVE

### 6.1 DETAILS OF ALL ALTERNATIVES CONSIDERED

This section describes alternative means of carrying out the operation and the consequences of not proceeding with the proposed project.

The shallow ore reserves that were identified during prospecting would be developed in the form of open pit mining, as these areas cannot be accessed using underground mining methods. The deeper ore bodies could only be mined by underground mining, as has been undertaken historically in the area. Once the open pit mining areas have been mined and rehabilitated the land would be made available for housing developments earmarked for the area and/or agricultural activities.

As indicated above, the location of the open pit mining areas was informed by the presence of economically mineable resources to which West Wits would have access. The layouts of the open pit operations have been designed to optimise the extraction of mineral resources. The topsoil and waste rock dumps have been positioned to create a safety, visual and/or noise berm between the mining operations and nearby receptors. No other surface infrastructure is planned for these areas.

For the underground mining, the positioning of the three infrastructure complexes was informed by the position of the mineable resource, areas historically disturbed by mining activities and infrastructure in order to ensure a feasible access point to the mineable resource. Thus no locational alternatives are considered in this EIA.

The network of roads existing in the area would be used to access the operational sites. Where site specific access is required, this would be undertaken in consultation with a traffic specialist and the relevant roads authority (as part of the EIA). Any site specific access routes would be optimised to ensure compliance with road regulations and requirements. Therefore no access alternatives are considered in this EIA.

The “no-go” alternative refers to the option of not going ahead with the proposed project. This would mean that there would be no change to the current status of the site and the positive socio-economic benefits of the proposed project would not be realised.

The project alternatives being considered therefore include:

- Layout and orientation of the infrastructure complexes;
- Operational aspects; and
- the “No-go” alternative.

### 6.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section describes the public participation process (PPP) undertaken to date in line with Chapter 6 of the EIA Regulations (2014). The intention of the PPP was to inform I&APs, in sufficient detail, of the proposed project in order that I&APs may contribute meaningfully to the EIA process.

The PPP to date has included notification of I&APs through distribution of a Background Information Document (BID), placement of newspaper advertisements, placement of site notices, distribution of flyers, radio announcements, focussed engagement and meetings with community structures and public scoping meetings.

A key aspect of public consultation is the notification of landowners, occupier and users within and adjacent to the application area. It was a condition of appointment that the relevant contact information



will be provided to SLR by the applicant given related time constraints. This information has not yet been provided to SLR which has related limitations. However, effort has been made to notify all stakeholders via a host of other standard industry measures.

The lodging of newspaper advertisements and placing of site notifications were undertaken in order to notify I&APs of the project, the EIA process and planned public scoping meetings and to elicit registration and comment from I&APs.

More detail in this regard is provided below.

### **6.2.1 Interested and affected party (I&AP) database**

As part of the PPP an I&AP database has been developed for the project. I&APs identified for the project include:

- landowners, lawful occupiers and ward councilors within and adjacent to the mining right application area
- ratepayer organisations, community leaders and community structures
- non-government organisations and associations working in the area
- mines, industry and businesses in the area
- parastatals
- commenting authorities:
  - Gauteng Department of Agriculture and Rural Development (GDARD)
  - Department of Water and Sanitation (DWS)
  - Department of Agriculture, Forestry and Fisheries (DAFF)
  - Department of Rural Development and Land Reform (DRDLR): Land Claims Commissioner
  - Department of Roads and Transport (DRT)
  - South Africa Heritage Resource Agency (SAHRA)
  - Provincial Heritage Resources Authority Gauteng (PHRAG)
  - Department of Economic Development
  - City of Johannesburg Health Department
  - City of Johannesburg Metropolitan Municipality
  - Roodepoort Magisterial District Municipality
  - Krugersdorp Magisterial District Municipality.

I&APs who attended meetings and /or submitted their contact details to SLR have been registered on the I&AP database. The latest copy of the database is included in Appendix F. The database will be updated on an on-going basis throughout the EIA process. If there are any additional I&APs that should be included in the I&AP database, please notify SLR and/or send SLR their contact details. There is still opportunity to be registered and included in the EIA.

### **6.2.2 Advertisements and site notices**

At the start of the PPP, advertisements were placed in the following newspapers:

- Daily Sun on Thursday 22 March 2018 (national newspaper);
- Roodepoort Record on Friday 23 March 2018) (local newspaper); and
- Dobsonville Urban News on Friday 30 March 2018) (local newspaper).

Site notices (400) in a mixture of English, Afrikaans, Zulu and Sotho were placed in key conspicuous positions in and adjacent to the mining right application area (between 23 and 28 March 2018). Where requested by ward councillors additional notices were provided as A4 handouts to the councillors for distribution in their wards.

A copy of the newspaper advertisements, site notices and a map showing the distribution of site notices are included in Appendix F.

In May, further advertisements were placed in the following newspapers:

- Roodepoort Record on Friday 4 May 2018;
- Roodepoort Record on Friday 10 May 2018;
- Daily Sun on Friday 18 May 2018;
- Roodepoort Record on Friday 18 May 2018; and
- Soweto Urban Dobsonville on Friday 18 May 2018.

Further site notices (in English) were placed at key locations in and adjacent to the mining right application area and flyers containing the same information were handed out (between 15 and 17 May 2018). Radio announcements were also made on Jozi FM on Friday 18 May 2018. The newspaper advertisements, site notice, flyer, radio announcement and a map showing the distribution of site notices is included in Appendix F.

### 6.2.3 Background Information Document (BID)

A BID document was compiled for the proposed project. The purpose of the BID was to inform I&APs about the proposed project, the EIA process, environmental attributes, possible impacts and means of providing input into the EIA process. The BID was made available in English and included details of the public scoping meetings. The BID was distributed by email, at the public scoping meetings and by hand (starting on 23 March 2018). The BID together with the proof of distribution are included in Appendix F.

### 6.2.4 Scoping meetings

#### a. Public scoping meetings

The purpose of holding the public scoping meetings was to:

- to provide an overview of the project and related EIA process
- to provide an overview of the social and labour plan (SLP);
- to provide I&APs with an opportunity to:
  - raise any issues and concerns (both positive or negative)
  - provide input on any environmental sensitivities and potential impacts
- to record issues within the formal assessment process so that they can be addressed during the course of the EIA
- to outline the way forward.

The date, venue and time of the public scoping meetings are provided in Table 9.

**TABLE 9: PUBLIC SCOPING MEETINGS**

Date	Venue	Time
Tuesday 3 April 2018	Solplaatjie Hall, Solplaatjie	11h00
	E-Hall, Mathoeshville	17h00
Wednesday 4 April 2018	NG Kerk, Witpoortjie	17h00
Thursday 5 April 2018	Multi-Purpose Centre, Braamfischerville	17h00
Friday 6 April 2018	Moses Kotane Primary School, Braamfischerville	17h00

The meetings were held in English due to the diversity of languages present at the meetings. However, attendees were informed that they could ask questions in any language with which they were comfortable.

Copies of the BID were made available to attendees at the meetings. Maps indicating the local setting of the project were displayed on the walls at the meetings.

Minutes of the meetings are included in Appendix F.

#### **b. Focused meetings with community structures**

A number of focused meetings took place with individuals from municipal and community structures.

### **6.2.5 Review of the scoping report**

#### **a. I&AP review of scoping report**

The draft scoping report has been made available for a 30-day review and comment period (from 17 May 2018 to 17 June 2018) at the following venues:

- Roodepoort Civic Centre;
- Witpoortjie Library;
- Braamfischerville Multipurpose Centre;
- Moses Kotane Primary School;
- Solplaatjie Hall;
- Meadowlands Library; and
- SLR's website [www.slrconsulting.com](http://www.slrconsulting.com).

An executive summary of the Scoping Report has been made available to I&APs:

- via email and post to registered I&APs on the I&AP database;
- via email to municipal structure; and
- hard copies were provided to ward councillors for distribution in their respective wards.

In addition, registered I&APs have been notified of the availability of the Scoping Report for review via SMS notification. Electronic copies of the Scoping Report will be made available on request.

Where meetings take place during the review period, hard copies of the executive summary will be provided to all attendees.

Additional public scoping meetings will take place during the report review period as outlined below.

**TABLE 10: ADDITIONAL PUBLIC SCOPING MEETINGS**

Date	Venue	Time
Thursday 31 May 2018	Roodepoort City Hall, Roodepoort	18h00
Monday 4 June 2018	Tshepisoong Multi-Purpose Centre	16h00

Notes of the meetings will be included in the scoping report that is submitted to the DMR.

#### **b. DMR review of scoping report**

On completion of the 30 day review period, a final Scoping Report will be compiled which will include comments received during the I&AP review period. On 18 June 2018, the report will be submitted to the

DMR for its review via the online SAMRAD system. Due to the limited time available to fully analyse the comments received, only a high level analysis of them is provided.

### 6.3 SUMMARY OF ISSUES RAISED BY IAPS

The issues and response table is included in Appendix E.

## 6.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PROJECT AND ALTERNATIVES

The information in this section provides a high level preliminary indication of the baseline environment of the study area. Further detailed information will be provided in the EIA once the project-specific specialist studies and other research has been concluded.

### 6.4.1 Type of environment affected by the proposed activity

#### a. Geology

The dominant geological formations found within the project area are those of the Central Rand Group and the Klipriviersberg Group within the Witwatersrand Supergroup and the Ventersdorp Supergroup, respectively. These supergroups are dominated by quartzite, shale and the following mining target conglomerates; North Reef, Main Reef, Main Reef Leader, South Reef, Livingstone Reef, Bird Reef, Monarch Reefs, Kimberley Reefs and Ventersdorp Contact Reef. The Central Rand Group is divided into two sub-divisions; the older Johannesburg (containing the Main, Randfontein, Luipaardsvlei, Krugersdorp, and Booyens formations) and the younger Turffontein (containing the Kimberley, Elsburg and Mondeor formations) subgroups. The Venterspost formation of the Kliprivierberg Group contains the Ventersdorp Contact Reef. A depiction of the stratigraphy of the geology underlying the site is provided in Figure 9.

The Witwatersrand Supergroup stretches through the North West, Gauteng and the Free State Provinces. It has a geological time that coincides with the emplacement of Vredefort Dome of (2.023 Ga) and the Bushveld Igneous Complex which ranges in age from 2.7 Ga to 2.4 Ga. The gold ore within the Witwatersrand Supergroup occurs in reefs, or thin bands between 20 to 540 m in thickness that are mined at depths down to 4 000 m. Silver and iridium are recovered as gold-refining by-products.

The northern perimeter of the project area follows the outcrop of the Johannesburg Subgroup which is overlain towards the south by strata of the Turffontein Subgroup. In the southwestern portion of the project area are volcanic rocks of the Ventersdorp Supergroup outcrop. A circular outcrop of Transvaal Supergroup sedimentary rocks is found in the central southern portion of the project area. These Transvaal Supergroup rocks predominantly consist of dolomite, with the Black Reef present at its base (Figure 10 - *Dwyka Tillite v Karoo (Pd)*; *Malmani dolomite (Vmd)*; *Black Reef quartzite (Vbr)*; *Ventersdorp andesite (Rk)*; *Quartz Conglomerate and sandy shale (Rt)*; *Shale (Rb)*; *Quartzite and conglomerate (Rjo)*; *Shale, Conglomerate and Quartzite (Rj)*).

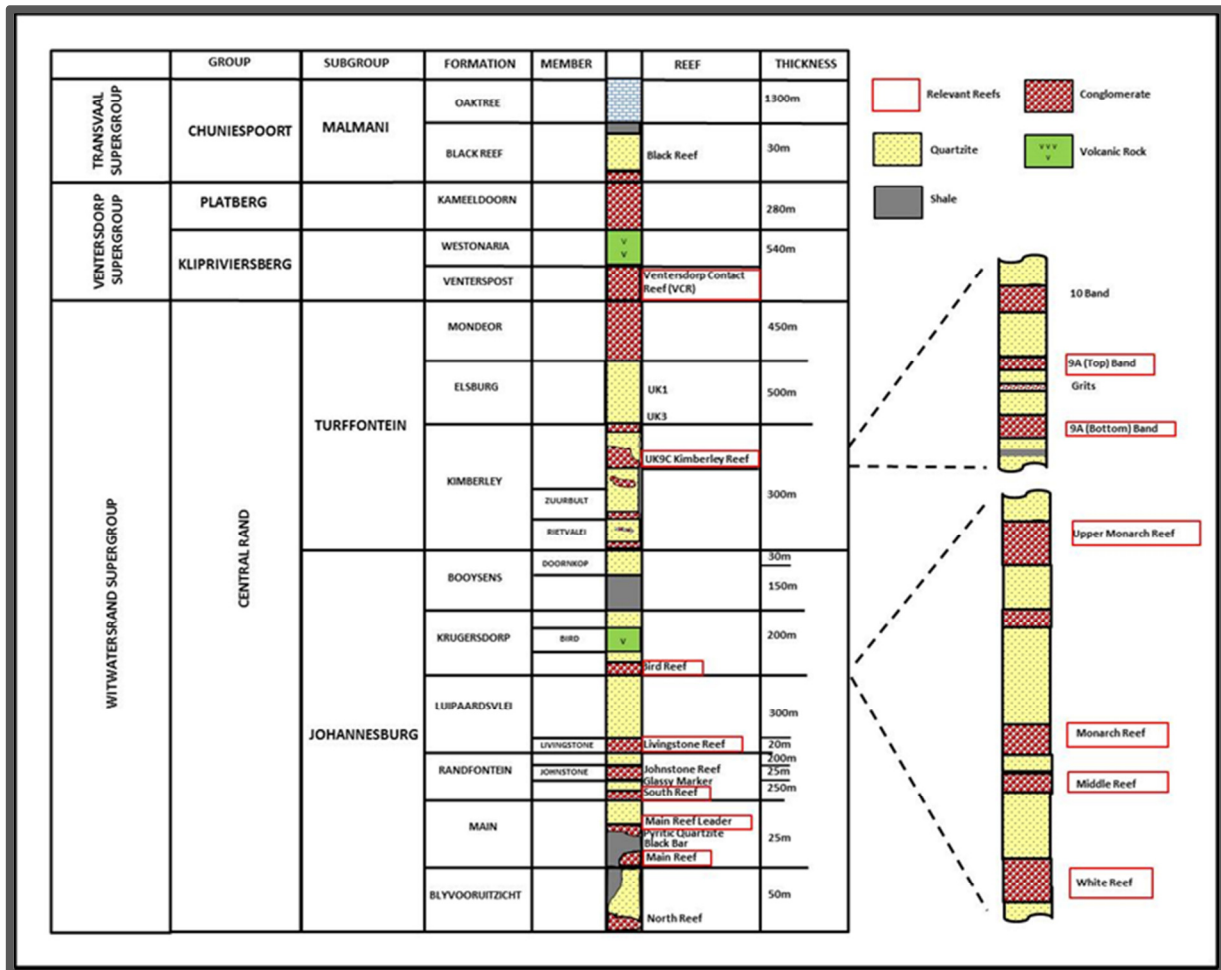
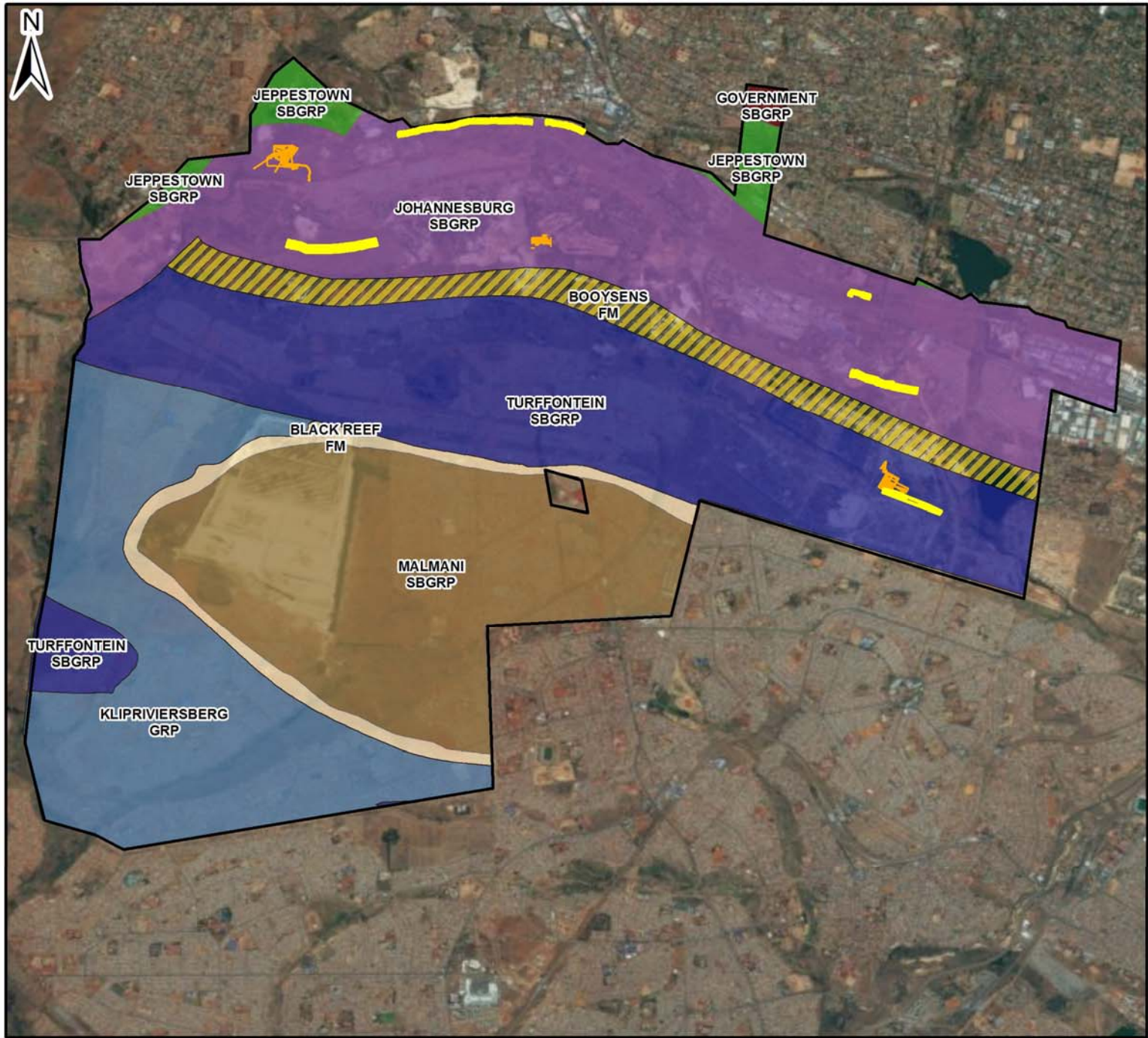


FIGURE 9: STRATIGRAPHIC COLUMN





**Legend**

- Proposed Infrastructure Complexes
- Proposed Opencast Mining Areas
- Proposed Mining Right Application Area

**Simplified Geology**

- Dolomite, subordinate chert, minor carbonaceous shale, limestone and quartzite
- Quartzite, conglomerate
- Quartzite, shale, minor/subordinate conglomerate
- Quartzite, subordinate conglomerate and shale
- Quartzite, subordinate conglomerate, shale and amygdaloidal lava
- Shale, quartzite, subordinate lava, minor conglomerate
- Shale, subordinate quartzite
- Tholeiitic basalt

Kilometers  
 0      0.75      1.5      3  
 Scale: 1:71 584  
 Projection: Transverse Mercator  
 Datum: WGS84

**WEST WITS MINING RIGHT**

**Figure 10**

**Surface Geology of the Project Area**



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**b. Topography and Visual aspects**

The project area is dominated by rolling plains with interspersed hills, with a dominant hill crest in the north where previous mining activities have impacted on the outcrop. The general elevation across the project area varies from 1 600 to 1 780 m above mean sea level (mamsl), which generally slopes to the south-west. Historical mining activities have altered the natural topography with the presence of various old slimes dams scattered throughout the project area.

The Klip River, a perennial watercourse flows from north to south along the western boundary of the proposed mining right application area. Six other drainage lines which are all tributaries of the Klip River flow through the site.

Central to the visual character of an area are the concepts of sense of place and scenic quality. Sense of place is informed by the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area which lend that area its uniqueness and distinctiveness. The scenic quality of the project area and surrounding area is linked to the type of landscapes that occur within the area. The surrounding areas have been subject to various historic and current illegal mining activities for several years, as well as cultivated agricultural and grazing/browsing activities which have influenced the visual character of the area.

The dense population of the Soweto and Roodepoort residential areas result in a high concentration of potential receptors surrounding the proposed opencast mining and infrastructure complexes. It should be noted that depending on the distance between the residential areas and the proposed opencast mining and infrastructure complexes, the undulating topography with associated vegetation, buildings, walls and trees and houses serve to partially obscure the view from various surrounding viewpoints. Furthermore, existing anthropogenic infrastructure such as power lines, substations, buildings, and remains of demolished mining infrastructure and historic slimes dams are present within the area diminishing the overall visual quality of the area. The illegal and legal mining activities currently taking place in the area detract from the visual intrusion of the proposed opencast mining and infrastructure complexes.

**c. Climate**

The project area falls within the Highveld Climatic Zone. Average annual precipitation is approximately 680 mm, generally in the form of thunderstorms with high intensity lightning. Winds are generally from the north, north-west and north east. Annual average evaporation is expected to be almost double the annual average rainfall. Temperatures are warm-temperate with severe frost occurring in winter.

**d. Soil and land capability**

Soils within the parts of the project area that are earmarked for opencast mining and associated surface infrastructure are characterised as sub-dominant sandy soils. These soils have been significantly disturbed due to historic mining activities such that the natural diagnostic soil horizons can no longer be identified. Therefore, these soils are not regarded important for agricultural production due to chemical pollution, soil compaction and the unavailability of essential soil microorganisms to mediate and facilitate the uptake of essential plant nutrients from soil. As these soils have almost no clay content they are expected to be vulnerable to wind erosion when vegetation cover is removed.

### e. Biodiversity

The majority of the project area is located within Mesic Highveld Bioregion of the Grassland Biome. A large portion of this is in the Soweto Highveld Grassland and a small area of the lower portion is Tsakane Clay Grassland. The small portion of the project area to the south is located within the Azonal Vegetation Biome within the Freshland Wetlands Bioregion and the Eastern Temperate Freshland Wetlands.

#### National and provincial databases

A review of available national and provincial databases has highlighted the points below in relation to the project area (refer to Appendix C).

- The majority of the project area falls within an area that is currently not protected. The nearest protected reserves include the Walter Sisulu National Botanical Garden located approximately 6 km north, the Ruimsig Municipal Nature Reserve approximately 8.5 km north, the Kloofendal Municipal Nature Reserve approximately 2.5 km north and the Melville Koppies Municipal Nature Reserve approximately 8 km west of the project area.
- A large portion of the project area falls within an area where the ecosystem is classified as being critically endangered and vulnerable, with smaller patches classified as endangered.
- The study area itself not fall within a Conservation Area (CA). The nearest CA(s) include the Walter Sisulu National Botanical Garden and the Magaliesberg Biosphere Reserve located approximately 6 km and 10 km north west of the project area, respectively.
- The study area does not fall within a Nature Reserve (NR). It is located approximately 8 km west of the Melville Koppies NR and approximately 9.6 km north west of the Olifantsvlei NR.
- The project area does not fall within an Important Bird Area (IBA) (an area of international significance for the conservation of the world's birds and other biodiversity), however the Magaliesberg IBA is located approximately 10 km away.
- According to the Gauteng Biodiversity Plan the project area includes Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA).
- In terms of the Mining and Biodiversity Guideline (2012) the project area and more specifically the proposed opencast mining and infrastructure complexes fall within an area defined as being within a range of moderate, high and highest biodiversity importance. The guideline indicates that an EIA and associated specialist studies should focus on confirming the presence and significance of biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.
- According to the National Freshwater Ecosystem Priority Areas (2011) (NFEPA) database, three flat wetlands are located within the center and towards the south of the project area. A depression wetland is also located in the south-western portion of the project area, and a channeled valley-bottom wetland is bordering the south-western edge of the project area. Numerous seep wetlands are located within the northern and southern section of the project area. The Klip River along the western boundary of the project area has been identified as a NFEPA river.

It is important to note, that although all above data sources provide useful and often verifiable, high quality data, the various databases do not always provide an entirely accurate indication of the actual site characteristics. This information is, however, considered to be useful as background information. Site-specific information would be obtained during the project-specific specialist studies.

#### Terrestrial (floral and faunal)

Two local broad natural habitat units (namely Secondary Grassland Habitat and Transformed Habitat) and a transformed habitat unit occur within the project area. Similar habitat units are expected to occur in surrounding areas. All habitat units have been impacted and degraded to some extent as a result of long-term overgrazing and edge effects associated with agriculture, residential developments, historic and current legal and illegal mining activities, dumping of waste material and a relatively high abundance of alien and invasive floral species. Notwithstanding this, for all natural habitat units, the overall vegetation structure is considered to be reasonably intact and functional, especially within the

freshwater habitat unit which contributes significantly to the floral diversity and is considered to be more sensitive. Although the overall faunal species diversity is lower due to past and current anthropogenic activities, each of the habitat units is capable of sustaining a variety of faunal species at varying abundances. A number of faunal species have been observed within the project area such as *Lepus saxatilis* (Scrub Hare), *Cryptomys hottentotus* (Common Mole Rat), *Pycnonotus tricolor* (Dark-capped Bulbul), *Bostrychia hagedash* (Hadedda Ibis), *Danaus chrysippus* (African Monarch) and *Anoplolepis custodiens* (Pugnacious ant). Avifaunal diversity is considered to be high for the project area, due to the presence of a number of suitable habitats including micro habitats. Amphibian, invertebrate, reptile and arachnid species diversity is considered low due to the preferred habitat being lost and/or preferred food source not available.

Due to the historical and current impacts, no floral species of Conservation Concern is expected to occur within the opencast mining and infrastructure complexes. This will, however, be verified by specialist studies undertaken during the EIA.

The Freshwater Habitat unit within the greater project area (and at some of the opencast mining and infrastructure complexes), is regarded as being more sensitive than the other habitats in terms of habitat provision.

#### Aquatic

The Klip River has been significantly affected by the extensive historical and ongoing gold mining activities, industrial, sewage treatment and urban areas upstream and surrounding the project area. The aquatic macro-invertebrate community has significantly declined from the natural conditions in the system with a significant loss of more sensitive macro-invertebrate taxa. The fish community is expected to reveal an abundance of fish species, popular for angling including *Labobarbus aeneus*, *Labeo capensis* and *Clarias gariepinus*.

#### Wetland ecology

Several natural watercourses including the Klip River and several channelled valley bottom wetlands have been identified within the project area. These are associated with the drainage lines that feed into the Klip River along the western section of the project area in close proximity to some of the opencast mining and infrastructure complexes. An addition another channelled valley bottom system is located within the eastern section of the project area also in close proximity to some of the proposed opencast mining and infrastructure complexes. Several other natural wetland features are found within the project area.

The largest hydrological drivers of these systems are stormwater runoff from the surrounding impermeable surfaces, and seepage from slime dams in the northern section of the project area. These additional water inputs have also contributed to erosion of these systems.

The natural wetland and riparian vegetation of these watercourses are considered to be severely transformed, largely due to alien and invasive species encroachment where disturbances such as road infrastructure crossings and mine workings have occurred in close proximity to these watercourses. mine zone along the Vaal River is well established in areas not limited by steep rocky cliffs and contains habitat with a number of typical riparian indicator species.

The Ecological Importance and Sensitivity of the water bodies on site is considered to be moderate to high as these watercourses are located within a wetland vegetation type classified as Critically Endangered (the Mesic Highveld Grassland Group 3).

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**f. Surface water**

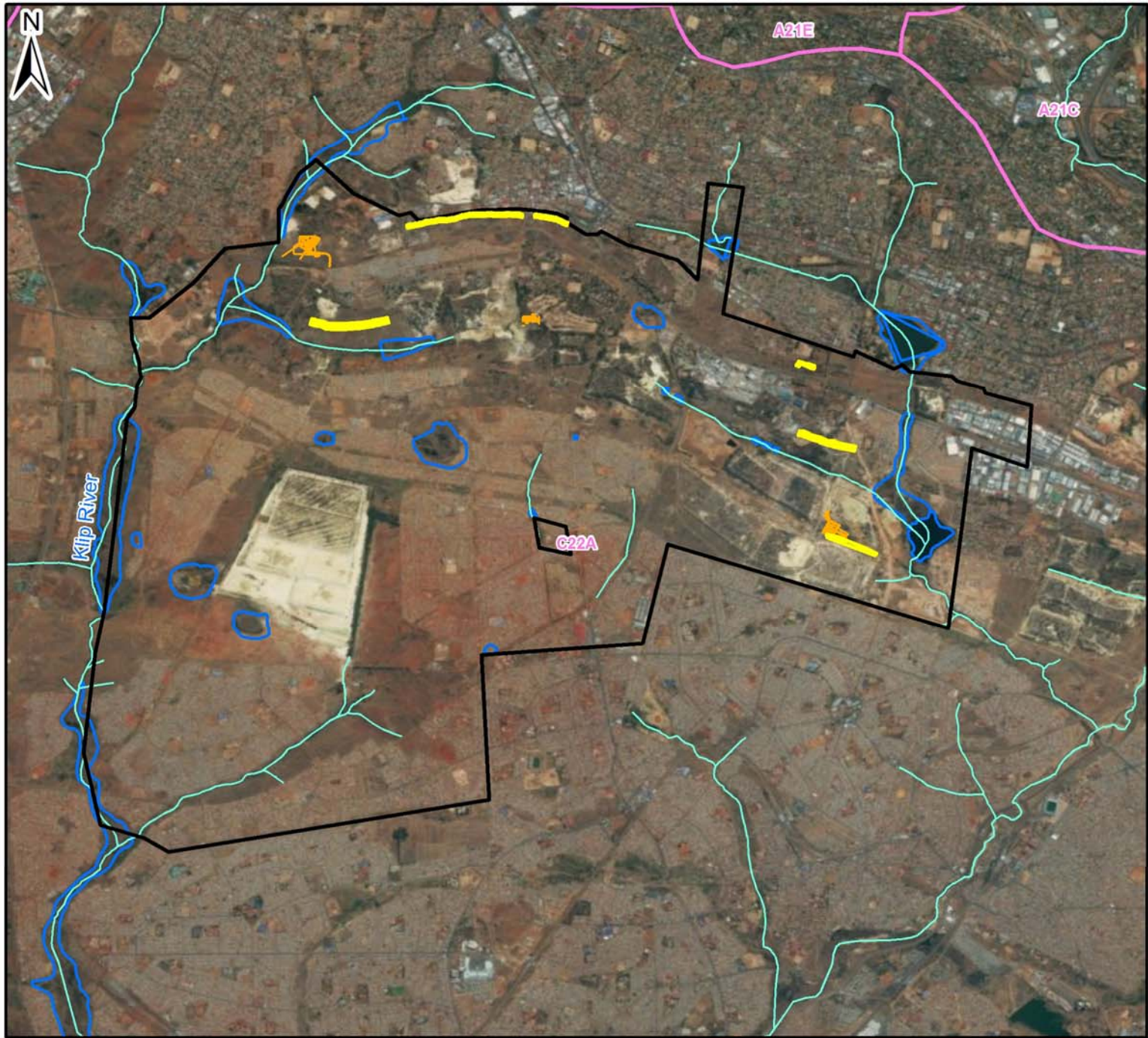
The proposed project area is located in the upper reaches of the Upper Vaal Water Management Area (WMA), approximately 60 km downstream of the Vaal Barrage (Figure 11). The Upper Vaal WMA includes a number of large river systems covering a large catchment area. This WMA includes dams important for South Africa's water supply. These include the Vaal Dam, Grootdraai Dam and Sterkfontein Dam, all located upstream of the proposed project area.

The project area falls within the northern portion of quaternary catchment C22A which has a gross total catchment area of 548 km<sup>2</sup>, with a net mean annual run-off (MAR) of 28.06 million m<sup>3</sup> (WR2012, 2015) (Figure 11). The Klip River is the major river within the quaternary catchment.

As mentioned above, there are six drainage lines flowing through the project area which feed into the Klip River (Figure 11). These Klip River tributaries are contaminated by historical and possible current mining and industrial activities and as such are not fit for use. No other drainage lines occur on the site.

There are no flow gauge data from the DWS's network of flow gauging stations within a 5 km radius from the project area. Therefore no information was available for stream flow analysis.





**Legend**

- Proposed Infrastructure Complexes
- Proposed Opencast Mining Areas
- Proposed Mining Right Application Area
- Watercourse
- Surface Water Features
- Catchments

Kilometers  
 0    0.75    1.5    3  
 Scale: 1:71 584  
 Projection: Transverse Mercator  
 Datum: WGS84

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**Figure 11**

**Surface Water Resources and Quaternary Catchments**



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### **g. Groundwater**

Groundwater occurrence in the Witwatersrand and Ventersdorp rocks or the quartzite is generally associated with zones of deep weathering, or faulting and jointing. The depth of weathering is not known due to a lack of information. Groundwater is often encountered in both the saturated weathered material below the regional groundwater rest level and in the transition zone between weathered and fresh formations.

The dolomitic zone is characterised by highly fractured chert layers. From a groundwater perspective, the chert content is the most important, with the chert-rich formations forming the main aquifers. The dissolution of calcite along fractures, together with folding and faulting, resulted in well-developed aquifers in the dolomite, with a high transmissivity and large storativity.

A characteristic of the area is a series of cross-cutting lineaments representing faults and dykes. The dykes are not 100% impermeable, but are at least several orders of magnitude less permeable than the dolomite. They therefore divide the dolomite into a series of characteristic compartments. Of relevance to the proposed mining area are the Zuurbekom and Upper Klip River dolomitic compartments. The Klip River dyke bisects the proposed mining area. It runs from the centre of Roodepoort, across the circular dolomitic deposit and down to the centre of Lenasia. The dolomite to the east of the dyke is known as the Upper Klip River Compartment and to the west as the Zuurbekom Compartment.

The local weathered aquifers generally support moderate yielding boreholes (less than 1 L/s). Most fault and joint zones in the deeper fractured aquifers are steeply dipping structures that tend to narrow and even pinch out at depth, with a corresponding decrease in permeability. The porosity is usually less than 1% while the fresh rock may be regarded as impermeable.

The groundwater level varied from 4.4 mbgl in the Hamberg residential area to a maximum depth of 36.2 mbgl at south of the Durban Deep Golf Course. The southern measurement could potentially reflect a mine impacted groundwater level. The hydrocensus data plus the information collected from the DWS's NGA (Table 3) indicate groundwater levels between 4.5 m and 12 m in the upgradient Roodepoort residential areas.

The groundwater table in the project area is located approximately 25 to 30 meters below ground level (mbgl). Groundwater movement often mimics the topography and generally flows towards the south; the Roodepoort residential areas are located upstream of the proposed mining areas and the Bram Fischer and Soweto residential areas and the dolomites downstream.

Groundwater is used in the project area, although most areas receive municipal water. Known groundwater uses include grey water for toilet systems, domestic use, swimming pools and garden irrigation. Some monitoring wells occur within the area.

Information presented in the DWAF (now DWS) dolomite study (2006) indicates that groundwater in the Zuurbekom compartment is used predominantly for mining and municipal use. In the Klip River compartment agriculture plays a more dominant role with a much smaller use from domestic and municipal requirements.

No springs have been identified within or in close proximity of the project area, however mention was made that springs occur in the Davidsonville area. This will be investigated by the Groundwater specialist and more detail will be provided in the EIA.

In general the groundwater quality indicates that groundwater is not suitable for human consumption.

## **h. Air quality**

Ambient air quality in the project area is likely to be influenced by local sources as well as emissions from various remote sources. The most significant of these sources within the Soweto and Roodepoort region include:

- fugitive dust emissions from mining operations;
- vehicle tailpipe emissions;
- vehicle entrained dust from paved and unpaved roads;
- household fuel combustion by means of coal, wood and paraffin;
- biomass and veld burning; and
- various miscellaneous fugitive dust sources, including: agricultural activities, and wind erosion of open areas.

Potential receptors in the area comprise residential areas, institutional areas, educational areas, rural type areas, industrial and the natural environment.

## **i. Noise**

The ambient noise environment of the project area is typical of a suburban, urban and central business district areas. Existing noise sources within and around the project area include:

- natural sounds from wind, animals and birds;
- school activities;
- community activities;
- mining activities;
- industrial activities;
- heavy road traffic; and
- air traffic.

Potential receptors of project-related noise are the same as those identified as air quality receptors (see section above).

## **j. Traffic**

A network of public roads exist in the project area. These comprise both surfaced and gravel roads. The northern section of the project area would be crossed by the R41 (Mainreef/Randfontein) provincial road; Cemetery Road feeds off Mainreef road to the south and runs through the project area linking Roodepoort in the north to Soweto in the south.

Due to the land uses in the area, the type of vehicles and related traffic volumes the northern section of the project area are typical of a mixed use residential/commercial/industrial area.

## **k. Heritage/cultural and palaeontological resources**

The greater Roodepoort region has been extensively altered by historical mining activities since the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal (in Krugersdorp) were proclaimed as public diggings by the then ZAR government in 1886. The expansion of gold prospecting activities in and around the farm Roodepoort, resulted in the need for a town. By February 1887, the first residential stands of what would become Roodepoort were sold.

Heritage resources in and surrounding the project area are likely to include the remains of historical mining structures, historical residential and community structures, formal and informal cemeteries and graves, and outdoor religious site(s).

The palaeontological sensitivity of areas proposed for opencast and underground mining (based on the SAHRIS regional map) is considered to be low.

## I. Socio-economic

The project area is located in the City of Johannesburg Metropolitan Municipality (CoJ) of the Gauteng Province. The CoJ is divided into seven regions, Regions A to G. The project area is mainly situated within Region C with a small section along the southern boundary situated within Region D. Various wards fall within and adjacent to the mining right application area.

The site is located within a mining belt, situated south of Roodepoort (Region C) and north of Soweto (Region D). Information on Region C and D, sourced from the CoJ website, is provided below.

### Region C

Region C covers the greater Roodepoort area, parts of Randburg and north-western suburbs like Olivedale, Northriding and Jukskei Park. It is also home to the mixed-use Cosmo City development.

Roodepoort and its surrounding suburbs including areas such as Florida to the southeast and Bram Fischer to the south and are mainly residential areas, with lower levels of economic growth compared to the central business areas of Randburg and Sandton. Urban sprawl is evident in the region, with rapid residential development, including townhouses and cluster developments, along and around major roads. Its built-up areas have a fairly even profile, with few high-rise buildings penetrating the skyline. Residential density varies, with concentrations of high densities in new residential suburbs. The suburbs in the north of Roodepoort are among the most attractive residential areas in the metro, with houses dotted along rolling hills offering good views of the city to the east and the Magaliesberg to the west.

Region C is also home to two universities and is well-served by amenities, including shopping centres, schools, a museum and theatre, health facilities, country lodges, restaurants, sporting facilities and nature trails.

Region C is well linked to the rest of the city with major roads, such as Main Reef Road and Ontdekkers Road. While the region has good links with the Johannesburg central business district, road links with other economic hubs, such as Randburg and Sandton, are poor. This has resulted in increasing traffic congestion on several secondary roads and residential areas.

Picturesque natural spaces are abundant, including the Walter Sisulu National Botanical Garden, most of which feature rocky ridges and watercourses. The development of the main Witwatersrand ridge has resulted in an increased focus on protecting the remaining open areas along it, though wetlands and watercourses – especially in the southern mining belt – are faced with higher pollution and development pressures.

Region C is part of Gauteng's Primary Urban Development Support Zone. The implications of this include the integration of the region with Johannesburg's southern areas and residential growth in the northwest, with infill and densification. Protection, growth and enhancement of residential areas should ensure the attraction of further investment.

Of the region's population of 326 416 in 2011, 65% are economically active and about 24 percent are of school-going age. The majority of the adult population is in the middle to high-income bracket, with many young working individuals and small families. Around 32 percent of the population has a post-matric qualification.

## Region D

Region D encompasses the whole of Soweto, where Orlando was the first township. Other long-established townships include Diepkloof, Dube, Meadowlands, Orlando East and Orlando West. There are also large informal settlements in the region.

Soweto is a composite name, standing for South-Western Townships. Situated in the southwest of the greater metropolitan area, Region D abuts Johannesburg's mining belt to its north and its western periphery forms the furthest boundary of the City of Johannesburg. A major landmark in Region D is the world-renowned Chris Hani Baragwanath Hospital, situated at the eastern entrance to Soweto.

The established areas of Region D are largely composed of the old "matchbox" houses built to provide cheap accommodation for Johannesburg's workers during the apartheid era. In some areas, prosperous Sowetans have built houses that can be compared to those in some of Johannesburg's most upmarket suburbs. However, there are also large areas of informal settlements. Hostels, originally built to house male migrant workers in the most basic of circumstances, are a feature of Soweto. Many of these have been improved and now accommodate couples and families.

The region is participating in the Wetlands Project, which is aimed at rehabilitating the rivers and streams of Soweto. Although many parts of the wetland have become extremely degraded, the project has the potential to provide green belt areas. There is a growing interest in the greening of Soweto, including private gardens for both decorative and food purposes. More trees have been planted in recent years and some previously desolate parks have been upgraded and are now attractive recreation areas.

There is sufficient road infrastructure in many parts of the region, with highways running to the Johannesburg central business district and Roodepoort. Commuters are largely reliant on trains and taxis. With a history that did not support the creation of major employment centres within Soweto, almost all its working people commute to work in other areas of Johannesburg.

Region D's population was 1,271,628 in 2011 many of whom live in informal settlements. Poverty is a major problem, with high unemployment and low educational levels.

Region D is faced with the challenge of building what was once the vast black-labour dormitory of Johannesburg into a prosperous urban area. With its central role in the larger history of South Africa, few places in the country are as determined to tackle the challenges of the future with such passion. The region is focused on positive municipal and community activity.

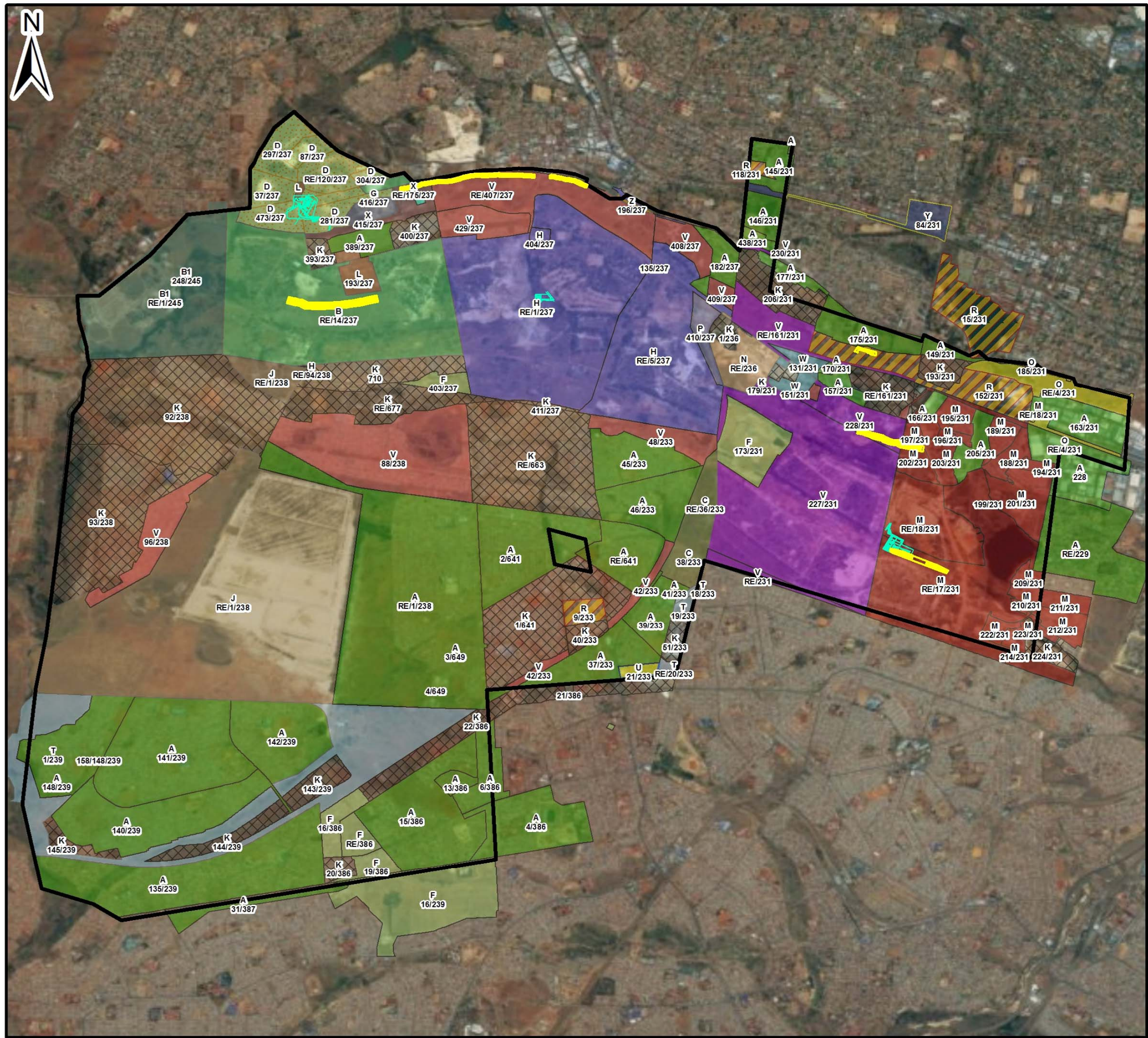
Detailed socioeconomic data will be included in the EIA.

### **6.4.2 Current land uses**

#### **a. Surface rights**

Surface rights within the project area are held by private individuals, companies, property developers, Gauteng provincial government, the local municipality and parastals (Figure 12). Surface rights of land immediately adjacent to the project area will be included in the EIA.





**Legend**

- Proposed Infrastructure Complexes
- Proposed Opencast Mining Areas
- Proposed Mining Right Application Area
- Ownership**
- A-FOR INFO REFER TO REGISTRAR OF DEEDS
- A1-VECTOR LOGISTICS PTY LTD
- B-68 STURDEE PTY LTD
- B1-WITPOORTJIE CALGRO M3 DEV CO PTY LTD
- C-ABLESUN INV PTY LTD
- D-ANSEC 171 PTY LTD
- E-BLUE FRAME PROP 46 CC
- F-CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY
- G-DJL INV PTY LTD
- H-DINO PROP PTY LTD
- J-DRDGOLD LTD
- K-DEED NOT FOUND
- L-ESCOM
- M-FLEURHOF EXTENSION 2 PTY LTD
- N-HOLCIM SOUTH AFRICA PTY LTD
- O-INDUSTRIAL ZONE
- P-JOHANNES PETRUS AND ELSIE EVELYNN
- Q-MONTY'S SCRAP YARD CC
- R-MUN ROODEPOORT
- S-PARETO LTD
- T-PROVINCIAL GOVERNMENT OF GAUTENG
- U-PUTROP LTD
- V-RAND LEASE SECURITISATION PTY LTD
- V-RAND LEASES PROP PTY LTD
- W-ROCLA PTY LTD
- X-ROODEPOORT BRICK WORKS PTY LTD
- Y-SUID-AFRIKAANSE SPOORPENDELKORPORASIE LTD
- Z-TRANSNET

Kilometers  
 0      0.75      1.5      3  
 Scale: 1:71 584  
 Projection: Transverse Mercator  
 Datum: WGS84

**WEST WITS MINING RIGHT**

**Figure 12**

**Surface Ownership in the Project Area**



**Johannesburg Office**  
 METAGO HOUSE  
 FOURWAYS MAN OR OFFICE PARK  
 CORNER ROOS AND MACBETH STREETS  
 FOURWAYS  
 JOHANNESBURG SOUTH AFRICA  
 T: +27 (11) 467-0945  
 F: +27 (11) 467-0978  
 www.slrconsulting.com



### b. Mineral/prospecting rights

West Wits currently holds a prospecting right (GP 30/5/1/1/2/10035 PR) over various portions of the farms Glen Lea 228 IQ, Perdekraal 226 IQ, Rand Glen 229 IQ, Dobsonville 386 IQ, Doornkop 239 IQ, Fleurhof Township, Roodepoort 236 IQ, Roodepoort 237 IQ, Uitval 677 IQ, Vlakfontein 233 IQ, Vlakfontein 238 IQ, Witpoortjie 245 IQ, Vogelstruisfontein 231 IQ, Vogelstruisfontein 233 IQ, Soweto 387 IQ, Klipspruit 298 IQ, Klipriviersoog 299 IQ, Durban Roodepoort Deep 641 IQ, Bram Fischerville 663 IQ, Bram Fischerville 649 IQ and Tshekisho 710 IQ. The prospecting right (MPT No. 29/2016) was ceded from Mintails SA Soweto Cluster (Proprietary) Limited to West Wits. Consent for the transfer of the prospecting right in terms of Section 11(2) of the MPRDA was granted by the DMR in 2018.

Third party mineral rights' holders exist within the project area and to the east, along the Central Rand Goldfield.

### c. Land claims

Consultation with the Department of Rural Development and Land Reform has been initiated regarding the lodging of land claims within the project area. The Department's response will be taken into consideration and included in the EIA.

### d. Traditional authorities

No traditional authority has jurisdiction over the project area.

### e. Land use within and surrounding the project area

Land uses associated with the project area include a combination of informal settlements, low-cost and high-cost residential areas, community and municipal facilities, agricultural areas, recreational areas, industrial areas, manufacturing and distribution facilities, commercial businesses, historical mine housing and historical mine infrastructure (slimes dams, shafts, derelict/abandoned buildings and water dams), illegal informal mining activities, mining activities, open land, substations and powerlines, gas and petrol pipelines and road infrastructure. Surrounding land uses are similar to those listed above.

Within the proposed opencast mining areas and infrastructure complexes, the land uses are limited to historical mine infrastructure (shafts and/or derelict/abandoned buildings), illegal informal mining activities, illegal dumping of waste and/or open land.

A preliminary list of land uses surrounding the proposed opencast mining areas and infrastructure complexes are outlined in Table 11. Distances used are for reference purposes and do not represent an impact zone. The extent of potential impacts on surrounding land uses will be determined in the next phase of the EIA. Information on the Transnet fuel pipeline will be included in the EIA.

**TABLE 11: PRELIMINARY LIST OF LAND USES SURROUNDING THE PROPOSED OPENCAST MINING AREAS AND INFRASTRUCTURE COMPLEXES**

Mining activity	Infrastructure and land uses*	
	Within 100 m	Within 500 m
<b>Opencast mining areas</b>		
Mona Lisa Bird Reef pit	Slimes dam and associated mining activities, open land, a gravel road, a tributary of the Klip River	Eskom substation, outskirts of Goudrand, outskirts of Solplaatjie, agricultural fields
Roodepoort Main Reef pit	Road infrastructure including Main Reef road, commercial businesses, residential and commercial business areas of the	Additional commercial businesses, a slimes dam and southern section of Davidsonville, a larger light industrial area of the Roodepoort CBD, southern

Mining activity	Infrastructure and land uses*	
	Within 100 m	Within 500 m
	Roodepoort CBD, a substation, a section of the railway line	section of Roodepoort residential area, sections of Matholeville
Rugby Club Main Reef pit	Illegal informal mining activities, rugby club, road infrastructure including Main Reef road	Illegal informal mining activities, informal settlement, road infrastructure including Albertina Sisulu road, southern outskirts of Florida Lake residential area, commercial and light industrial areas, a substation, residential structures south of Main Reef road, Sasol and related buffer
11 Shaft Main Reef pit	Demolished/abandoned structures of a substation, open land, light industrial businesses, high density residential development	Slimes dam, road infrastructure, a larger section of the high density residential development, a drainage channel
Kimberley Reef East pit	Slimes dams, open land	Commercial business, road infrastructure, Fleurhof dam
<b>Infrastructure complexes</b>		
Main/South Reef Shaft	Open land	Northern section of Goudrand, road infrastructure including Main Reef road, commercial business, section of the Klip River
Bird Reef Central Shaft	Open land, golf course, slimes dams, road infrastructure	Open land, larger section of the golf course, slimes dams, residential structures
Kimberley Reef East Shaft	Commercial business, slimes dams, open land	Larger area of the commercial business, road infrastructure

### 6.4.3 Description of specific environmental features and infrastructure on the site

The environmental features and infrastructure within the opencast mining areas and infrastructure complexes are described above in Sections 6.4.1 and 0, respectively. Notably there are Sasol and Transnet gas and fuel pipelines that run along the northern boundary of the project area.

### 6.4.4 Environment and current land use map

Topographical information as well as land uses within and surrounding project footprints is illustrated on Figure 3, Figure 4 and Figure 5.

## 6.5 ENVIRONMENTAL IMPACTS IDENTIFIED

This section provides a list of potential impacts on the biophysical, heritage/cultural and socio-economic aspects that have been identified in respect of each of the main project actions/activities and processes for each of the project phases (Table 12). A discussion of each of the impacts identified is provided in Section 6.7. The preliminary ratings for consequence, probability and significance of each of the impacts in the **unmitigated scenario** (which assumes that no consideration is given to the prevention or reduction of biophysical and social impacts) are also provided in the table below in accordance with the DMR report template. In this regard it must be noted that a conservative approach has been applied to these ratings in the absence of site specific studies. Once all the site specific studies have been completed the assessment and related ratings may change. The final ratings will be included in the EIA.

**TABLE 12: PRELIMINARY LIST OF POTENTIAL IMPACTS IDENTIFIED FOR THE PROPOSED PROJECT**

*Note: The preliminary assessment ratings provided in this table are for the unmitigated scenario only which assumes that no consideration is given to the prevention or reduction of biophysical and socio-economic impacts. Furthermore, a conservative approach has been applied to these ratings in the absence of site specific studies. Once all the site specific studies have been completed the assessment and related ratings may change. Moreover, once the mitigation/management measures have been incorporated into the assessment as part of the EIA a determination of residual impact will be provided.*

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
Surface Subsidence	Open pit mining Underground mining General site management Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	H	M	M	H	-	Possible	Managed/ Mitigated
Negative visual impacts	All activities	All	C, O, D, CI	H	H	M	H	H	Fully	Unlikely	Managed/ Mitigated
Loss of soil and land capability through removal, erosion and compaction	Site preparation and construction activities Open pit mining Underground mining Transportation General site management Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	M	L	H	M	Partially	Possible	be avoided/ Managed/ Mitigated

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
Loss of soil and land capability through contamination	Site preparation and construction activities Open pit mining	All	C, O, D, CI	H	H	M	H	H	Fully	Possible	be avoided/ Managed/ Mitigated
Physical loss and/or general disturbance of terrestrial biodiversity	Infrastructure complexes Transportation Power supply Residue waste management General and hazardous waste management Support facilities General site management Demolition Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	H	M	H	H	Partially	Possible	Managed/ Mitigated
Loss or disturbance of aquatic ecosystems	Site preparation and construction activities Open pit mining Infrastructure complexes Water supply and management Residue waste management General site management Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	H	M	H	H	Partially	Possible	be avoided/ Managed/ Mitigated



Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
Reduction in surface water quantity and quality affecting third party users (radiation and non-radiation)	Site preparation and construction activities Open pit mining Infrastructure complexes Water supply and management Residue waste management General site management Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	H	M	H	H	Partially	Possible	Managed/ Mitigated
Reduction in groundwater quantity and quality affecting third party users (radiation and non-radiation)	Site preparation and construction activities Open pit mining Underground mining Infrastructure complexes Water supply and management Residue waste management General site management Rehabilitation Maintenance and aftercare	All	C, O, D, CI	H	H	M	H	H	Partially	Possible	Managed/ Mitigated
Decrease in air quality from project emissions (radiation and non-radiation)	All activities	All	C, O, D, CI	H	H	M	H	H	Partially	Possible	Managed/ Mitigated
Increase in noise levels	All activities	All	C, O, D	H	H	M	H	H	Fully	Unlikely	Managed/ Mitigated
Blasting and vibration related impacts (air blasts, ground vibration and fly rock)	Open pit mining Underground mining	All	C, O	H	H	H	M	H	Fully	Possible	Managed/ Mitigated

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
Effects on roads due to project related traffic	Site preparation and construction activities Transportation General site management	All	C, O, D	H	H	M	H	H	Partially	Unlikely	Managed/ Mitigated
Loss of or damage to heritage and/or palaeontological resources	Site preparation and construction activities Open pit mining Underground mining General site management Demolition Rehabilitation	All	C, O, D	H	H	H	H	H	-	Possible	be avoided/ Managed/ Mitigated
Positive and negative socio-economic impacts (including health)	All activities	All	C, O, D, CI	H / L+	H to L	H to L	H to L	H	Partially	Unlikely	Managed/ Mitigated
Impact on surrounding land uses	All activities	All	C, O, D, CI	H	H	M	H	H	Fully	Possible	Managed/ Mitigated

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

The method used for the assessment of impacts is set out in Table 13. This assessment methodology enables the assessment of environmental impacts 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 13: IMPACT ASSESSMENT METHODOLOGY APPLIED IN SCOPING**

Note: Part A provides the definition for determining impact consequence (combining intensity, 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.

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

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

Potential impacts that were identified during the Scoping process, with inputs from I&APs, are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in Section 6.4.1 and 6.4.2.

The potential impacts associated with the project phases (construction, operations, decommissioning and closure) have been identified and described and reference has been made to the studies/investigations that are required to inform the impact assessment. In the absence of site specific studies the assessment conclusions are conservative. It follows that the assessment provided below is a **preliminary assessment** which will, after having obtained specialist input, be refined/changed as necessary in the EIA, as appropriate.

With reference to Section 6.1, alternatives are being considered as part of the proposed project. The assessment below provides a preliminary assessment of the project alternatives excluding the no-go option. The no-go option assumes the status quo would remain unchanged.

### 6.7.1 Geology

No geological impacts such as sterilisation of mineral resources are expected as the proposed project is being planned in a manner that allows for the maximum extraction of the targeted commodities within the project area.

### 6.7.2 Topography

The topography of the project area would be altered by project related activities. Previous mining activities have significantly altered the topography in some sections of the project area. The topography of the site could be further altered through:

- surface subsidence in backfilled and rehabilitated mining areas and the impact this can have on water drainage and topography (discussed further below)
- alteration of drainage patterns (discussed further under Section 6.7.6).

#### Issue: Surface subsidence

During the operational phase of the opencast mining operations and in the absence of access control, security control measures and rehabilitation that focuses on achieving the post-closure land use, the severity of any potential impact is expected to be high. In the event of injury to humans, the potential

impact could be long-term in nature and extend beyond the project area to the communities to which the injured people or animals belong. The probability of the impact occurring would be high. In the post closure phase, any surface subsidence would be considered significant and would affect the post closure land use objectives. The closure and rehabilitation plan would be key in mitigating this impact. The unmitigated significance would be high. With the implementation of mitigation measures focused on preventing impacts and thereby reducing the duration and probability of the impacts occurring, the mitigated significance can reduce to low.

The additional work required to address this issue is described in Section 7.2 of this scoping report.

### 6.7.3 Visual

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

Visual impacts on the receiving environment may be caused by activities and infrastructure in all mine phases. Given the size of the resource area and planned mining areas the area of visual disturbance could be significant if rehabilitation that supports the post-closure land use is not followed. The project activities would be visible to varying degrees from visual receptors in the surrounding area. Similar visual disturbances exist due to adjacent mining activities which collectively could result in cumulative impacts on visual receptors.

In the absence of mitigation measures that provide for rehabilitation and possible visual screening of facilities, the severity in the unmitigated scenario is expected to be high. Potential impacts would extend beyond the project area boundary to the visual receptors and be long term in nature. The related unmitigated significance would be high. The location of surface infrastructure may reduce negative impacts to a certain extent. Even with mitigation, during the operational phase, mining activities would likely remain visible from the more sensitive view points. At closure, where rehabilitation is completed in a manner that supports the post-closure land use, the significance would be reduced.

The additional work required to address this issue is described in Section 7.4.9 of this scoping report.

### 6.7.4 Soils and land capability

#### **Issue: Loss of soil and land capability through removal, erosion and compaction**

Topsoil is generally a resource of high value containing a gene bank of vegetation seeds and other organisms. Soil resources can be lost through removal, erosion and compaction which can result in a loss of soil functionality as an ecological driver. The conservation of topsoil, soil management practises and the related rehabilitation strategy and initiatives become highly important in achieving the post-closure land use. A number of activities/infrastructure in all phases have the potential to result in the loss of soils and related land capability, regardless of the alternatives that are selected.

In the absence of soil conservation and management measures and a rehabilitation plan that supports the post closure land use, the severity of potential impacts is expected to be high due to the impacted nature of the project area. Given the extent of the planned mining, the area of disturbance could be significant if rehabilitation is not followed. Without mitigation the loss of soil and related land capability would definitely occur and would extend beyond the life of the mine but would be localised to within the project area boundary. Due to the current disturbance of some of the proposed mining and infrastructure areas the significance of the unmitigated scenario is expected to be medium. This impact significance could be reduced to low with the implementation of mitigation measures focused on minimising impacts during operations and remedying any negative impacts at closure.

The additional work required to address this issue is described in Section 7.4.1 of this scoping report.



**Issue: Loss of soil and land capability through contamination**

Mining projects in general have the potential to result in the loss of or damage to soil resources through contamination. Contamination of soil resources would result in a decrease in the rehabilitation and post-closure land use potential. Contaminants could include construction related consumables, fuels, hydrocarbons and hazardous wastes. There are a number of likely contamination sources in all phases that have the potential to contaminate soil resources for all alternatives that are being considered.

In the absence of pollution containment and spill management measures the severity of potential impacts is expected to be high given the importance of the resource in supporting rehabilitation initiatives. Without mitigation, the impacts from contamination and associated loss in land capability is likely occur and could remain long after closure. The significance of this impact could be high in the unmitigated scenario. In the mitigated scenario that focuses on avoiding impacts through containment of potential contamination at source and implementation of spill management procedures, the significance could reduce to low as the severity, duration, spatial scale and probability would all reduce.

The additional work required to address this issue is described in Section 7.4.1 of this scoping report.

**6.7.5 Biodiversity**

In the broadest sense, biodiversity provides value for ecosystem functionality, aesthetic, spiritual, cultural, and recreational reasons. The known ecosystem related value is listed as follows:

- Soil formation and fertility maintenance;
- Primary production through photosynthesis, as the supportive foundation for life;
- Provision of food and fuel;
- Provision of shelter and building materials;
- Regulation of water flows and water quality;
- Regulation and purification of atmospheric gases;
- Moderation of climate and weather;
- Control of pests and diseases; and
- Maintenance of genetic resources (key for medicines, crop and livestock breeding).

The discussions below consider terrestrial and aquatic ecosystems.

**Issue: Physical loss and/or general disturbance of terrestrial biodiversity**

The placement of infrastructure and activities in general have the potential to destroy biodiversity through the physical loss of specific biodiversity areas, of linkages between biodiversity areas and related species (flora and fauna) which are considered to be significant because of their status, and/or the role that they play in the ecosystem. In the absence of site specific specialist input it is not possible at this stage to assess which operational alternatives would be preferred from a biodiversity perspective and therefore a conservative approach has been taken in the discussion below.

Mining and mineral processing related activities have the potential to directly disturb vegetation, vertebrates and invertebrates in all project phases, regardless of the alternatives that are selected. Disturbances from mining and anthropogenic activities could include use of lighting, mortality of fauna, removal of fauna and flora species, settlement of dust on vegetation and related effects on vertebrates, generation of noise or vibrations, road kills, contamination of soil or water resources, general litter and occurrence of fires.

The existing habitat units of the project area have been impacted and degraded to some extent as a result of past and current mining and anthropogenic activities, however, the project area still contains habitat units which are considered to be ecologically sensitive. Given the size of the resource area and

planned mining extent the area of disturbance could be significant if rehabilitation that supports the post-closure land use is not followed.

In the absence of mitigation measures any potential impacts would result in long term high severity impacts that could extend beyond the site boundary, in instances where impacts reach watercourses and because of the linkages between biodiversity components and areas. The significance of this impact is high in the unmitigated scenario. Where the project plan takes into account the findings of the specialist studies and avoids or minimises impacts on ecologically sensitive biodiversity areas the significance of potential impacts can be reduced.

The additional work required to address this issue is described in Section 7.4.2 of this scoping report.

#### **Issue: Loss or disturbance of aquatic ecosystems**

Where natural freshwater features exist within or adjacent to a project footprint, aquatic ecosystems can be impacted through physical loss of specific aquatic areas, of linkages between biodiversity areas and related aquatic species which are considered to be significant because of their status, and/or the role that they play in the ecosystem. Aquatic ecosystems are also sensitive to flow and water quality changes.

The project area lies adjacent to the Klip River, an important river system in the region. Drainage lines feed from the project area into the Klip River. At this stage in project planning the mine plan includes opencast mining in close proximity to some of these drainage lines. Erosion, siltation, hydrocarbon contamination and changes in flow due to water supply and dewatering activities could impact on aquatic ecosystems. In the absence of mitigation measures any potential impacts would result in long term high severity impacts that could extend beyond the site boundary. The significance of this impact is high in the unmitigated scenario. Where the project plan takes into account the findings of the specialist study and avoids or minimises impacts on ecologically sensitive biodiversity areas the significance of potential impacts can be reduced.

The additional work required to address this issue is described in Section 7.4.2 of this scoping report.

#### **6.7.6 Surface water (radiation and non-radiation)**

The discussion below considers surface water and focuses on third party users. Biodiversity-related impacts are discussed in Section 6.7.5.

#### **Issue: Reduction in water quantity and quality affecting third party users**

Mining projects have the potential to negatively impact on water resources through abstraction for water supply, dewatering activities and altering drainage patterns through infrastructure placement and stormwater controls, regardless of the alternatives that are selected. Mining projects also present a number of emission sources that can have a negative impact on water quality, regardless of the alternatives that are selected. Contaminants from the project are expected to include construction related consumables, silt, fuels, hydrocarbons, residues and hazardous wastes.

In the absence of mitigation, given the importance of the Klip River system and based on the mine plan as presented in this report, the severity of unmitigated impacts would be high. For water quantity impacts, where water resources are used by third party users, potential impacts affecting third party supply could occur. Where these water resources are used by third party users for extended periods of time, potential health impacts could occur. Impacts could extend beyond the site boundary to the water users and could extend beyond closure. In time, losses in water quantities and reduced water qualities could be reversed, however, at this stage, the related time period is not known. The related unmitigated significance is considered to be high. It is important to note that the use or potential contamination of

water resources is regulated through water use licensing requirements of the DWS as the custodian of water resources in South Africa. Where the project plan takes into account the findings of specialist studies, applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy and operates under a water use license, the significance of potential impacts can be reduced.

The additional work required to address this issue is described in Section 7.4.3 of this scoping report.

### **6.7.7 Groundwater (radiation and non-radiation)**

The discussion below considers groundwater and focuses on third party users. Biodiversity-related impacts are discussed in Section 6.7.5.

#### **Issue: Reduction in water quantity and quality affecting third party users**

Mining projects have the potential to negatively impact on water resources through abstraction for water supply and dewatering activities, regardless of the alternatives that are selected. Mining projects also present a number of emission sources that can have a negative impact on water quality. Contaminants from the project are expected to include construction related consumables, silt, fuels, hydrocarbons, residues and hazardous wastes. Metal and acid drainage qualities are associated with the targeted mineral resource.

In the absence of mitigation, given the importance of the Klip River system and based on the mine plan as presented in this report, the severity of unmitigated impacts would be high. Regarding water quantity impacts, where water resources are used by third party users, potential impacts affecting third party supply could occur. Where these water resources are used by third party users for extended periods of time, potential health impacts could occur. Impacts could extend beyond the site boundary to the water users and could extend beyond closure. In time, losses in water quantities and reduced water qualities could be reversed, however, at this stage, the related time period is not known. The related unmitigated significance is high. Important to note is that the use or potential contamination of water resources is regulated through water use licensing requirements of the DWS as the custodian of water resources in South Africa. Where the project plan takes into account the findings of specialist studies, applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy and operates under a water use license, the significance of potential impacts can be reduced.

The additional work required to address this issue is described in Section 7.4.4 of this scoping report.

### **6.7.8 Air quality (radiation and non-radiation)**

The discussion below focuses on potential human health impacts. Biodiversity-related impacts are discussed in Section 6.7.5.

#### **Issue: Decrease in air quality from project emissions**

Mining projects usually present a number of emission sources that can have a negative impact on ambient air quality and surrounding land uses in all phases, regardless of the alternatives that are selected. Emission sources would include land clearing activities for construction and ahead of mining, materials handling, wind erosion from stockpiles, wind erosion of disturbed areas, vehicle movement along unpaved roads, crushing, drying and exhaust emissions. The main contaminants would include inhalable particulate matter less than 10 microns in size (PM<sub>10</sub>), larger total suspended particulates (TSP) that relate to dust fallout and diesel particulate matter (DPM). Similar emission sources are likely to be produced by adjacent mining activities which collectively could result in cumulative air quality impacts on

potential receptors. Potential receptors in the area comprise residential areas, institutional areas, educational areas, rural type areas, industrial and the natural environment.

In the absence of mitigation measures that focus on the control of emissions at source and a rehabilitation plan that allows for rehabilitation and supports the post closure land use, the severity is expected to be high. Where third parties are exposed to project-related emissions negative impacts could result in health impacts and cause a nuisance impact. Air pollution impacts would extend beyond the site boundary and beyond the closure phase of the mine. The related unmitigated significance would be high. With mitigation that focuses on controlling emissions sources, the significance could be reduced to medium as the severity, duration, spatial scale and probability would reduce.

The additional work required to address this issue is described in Section 7.4.5 of this scoping report.

### **6.7.9 Ionising radiation**

Uranium and Thorium are found in the gold and uranium bearing ore. Radiological impacts are an aspect of various impact types that have been discussed in Section 6.7. In this regard, the proposed project has the potential to contaminate the environment with ionising radiation, radon gas and radioactive substances. These could be dispersed by groundwater, surface water and air. The related impacts extend from physical damage to human tissue resulting in human health impacts to ecosystem functionality. Potential health impacts could comprise kidney toxicity and increased potential to develop cancer, however this is dependent on numerous factors such as the solubility of the uranium, type of radiation, and exposure pathway.

The additional work required to address this issue is described in Section 7.4.7 of this scoping report.

### **6.7.10 Noise**

The discussion below focuses on potential human health impacts. Biodiversity-related impacts are discussed in Section 6.7.5.

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

Mining projects in general have the potential to contribute to an increase in ambient noise levels in all operational phases. For this proposed project pre-mining ambient noise environment can be described as suburban, urban and of central business district in nature. Project-related noise sources would include construction related activities, emergency power supply, operation and movement of machinery and equipment (including reverse beepers), crushing, transport of product off site and demolition activities. Similar noise sources are likely to be produced by adjacent mining activities which collectively could result in cumulative noise impacts on potential noise receptors. Potential receptors in the area comprise residential areas, institutional areas, educational areas, rural type areas, industrial and the natural environment.

In the absence of mitigation measures that consider potential receptor sites in relation to project activities the severity is expected to be high. Noise pollution impacts would extend beyond the site boundary and would occur until full closure is reached. The related unmitigated significance would be high. With mitigation that focuses on minimising impacts through the application of noise control measures, the significance could reduce to medium-high as the severity, duration and probability would reduce.

The additional work required to address this issue is described in Section 7.4.7 of this scoping report.

### 6.7.11 Blasting and vibration

#### **Issue: Blasting and vibration related impacts (air blasts, ground vibration and fly rock)**

Previously disturbance levels caused by hydraulic hammers and roller compactors were measured at distances ranging from seven to thirty metres. The ground vibration levels were highest close to the equipment and attenuated rapidly with increase in distance. The ground vibration levels recorded, even in close proximity to the equipment, were not high enough to cause damage to structures.

Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the proposed project area. This activity will occur from year 6 onwards, during the initial blasting of the shaft portals in particular the vertical shaft and the incline/decline shaft and during the operational phase (main shaft). It is important to note that with the deepening of the shafts, the blasting effects will reduce. Blasting hazards include ground vibration, airblast and fly rock. 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 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.

The potential impact could have a high severity in the unmitigated scenario. In the mitigated scenario, this severity reduces to low because measures can be taken to control blasts and associated impacts. Blasting will only take place from year 6 of the project onwards, however, injury or death is considered long term in nature. The spatial scale may extend beyond the mine boundary in both the unmitigated and mitigated scenario. The probability of injury to third party or damage to third party infrastructure is considered to be moderate in the unmitigated scenario and can be reduced to low with mitigation. The overall significance is expected to be high in the unmitigated scenario and low in the mitigated scenario.

The additional work required to address this issue is described in Section 7.4.8 of this scoping report.

### 6.7.12 Traffic

#### **Issue: Effect on roads due to project related traffic**

Mining projects contribute to increased traffic and introduce mine-related trucks on public road networks which can result in an inconvenience to current road users, higher accidents (for people and animals) decreased road service levels and/or increased road damage. This in turn can put pressure on the relevant roads authority to increase the maintenance programmes and/or upgrade the roads. The proposed project would require several access points onto the R41 road.

In the absence of active mining activities, traffic volumes along the R41 are generally high and mostly limited to light vehicles (rather than heavy vehicles that would be generated by the mining operation). Regardless of the alternatives that are selected, the project would contribute to traffic volumes on public roads. Traffic impacts are expected from construction through to the end of the decommissioning phase.

In the absence of mitigation measures that take into account other road uses and users, project-related use of public roads could result in a high severity impact. Any serious injury or death is a long term impact that would extend to the communities to which injured people/animals belong. The related unmitigated significance is high. With mitigation that focuses on ensuring adequate capacity on the road network and safety measures for other road users, the significance could reduce to medium as the severity, duration and frequency of potential accidents is expected to reduce.

The additional work required to address this issue is described in Section 7.4.10 of this scoping report.



### 6.7.13 Heritage/Cultural resources

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

The placement of infrastructure and mining activities in general, in all phases prior to closure, have the potential to remove, damage or destroy heritage/cultural and palaeontological resources, either directly or indirectly, and result in the loss of the resource for future generations.

In the absence of mitigation measures, if the resources are considered to be of heritage significance, the unmitigated severity could be high. Any loss or damage to resources would be long term and on a regional scale. The related unmitigated significance would be high. Where the project planning takes into account the findings of the specialist studies and either avoids resources of high significance or alternatively document and/or relocate resources in line with a permit or the necessary approvals the significance of potential impacts can be reduced.

The additional work required to address this issue is described in Sections 7.4.11 and 7.4.11 of this scoping report.

### 6.7.14 Socio-Economic

#### Issue: Positive and negative socio-economic impacts

Mining projects have the potential to have positive and/or negative impacts on the following, regardless of the alternatives that are selected:

- employment for local communities;
- the local and national economy;
- social structures within communities;
- increased crime, trespassing and social ills associated with inward migration – this is a negative impact;
- decreased crime and social ills and increased safety in areas where illegal mining activities are eradicated – this is a positive impact;
- increased pressure on basic services;
- impact on property values – this is currently considered to be a negative impact;
- quality of life and health related issues (this issue is discussed under Section 6.7.15 of the scoping report); and
- livelihoods of businesses (this issue is discussed under Section 6.7.15 of the scoping report).

Socio-economic impacts would occur during all project phases. The extent to which impacts would occur would depend on the final project plan. In the absence of mitigation that focuses on enhancing positive impacts and reducing negative impacts, the severity of unmitigated impacts would be high for negative impacts and low (positive) for positive impacts. The duration of potential impacts could vary from less than the project life to beyond closure and the spatial scale could vary from localised to widespread (regional). In some instances the probability of impacts occurring could vary from definite to seldom or unlikely. The related unmitigated significance could be high. Where the project planning takes into account the findings of specialist studies and applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy, the significance of potential negative impacts can be reduced and potential positive impacts can be increased.

The additional work required to address this issue is described in Sections 7.4.12 of this scoping report.

### 6.7.15 Land Use

#### Issue: Impact on surrounding land uses

A wide mix of land uses occur in the project area from residential areas to light industrial and mining. Transmission lines, gas and fuel pipelines and third party service infrastructure occurs within and adjacent to the project area. Project activities have the potential to impact on these land uses in all phases, regardless of the alternatives that are selected. These land uses may be affected by one or more of the biophysical, cultural and socio-economic impacts that could occur as a result of the proposed project. Although mining has historically and is currently taking place in the project area, the proposed project presents activities that would take place close to built-up residential and commercial business areas, third party service infrastructure and along main transport routes that have established over time since large scale mining ceased in the area in 2001. Collectively these impacts could present health and safety risks to receptors, reduce the quality of life of nearby residential areas and negatively affect property values, if left unmitigated. In the absence of mitigation that focuses on effectively mitigating each biophysical, cultural and socio-economic impact type, the severity would be high; potential impacts would extend to the land uses located beyond the site boundary. The severity is likely to decrease with an increase in distance from the impact source. For the proposed opencast mining areas, with mitigation in place, the duration of impacts would be linked to the life of the individual pits. In this regard, it is estimated that individual pits would take between six and 16 months to be mined and rehabilitated. Rehabilitation would focus on achieving the post-closure land use objective of opening up land for property development. For the proposed infrastructure complexes, the duration of impacts would be linked to the construction and operation of the shaft, which at this stage is estimated at 30 years. The option would exist to increase the duration of the underground mining activities if additional economically mineable resources are identified through ongoing exploration. In the absence of mitigation the significance of potential impacts would be high. Where project planning takes into account the findings of specialist studies and applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy, the significance of potential impacts could be reduced,

The additional work required to address this issue is described in Section 7.4.12 of this scoping report.

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

Table 14 provides a list of the 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 would be refined during the EIA phase with specialist input as appropriate.

**TABLE 14: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK**

Activity	Potential impact	Possible mitigation	Potential for residual risk
Underground mining Mineralised waste	Loss and sterilization of mineral resources	<ul style="list-style-type: none"> <li>- Incorporate cross discipline planning to avoid mineral sterilisation. A key component of the cross cutting function is the Mine resource manager.</li> <li>- Mine workings will be developed and designed so as not to limit the potential to exploit deeper minerals.</li> </ul>	Low
Open pit mining Underground mining General site management Rehabilitation Maintenance and aftercare	Surface subsidence	<ul style="list-style-type: none"> <li>- Access control, barriers and warning signs at hazardous areas.</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 West Wits has caused injury or death to third parties and/or animals, appropriate compensation will be provided.</li> <li>- In case of injury or death due to subsidence, an emergency response procedure must be implemented.</li> </ul>	Medium
All activities	Negative visual impacts	<ul style="list-style-type: none"> <li>- Limit the extent of disturbed areas.</li> <li>- Suppress dust to prevent a visual dust cloud.</li> <li>- Effective waste management.</li> <li>- Implement effective use of lighting which reduces light spill.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> <li>- The use of berms where appropriate.</li> </ul>	Medium
Site preparation and construction activities Open pit mining Underground mining Transportation General site management Rehabilitation Maintenance and aftercare	Loss of soil and land capability through removal, erosion and compaction	<ul style="list-style-type: none"> <li>- Limit site clearance to what is absolutely necessary for the immediate future mining area.</li> <li>- Strip, handle, stockpile and re-use soil resources in line with site specific soil conservation and management plan.</li> </ul>	Low
Site preparation and construction activities Open pit mining Infrastructure complexes Transportation Power supply Residue waste	Loss of soil and land capability through contamination	<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> <li>- In case of major spillage incidents an emergency response procedure must be implemented.</li> </ul>	Low
	Physical loss and/or	<ul style="list-style-type: none"> <li>- Limit site clearance to what is absolutely necessary.</li> </ul>	Medium

Activity	Potential impact	Possible mitigation	Potential for residual risk
management General and hazardous waste management Support facilities General site management Demolition Rehabilitation Maintenance and aftercare	general disturbance of terrestrial biodiversity	<ul style="list-style-type: none"> <li>- Undertake pre-construction surveys of the development footprints for species suitable for search and rescue operations.</li> <li>- Avoid sensitive areas as far as practically possible.</li> <li>- Obtain relevant permits prior to removal of protected species.</li> <li>- Implementation of an alien invasive species programme.</li> <li>- Limit emissions (dust, light, noise).</li> <li>- Training of employees on the value of biodiversity.</li> <li>- Zero tolerance for harming and harvesting fauna and flora.</li> <li>- Effective waste management and pollution prevention.</li> <li>- Implementation of a biodiversity action plan to ensure that the undeveloped/disturbed areas within the property are properly conserved and maintained.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> </ul>	
Site preparation and construction activities Open pit mining Infrastructure complexes Water supply and management Residue waste management General site management Rehabilitation Maintenance and aftercare	Loss or disturbance of aquatic ecosystems	<ul style="list-style-type: none"> <li>- Limit site clearance to what is absolutely necessary.</li> <li>- Avoid sensitive areas as far as practically possible.</li> <li>- Ensure necessary setback distances from watercourses and wetlands.</li> <li>- Implementation of an alien invasive species programme.</li> <li>- Limit emissions (dust, light, noise).</li> <li>- Training of employees on the value of biodiversity.</li> <li>- Zero tolerance for harming and harvesting fauna and flora.</li> <li>- Effective waste management and pollution prevention.</li> <li>- Implementation of a biodiversity action plan to ensure that the undeveloped/disturbed areas within the property are properly conserved and maintained.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> </ul>	Medium
Site preparation and construction activities Open pit mining Infrastructure complexes Water supply and management Residue waste management General and hazardous waste management Support facilities	Reduction in surface water quality affecting third party users (radiation and non-radiation)	<ul style="list-style-type: none"> <li>- Design and implement contamination containment measures.</li> <li>- Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999): <ul style="list-style-type: none"> <li>o Clean and dirty water system will be separate.</li> <li>o Clean run-off will be diverted away from the site.</li> <li>o Dirty water will be contained.</li> <li>o The necessary exemptions and approvals will be obtained for activities and infrastructure located within 100 m or within the 1:100 year floodline of the Klip River and its tributaries.</li> </ul> </li> <li>- Conduct surface water monitoring and implement remedial actions as required.</li> <li>- Effective equipment and vehicle maintenance.</li> <li>- Fast and effective clean-up of spills.</li> </ul>	Medium

Activity	Potential impact	Possible mitigation	Potential for residual risk
General site management Rehabilitation Maintenance and aftercare		<ul style="list-style-type: none"> <li>- Effective waste management.</li> <li>- Education and training of workers.</li> <li>- Apply and operate in line with a water use license.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> </ul>	
Site preparation and construction activities Open pit mining Infrastructure complexes Water supply and management Residue waste management General site management Rehabilitation Maintenance and aftercare	Reduction in surface water quantity affecting third party users (radiation and non-radiation)	<ul style="list-style-type: none"> <li>- Obtain the necessary authorisations in terms of the NWA and exemptions in terms of Regulation 704 (4 June 1999) for activities and infrastructure located within 100 m or within the 1:100 year floodline of the Klip River and its tributaries.</li> <li>- Develop and implement a stormwater management plan to minimise containment areas and divert clean water away from the site.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> </ul>	Medium
Site preparation and construction activities Open pit mining Underground mining Infrastructure complexes Water supply and management Residue waste management General and hazardous waste management General site management Rehabilitation Maintenance and aftercare	Reduction in groundwater quality affecting third party users (radiation and non-radiation)	<ul style="list-style-type: none"> <li>- Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999).</li> <li>- Design and implement contamination containment measures.</li> <li>- Infrastructure that has the potential to pollute groundwater will be identified and included into a groundwater pollution management plan which will be implemented as part of the operational phase through post-closure as required.</li> <li>- Conduct groundwater monitoring and implement remedial actions as required. This includes compensation for mine related loss of third party water supply.</li> <li>- Effective equipment and vehicle maintenance.</li> <li>- Fast and effective clean-up of spills.</li> <li>- Effective waste management.</li> <li>- Education and training of workers.</li> <li>- Apply and operate in line with a water use license.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> </ul>	Medium
Underground mining Water supply and use	Reduction in surface water quantity affecting third party users	<ul style="list-style-type: none"> <li>- Conduct groundwater monitoring and implement remedial actions where required. This includes compensation for mine related loss of third party water supply.</li> <li>- This monitoring programme should include third party boreholes.</li> <li>- Apply and operate in line with a water use license.</li> <li>- Minimise water usage and optimise water recycling and treatment of dewatering water.</li> </ul>	Medium



Activity	Potential impact	Possible mitigation	Potential for residual risk
All activities	Decrease in air quality from project emissions	<ul style="list-style-type: none"> <li>- Limit disturbed areas.</li> <li>- Suppress dust effectively.</li> <li>- Maintain equipment and vehicles in good working order.</li> <li>- Monitor pollutants of concern and implement additional mitigation as required.</li> <li>- Effective rehabilitation to achieve post closure land use.</li> <li>- Undertake a carbon footprint assessment.</li> </ul>	Medium
All activities	Increase in noise levels	<ul style="list-style-type: none"> <li>- Maintain vehicles and equipment in good working order.</li> <li>- Provide noise berms where possible between activities and receptors.</li> <li>- Conduct noise monitoring in response to noise complaints.</li> </ul>	Medium - High
Opencast mining Underground mining	Blasting and vibration related impacts (air blasts, ground vibration and fly rock)	<ul style="list-style-type: none"> <li>- Develop and implement a vibration and blast management plan which addresses vibration and blast design criteria to limit air blast, ground vibration and fly rock; pre-blast warning and evacuation and auditing of the blasts to check compliance to applicable requirements.</li> <li>- Communication of scheduled blasts with I&amp;APs.</li> <li>- Remediation of all impacts caused by vibration and blasting.</li> <li>- In case of a person or animal being injured by blasting activities an emergency response procedure will be followed.</li> <li>- Limit blasting frequency and conduct blasting during daylight hours.</li> </ul>	Medium
Site preparation and construction activities Transportation General site management	Effect on roads due to project related traffic	<ul style="list-style-type: none"> <li>- Construct safe access points/intersections.</li> <li>- Educate employees (temporary and permanent) about road safety.</li> <li>- Enforce strict vehicle speeds.</li> <li>- If a person or animal is injured by transport activities an emergency response procedure must be implemented.</li> </ul>	Medium
Site preparation and construction activities Open pit mining Underground mining General site management Demolition Rehabilitation	Loss of or damage to heritage and/or palaeontological resources	<ul style="list-style-type: none"> <li>- Plan project to avoid any resources of significant importance.</li> <li>- Training of workers regarding the heritage and cultural sites that may be encountered and about the need to conserve these.</li> <li>- Fence off and limit access to the heritage and cultural sites that could be indirectly disturbed by mining activities.</li> <li>- In the event that resources are identified, a chance find emergency procedure should be implemented.</li> </ul>	Medium
All activities	Positive and negative socio-economic impacts	<ul style="list-style-type: none"> <li>- Develop and implement procedures for recruiting, training and procurement that align with good industry practise.</li> <li>- Employ local people and procure goods and services locally as far as practically possible.</li> <li>- Effective communication to manage expectations with regard to employment and other opportunities.</li> <li>- Ensure that closure planning considerations address the re-skilling of employees for the</li> </ul>	Medium

Activity	Potential impact	Possible mitigation	Potential for residual risk
		downscaling, early closure and long-term closure scenarios. - Work together with residents to manage issues such as security.	
All activities	Change in land use affecting surrounding land uses	- Effectively manage biophysical, cultural and socio-economic impacts. - Effectively rehabilitate opencast mining areas in line with an approved rehabilitation plan that meets the post closure land use objectives and ensure rehabilitation is completed as soon as mining is complete. - Schedule the opencast mining operations in a manner that minimises cumulative impacts on receptors. - Establish a stakeholder communication and grievance mechanisms for the duration of the mining operation.	Medium

## 6.9 OUTCOME OF THE SITE SELECTION MATRIX

In the absence of site specific specialist studies it is not possible to complete a site selection matrix at this stage. With reference to Section 6.1, the positioning of the open pit mining areas was informed by the presence of economically mineable resources that West Wits has identified and proposes to mine. The positioning of the three infrastructure complexes was informed by the position of the mineable resource, the fact that the land has been disturbed by previous mining activities and infrastructure and ensuring a feasible access point to the mineable resource. Thus no locational alternatives are considered in this EIA. Alternative layouts and orientations for the infrastructure complexes will be assessed in the EIA phase with input from specialist studies.

## 6.10 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Refer to Section 6.1.

## 6.11 THE PREFERRED ALTERNATIVES

Refer to Section 6.1.

# 7 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

The main objectives of the EIA phase would be to:

- Assess the potential impacts associated with the preferred project alternatives as per the terms of reference for the assessment that are set out in the scoping report.
- Identify and describe procedures and measures that would enhance potential positive impacts and avoid, minimize, remedy or compensate potential negative impacts.
- Liaise with relevant government departments on issues relating to the proposed development to ensure compliance with existing guidelines and regulations.
- Undertake consultation with I&APs and provide them with an opportunity to review and comment on the outcomes of the EIA process and acceptability of mitigation measures.
- Develop an EMP 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 report.

This chapter describes the nature and extent of further investigations to be conducted in the EIA, and sets out the proposed approach to the EIA phase.

## 7.1 ALTERNATIVES TO BE CONSIDERED

The alternatives considered are provided in Section 6.1.

## 7.2 ASPECTS TO BE ADDRESSED BY THE EAP

Aspects to be assessed include those listed in Section 7.3 below where specific specialist input is required as well as aspects where specialist investigations are not required as outlined below.

## Geology

No specialist investigation is proposed for assessing the impact on geology. The assessment and detailed mitigation measures will be provided in the EIA by SLR with input from the technical project team that is responsible for the mine planning.

## Topography

It is proposed that no specialist investigation is required in this regard. The assessment and detailed mitigation measures will be provided in the EIA by SLR with input from the project team landscape architect that is responsible for the rehabilitation plan.

### 7.3 ASPECTS TO BE ASSESSED BY SPECIALISTS

This section lists the aspects to be subjected to specialist investigation in the EIA phase in line with the terms of reference outlined in Section 7.4 below. These include:

- Visual;
- Soil and land capability;
- Biodiversity (terrestrial and aquatic);
- Surface water;
- Groundwater);
- Air quality;
- Noise;
- Traffic;
- Heritage/Cultural resources;
- Socio-economic including health and land use; and
- Financial provision.

### 7.4 METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS

This section describes the nature and extent of the investigations required. In particular it describes the scope of work for the specialist investigations. The impact assessments and detailed management measures for each aspect will be included in the EIA. Copies of the specialist reports will be attached as appendices to the EIA.

#### 7.4.1 Soil and land capability

This specialist study will be conducted by a soil scientist from Scientific Aquatic Services CC. The study would map and characterise the soil resources and related land capability within the project area, assess potential impacts associated with each of the project phases and develop a soil conservation and management plan that aligns with the post-closure land use of potential housing developments and/or other activities that are best suited for this area.

#### 7.4.2 Biodiversity

This specialist study will cover terrestrial and aquatic ecosystems and will be conducted by biodiversity specialists from Scientific Terrestrial Services CC and Scientific Aquatic Services CC. The study would review available literature to obtain background information on the site and its importance in terms of national and provincial databases and biodiversity-related guideline documents. Site-specific work focused on the project area would map and characterise the baseline terrestrial conditions of the site and related sensitivities. Aquatic assessments would be focused on the Klip River and the water courses

on site that drain into the Klip River. Cognisance would also be taken of biodiversity in the area surrounding the project area. The study would draw on the findings of other specialist studies as necessary to inform any related impacts on biodiversity. The study would provide input on the project plan and alternatives being considered, assess potential impacts associated with each of the project phases and include the development of mitigation measures that align with the post-closure land use of potential housing developments and/or other activities that are best suited for this area.

### **7.4.3 Surface water**

The surface water study will consider the inter-related aspects of surface water resources. The study would be conducted by hydrologists from SLR. The study would characterise the hydrological features of the site and local catchment, review available floodlines for the Klip River and record the water quality of the Klip River. The hydrological study would also develop a climatic project water balance and a conceptual stormwater management plan (in line with Regulation 704) to inform the design of the stormwater management facilities and water supply options for the project. The study would provide input to the project plan and alternatives being considered, assess potential impacts associated with each of the project phases and include management and monitoring plans. During the course of the studies the necessary consultation would take place with the Department of Water and Sanitation.

### **7.4.4 Groundwater**

A specialist groundwater study will be undertaken to address the inter-related aspects of groundwater resources. The study would be conducted by geohydrologists from Noa Agencies. The groundwater study would characterise the groundwater resource by reviewing available DWS databases, conducting a hydrocensus of existing water uses and users, measure the water quality of groundwater resources and determine the aquifer parameters on the site. The groundwater study would include a geochemical and waste assessment to inform the contamination potential of any residues/discards generated by the project. The waste assessment would be undertaken in terms of the National Norms and Standards (Regulation 635 and 656 of 2013). The study would provide input to the project plan and alternatives being considered, assess potential impacts associated with each of the project phases and include management and monitoring plans. The groundwater study would make use of modelling techniques to inform the groundwater assessment of potential dewatering and contamination impacts. During the course of the study consultation would take place with the Department of Water and Sanitation.

### **7.4.5 Air quality**

The specialist air quality study will be conducted by an air quality specialist from Airshed Planning Professionals (Pty) Ltd. The study would characterise the baseline air quality environment through review of available ambient data, would identify potential receptor sites, provide input on design controls, assess potential impacts associated with each of the project phases against relevant health assessment criteria (that considers human, animal and plant health) and develop an emissions (including dust) management and monitoring plan.

### **7.4.6 Radiation**

This specialist study will be conducted by a radiation specialist from SciRad Consulting. The study would characterise the baseline environment with input from abovementioned air and water specialists, assess potential impacts associated with each of the project phases and develop mitigation measures.



#### **7.4.7 Noise**

The noise specialist study will be conducted by a noise specialist from Airshed Planning Professionals (Pty) Ltd. The study would characterise the baseline environment through on-site noise sampling, would identify potential receptor sites, provide input on design controls, assess potential impacts associated with each of the project phases against noise assessment criteria and develop a noise management and monitoring plan.

#### **7.4.8 Vibration and blasting**

This specialist study will be conducted by a vibration and blasting specialist from Cambrian CC. The study would characterise the baseline conditions in and around the site, identify the source locations and levels, assess potential impacts of each of the project phases on the receiving environment and develop mitigation measures.

#### **7.4.9 Visual**

The visual specialist study will be conducted by a visual specialist from Scientific Aquatic Services CC. The study would characterise the baseline environment by considering the natural and cultural landscape, scenic resources, sense of place and visual receptors, compile a viewshed analysis, assess potential impacts associated with each of the project phases and develop mitigation measures.

#### **7.4.10 Traffic**

This study would be conducted by traffic specialists from the consulting engineering firm Siyazi Gauteng (Pty) Ltd. The study would establish the baseline traffic volumes by means of traffic counts, calculate project-related contributions to baseline traffic volumes, evaluate the performance and layout of intersections, provide input on road conditions and the design of the access point, assess potential impacts associated with each of the project phases, recommend any road and safety improvements and develop a traffic management plan.

#### **7.4.11 Heritage/Cultural resources**

The study will be conducted by accredited heritage and palaeontological specialists from Professional Grave Solutions. The study would identify and map heritage resources within the opencast mining areas and infrastructure complexes, determine the likelihood of fossils occurring within the project area, provide input on the project plan, assess potential impacts associated with each of the project phases, identify requirements for any additional permits and develop a heritage management plan.

#### **7.4.12 Socio-economic including health and land use**

The specialist study will be conducted by a social specialist and a financial specialist from Mercury Financial Consultants. The study would characterise the baseline socio-economic environment with respect to the immediate area and broader municipal areas, identify and map land uses, liaise with other appointed specialists, as required, to understand the potential extent and significance of impacts (including health), provide input on the project plan, assess both potential positive and negative impacts associated with each of the project phases, provide input into enhancing positive and minimising negative socio-economic impacts, provide input on the issue of property value, and develop related management plans.

### **7.4.13 Financial provision**

The financial provision for the proposed project will be determined by Golder Associates and would be determined in accordance with the NEMA Regulations (1147 of 2015) pertaining to the financial provision for mining operations.

## **7.5 METHOD OF ASSESSING IMPACT SIGNIFICANCE**

Refer to Section 6.6.

## **7.6 CONSULTATION WITH THE COMPETENT AUTHORITY**

A final EIA report including comments received during the I&AP review process will be prepared and submitted to the DMR for their review and decision-making. A site visit and meeting will be held, if requested.

## **7.7 THE PUBLIC PARTICIPATION PROCESS IN THE EIA**

### **7.7.1 Notification of Interested and Affected Parties**

I&APs will be notified via email, post, bulk SMS and community structures.

### **7.7.2 Details of the engagement process to be followed**

The PPP in the EIA phase would include:

- Placement of full hard copy EIA reports at public review venues;
- Providing an electronic copy of the EIA report on the SLR website;
- Distribution of an Executive Summary to I&APs;
- I&APs would be provided with a 30-day review period in line with the EIA Regulations
- I&APs would be informed and given feedback during the EIA phase;
- Collect and respond to issues in an Issues and Response table;
- Submit final EIA report including the Issues and Response table to DMR; and
- Notify I&APs on the project I&AP database of the decision taken by DMR.

### **7.7.3 Information to be provided to Registered Interested and Affected Parties**

The following information would be included in the EIA report which would be made available for public review:

- detailed description of the proposed project;
- a site layout;
- details of the list of activities to be authorised in terms of NEMA and NEM:WA;
- scale and extent of activities to be authorised in terms of NEMA and NEM:WA;
- the duration of the activity;
- an assessment of the environmental and socio-economic impacts identified during the EIA process, with input from I&APs, regulatory authorities and specialists;
- detailed management measures to reduce and control environmental and socio-economic impact; and
- copies of the specialist reports undertaken for the proposed project.

As part of the review of the EIA report an Executive Summary of the EIA report would be provided to I&APs.

Once the DMR has issued a decision on the application, registered I&APs would be informed by SLR on behalf of the applicant.

## 7.8 TASKS TO BE UNDERTAKEN DURING THE EIA

A description of the tasks that would be undertaken during the EIA phase is provided below in Table 15. A preliminary schedule for the EIA phase that aligns with regulatory timeframes is included below.

**TABLE 15: EIA TASKS AND TIMING**

Phase	EAP activity	Opportunities for Consultation and Participation		Schedule*
		Competent Authorities	I&APs	
Specialist Studies	EAP to manage specialist activities and receive inputs for EIA.	-	-	March to July 2018
EIA Phase	Compile EIA report	-	-	July/August 2018
	Distribute EIA for review	Provide copy to DMR for records	Review of EIA (30 days), Comments to EAP	October 2018
	I&AP consultations	-	Consultation with I&APs	
	Collate and respond to comments and finalise EIA report	-	-	November 2018
Competent authority review and decision-making	EIA report to DMR (106 days from acceptance of Scoping report).	DMR Acknowledge Receipt of EIA (10 days).	Notify I&APs of final report submission	November 2018
		DMR Review (107 days)		
		Environmental Authorisation Granted / Refused		March 2019
Decision	Notify registered I&APs of decision (within 14 days of date of decision)	-	-	March 2019
Appeal Phase	EAP to provide information on appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations, 2014	120 day process

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

See Table 14. It should be noted that this table has been compiled with the information in hand and would be refined during the EIA phase.

## 7.10 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional requests for information have been received to date.

### 7.10.1 Impact on the socio-economic conditions of any directly affected person

The potential socio-economic impacts are discussed in Section 6.7.14 and will be investigated further during the EIA phase as outlined in Section 7.4.12.

### **7.10.2 Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act**

A heritage study will be conducted to identify potential impacts on heritage resources. The results of this study will be included in the EIA.

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

No other matters are required in terms of Section 24(4)(A) and (B) of the act.

## 9 UNDERTAKINGS BY THE EAP

I, Marline Medallie, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- the information provided herein is correct
- the comments and inputs from stakeholders and I&APs have been correctly recorded, although due to the volume of comments and objections received from I&APs, it's possible that not all the information has been included
- information and responses provided to stakeholders and I&APs by the EAP is correct to the best of SLR's knowledge at the time of compiling the report
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.



\_\_\_\_\_  
Signature of the EAP

Date: 16 May 2018



## 10 REFERENCES

Department of Water Affairs, August 2012: Aquifer Classification of South Africa.

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SACAD: Department of Environmental Affairs. 2017. South Africa Conservation Areas Database (SAPAD\_OR\_2017\_Q3). Online available: [<http://egis.environment.gov.za>]

SAPAD: Department of Environmental Affairs. 2017. South Africa Protected Areas Database (SAPAD\_OR\_2017\_Q3). Online available: [<http://egis.environment.gov.za>]

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Threatened Ecosystems: National Environmental Management Biodiversity Act: National list of ecosystems that are threatened and in need of protection (G 34809, GoN 1002). 2011. Department of Environmental Affairs. Online available: <http://bgis.sanbi.org/ecosystems/project.asp>

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