SCOPING REPORT FOR THE AMENDMENT OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND RELATED ENVIRONMENTAL AUTHORISATIONS

UMK Mine, near Hotazel

APRIL 2021

SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998, AS AMENDED) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (ACT 59 OF 2008, AS AMENDED) 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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EXECUTIVE SUMMARY

INTRODUCTION

This Executive Summary provides a summary of the Scoping Report compiled and distributed for review and comment as part of the Scoping and Environmental Impact Assessment process (S&EIA) that is being undertaken for the United Manganese of Kalahari (Pty) Ltd (UMK) manganese mine (the UMK Mine).

The UMK Mine is an opencast manganese mine located on farm Botha 313, the remaining extent (RE) of the farm Smartt 314, and portion 1 and RE of farm Rissik 330 near Hotazel in the Northern Cape Province. The UMK Mine lies directly adjacent and to the west of the R380 provincial road.

UMK currently holds the following authorisations:

- A mining right (30/5/1/2/3/2/1(113) MR) issued by the Department of Mineral Resources and Energy (DMRE);
- An Environmental Management Programme report (EMPr) approved by DMRE (previously DMR);
- Environmental Authorisations (NC/KGA/HOT7/15/2006 & NC 30/5/1/2/2/113 MR) issued by the Department of Environment and Nature Conservation (DENC) and the Department of Mineral Resources and Energy (DMRE) respectively; and
- An Integrated Water Use License (IWUL) (10/D41K/ABEGJ/2814) issued by the Department of Water and Sanitation (DWS).

SLR Consulting (South Africa) (Pty) Ltd (SLR), an independent firm of environmental assessment practitioners has been appointed by UMK to manage the S&EIA process required to inform the integrated Environmental Authorisation and EMPr amendment applications to authorise the changes detailed below.

PROJECT BACKGROUND

United Manganese of Kalahari (Pty) Ltd (UMK) is applying for an Environmental Authorisation for new listed activities on the farm Botha 313, the RE of the farm Smartt 314, and portions 1, 2 and 3 (a portion of the RE) of the farm Rissik 330. The UMK Mine is an opencast manganese mine located approximately 13 km to the south of the town of Hotazel in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

The manganese mine lies directly adjacent and to the west of the R380 provincial road. Refer to Figure 1 and Figure 2 for the regional and local settings respectively.

UMK currently holds the following authorisations:

- A mining right (30/5/1/2/3/2/1(113) MR) issued by the Department of Mineral Resources and Energy (DMRE);
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- A Water Use License (IWUL) (10/D41K/ABEGJ/2814) issued by the Department of Water and Sanitation (DWS) now known as the Department of Human Settlements, Water and Sanitation (DHSWS).

The mine consists of open pit mining sections, crushing, and screening operations, run of mine, stockpiles, waste rock and product stockpile dumps, and associated support and administrative infrastructure.

UMK is proposing to change the approved surface layout for the mine to optimize their mining operations. The proposed changes to the approved layout are discussed in detail below:

New Infrastructure to be established on site in support of the current mining operations.

- New parking area (0.52 Ha);
- Solar equipped boreholes and associated storage tanks;
- Tyre fitting bay, workshop/ tyre centre and oil storage (7 Ha);
- Waste rock and sand stockpiles:
    - Central West Waste Rock Dump (WRD) (84 Ha)
    - Central West Sand Stockpile (40.9 Ha)
    - J Block West WRD (133 Ha)
    - J Block West Sand Stockpile (46.5 Ha)
    - J Block East WRD (63.5 Ha)
    - J Block East Sand Stockpile (16.5 Ha)
    - Powerline West WRD (196 ha)
    - Powerline West Sand Stockpile (35,9 Ha)
    - A Block West WRD (145 Ha)
- Product stockpile area within the approved sinter plant area (21.4 Ha);
- Truck staging area (20.4 ha);
- Hard park areas (Phase 1 and 3) (14.3 Ha);
- Barlow's Store (1 Ha);
- Explosive depo and associated service road (13.1 Ha); and
- Engineering salvage yard (temporal and permanent) (2.43 Ha).

Upgrade of existing approved infrastructure:

- Prentec Sewage Plant;
- Existing weigh bridge and associated access road.

Expansion of existing approved infrastructure

- Product stockpile (53.6 Ha);
- Modular crushing plant (34.6 Ha);
- Fuel storage farm (0.45 Ha);
- EME workshop for major repair and maintenance (3.6 Ha);
- Road truck staging area (1.6 Ha);and
- Offices (19.1 Ha).

Relocation of the following surface infrastructure at the mine:

- Approved dirty water dams/pollution control ponds;
- 132 KV powerline from current location to its old location

SUMMARY OF AUTHORISATION REQUIREMENTS

The proposed project will require an amendment of UMK's EMPr. In terms of the Mineral and Petroleum Resources Development Act, 2002 (No. 8 of 2002, as amended) (MPRDA), an EMPr may not be amended or varied without the written consent of the Minister of Minerals and Energy.

The proposed project includes activities listed under the National Environmental Management Act, 1998 (No. 107 of 1998, as amended) (NEMA) and waste management activities listed under the National Environmental Management: Waste Act (No. 59 of 2008, as amended) (NEM:WA). Prior to the commencement of the proposed project, an integrated environmental authorisation and waste management license from the Northern Cape DMRE in terms of Section 24 of NEMA and Section 45 of NEM:WA must be applied for and obtained. Listed activities are prohibited from commencing until written authorisation is obtained from the competent authority, which in this case is the Northern Cape DMRE. The activities that are triggered require a Scoping and EIA process in terms of the EIA Regulations 2014 (as amended). The EIA Regulations being followed are Government Notice Regulation (GNR) 982 of 4 December 2014, as amended. The EIA process is used to inform the environmental authorisation application. Further detail is included in Section 6.1. In addition, the proposed project may require an amendment of the water use license from the Department of Water and Sanitation (DWS) for specific water uses under Section 21 of the National Water Act, 1998 (No. 36 of 1998, as amended) (NWA). This process will be initiated by UMK, as required.

This S&EIA process does not cover occupational health and safety legislation requirements.

OPPORTUNITY TO COMMENT

This Scoping Report was distributed for a 30-day comment period from **29 April 2021- 31 May 2021**in order to provide I&APs with an opportunity to comment on any aspect of the proposed project and the findings of the S&EIA process to date. Copies of the full report were made available on the SLR website (at https://slrconsulting.com/za/slr-documents/).

PLAN OF STUDY FOR THE EIA PHASE

The Plan of Study for EIA describes the nature and extent of the assessment to be conducted and sets out the proposed approach to the EIA phase. In this regard, upon acceptance of the Scoping Report by the DMRE, the EIA phase of the project may commence, and the following key steps will be undertaken:

- I&APs will be informed of the DMRE's decision with regards to the Scoping Report;
- I&APs will be provided with an opportunity to comment on any aspect of the project and the findings of the EIA and EMPr;
- The EIA and EMPr will be updated with any responses to comments raised during the review period and will be made available to the DMRE for decision making purposes; and
- I&APs will be informed of the DMRE's decision.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
AEL	Atmospheric Emission Licence
BIF	Banded Iron Formation
CAD	Computer-aided design
CARA	The Conservation of Agricultural Resources Act,1983 (No. 43 of 1983)
DAFF	Department of Agriculture, Forestry and Fisheries
DEFF	Department of Environment, Forestry and Fisheries
DENC	Department of Environment and Nature Conservation
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Frameworks
EMPA	Environmental Management Planning and Approvals
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
GW	Groundwater
GWC	Griqualand West Centre
IBAs	Important Bird and Biodiversity Areas
IDP	Integrated Development Plans
IFC	International Finance Corporation
IWUL	Integrated Water Use License
LC	Leachable concentration
MFT	Managed File Transfer
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (No. 8 of 2002)
NCNCA	Northern Cape Nature Conservation Act, 2009 (No. 9 of 2009)
NCPGDS	Northern Cape Provincial Growth and Development Strategy
NCPSPF	Northern Cape Provincial Spatial Development Framework
NDP	National Development Plan 2030
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)

Acronym / Abbreviation	Definition
NEM:WA	National Environmental Management: Waste Act (No 59 of 2008)
NEMA	National Environmental Management Act, 1998 (No. 107 of 1998),
NFEPA	National Freshwater Ecosystem Priority Areas
NGP	New Growth Path
NHRA	National Heritage Resources Act, 1999 (No. 25 of 1999)
NPAES	National Protected Areas Expansion Strategy
NSSD	National Strategy for Sustainable Development and Action Plan 2011 - 2014
NWA	National Water Act, 1998 (No. 36 of 1998)
PMP	Probable maximum precipitation
PPP	Public Participation Process
PSDF	Northern Cape Provincial Spatial Development Framework
RE	Remaining extent
RoM	Run-of-Mine
S&EIA	Scoping and Environmental Impact Assessment
SACAD	South Africa Conservation Areas Database
SAHRA	South African Heritage Resources Association
SANBI	South African National Botanical Institute (SANBI)
SANS	South Africa National Standard
SAPAD	South Africa Protected Area Database
SDF	Spatial Development Frameworks
SLP	Social and Labour Plan
SLR	SLR Consulting (South Africa) (Pty) Ltd
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (No. 6 of 2013)
TC	Total concentration
UMK	United Manganese of Kalahari (Pty) Ltd
WHO	World Health Organisation
WRD	Waste Rock Dump

1. INTRODUCTION

This chapter describes the purpose of this report, provides a brief description of the project background, summarises the legislative authorisation requirements, provides the study terms of reference, describes the structure of the report, and outlines the opportunity for comment.

1.1 PURPOSE OF THIS REPORT

This Draft Scoping Report was compiled and will be distributed for review and comment as part of the Scoping and Environmental Impact Assessment (S&EIA) process that is being undertaken for the proposed project at the United Manganese of Kalahari (Pty) Ltd (UMK) manganese mine (the UMK Mine). The S&EIA is contemplated in the Environmental Impact Assessment Regulations, 2014 (published under Government Notice Regulation (GNR) 982 of 4 December 2014, as amended) made in terms of the NEMA.

This Draft Scoping Report documents the applicable regulatory framework; provides a description of the proposed project and the affected environment; summarises the S&EIA process followed to date; details the consideration of alternatives; identifies potential project impacts and presents a Plan of Study for the Environmental Impact Assessment (EIA) phase.

Interested and Affected Parties (I&APs) will be asked to comment on the Draft Scoping Report. The document will then be finalised incorporating all comments received during the comment period. The Final Scoping Report will be submitted to the Department of Mineral Resources and Energy (DMRE) for consideration as part of the application for an Integrated Environmental Authorisation made in terms of Chapter 5 of NEMA.

1.2 PROJECT BACKGROUND

United Manganese of Kalahari (Pty) Ltd (UMK) is applying for an Environmental Authorisation for new listed activities on the farm Botha 313, the RE of the farm Smartt 314, and portions 1, 2 and 3 (a portion of the RE) of the farm Rissik 330. The UMK Mine is an opencast manganese mine located approximately 13 km to the south of the town of Hotazel in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

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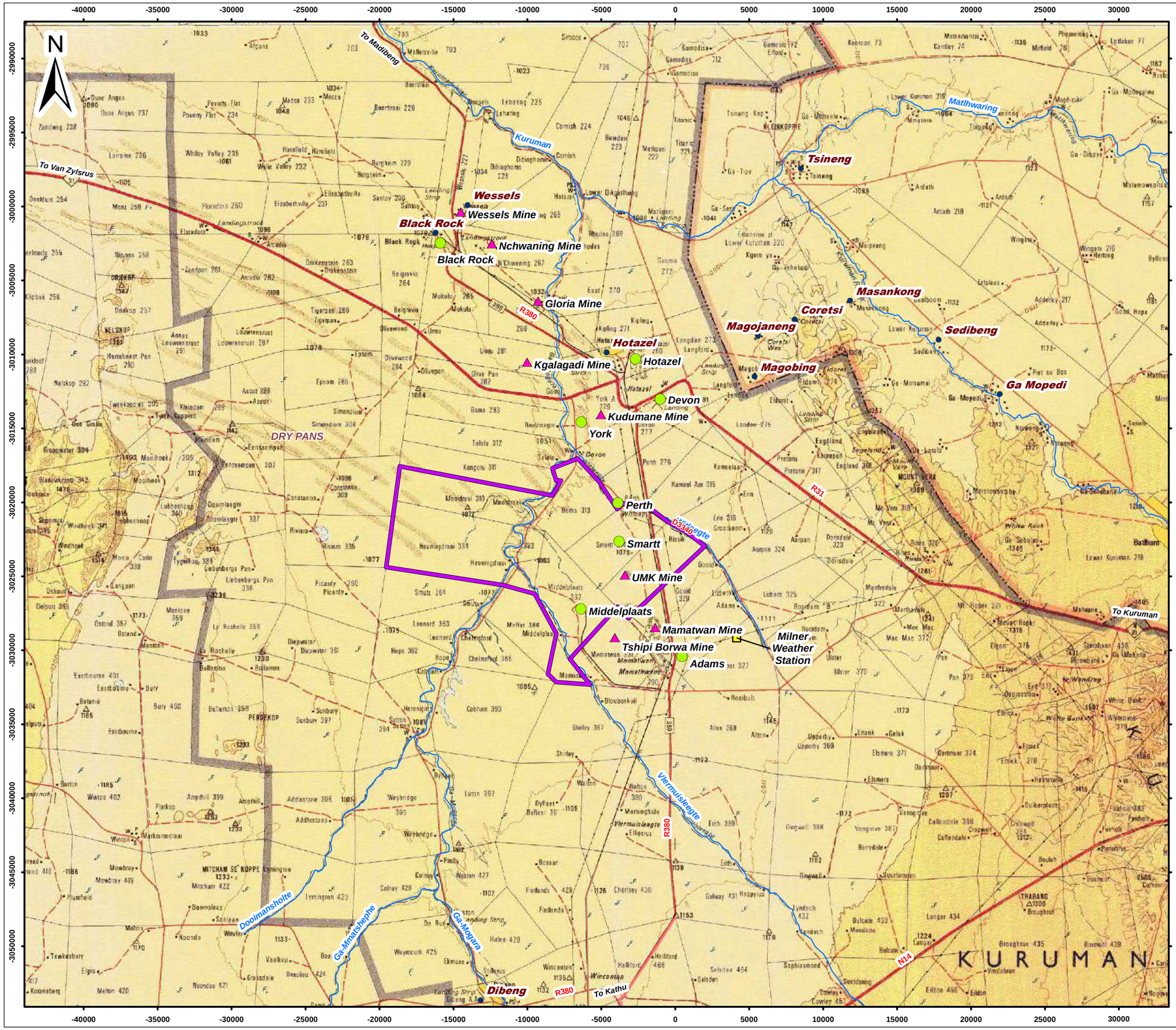

UNITED MANGANESE OF KALAHARI

Figure 1-1

Regional Setting

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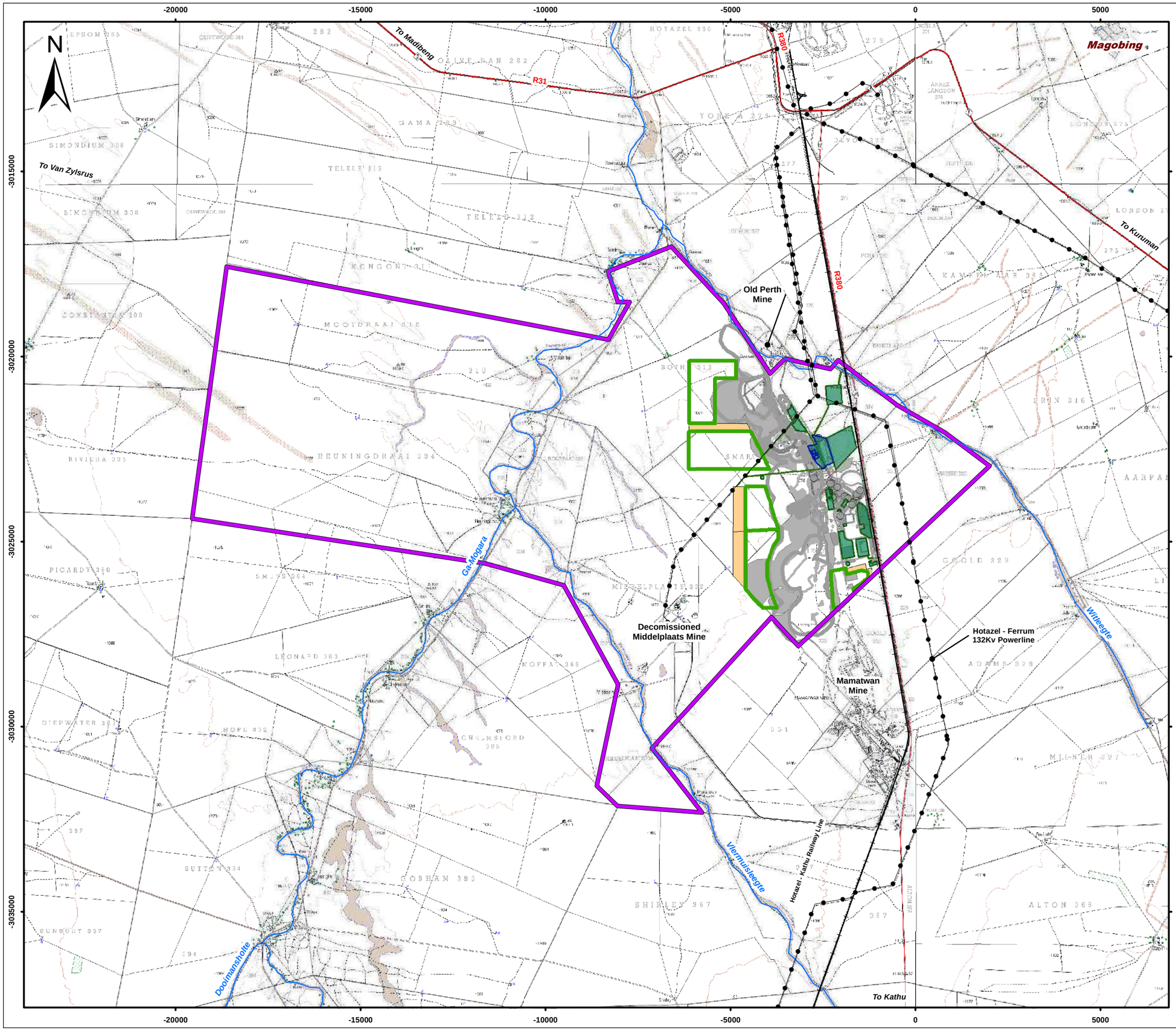
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.21002.00055	2020/09/02



Legend

- UMK Mining Right Area
- Main Roads
- Railway Line
- Power Line
- Rivers and Streams
- As per the approved infrastructure layout

Proposed Changes to the Layout or Operations

- Proposed Waste Rock Dumps
- Proposed Topsoil Stockpiles
- Proposed Infrastructure

0 1 2 Kilometers

Scale: 1:100 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

UNITED MANGANESE OF KALAHARI

Figure 1- 2

Local Setting

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2021/03/18

1.3 SUMMARY OF AUTHORISATION REQUIREMENTS

The proposed project will require an amendment of UMK's EMPr. In terms of the Mineral and Petroleum Resources Development Act, 2002 (No. 8 of 2002, as amended) (MPRDA), an EMPr may not be amended or varied without the written consent of the Minister of Minerals and Energy.

The proposed project includes activities listed under the NEMA and waste management activities listed under the National Environmental Management: Waste Act (No. 59 of 2008, as amended) (NEM:WA). Prior to the commencement of the proposed project, an integrated environmental authorisation and waste management license from the Northern Cape DMRE in terms of Section 24 of NEMA and Section 45 of NEM:WA must be applied for and obtained. Listed activities are prohibited from commencing until written authorisation is obtained from the competent authority, which in this case is the Northern Cape DMRE. The activities that are triggered require a Scoping and EIA process in terms of the EIA Regulations 2014 (as amended). The EIA Regulations being followed are Government Notice Regulation (GNR) 982 of 4 December 2014, as amended. The EIA process is used to inform the environmental authorisation application. Further detail is included in Section 6.1.

In addition, the proposed project may require an amendment of the water use license from the Department of Human Settlement, Water and Sanitation (DHSWS) for specific water uses under Section 21 of the NWA. This process will be initiated by UMK.

This S&EIA process does not cover occupational health and safety legislation requirements.

1.4 TERMS OF REFERENCE

SLR, as the independent Environmental Assessment Practitioner (EAP), is responsible for undertaking the environmental regulatory process and conducting the public participation process. The environmental impact assessment process is conducted in two phases. The first is the Scoping phase and the second is the EIA phase. The terms of reference for the S&EIA regulatory process are to:

- make an application for an integrated Environmental Authorisation of the proposed project in terms of the NEMA and the NEM:WA;
- ensure the Scoping and EIA process is undertaken in accordance with the requirements of the NEMA and the EIA Regulations;
- ensure the Scoping and EIA is undertaken in an open, participatory manner to ensure that all potential impacts are identified;
- undertake a public participation process, which includes the distribution of information to I&APs and provides the opportunity for I&APs to raise any concerns/issues, as well as an opportunity to comment on the Scoping and EIA documentation; and
- integrate all the information, including the findings of the specialist studies and other relevant information, into Scoping and EIA reports to allow an informed decision to be taken on the proposed project.

Further to this and in accordance with the Northern Cape DMRE reporting requirements and Appendix 2 to the EIA Regulations 2014, the key objectives of the scoping process are the following:

- identify the relevant policies and legislation relevant to the activity;

- motivate the need and desirability of the proposed activity;
- identify and confirm the preferred activity, technology, and site alternatives;
- identify the key issues to be addressed in the assessment phase;
- determine the level of assessment (including specialist investigations) and public participation required; and
- identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

1.5 STRUCTURE OF THE REPORT

This document has been prepared in accordance with the DMRE Scoping Report template format and was informed by the guidelines posted on the official DMRE website. In addition, this report complies with the requirements of the NEMA and Appendix 2 of EIA Regulations 2014, as amended. Table 1-1 provides a summary of the requirements, with cross references to the report sections where these requirements have been addressed.

Table 1-1: Structure of the Scoping Report

Legal and Regulatory Requirement		**Section of Report**
DMRE template requirement	**NEMA: GNR 982 Appendix 2 Section 2**	
-	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:	See references below
The EAP who prepared the report; Expertise of the EAP.	Details of: the EAP who prepared the report; and the expertise of the EAP, including a curriculum vitae;	Section 2.1.
Description of the property.	The location of the activity, including: The 21-digit surveyor general code of each cadastral land parcel; Where available, the physical address and farm name; Where the requirement information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Section 3.
Locality plan.	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 4.
Description of the scope of the proposed overall activity, including listed and specified activities;	A description of the scope of the proposed activity: all listed and specified activities triggered;	Section 5

Legal and Regulatory Requirement		Section of Report
DMRE template requirement	**NEMA: GNR 982 Appendix 2 Section 2**	
Description of the activities to be undertaken.	a description of the activities to be undertaken, including associated structures and infrastructure.	
Policy and legislative context.	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 6.2
Need and desirability of the proposed activity.	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 7.
Period for which the environmental authorisation is required.	-	Section 8.
Description of the process followed to reach the proposed preferred site.	A full description of the process followed to reach the proposed preferred activity, site, and location within the site, including:	Section 1.
Details of the alternatives considered.	Details of all the alternatives considered;	Section 9.3.
Details of the public participation process followed.	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 9.4.
Summary of issues raised by IAPs.	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 9.5.
Environmental attributes associated with the sites.	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9.6.
Impacts identified.	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts-can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed, or mitigated;	Section 9.7
Methodology used in determining the significance of environmental impacts.	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 9.8
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.	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 9.8.

Legal and Regulatory Requirement		Section of Report
DMRE template requirement	**NEMA: GNR 982 Appendix 2 Section 2**	
The possible mitigation measures that could be applied and the level of risk.	The possible mitigation measures that could be applied and level of residual risk;	Section 9.9.
The outcome of the site selection matrix. Final site layout plan.	The outcome of the site selection matrix;	Section 9.10.
Motivation where no alternative sites were considered.	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Section 9.11.
Statement motivating the preferred site.	A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 9.12.
Plan of study for the environmental impact assess process;	A plan of study for undertaking the environmental impact assessment process to be undertaken, including:	Section 10.
Description of alternatives to be considered including the option of not going ahead with the activity	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 10.2.
A description of the aspects to be assessed as part of the environmental impact assessment process	A description of the aspects to be assessed as part of the environmental impact assessment process;	Section 10.3.
Description of aspects to be assessed by specialists.	Aspects to be assessed by specialists;	Section 10.4.
Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives.	A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 0.
Proposed method of assessing duration significance.	A description of the proposed method of assessing duration and significance;	Section 10.6.
The stages at which the competent authority will be consulted.	An indication of the stages at which the competent authority will be consulted;	Section 10.7.
Particulars of the public participation process with regard to the impact assessment process that will be conducted.	Particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 10.8.
Description of the tasks that will be undertaken during the environmental impact assessment process.	A description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 10.9
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.	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 10.10

Legal and Regulatory Requirement		Section of Report
DMRE template requirement	**NEMA: GNR 982 Appendix 2 Section 2**	
Undertaking regarding correctness of information;	An undertaking under oath or affirmation by the EAP in relation to: The correctness of the information provided in the report; The inclusion of comments and inputs from stakeholders and interested and affected parties; and 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 13
Undertaking regarding level of agreement.	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 13
Other information required by the competent authority.	Where applicable, any specific information required by the competent authority; and	Section 11
Other matter required in terms of section 24(4)(a) and (b) of the Act.	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	Section 12.

1.6 OPPORTUNITY TO COMMENT

This Scoping Report is distributed for a 30-day comment period from **29 April 2021- 31 May 2021** in order to provide I&APs with an opportunity to comment on any aspect of the proposed project and the findings of the S&EIA process to date. Copies of the full report are available on the SLR website (at https://slrconsulting.com/za/slr-documents/). Copies of the full report and Non-Technical Summary (NTS) are available on the SLR website (at https://slrconsulting.com/public-documents) and the SLR data free website (at slrpublicdocs.datafree.com). Electronic copies (compact disk) of the report are available from SLR, at the contact details provided below.

Please send your comments to SLR at the address, telephone number or e-mail address shown below by no later than **31 May 2021** for them to be included in the updated Scoping Report. All comments received during the review process will be included in the Scoping Report.

SLR Consulting (Africa) (Pty) Ltd

Attention: Reinett Mogotshi

PO Box 1596, Cramerview 2060 (if using post please call SLR to notify us of your submission)

Tel: (011) 467 0945

E-mail: rmogotshi@slrconsulting.com

2. DETAILS OF THE EAP WHO PREPARED THE REPORT

This chapter provides the details, qualifications and experience of the environmental assessment practitioner undertaking the S&EIA.

2.1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

SLR has been appointed as the independent EAP to undertake the S&EIA for the proposed project in line with Part 2, Regulation 12 and 13 of the EIA Regulations (2014), as amended. The details of the EAP project team that that were involved in the preparation of this Draft Scoping Report are provided in Table 2-1 below.

Table 2-1: Details of the EAP

Details	Project Manager	Project Consultant	Reviewer
Name of the practitioner	Sharon Meyer	Reinett Mogotshi	Edward Perry
Tel No.:	011 467 0945	011 467 0945	011 467 0945
Fax No.:	011 467 0978	011 467 0978	011 467 0978
E-mail address	smeyer@slrconsulting.com	rmogotshi@slrconsulting.com	eperry@slrconsulting.com

Neither SLR nor any of the specialists involved in the S&EIA process have any interest in the project other than contractually agreed payment for consulting services rendered as part of the EIA process. An undertaking by SLR is provided in Section 13.

2.2 QUALIFICATIONS AND EXPERIENCE OF THE EAP

Sharon Meyer has an MSc in Environmental Science and Biological Control. Sharon has over 20 years of experience as an environmental scientist and project manager. She has managed complex projects within the mining and power generation sectors, with a focus on industrial waste management. Sharon has managed multi-national and multi-disciplinary teams on authorisation processes and social due diligence mining projects in Africa. Sharon has worked on a variety of mining projects including diamond, coal, gold, vanadium, and tailings reclamation projects.

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3. DESCRIPTION AND LOCATION OF ACTIVITY

This chapter provides details of the project location and properties.

A description of the properties on which the UMK Mine and proposed project are located is provided in Table 3-1**.**

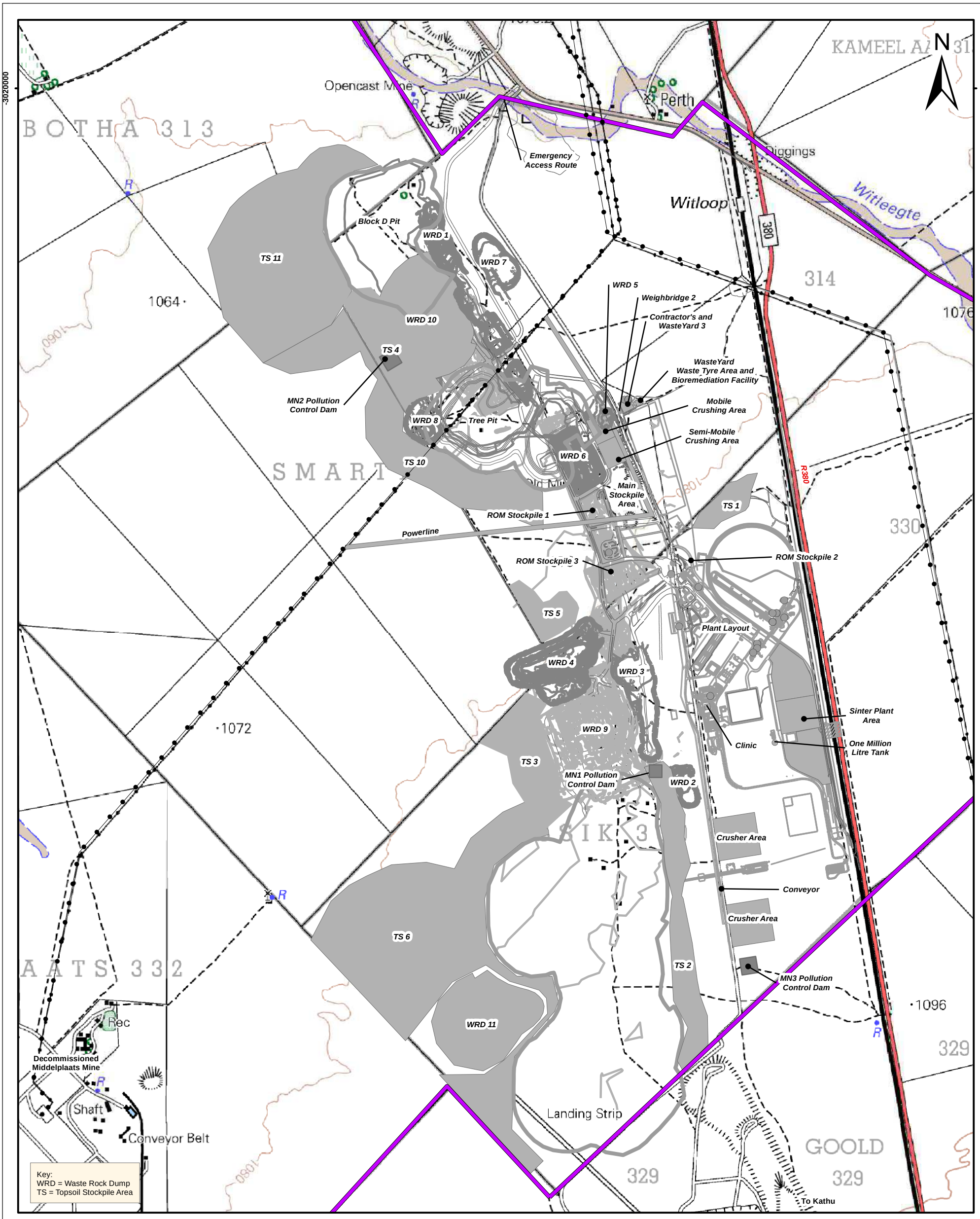
Table 3-1: Description of the Property

Description	Detail
Farm name	Rissik 330 Portion 3 (3 (a portion of the remaining extent) Rissik 330 portion 1 Rissik 330 portion 2 Smartt 314 RE Smartt 314 portion 1 Botha 313 portion 1 Botha 313
Application area (ha)	A surface disturbance area of approximately 951 ha
Magisterial district	Kuruman Magisterial District
Distance and direction from nearest town	The UMK Mine is located approximately 13 kilometres south of Hotazel, 21 km south east of Black Rock, 42 km north of Kathu and 80 km north west of Kuruman.
21-digit Surveyor General code for each farm portion	**21 Digit Code** / **Farm Portion** C04100000000033000001 / Rissik 330 portion 1 C04100000000033000002 / Rissik 330 portion2 C04100000000033000003 / Rissik 330 portion 3 C04100000000031400000 / Smartt 314 RE C04100000000031300000 / Botha 313

4. LOCALITY PLAN

This chapter provides regional location and site layout plans.

The regional and local settings of the UMK Mine are illustrated in Figure 1-1 and Figure 1-2 respectively. The location and layout of the project components are illustrated in Figures in Section 5.



Legend

UMK Mining Right Area

As per the approved infrastructure/facilities layout

0 500 1 000 Meters

Scale: 1:24 000 @ A3

Projection: Transverse Mercator

Datum: WGS1984, Lo23

UNITED MANGANESE OF KALAHARI

Figure 4-1
Current Infrastructure

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710.21002.00055

2021/04/09

5. PROJECT DESCRIPTION

This chapter introduces the project, describes the activities that would be undertaken as part of the proposed project and identifies the listed and specified activities applicable to the project. A description of the existing operations and infrastructure is also provided. It has been compiled using information provided by the UMK Mine project team and preliminary project specific specialist input.

5.1 LISTED AND SPECIFIED ACTIVITIES

The main project activities are included in Section 5.2. The associated listed or specified activities are also included in Table 5-1.

The latest Listing Notices 1 (GNR 983), 2 (GNR 984), and 3 (GNR 985) were published on the 4th December 2014 in conjunction with the Environmental Impact Assessment Regulations (Gazette 38282). These Regulations and Listing Notices have since been amended. The latest amendment to the Listing Notices was through GNR 324, 325 and 327 published on the 7 April 2017, which amended Listing Notices 3, 2, and 1 respectively. When referring to the Listing Notices below the number of the original Government Notice is referred to e.g. GNR 983 but this considers subsequent amendments.

This table does not include decommissioning activities approved in previous EMPrs.

Table 5-1: Project Activities and Associated Listed Activities

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
Establishment of the following Infrastructure on site				
Mineralised waste management: • Central West Waste Rock Dump (WRD) (84 ha) • Central West Sand Stockpile (40.9 ha) • J Block West WRD (133 Ha) • J Block West Sand Stockpile (46.5 ha) • J Block East WRD (80.2 Ha) • J Block East Sand Stockpile (16.5 ha) • Powerline West WRD (196 ha) • Powerline West Sand Stockpile (35,9 ha) • A Block West WRD (145 Ha) • Product stockpile area (21.4 Ha)	799 Ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 34**: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding - (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water, or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or (iii) the expansion is directly related to aquaculture facilities or infrastructure where	**Category B 4(7):** The disposal of any quantities of hazardous waste to land **Category B 4 (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). **Category B 4 (11):** The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			the wastewater discharge capacity will be increased by 50 cubic meters or less per day. **RELEVANCE:** The expansion of WRD capacity will require an amendment to the existing IWUL.	
			NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding - (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (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; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			RELEVANCE: The establishment of additional WRD will require an amendment to the existing IWUL and a new Waste Management License.	
			NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The establishment of WRD will clear an area of more than 20 ha.	
Engineering salvage yard (temporal and permanent)	2.43 Ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 27**: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The establishment of the Engineering salvage yard (temporal and permanent) will clear an area of more than 1 ha but less than 20 ha.	-

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
Water supply, use and management: Solar equipped boreholes and associated storage tanks with a combined storage capacity of 755 m^3	Not applicable	Not applicable	-	-
Support infrastructure or services: • Parking area (0.52 Ha) • Tyre fitting bay, workshop/ tyre centre and oil storage (10.3 Ha) • Explosive depo and associated service road (13.1 Ha) • Hard park areas (Phase 1 and 3) (14.3 Ha) • Barlow's Store (1 Ha)	39.22 Ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 27**: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE**: The establishment of tyre fitting bay, workshop/ tyre centre, oil storage and explosive depo will clear an area of more than 1 ha but less than 20 ha.	
			NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 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.	

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			RELEVANCE: Storage of dangerous goods with a combined capacity of 325 cubic metres.	
Transportation: Truck staging area	20.4 Ha	X	**NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 15:** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The establishment of truck staging area will clear an area of more than 20 ha.	-
Upgrade of the following existing approved infrastructure				
Prentec Sewage Plant, with an increased capacity of 50 M^3 within the approved footprint.	Within the approved footprint	Not applicable	-	-
Existing weigh bridge and associated access road	Not applicable	Not applicable	-	-
Expansion of the following existing approved infrastructure on site				
Mineralised waste management: Product stockpile	53.6 Ha	X	**NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 15:** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	-

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			RELEVANCE: The establishment of product stockpile will clear an area of more than 20 ha.	
Processing Plant: Modular crushing plant	54.3 Ha	X	**NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 15:** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The establishment of Modular crushing plant will clear an area of more than 20 ha.	-
			NEMA (GNR 984 of 2014) as amended by GNR.325 of 2017 (G.G. 40772 of 07/04/2017): Listing Notice 2, Activity 17: Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including -(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies. **RELEVANCE:** Modular crushing plant is classified as primary processing of minerals.	

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
Support infrastructure/services: • Fuel storage farm (above ground fuel storage facilities with a combined capacity of 300 m^3) (0.45 Ha) • Offices including training centre, additional management offices, vehicles parking, taxis, and buses parking; and permanent GPS station (19.1 Ha) • EME workshop for major repair and maintenance (3.6 Ha)	19.55 Ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 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. **RELEVANCE:** The above ground fuel storage facilities with a capacity of 300 m^3.	-
			NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The establishment of offices will clear an area of more than 1 ha but less than 20 ha.	-
Transportation: Road truck staging area	1.6 Ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 27**: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of	-

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The expansion of the road truck staging area will clear an area of more than 1 ha but less than 20 ha.	
Relocation of the following existing approved infrastructure				
Dirty water dams/pollution control ponds:	MN1 (~ 0.2ha and 2 900 m^3); MN2 (~ 1.3ha and 27 500 m^3);	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 27**: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. **RELEVANCE:** The relocation of the approved dirty water dams/ pollution control ponds will clear an area of more than 1 ha but less than 20 ha.	-
132 KV powerline from the current position to its original position following complete backfilling of the pit	7.75 ha	X	**NEMA (GNR 983 of 2014) as amended by GNR.327 of 2017 (G.G. 40772 of 07/04/2017) and GNR.706 of 2018 (G.G. 41766 of 13/07/2018: Listing Notice 1, Activity 11,** The development of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts	-

Main project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice	Waste Management Authorisation
			or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is - (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development. **RELEVANCE:** The capacity of the powerline is 132 kilovolts outside urban areas.	

5.2 OVERVIEW OF CURRENT MINING ACTIVITIES

The information in this section draws from the approved EMPr (Metago, April 2007) and its subsequent amendments. This information has also been updated where relevant using information provided to SLR, by the UMK project team. For completeness purposes, the section below will refer to existing approved infrastructure.

5.2.1 Open Pit Mining Methods

The approved operations comprise conventional drill and blast, truck and shovel open pit mining methods. The project will not result in any changes to the mining method. The mining of the open pit commenced in the central section and is progressing to the north and south. The depth of the manganese seam at the start of mining was approximately 50m below the surface and the deepest point will be approximately 150m below surface. In the longer-term underground mining methods may be required to access the deeper ore. Further detail pertaining to the mining method is provided in Table 5-2 below.

Table 5-2: Mining Methods Description

Activity	Description
Topsoil stripping	Topsoil will be stripped and stockpiled separately in accordance with the soil conservation management procedures.
Drilling and blasting	Once the topsoil and waste rock material have been removed, the hard overburden rock will be drilled as per a predetermined design. Charges for blasting will be designed to prevent excessive ground vibration, fly rock, and air blast.
Removal of waste rock	The removal of the waste rock above the ore body will be done by means of dozing / loading and hauling with large equipment and stockpiled on waste rock dumps. Some waste rock will be placed into some of the previously mined out areas thus ensuring that the rehabilitation is done concurrently to the mining, while others will be sloped/shape and made safe.
Removal of ore	The ROM ore will be transported via dump trucks to designated ROM stockpiles prior to being fed into the processing plant.
Rehabilitation and partial backfilling of pits	Rehabilitation will be concurrent with mining. Some waste rock will be used to partially backfill some of the open pits. Topsoil will be replaced on the waste rock to enable vegetation to re-establish. Excess topsoil will be stored in berms and designated stockpile areas in accordance with conservation management procedures immediately adjacent to areas where this topsoil will be used for rehabilitation at the end of the life of mine.

5.2.2 Mineral Processing Method

The mineral processing method is described in Table 5-3 below. The project will not result in any changes to the mineral processing methodology.

Table 5-3: Mineral Processing Methods

Activity	Description
Semi mobile and mobile crushing and screening	Ore from the ROM stockpile will be transported via front end loaders/ articulated trucks/ conveyor to the crushing section (consisting of a primary feed bin, vibrating grizzly, jaw crusher, conveyor, secondary cone crusher and a convoy our to stockpile area) in order to reduce the ROM material to a size required by the downstream processes. The crushed material from the stockpile area will be transported via conveyor to a surge bin that will in turn supply the triple deck screen in order to screen out the required product specifications. The crushed material will be recirculated back to the screening plant. Correctly sized material will be fed to the final product stockpiles.
Mobile crushing and screening	Other than crushing and screening equipment being track mounted for quick and easy relocation, material processing is similar to the semi mobile crushing and screening.
J-Block extended crusher	ROM ore from the J-Block extended open-pit will be transported to the crusher. The crushed material will be conveyed to the permanent processing plant.
Product stockpiling	The correctly sized product from the screening plant will be fed onto three elevated product stockpile conveyors to three separate final product stockpiles i.e. lumpy, chips and fines. Due to limited stockpile space under the elevated stockpile conveyors the saleable product is moved to the mobile stockpile areas by means of front-end loader and articulated dump trucks.
Transportation of product	Saleable product will be moved by front end loaders/ articulated trucks/ conveyor to the load-out station for removal off-site via railway/ truck for sale to third parties.
Dust suppression	Dust suppression will be utilised at all material handling transfer points.

5.2.3 Approved Surface Infrastructure and support services

An overview of the approved key infrastructure is provided as follows (the approved layout is illustrated in Figure 4-1)

- Open-pit mining sections;
- Plant area consisting of a Primary and Secondary crushing and screening areas;
- Mobile and semi-mobile crushing and screening areas;
- J-Block extended crushing area;
- Plant conveyors;
- Topsoil stockpiles and berms;
- Waste rock dumps and berm;

- Run-of-mine (ROM) stockpiles;
- Product stockpiles, -6mm product stockpile, kidney product stockpile, mobile crusher stockpiles, and final product stockpiles;
- Stormwater management facilities (drains, berms, and recycled water ponds/ pollution control dams);
- Water holding facilities (dirty water dams/ponds, potable water storage tanks and reservoirs, service, and dust suppression water storage tanks);
- Potable water, service water and sewage effluent pipelines;
- Eskom substation and internal power line;
- Road truck parking area (hard park);
- Possible D3340 emergency access point/escape route;
- Internal haul roads;
- Weighbridge;
- Administrative offices, stores, contractors' yard (including water and diesel storage facilities), change house and clinic;
- Fuel farm and storage tanks;
- Laboratory and preparatory laboratory;
- Core yard;
- Workshop and wash bays (temporary and permanent);
- Salvage yard and temporary waste storage area including waste tyres (waste yard); and
- Bioremediation facility.

5.3 DESCRIPTION OF ACTIVITIES

UMK is now proposing to amend the approved mine layout to optimize their mining operations to make provision for proposed activity/infrastructure changes. In this regard, a layout illustrating the approved layout versus the layout changes is provided in Figure 5-1. The key elements listed above are discussed in detail below.

5.3.1 New Infrastructure to be established on site in support of the current mining operations.

Mineralised waste management

UMK is proposing to establish additional waste rock dumps, sand stockpile and product stockpiles to accommodate additional waste rock and product tonnages. These includes:

- Central West Waste Rock Dump (WRD) (84 ha)
- Central West Sand Stockpile (40.9 ha)
- J Block West WRD (133 Ha)
- J Block West Sand Stockpile (46.5 ha)
- J Block East WRD (80.2 Ha)
- J Block East Sand Stockpile (16.5 ha)
- Powerline West WRD (196 ha)
- Powerline West Sand Stockpile (35,9 ha)
- A Block West WRD (145 Ha)
- Product stockpile area (21.4 Ha)

Table 5-4: Waste Rock Dumps and Sand Stockpiles Design Criteria

Item	Central West WRD	Central West Sand	Block J West WRD	Block J West Sand	Block J East WRD	Block J East Sand	Power Line West WRD	Power Line West Sand	A Block West WRD
Available airspace (Mm^3)	67	34	34	38	51	13	157	29	115
WRD dump height (m)	60	20	60	20	60	20	60	20	60
Footprint (ha)	84	40.9	133	46.5	80.2	16.5	196	35.9	145
WRD Volume (LCM million)	35	6	18	7	27	2	82	5	60
WRD Material Quality	Predominantly weak to very strong rocks of low to high durability / greater than about 25% fines and overburden comprising clay, calcrete and sand								
WRD method of construction	15m lifts with 10m benches	20m lifts	15m lifts with 10m benches	20m lifts	15m lifts with 10m benches	20m lifts	15m lifts with 10m benches	20m lifts	15m lifts with 10m benches

Item	Central West WRD	Central West Sand	Block J West WRD	Block J West Sand	Block J East WRD	Block J East Sand	Power Line West WRD	Power Line West Sand	A Block West WRD
Lift Height (m)	15	20	15	20	15	20	15	20	15
Lift Side Slope Angle (degrees)	33.7°	33.7°	33.7°	33.7°	33.7°	33.7°	33.7°	33.7°	33.7°
Overall Side Slope Angle (degrees)	24.8°	24.8°	24.8°	24.8°	24.8°	24.8°	24.8°	24.8°	24.8°
Bench Width (m)	10	10	10	10	10	10	10	10	10

The dimensions of the proposed product stockpile are included below:

Table 5-5: Design Criteria for the Product Stockpile

product stockpile	Dimension
Length (m)	80
Height (m)	3
Width	8
Footprint (ha)	21.4
Volume	Approximately 1 700 tonnes

Engineering salvage yard (temporal and permanent)

UMK proposed to establish an engineering salvage yard that will be used primarily for the storage of equipment and materials that will be utilised at the UMK mine during operation. The estimated footprint of engineering salvage yard is 2.43 Ha. Waste generated from UMK mining operations will not be stored within the proposed salvage yard.

Solar equipped boreholes and associated storage tanks

UMK proposes to establish solar equipped boreholes for abstraction of groundwater. This activity will consist of two systems which consist of PV source, battery backup, three borehole pumps which feeds into two zinc steel tanks with a pumping rate of 5 L/s and 10 L/s. The capacity of zinc steel tanks is 543 m^3 and 210 m^3 respectively.

Support infrastructure or services

UMK proposes to establish support infrastructure to optimise their mining operations. These include parking area (0,52 Ha), tyre fitting bay, workshop/ tyre centre and oil storage (10,3 Ha) and explosive depo and associated service roads (13,1 Ha) at several areas around the mining right boundary. The total footprint of disturbance is 24 Ha.

Truck staging area

UMK proposes to establish a truck staging area and associated road north of the mine in support of the current mining operations. The total footprint of disturbance is approximately 20,4 Ha).

5.3.2 Upgrade of existing approved infrastructure

Prentec Sewage Plant

. Sewage effluent is collected from the main admin block, admin block change house, engineering building and store building. The sewage effluent is pumped from these designated conservancy tanks for storage in two inlet buffer tanks prior to being sent to the sewage plant for treatment. Raw sewage stored in the inlet buffer tanks is pumped to the anoxic tank for anaerobic treatment. Treated sewage effluent is collected in a lined stormwater dam and re-used within the mine process. The approved footprint for the sewage plant is approximately 0,3 ha with a 50 m^3 capacity.

UMK is proposing to increase the capacity of the sewage plant by 50 m^3, the increase in capacity would be undertaken within the approved project footprint and would not require clearance of any additional land.

Existing weigh bridge and associated access road

UMK currently has two weighbridges located on site, the two weighbridges are used to weigh road vehicles and their contents. UMK proposes to upgrade the existing weight bridge and access road north of the mine to support the current and future mining operations. The upgrade of the existing weighbridge will not result in clearance of additional land.

5.3.3 Expansion of existing approved infrastructure

Mineralised waste management

The approved EMPr made provision for a primary and final ore product stockpile. UMK has established eight product stockpile areas (Finished product stockpile; -6mm product stockpile; Kidney product stockpile; mobile crusher stockpiles No. 1 and No. 2; and product stockpiles No. 3, 4 and 5). These product stockpiles receive product from both the primary and secondary crushing and screening circuits prior to being sent-off site via road truck and trains for sale to third parties.

UMK proposes to expand the mobile crusher product stockpile area east of the mine by 53,6 Ha to support the current mining operations. The dimensions of the product stockpiles are provided in Table 5-6 below.

Table 5-6: Design Criteria for the expansion of the mobile crusher Product Stockpile

Product stockpile	Dimension
Length (m)	80
Height (m)	3
Width	8
Footprint (ha)	53.6
Volume	Approximately 1 700 tonnes

Processing Plant

Currently, the ore from the ROM stockpile will be transported via front end loaders/ articulated trucks/ conveyor to the crushing section (consisting of a primary feed bin, vibrating grizzly, jaw crusher, conveyor, secondary cone crusher and a convoy our to stockpile area) in order to reduce the ROM material to a size required by the downstream processes. The crushed material from the stockpile area will be transported via conveyor to a surge bin that will in turn supply the triple deck screen in order to screen out the required product specifications. The crushed material will be recirculated back to the screening plant.

Correctly sized material will be fed to the final product stockpiles.

The approved processing plant consist of the following areas:

- Primary crushing area (~ 0.1ha);
- Secondary crushing area (~ 0.1ha);
- Semi mobile crushing area (~ 2.7ha);
- Block J pit extended crushing area (~ 18ha); and
- Mobile crushing area (~ 2.6 ha).

UMK proposes to expand the footprint of the mobile crusher by 53,4 Ha. The new processing plant will be known as the Modular Crusher plant and will optimise mining operations within the UMK Mine.

5.3.4 Relocation of approved surface infrastructure

Approved dirty water dams/pollution control ponds:

The following dirty water containment facilities have been approved:

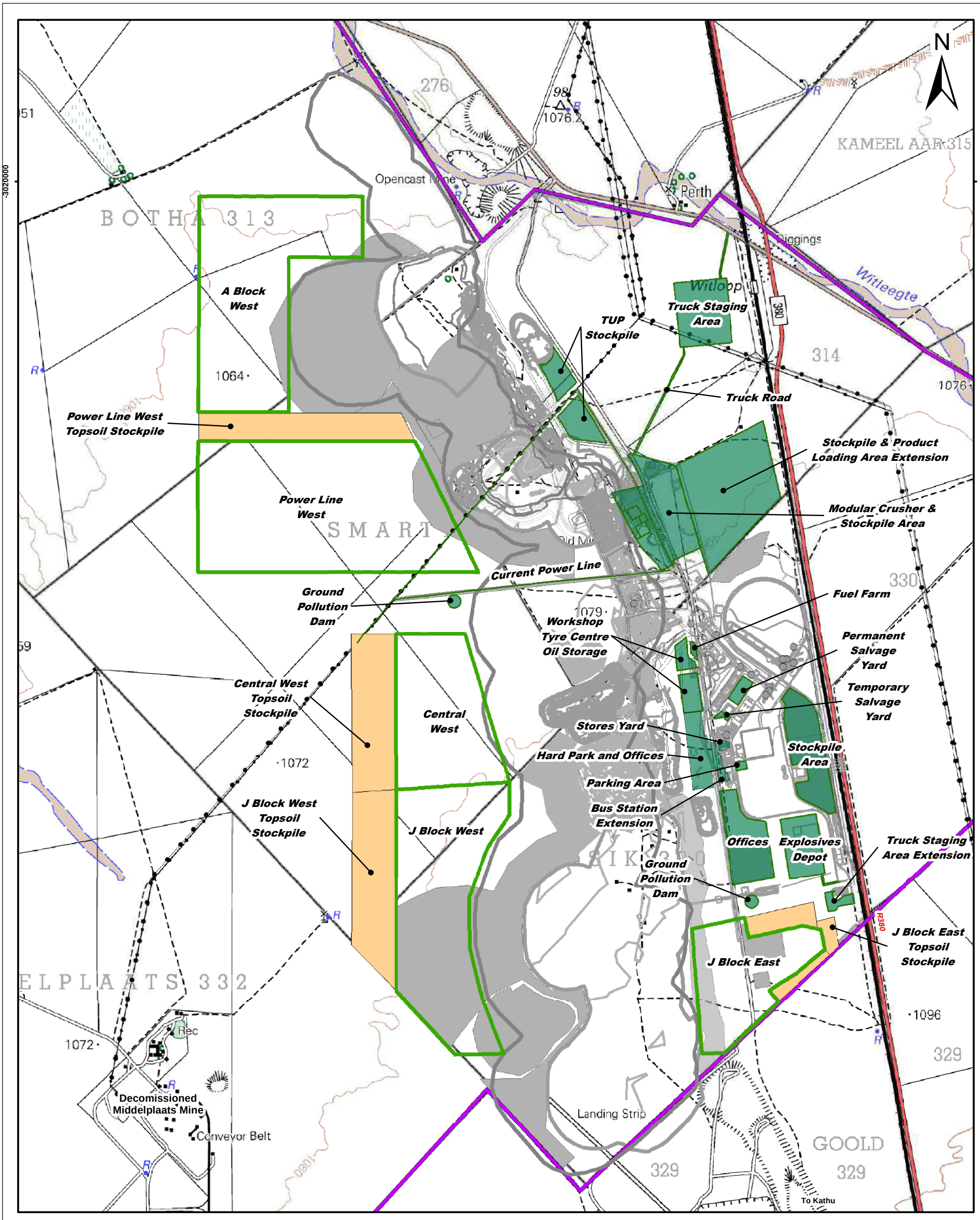
- Mine Pit Water Supply pollution control pond (MN1) (~ 0.2ha and 2 900 m3) will receive dirty water run-off from the opencast Block J pit. Water from the pit will be pumped into a silt trap from where it will be collected in MN1. This water will be re-used for dust suppression. The MN1 will be lined with an HDPE liner.

UMK proposes relocation of NM1 approved dirty water containment facility to optimise their mining operations.

132 KV powerline from the current location to its old location

Power at the UMK Mine was sourced from Eskom by means of an existing substation/transformer connection of 10MVA at 132/11kV. The external power line size is 132kV, with internal reticulation of power from the substation/transformer by means of 11KV power lines. The powerline was relocated to its current location when the open pit mining activities commenced.

UMK proposes the relocation of the powerline to its old route once the open pit is backfilled.



Legend

- UMK Mining Right Area
- As per the approved infrastructure/facilities layout
- Main Roads
- Railway Line
- Power Line
- Rivers and Streams

Proposed Changes to the Layout or Operations

- Proposed Changes to the Layout or Operations
- Proposed Topsoil Stockpiles
- Proposed Infrastructure

0 500 1 000 Meters

Scale: 1:24 000 @ A3

Projection: Transverse Mercator

Datum: WGS1984, Lo23

UNITED MANGANESE OF KALAHARI

Figure 5-1
Proposed Changes to the Layout or Operations

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2021/04/23

6. POLICY AND LEGISLATIVE CONTEXT

This chapter outlines the key legislative context applicable to the proposed project and outlines the guidelines, policies and plans that have been considered during the Scoping phase of the S&EIA process.

6.1 LEGISLATION CONSIDERED IN THE PREPARATION OF THE SCOPING REPORT

In accordance with the EIA Regulations 2014 (as amended), all legislation and guidelines that have been considered in the S&EIA process must be documented. A summary of the applicable legal framework that has been taken into account and will be considered in the assessment process is provided in Table 6-1. The Acts and Regulations listed below include all subsequent amendments.

Table 6-1: Legal Framework

Applicable legislation	Reference where applied	Applicability to the project
The South African Constitution, 1996	All	The UMK mine and proposed activity/layout changes must comply with South African constitutional and common law by conducting its construction and operational activities with due diligence and care for the rights of others. Section 24 (a) of the South African Constitution states that everyone has the right to an environment that is not harmful to their health and well-being. This provision supersedes all other legislation.
Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002) and associated regulations.	Introduction and Section 6.1.1	Any changes to the mine's approved documents (i.e. right, work programme, environmental authorisation and EMPr) require consent from the Minister of Mineral Resources. A Section 102 Amendment will be applied for in terms of the MPRDA.
National Environmental Management Act, 1998 (No. 107 of 1998) and EIA Regulations 2014.	Introduction, Section 6.1.2	The project and operations at UMK mine will need to comply with the principles of NEMA. The project triggers activities listed under NEMA and requires Environmental Authorisation before commencement. The EIA Regulations 2014 set out the process required to inform an Environmental Authorisation decision.
National Environmental Management Waste Act, 2008 (No. 59 of 2008) and associated regulations.	Introduction, Section 6.1.3	The project will require the disposal and reclamation of mine residue and therefore triggers listed waste management activities. The project requires a Waste Management Licence in terms of the NEM:WA. The EIA Regulations 2014 set out the process required to inform a WML decision.
National Water Act, 1998 (No. 36 of 1998) and water use licensing regulations.	Section 6.1.4	The project will need to comply with the principles of NWA. The project includes water uses requiring authorisation.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA).	Section 6.1.5	The project will need to comply with the principles of NEM:AQA. The project does not include emissions activities requiring authorisation.

Applicable legislation	Reference where applied	Applicability to the project
National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004) (NEM:BA)	Section 6.1.6	Biodiversity was considered as part of project planning and in the assessment of potential impacts.
National Heritage Resources Act, 1999	Section 6.1.7	Heritage/cultural and palaeontological resources were considered as part of project planning and in the assessment of potential impacts. Where new land is disturbed by the project, the provisions of the Act will be considered.

6.1.1 Mineral and Petroleum Resources Development Act, 2002

The MPRDA (No. 28 of 2002), as amended governs the acquisition, use and disposal of mineral and petroleum resources in South Africa. The MRPDA promotes equitable access to the nation's mineral and petroleum resources. The objectives of the act, amongst others, are to promote economic growth and mineral and petroleum resources development in the Republic, particularly development of downstream industries through provision of feedstock and development of mining and petroleum inputs industries and also to promote employment and advance the social and economic welfare of all South Africans.

Chapter 4 of the Mineral and Environmental Regulation provides a framework to regulate the application for mining, prospecting, and closure rights. In addition, Section 102 of the MPRDA governs the amendment of rights, permits, work programmes and environmental authorisations and management programmes and ministerial consent is required.

With the establishment of the “One Environmental System” in 2014, the DMRE must apply the range of environmental principles included in Section 2 of NEMA when taking decisions that significantly affect the environment. To give effect to the general objectives of Integrated Environmental Management, the potential impacts on the environment of listed or specified activities must be considered, investigated, assessed, and reported on to the competent authority. Section 24(4) of NEMA provides the minimum requirements for procedures for the investigation, assessment, management, and communication of the potential impacts.

MPRD Regulations, 2004

The Mineral and Petroleum Resources Development Regulations, 2004 (as amended by GN No. 420 of 27 March 2020), promulgated in terms of Section 107 of the MPRDA, provide for a range of matters relating to the administration of the Act. Part 1 details regulations for the lodgement of applications, Part 2 deals with Social and Labour plans while Part 3 set out environmental regulations for mineral development. The recent amendment in March 2020 removed the great majority of the environmental provisions from the Regulations. These regulations had not been practicably implementable since the December 2014 introduction of the “One Environmental System” and the amendment of the overriding legislation (MPRDA and NEMA).

6.1.2 National Environmental Management Act, 1998

The National Environmental Management Act, 1998 (No. 107 of 1998), as amended, establishes principles, and provides a regulatory framework for decision-making on matters affecting the environment. All organs of state must apply the range of environmental principles included in Section 2 of NEMA when taking decisions that significantly affect the environment. Included amongst the key principles is that all development must be socially, economically, and environmentally sustainable and that environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably. The participation of I&APs is stipulated, as is that decisions must consider the interests, needs and values of all I&APs.

Chapter 5 of NEMA provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for granting of environmental authorisations. To give effect to the general objectives of Integrated Environmental Management (IEM), the potential impacts on the environment of listed or specified activities must be considered, investigated, assessed, and reported on to the competent authority. Section 24(4) provides the minimum requirements for procedures for the investigation, assessment, management, and communication of the potential impacts. In terms of the management of impacts on the environment, Section 24N details the requirements for an Environmental Management Programme (EMPr).

EIA Regulations, 2014

The EIA Regulations, 2014 (as amended by GN No. 326 of 7 April 2017) promulgated in terms of Chapter 5 of NEMA provide for control over certain listed activities. These listed activities are detailed in Listing Notice 1 (as amended by GN No. 327 of 7 April 2017), Listing Notice 2 (as amended by GN No. 325 of 7 April 2017) and Listing Notice 3 (as amended by GN No. 324 of 7 April 2017). The undertaking of activities specified in the Listing Notices is prohibited until Environmental Authorisation has been obtained from the competent authority. Such Environmental Authorisation, which may be granted subject to conditions, will only be considered once there has been compliance with the EIA Regulations, 2014.

The EIA Regulations, 2014 (as amended) set out the procedures and documentation that need to be complied with when applying for Environmental Authorisation. A Basic Assessment process must be applied to an application if the authorisation applied for is in respect of an activity or activities listed in Listing Notices 1 and/or 3 and a Scoping and EIA process must be applied to an application if the authorisation applied for is in respect of an activity or activities listed in Listing Notice 2. The proposed project would trigger activities specified in Listing Notice 2 (see Section 5.1) and therefore a S&EIA process is required in order for the DMRE to consider the application in terms of NEMA.

As the DMRE are the competent authority for the NEMA and NEM:WA activities, UMK will apply for an integrated Environmental Authorisation, as provided for in section 24L of the NEMA.

Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015

The purpose of the Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations (GN R 1147 of 2015) is to regulate the determination and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future.

National Guideline on minimum information requirements for preparing Environmental Impact Assessments for mining activities that require environmental authorisation, 2018

The Minister of Environmental Affairs gave a notice (GN 86 of 2018) of intent to publish National Guideline on minimum information requirements for preparing Environmental Impact Assessments for mining activities that require environmental authorisation. The purpose of the guideline is to allow for a more standardised approach during the compilation of EIA for mining activities. This guideline remains in draft format.

6.1.3 National Environmental Management: Waste Act, 2008

The National Environmental Management: Waste Act, 2008 (No. 59 of 2008) regulates all aspects of waste management and has an emphasis on waste avoidance and minimisation. NEM:WA creates a system for listing and licensing waste management activities which may have a detrimental effect on the environment. A waste management activity identified in terms of the NEM:WA may not commence, be undertaken or conducted except in accordance with published standards or a Waste Management Licence.

Listed waste management activities

Listed waste management activities are included in GN R 921 of November 2013. Category A and Category B listed waste management activities above certain thresholds are subject to a process of impact assessment and licensing. Category C listed waste management activities do not require a waste management license but are subject to the provisions of National Norms and Standards (GN R 926, November 2013). The assessment and reporting process in support of a Waste Management Licence application must be undertaken in accordance with the EIA Regulations, 2014. These Regulations define the requirements for the submission; processing, consideration, and decision of applications authorisation of listed activities (refer to Section 6.1.2). Activities listed in Category A require a Basic Assessment process, while activities listed in Category B require a Scoping and EIA process in order for authorities to consider an application in terms of NEM:WA.

The UMK project activities will trigger waste management listed activities under Category B activity (Table 5-1), requiring a waste management licence. As the DMRE are the competent authority for the NEMA and NEM:WA activities, UMK will apply for an integrated Environmental Authorisation, as provided for in section 24L of the NEMA.

Waste Classification and Management Regulations, 2013

The purpose of the Waste Classification and Management Regulations (GNR 634 of 23 August 2013) is to ensure adequate and safe storage and handling of hazardous waste, and to inform the consideration of suitable waste management options. These regulate the classification of waste in terms of South Africa National Standard (SANS) 10234; prescribe requirements for the assessment of waste destined for disposal (GN R 635); require that disposal of waste to landfill take place in terms of GN R 636; prescribe requirements and timeframes for the management of certain wastes and prescribe the general duties of waste generators, transporters and managers. They also include communication elements for labelling and information required for Safety Data Sheets.
Although the Norms and Standards primarily refer to landfills, the definition of waste in South Africa includes mine residues such as waste rock and therefore the Norms and Standards apply to mine residue classification.

Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015

The purpose of these Regulations (GN R 632) is to regulate the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration, or production operation. The management of residue stockpiles and deposits must be undertaken in accordance with the Regulations, as well as the complimentary Norms and Standards and other Regulations published under the NEM:WA.

National Norms and Standards for the Assessment of Waste for Landfill Disposal, 2013

This (GN R 635) prescribes the requirements for the assessment of waste prior to disposal to landfill. Waste generators must ensure their waste is assessed in terms of the standard prior to disposal. The assessment is based on the total concentration (TC) and leachable concentration (LC) of certain elements and chemical substances in the waste compared against concentrations specified in the standard. Following laboratory analysis, the TC and LC are compared with specific TC and LC threshold values in the standard, which then determines the particular type of waste (Type 0, 1, 2, 3 and 4) for disposal.

National Norms and Standards for Disposal of Waste to Landfill, 2013

This (GN R 636) determines the requirements for the disposal of waste to landfill; define landfill classification and containment barrier designs, waste acceptance criteria for landfills and certain restrictions on waste disposal. Four classes of landfill (Class A, B, C or D) are prescribed in the standard, each with a particular barrier (liner) design. The new landfill classes do not make a distinction between sites for the disposal of general or hazardous waste. The standard stipulates which types of waste are allowed to be disposed at a particular class of landfill. Waste disposal prohibitions, aimed at eliminating the disposal of certain wastes within set periods of time include certain hazardous wastes, recoverable materials such as used oils and solvents, liquid wastes, and brines, as well as high calorific value wastes.

6.1.4 National Water Act, 1998

The National Water Act, 1998 (No. 36 of 1998) (NWA) provides a legal framework for the effective and sustainable management of water resources in South Africa. It serves to protect, use, develop, conserve, manage and control water resources as a whole, promoting the integrated management of water resources with the participation of all stakeholders. This Act also provides national norms and standards, and the requirement for authorisation (either a Water Use Licence or General Authorisation) of water uses listed in Section 21 of the Act. The competent authority is the Department of Water and Sanitation (DWS).

Section 21 water uses

The existing IWUL caters for numerous water uses at the UMK Mine. The project includes water uses identified in terms of Section 21 of the NWA. The existing IWUL will be updated by UMK mine to cater for the establishment of additional waste rock dumps.

Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 2017

These Regulations, published in terms of the NWA (GN R 267), prescribe the procedure and requirements for water use licence applications as contemplated in sections 41 of the NWA; as well as an appeal in terms of section 41(6) of the NWA.

6.1.5 National Environmental Management: Air Quality Act, 2004

The National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004) (NEM:AQA) regulates all aspects of air quality, including: prevention of pollution and environmental degradation; providing for national norms and standards (through a National Framework for Air Quality Management) regulating air quality monitoring, management and control; and licencing of activities that result in atmospheric emissions and have or may have a significant detrimental effect on the environment.

Listed activities and Minimum Emission Standards

In terms of Section 22 of NEM:AQA no person may conduct an activity releasing emissions (GN No. 893, 22 November 2013) without an Atmospheric Emission Licence (AEL). The proposed project does not trigger any activity set out in the notice and thus there is no requirement for an amendment to the AEL.

6.1.6 National Environmental Management: Biodiversity Act,2004

The National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection. NEM:BA regulates the carrying out of restricted activities, without a permit, that may harm listed threatened or protected species or activities that encourage the spread of alien or invasive species and makes provision for the publication of bioregional plans and the listing of ecosystems and species that are threatened or in need of protection. Bioregional plans should be considered by competent authorities in their decision-making regarding an application for Environmental Authorisation.

Alien and Invasive Species Regulations, 2014 and Lists

Alien and Invasive Species Regulations (GN R 598 of 2014) as well as the Alien and Invasive Species List (GN R 864 of 2016) have been published to regulate the monitoring, control, and eradication of listed invasive species. All landowners on whose land alien and invasive species occur must make the necessary arrangements to be compliant with these Regulations. These will guide the EMPr for the project.

6.1.7 National Heritage Resources Act, 1999

The National Heritage Resources Act, 1999 (No. 25 of 1999) (NHRA) provides for the identification, assessment, and management of the heritage resources of South Africa. The Act lists development activities that would require authorisation by the responsible heritage resources authority. The Act requires that a person who intends to undertake a listed activity notify the relevant provincial heritage authority at the earliest stages of initiating such a development. The relevant provincial heritage authority would then in turn, notify the person whether a Heritage Impact Assessment (HIA) should be submitted. However, according to Section 38(8) of the NHRA, a separate report would not be necessary if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act (No. 73 of 1989) (now replaced by NEMA) or any other applicable legislation. The decision-making authority should, however, ensure that the heritage evaluation fulfils the requirements of the NHRA and consider in its decision-making any comments and recommendations made by the relevant heritage resources authority.

Where new land is disturbed by the project, the provisions of the NHRA will be considered. The BID for the original project was uploaded to the South African Heritage Resources Association (SAHRA) website (SAHRA Case No. 15370).

It should be noted that an updated project description in support of the amendment application will be uploaded on SAHRA website for comments.

6.1.8 Other Legislation

Conservation of Agricultural Resources Act, 1983

The Conservation of Agricultural Resources Act,1983 (No. 43 of 1983)(CARA) and the associated Regulations, 1984 (GN No. 1048) provide for control over the utilization of the natural agricultural resources in order to promote the conservation of the soil, water sources, vegetation and the combating of weeds and invader plants.

Landowners on whose land declared weed species occur must make the necessary arrangements to be compliant with the CARA Regulations.

The Spatial Planning and Land Use Management Act, 2013

The Spatial Planning and Land Use Management Act, 2013 (No. 6 of 2013) (SPLUMA) aims to develop a new framework to govern planning permissions and approvals, sets parameters for new developments and provides for different lawful land uses in South Africa. SPLUMA is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning. SPLUMA also provides clarity on how

planning law interacts with other laws and policies. SPLUMA requirements are not considered in the S&EIA process.

Northern Cape Nature Conservation Act, 2009

In terms of the Northern Cape Nature Conservation Act, 2009 (No. 9 of 2009) (NCNCA) no protected plants may be removed, damaged, disturbed or relocated without a valid permit. Similarly, no active bird nests may be disturbed without a permit. Protected plant species such as *Olea europaea* and *Boscia albitrunca* was recorded on site, with high potential occurrence of species such as *Harpagophytum procumbens*, *Moraea pallida* and *Boophone Disticha*. The integrated permit application for removal and translocation of protected species will be lodged with the DENC.

National Forests Act, 1998

The National Forests Act provides for the protection of forests as well as specific tree species, quoting directly from the Act: "no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated". A permit is required for the destruction or transplant or transport of *Vachellia erioloba* and *Vachellia haematoxylon* protected tree species.

6.2 GUIDELINES, POLICIES, PLANS AND FRAMEWORKS

The guidelines, policies and plans listed in Table 6-1 have been considered during the scoping phase of the EIA process.

Table 6-1: Guideline and Policy Framework

Guideline	Governing body	Relevance
Public participation guideline in terms of NEMA (2012, updated in 2017)	Department of Environmental Affairs	The purpose of this guideline is to ensure that an adequate public participation process is undertaken during the Scoping and EIA process.
Guideline on need and desirability (2014, updated in 2017)	Department of Environmental Affairs	This guideline informs the consideration of the need and desirability aspects of the proposed project.
National Development Plan 2030	National Planning Commission	The National Development Plan 2030 (NDP) is the overarching development planning policy for the country, to which all other development planning, in particular spatial planning, must be aligned. The NDP outline South Africa's Vision, and provides the Framework for eliminating poverty and reducing inequality by 2030.

Guideline	Governing body	Relevance
Northern Cape Provincial Spatial Development Framework (NCPSPF, 2012)	Department of Rural Development and Land Reform	The NCPSDF is needed for coherent prioritisation of projects within a spatial economic framework that takes cognises of environmental realities and the imperative to create a developmental state. The NCPSDF was designed as an integrated planning and management tool to facilitate on-going sustainable development through the province. The Northern Cape PSDF recognises the importance of the mining sector in the province's economic growth. However, it also aims to manage any direct detrimental impacts of resource use and promote positive socio-economic conditions once the resource use has reached its productive life cycle.
Joe Morolong Local Municipal Integrated Development Plan (2019-2020 Review)	Joe Morolong Local Municipality	The Joe Morolong Local Municipality Integrated Development Plan is the principle strategic instrument guiding all planning, management, investment, and development within the province in order to provide best solutions towards sustainable development.
SANS 10103 (2008)	South African Bureau of Standards	These local and international standards provide best practice for the prediction, prevention, and management of mine drainage. These standards will be considered during the Geochemical study.
World Health Organisation (WHO) Standard for drinking water	WHO	
International Finance Corporation (IFC) Mining Effluent (2007)	IFC	
Quality of Domestic Water Supplies Volume 1: Assessment Guide, Second Edition, (1998)	DWS	Groundwater quality at UMK Mine is compared against these guidelines and standards.
South African Water Quality Guidelines – Volume 1 Domestic Use (1993 and 1996)	DWS	
SANS for drinking water (SANS 241:2015)	South African Bureau of Standards	
National Freshwater Ecosystem Priority Areas 2011 (NFEPA)	DWS	Biodiversity was considered as part of project planning and in the assessment of potential impacts. Reference was made to various national and provincial databases to determine potential presence and conservation sensitivity.
Northern Cape Critical Biodiversity Areas (2016)	South African National Botanical Institute (SANBI)	
South Africa Conservation Areas Database (SACAD, 2017)		
South Africa Protected Area Database (SAPAD, 2017)		

Guideline	Governing body	Relevance
Mining and Biodiversity Guideline (2013)		
Important Bird and Biodiversity Areas (IBAs)	Birdlife International	
National Biodiversity Assessment	Department of Environment, Forestry and Fisheries (DEFF)	
National Protected Areas Expansion Strategy 2008 (NPAES)		
National Threatened Ecosystems (2011)		

7. NEEDS AND DESIRABILITY

This Chapter aims to provide an overview of the need and desirability of the proposed project with the strategic context of national development policy and planning, broader societal needs, and regional and local planning, as well as the NEMA principles and sustainable development.

The DEA guideline on need and desirability (GN R891, 20 October 2014) notes that while addressing the growth of the national economy through the implementation of various national policies and strategies, it is also essential that these policies take cognisance of strategic concerns such as climate change, food security, as well as the sustainability in supply of natural resources and the status of our ecosystem services. In 2017, the DEA published an updated guideline, although this is yet to be formally gazetted. The 2017 guideline on need and desirability provides that addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable –ensuring the simultaneous achievement of the triple bottom-line.

When considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). The assessment reports need to provide information as to how the development will address the socio-economic impacts of the development, and whether there would be any socio-economic impact resulting from the development on people's environmental rights. Considering the need and desirability of a development entails the balancing of these factors. Consistent with the aim and purpose of the EIA, the concept of "need and desirability" relates to, amongst others, the nature, scale, and location of the development being proposed, as well as the wise use of land and natural resources.

7.1 NATIONAL POLICY AND PLANNING FRAMEWORK

This section aims to provide an overview of the national and regional policy and planning context relating to the mining sector within South Africa and Northern Cape.

7.1.1 National Development Plan 2030

The National Development Plan (NDP) aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality by 2030. The core elements of a decent standard of living identified in the plan are:

- Housing, water, electricity, and sanitation;
- Safe and reliable public transport;
- Quality education and skills development;
- Safety and security;
- Quality health care;
- Social protection;
- Employment;
- Recreation and leisure;
- Clean environment; and
- Adequate nutrition.

The NDP provides the context for all growth in South Africa, with the overarching aim of eradicating poverty and inequality between people in South Africa through the promotion of development. The NDP provides a broad strategic framework, setting out an overarching approach to confronting poverty and inequality based on six focused and interlinked priorities.

One of the key priorities is “faster and more inclusive economic growth”. In order to transform the economy and create sustainable expansion for job creation, an average economic growth exceeding 5% per annum is required. The NDP sets out that transforming the economy also requires changing patterns of ownership and control.

It is also acknowledged that environmental challenges are in conflict with some of these development initiatives. As such, it is emphasised that there is also a need to:

- Protect the natural environment;
- Enhance the resilience of people and the economy to climate change;
- Reduce carbon emissions in line with international commitments;
- Make significant strides toward becoming a zero-waste economy; and
- Reduce greenhouse gas emissions and improve energy efficiency.

7.1.2 New Growth Path 2010

South Africa has embarked on a new economic growth path in a bid to create 5 million jobs and reduce unemployment from 25% to 15% over the next ten (10) years. The plan aims to address unemployment, inequality, and poverty by unlocking employment opportunities in South Africa's private sector and identifies seven job drivers. These job drivers have the responsibility to create jobs on a large scale. The seven key economic sectors or “job drivers” for job creation are listed below:

- Infrastructure development and extension: Public works and housing projects;
- Agricultural development with a focus on rural development and specifically
    - “Agro-Processing”;
    - Mining value chains;
    - Manufacturing and industrial development (IPAP);
    - Knowledge and green economy;
    - Tourism and services; and
    - Informal sector of economy.

The New Growth Path reflects the commitment of Government to prioritise employment creation in all economic policies and sets out the key drivers and sectors for employment which will be the focus of Government. Mining is identified as a key sector for prioritisation in order to drive economic growth and create jobs.

7.1.3 National Strategy for Sustainable Development and Action Plan

The National Strategy for Sustainable Development and Action Plan 2011 - 2014 (NSSD 1) (2011) states the following:

- In the first instance, it recognises that the maintenance of healthy ecosystems and natural resources are preconditions for human wellbeing. In the second instance, it recognises that there are limits to the goods and services that can be provided. In other words, ecological sustainability acknowledges that human beings are part of nature and not a separate entity.
- What is needed and desired for a specific area should primarily be strategically and democratically determined beyond the spatial extent of individual EIAs. The strategic context for informing need and desirability may therefore firstly be addressed and determined during the formulation of the sustainable

development vision, goals and objectives of Municipal IDPs and SDFs during which collaborative and participative processes play an integral part, and are given effect to, in the democratic processes at local government level.

- When formulating project proposals and when evaluating project specific applications, the strategic context of such applications and the broader societal needs and the public interest should be considered. In an effort to better address these considerations and their associated cumulative impacts, the NEMA also provides for the compilation of information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account. Whether a proposed activity will be in line with or deviate from the plan, framework, or strategy per se is not the issue, but rather the ecological, social, and economic impacts that will result because of the alignment or deviation. As such, the EIA must specifically provide information on these impacts in order to be able to consider the merits of the specific application. Where a proposed activity deviates from a plan, framework or strategy, the burden of proof falls on the applicant (and the EAP) to show why the impacts associated with the deviation might be justifiable. The need and desirability of the development must be measured against the abovementioned contents of the IDP, SDF and EMF for the area, and the sustainable development vision, goals and objectives formulated in, and the desired spatial form and pattern of land use reflected in, the area's IDP and SDF. While project-level EIA decision-making therefore must help us stay on course by finding the alternative that will take us closer to the desired aim/goal, it is through Integrated Development Planning (and the SDF process) that the desired destination is firstly to be considered and the map drawn of how to get there.

7.2 REGIONAL AND LOCAL POLICY AND PLANNING FRAMEWORK

This section aims to provide an overview of the regional and local policy and planning context relating to the proposed project.

7.2.1 Northern Cape Provincial Spatial Development Framework 2018

The Reviewed Northern Cape Provincial Spatial Development Framework (PSDF) 2018 identifies the PSDF as an enabling mechanism to comply with the National Spatial Development framework. The PSDF functions as an innovate strategy that will apply sustainability principles to all spheres of land use management throughout the Northern Cape and which is to facilitate practical results, as it relates to the eradication of poverty and inequality and the protection of the integrity of the environment. In short, the PSDF is to serve as a mechanism towards enhancing the future of the Northern Cape and its people.

Five growth and development strategies are proposed to assist the province and municipalities in managing future growth of settlements. These strategies are listed below:

- Strategy 1: A Diversification and Maintenance Strategy for settlements with a Low Social Need and High Development Potential (60% of the provincial population);
- Strategy 2: A Growth Management Strategy for settlements with a High Social Need and High Development Potential. (20% of the provincial population);
- Strategy 3: A Migration and Maintenance Strategy for settlements with a High Social Need and Low Development Potential. (10% of the provincial population);
- Strategy 4: A Sustainable Livelihood Strategy for settlements with Low Social Need and Low Development Potential (10% of the provincial population); and
- Strategy 5: Mining development management strategy.

In addition, The PSDF identifies five zones of development in the province, these zones are listed below:

- Manufacturing;
- Agriculture;
- Administrative;
- Transportation; and
- Logistics.

The proposed project will optimize the mining related activities at UMK and provide economic opportunities derived from wages, taxes, and profits. Indirect economic benefits associated with the project are derived from the procurement of goods and services and the spending power of employees.

7.2.2 The Northern Cape Provincial Growth and Development Strategy 2009 – 2014

The primary purpose of the Northern Cape Provincial Growth and Development Strategy (NCPGDS) is to provide a collaborative framework within which to drive and ensure effective and coordinated delivery and implementation in the Province. It provides the public and private sector and parastatals, as well as labour and civil society, with a strategic focus derived through consensus, to harness their collective efforts in promoting economic growth and social development. The vision of the NCPGDS is to build a prosperous, sustainable growing provincial economy to reduce poverty and improve social development for a caring society by promoting growth, diversification, and diversification of local economy as well as eradication of poverty through social development.

The proposed project will continue to contribute to poverty eradication by provide economic opportunities in the broader area.

7.2.3 John Taolo Gaetsewe District Spatial Development Framework 2012

The John Taolo Gaetsewe District Spatial Development Framework (SDF) is a mid to higher level strategic spatial framework that provides the municipality sphere with objectives as set out in the national and provincial spheres regarding sustainable development, natural resources management, regional economic investment, job creation and eradication of poverty. This SDF also provide an indicative framework informed by provincial and national analyses within which the more detailed spatial development planning of local municipalities can be located for the following:

- Infrastructure investment and development spending in regionally significant nodes and corridors;
- Integrated rural development;
- Economic sectors to be targeted; and
- Environmental management.

The project will boost economic development by generating direct and indirect economic opportunities thus aligning with the objectives of the SDF.

7.2.4 Joe Morolong Integrated Development Plan (2019-2020 Review)

The Joe Morolong Integrated Development Plan (IPD) outlines 5 development objectives for the municipality including expansion of mining activities to benefit communities while also minimising its negative environmental impacts, development of economic centres around current small towns, development of human development hubs in high density areas, introduction of agricultural growth and development (including afro-processing) high density rural areas and retention of tourism initiatives (game farming) around low density rural areas. The Provincial SDF identifies eco-tourism, agriculture, mining, and community services as main economic sectors within the Joe Morolong Municipality.

The project will boost economic development by generating direct and indirect economic opportunities thus aligning with the objectives of the IDP.

7.3 CONSISTENCY WITH POLICY AND PLANNING CONTEXT

The previous sections have considered the policy and planning context at national, regional, and local level, which are relevant to the UMK Mine. As highlighted above, there is a drive from national and provincial Governments to stimulate development and grow the economy of South Africa with a strong focus on job creation in all sectors. Mining and the mining value chain have been identified as drivers of economic growth and job creation and are considered important in the Northern Cape provincial and local economy.

The proposed project is considered to be consistent with and in support of the broad national policy framework for the development of mining in South Africa. At the regional level, it is deemed consistent with the Northern Cape PSDF and the SDF of the John Taolo Gaetsewe and Joe Marolong. The priorities of the Joe Morolong Local Municipality's IDP and the John Taolo Gaetsewe District Municipality's SDF which are mainly focused around the reduction of unemployment and halving poverty by investing in key sectors. One of the ways of achieving this, according to the SDF, is to discourage urban sprawl, and to promote more compact and efficient cities. In order to achieve this, development must be channelled into specific nodes and corridors. One of the Key Focus Areas for economic growth is the Gamagara Development Corridor, within which the mine is located.

The proposed project will boost economic development by generating direct and indirect economic opportunities thus contributing to unemployment and poverty reduction in the Northern Cape.

7.3.1 Consistency with NEMA principles

The national environmental management principles contained in NEMA serve as a guide for the interpretation, administration, and implementation of NEMA and the EIA Regulations. In order to demonstrate consistency with the NEMA principles, a discussion of how these principles are taken into account during the Scoping and EIA process is provided in Table 7-1 below.

Table 7-1: Consideration of NEMA Principles in Relation to the Proposed Project

National Environmental Management Principles	Comment
(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests equitably.	Mining has long been one of the key drivers of economic growth and employment in South Africa. The proposed project activities would continue to support the day to day operations of the UMK mine while ensuring that environmental management principles are implemented during operation. The EIA process identifies the needs and interests of potentially affected parties and attempts to address issues and concerns raised through the course of the study.
(3) Development must be socially, environmentally, and economically sustainable.	Government has set development goals aimed at reducing poverty, unemployment, and inequality. The New Growth Path identifies the mining value chain as one of the seven key economic sectors for job creation. Mining is promoted in the national, regional, and local policy and planning frameworks; thus, the Section 24G activities support the continuation of the mine's operation and aims to find acceptable environmental management strategies for that promotes sustainable development.
(4)(a) Sustainable development requires the consideration of all relevant factors including the following:	The EIA process considers resultant social, economic, biophysical impacts through the implementation of

National Environmental Management Principles	Comment
(i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; (ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; (iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied; (iv) that waste is avoided, or where it cannot be altogether avoided, minimised, and re-used or recycled where possible and otherwise disposed of in a responsible manner; (v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and considers the consequences of the depletion of the resource; (vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;	the mine's operational activities. Measures to avoid, minimise and/or remedy potential pollution and/or degradation of the environment that may occur as a result of the Project shall be detailed in the EMPr.
(4)(a)(vii) that a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and	Assumptions, uncertainties, and limitations associated with the compilation of the Scoping Report are discussed within the report. Compliance with the various legislative requirements is presented in the report.
(4)(a)(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.	The EIA process considers and assesses the resultant social, economic, and biophysical impacts of the project. The EMPr provides the recommended management measures to mitigate the significance of identified impacts.
(4)(b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.	The EIA process that is being followed recognises that all elements of the environment are linked and interrelated. The DMR, as the decision-making authority, will be responsible for taking all aspects of the environment, including whether or not the impacts of the project would unfairly discriminate against any person, into consideration when deciding regarding the UMK project activities.
(4)(c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.	
(4)(d) Equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.	The UMK Project activities do not limit access to environmental resources that meet basic human needs.

National Environmental Management Principles	Comment
(4)(e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service, or activity exists throughout its life cycle.	UMK is committed to complying with environmental health and safety obligations of the for their operations.
(4)(f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	The public participation process will be undertaken in accordance with the requirements of the EIA Regulations 2014.
(4)(g) Decisions must consider the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.	The EIA process to be undertaken will take into the account the interests, needs and values of all I&APs, providing I&APs with an opportunity to submit comments on the project. Thus, the decision-makers will have all the necessary information before them on which to base an informed decision.
(4)(h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	The Scoping Report that has been prepared for the project will be made available to communities for review and comment.
(4)(i) The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.	The EIA process considers identified resultant social, economic, biophysical impacts of the project in an integrated manner. The significance of these impacts is presented in the Scoping Report.
(4)(j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.	UMK (and its appointed contractors) would be required to continue complying with the Occupational requirements of the Mine Health and Safety Act. An Environmental Awareness Plan has been prepared, which requires that staff be informed about any aspects of their work that may pose a danger to the environment.
(4)(k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	As mentioned previously, the public consultation process is being undertaken in accordance with the requirements of the EIA Regulations 2014 (as amended) and will allow for the distribution of the Scoping Report for public review and comment. This information will be provided in an open and transparent manner.
(4)(l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.	The public participation process for the project provides an opportunity for the Organs of State to provide comment on the project and address any potential conflicts between policies or other developmental proposals administered by them that may be in conflict with the project before decision-making.

National Environmental Management Principles	Comment
(4)(m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	It is not anticipated that the project would result in any conflicts between organs of state.
(4)(n) Global and international responsibilities relating to the environment must be discharged in the national interest.	The DMR, as the decision-making authority, will be responsible for taking cognisance of any international obligations that could have influenced project activities.
(4)(o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.	The EIA process considers and assesses the identified resultant social, economic, biophysical impacts of the project.
(4)(p) The costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling, or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.	As the holder of the authorisation, UMK will be responsible for the implementation of the measures included in the EMPr.
(4)(q) The vital role of women and youth in environment management and development must be recognised and their full participation therein must be promoted.	The public participation process for the project has been and will continue to be inclusive of women and the youth.
(4)(r) Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	The EIA process to be undertaken for the proposed project will identify relevant sensitive and/or vulnerable areas and assess potential impacts. Appropriate mitigation measures will be proposed.

7.4 ENSURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

Mining is a necessary activity in order to extract natural resources required for manufacturing and development. Manganese is primarily used by the steel industry in deoxidizing and desulfurizing additives and as an alloying constituent, as such it is in high demand. Due to the nature of mining projects, impacts on biodiversity are inevitable.

The UMK mine has a direct impact on the biodiversity of terrestrial and freshwater ecosystems, however the indirect loss of species and habitats increases the significance of the impacts on the biodiversity. The proposed increase in infrastructure and mining operations are likely to affect the local biodiversity.

The impacts to the biodiversity, which are of concern with respect to the proposed amendments, are the potential loss of additional protected trees. The continued clearing of *Vachellia erioloba* and *Vachellia haematoxylon* woodlands in the region is a cause for concern as the exact extent of this resource is unknown. The project has the potential to directly disturb soils, vegetation, and fauna. The disturbances also have the potential to allow proliferation of alien and invasive plants. In addition, the changes may further disrupt the ecological functions and ecosystem services derived from the site. The mine has already undertaken an offset investigation for the original mining area. This process needs to be re-investigated and updated; to reflect the associated impacts on fauna and flora, to determine how these impacts may influence the outcome of the original offset investigation, and whether other alternatives should be investigated.

Biodiversity and soil studies will be necessary to determine the sensitivity of the project area and potential impacts of the proposed changes. The biophysical impacts of the proposed project will be further investigated in the EIA phase. Measures to enhance the benefits and mitigate the impacts to these resources will be included in the EIA Report.

7.5 PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

According to DMRE (2011) South Africa has been a resource economy for in excess of a century. An independent evaluation of South Africa's non-energy *in situ* mineral wealth is estimated at US$2.5 trillion (Citibank report, May 2010), making the country the wealthiest mining jurisdiction. However, a considerable amount of South Africa's mineral resources is exported as raw ores or only partially processed. Although South Africa has steadily improved its ratio of beneficiated to primary products exported since the 1970s, these ratios are still well below the potential suggested by the quality and quantity of its mineral resource's endowment.

The Government's industrialisation policy as outlined in the beneficiation strategy for the minerals industry for South Africa calls for the following:

- Paradigm shift in mineral development;
- Strategic investment in assets to maximise long-term growth beneficiation projects;
- Enhance value of exports;
- Increased sources for consumption of local content; and
- Creation of opportunities for sustainable jobs.

Minerals are a vital input to an industrialisation programme, which is intended to accelerate manufacturing in South Africa (for local consumption and export). Competitive access to minerals for local beneficiation is one of the key success factors for the country's industrialisation initiative. The government declared 2011 as the year of job creation and adopted the New Growth Path (NGP), which seeks to create more inclusive economic growth by systematically encouraging more labour absorptive economic activities. The NGP had a set target of 5 million new jobs to be created by 2020 within six priority sectors including mining. The NGP identifies mineral beneficiation as one of the priority growth nodes for job creation. Given that the Kalahari Manganese Field contains approximately 80% of the world's known high-grade manganese ore reserves, it is in high demand as it is primarily used by the steel industry in deoxidizing and desulfurizing additives and as an alloying constituent. Mining of the manganese results in the production of ore for sale, creates sustainable jobs and supports economic activity. Direct economic benefits from the UMK Mine are derived from wages, taxes, and profits. Indirect economic benefits are derived from the procurement of goods and services and the spending power of employees. Further to these employees of the mine are afforded the opportunity to further their education through the skills development plan of the mine's social and labour plan (SLP). The skills development plan is not the extent of human resources development at the mine. Supplementary plans to enhance the socio-economic benefits of the project are also in place, and these include a career progression plan, a mentorship plan and internships and bursaries. In addition to these social development plans, the mine also has in place an Employment Equity Plan and targets historically disadvantaged South Africans (HDSAs).The benefits not only contribute to the country's GDP but result in significant contributions to the economies and people of the Northern Cape Province, and specifically the Taolo Gaetsewe District.

Community priorities are officially expressed through public documents including the provincial growth and development strategy and spatial development framework documents. In this regard, the priorities of the Joe Morolong Local Municipality's Integrated Development Framework (IDP) and the John Taolo Gaetsewe District Municipality's Spatial Development Framework (SDF) (May 2016) are mainly focused around the reduction of unemployment and halving poverty, as well as establishing affordable accommodation in towns experiencing rapid expansion by investing in key sectors and developing and upgrading basic service delivery and infrastructure. In order to achieve this, development must be channelled into specific nodes and corridors (John Taolo Gaetsewe District Municipality, 2019). One of the Key Focus Areas for economic growth is the Gamagara Development Corridor, within which the UMK mine is located (Figure 7-1).

The socio-economic impacts of the proposed project will be assessed in the EIA phase. Measures to enhance the benefits and mitigate the impacts to these resources will be included in the EIA Report.

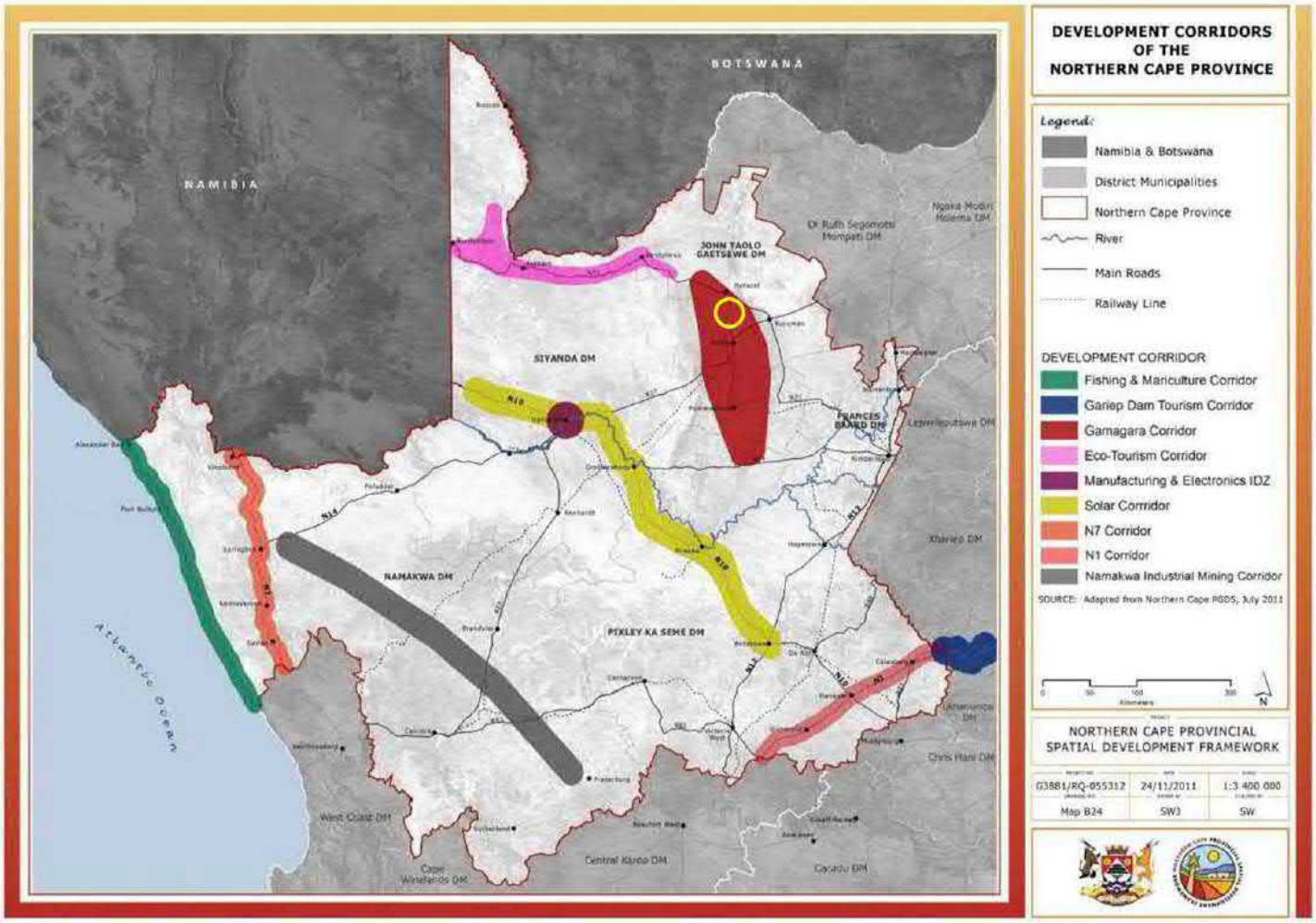


Figure 7-1: Development Corridors of the Northern Cape

Source: NPSDF, 2012 (UMK Mine location shown by yellow circle)

8. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

This chapter provides details regarding the period for which the environmental authorisation is required.

The additional surface infrastructure facilities that will be developed will be operated for the life of mine as support to the day-to-day operations of the UMK Mine. It follows that the Environmental Authorisation is required for the remaining life of the open pits including decommissioning of the mine as well as for a period of maintenance and aftercare post-closure. At this stage in the project planning, the anticipated life of the mine is approximately 32 years.

9. PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVE

This chapter describes the alternatives to the proposed project, documents the information and process used to compare the alternatives and summarises the process being followed to reach the preferred alternatives.

9.1 MITIGATION HIERARCHY

Implementing the mitigation hierarchy is key when considering project alternatives and identifying the preferred alternative. The mitigation hierarchy is defined as:

- **Avoidance:** measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts.
- **Minimisation:** measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect, and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible.
- **Rehabilitation/restoration:** measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.
- **Offset:** measures taken to compensate for any residual significant adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored, in order to achieve no net loss (NNL) or a net gain (NG) of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation, or averted risk, protecting areas where there is imminent or projected loss of biodiversity.

The mitigation process for the project has largely adopted avoidance, minimisation, and rehabilitation as the preferred mechanisms to address project impacts. The 2010 Biodiversity Offset Study for the UMK Mine will be updated to accommodate the preferred closure option.

9.2 IDENTIFICATION OF ALTERNATIVES

A summary of the process being followed by UMK Mine to define the project, identify alternatives and reach the preferred alternatives for the proposed layout and activity changes is outlined in Table 9-1 below. Further detail on the alternatives is provided in the sections that follow.

Table 9-1: Process Followed to Reach the Proposed Preferred Alternative

Objectives	Corresponding activities
Concept and screening phase	
Initiate the screening process Initiate the EIA process Identify interested and/or affected parties (IAPs) and involve them in the scoping and EIA process through information sharing	• Options analysis studies for the proposed alternatives. • Decision on the EIA Process to be followed and likely specialist studies to be undertaken.
Pre-feasibility phase	
Develop conceptual rehabilitation and closure plan	• Specialist and stakeholder inputs on the rehabilitation and closure plan.
Application and Scoping phase	
Identify potential environmental issues associated with the proposed project. Consider alternatives. Identify any fatal flaws.	• Baseline investigations by environmental team. • Scoping meetings with authorities and IAPs. • Compilation of draft scoping report.

Objectives	Corresponding activities
Determine the terms of reference for additional assessment work.	• Distribute scoping report to relevant authorities and IAPs for review. • Finalisation of scoping report.

9.3 DETAILS OF ALL THE ALTERNATIVES CONSIDERED

9.3.1 Introduction

This section describes land use or development alternatives, alternative means of carrying out the operation, and the consequences of not proceeding with the project.

The main type of alternatives considered included: -

- Property or locality;
- Design or layout;
- Operational aspects; and
- The “no-go” alternative.

The alternatives considered are discussed further below:

9.3.2 Property or locality

The property on which the mining optimization related activities will take place is dependent on the location of the target mineral resource and existing approved mine. It follows that no alternatives localities could be considered for the project.

9.3.3 Design or layout

Infrastructure within the site layout has been optimised to improve efficiencies and productivity within the mine. Where proposed changes to the infrastructure layout still need to be implemented, no site layout alternatives are being considered. The optimisation areas for the surface infrastructure are dictated by the location of the fixed ore body. No other layout or design alternatives are applicable.

9.3.4 Operational aspects

No alternatives in terms of operational service aspects were considered as the services already approved, constructed and/or in use by the UMK Mine will be utilized and where required extended to cater for the project.

9.3.5 The “no-go” alternative

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. Proceeding with the project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the project leaves the status quo. This will be detailed further in the EIA and EMP report.

9.4 DETAILS OF THE PUBLIC PARTICIPATION PROCESS

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

A summary of the public participation process undertaken to date or to be undertaken (i.e. project announcement, initial scoping phase and the current scoping phase amendment) is provided below:

9.4.1 Project Announcement

Competent Authority Consultation

A pre-application meeting was held with the DMRE in Kimberly on 11 July 2019. The purpose of the meeting was to discuss the requirements of the integrated regulatory process and the approach to the Scoping and EIA process for the application to ensure agreement and compliance. Additional meetings with the DMRE were held on 8 December 2020 and 15 February 2021 respectively. A copy of the presentation and minutes of this meeting are provided in Appendix C.

Interested and Affected Party Database

A preliminary I&AP database has been compiled consisting of landowners, councillors, authorities (local, regional, and national, as applicable), Organs of State, Non-Government Organisations, Community-Based Organisations, and other key stakeholders. The database has been compiled using databases from the UMK and previous projects undertaken in the broader study area.

The I&AP database will be continually updated during the EIA process. Additional I&APs will be added to the database based on responses to the site notices, advertisements, and notification letters, all of which are outlined below.

Site Notices

Site notices, in English and Afrikaans, were placed at the Corner of R31 and R380 to Hotazel, Near Stokkies Draai Guest House, UMK Main Entrance, Back Gravel Road, Hotazel OK Grocer, Hotazel Slaghuis / Butchery and Hotazel Post Office to notify I&APs of the commencement of the Scoping and EIA process for the UMK Mine.

Additional site notices notifying the public of the availability of the amended Scoping Report will be placed at similar location.

Advertisements

Newspaper advertisements notifying the public of the proposed project and availability of the draft Reports for comment were placed in the Kalahari Bulletin and Kathu Gazette, in English and Afrikaans, respectively. The adverts were dated 13 and 14 August. Adverts were placed to notify the stakeholders of the following stages of the process:

- Announcement of the project;
- Availability of the Background Information Document for review; and
- Availability of Draft Scoping Report for review.

Additional newspaper adverts notifying the public of the availability of the amended Scoping Report will be placed in Kalahari Bulletin and Kathu Gazette.

9.4.2 The Initial Scoping Phase

General I&AP notifications

A notification letter has been sent to all potential I&APs included on the preliminary project database to inform them of the commencement of the EIA process and the availability of the draft Scoping Report and then the Draft Impact Assessment Report for a 30-day public review and comment period, respectively. The notification was sent via e-mail, SMS or post (depending on the contact information available) on the 14th of August 2020. The notification also contained a link to the SLR website (at https://slrconsulting.com/za/slr-documents/) and the data-free website (at https://slrpublicdocs.datafree.co/public-documents/) that I&APs can use to access and download the draft reports.

In terms of the previously mentioned Directions (GN No. 650 of 5 June 2020), reports may not be made available at any public places or premises closed to the public, thus the placement of hard copy reports for public review in public libraries was not possible at this stage. Electronic copies were made available from SLR, at the contact details provide. All comments received in response to the draft reports have been collated and responded to in the Comments and Responses Report, which has been appended to the final reports submitted to DMRE. The comments have been duly taken into consideration in the process of updating the draft reports. A copy of the final reports will be submitted to the competent authority for decision making. Thereafter, a notification will be sent to all registered I&APs on the project database to inform them of the submission. The notification will be sent via e-mail, SMS post (depending on the contact information available). The notification will also contain a link to the SLR website that I&APs can use to access the final reports.

Authority notifications

A notification was sent to all commenting authorities on the project database to inform them of the availability of the draft Scoping Report and draft Impact Assessment Report for a 30-day authority review and comment period, respectively. The notification was sent via e-mail and/or courier. Additionally, a link to download an electronic copy of the full draft reports (via AMS Managed File Transfer (MFT) software) was provided to all commenting authorities by email.

The draft Scoping report was uploaded on the SAMRAD portal for review and comment by the DMRE.

Public Scoping Meeting

Considering the current COVID regulations around social distancing, it was not recommended that Public Meetings be held for this project. However, SLR held webinars for the Scoping Phase public review period. These webinars were scheduled for the 17th of September 2020 and allowed for presentation of the Scoping Report. These webinars were grouped into two sessions; one at 10am to accommodate Authorities, Municipalities, NGOs, and another at 18h00 to accommodate I&APs that cannot join the earlier meeting due to work.

The webinars were held at 10am and at 6pm on 17th September 2020, but the stakeholders did not attend. The presentation from the webinar was made available to all stakeholders via access on the SLR website and the registered IAPs were notified of the availability of the presentation.

9.4.3 The Scoping Phase Amendment (current process)

General I&AP notifications

A notification letter will be sent to all potential I&APs included on the preliminary project database to inform them of the commencement of the process to amendment the Scoping Report and the availability of the amended Draft Scoping Report and then the Draft Impact Assessment Report for a 30-day public review and comment period, respectively. The notification will be sent via e-mail, SMS, or post (depending on the contact information available) on the 19 April 2021. The notification will also contain a link to the SLR website (at https://slrconsulting.com/za/slr-documents/) and the data-free website (at https://slrpublicdocs.datafree.co/public-documents/) that I&APs can use to access and download the draft reports.

Authority notifications

A notification will be sent to all commenting authorities on the project database to inform them of the availability of the draft Scoping Report and draft Impact Assessment Report for a 30-day authority review and comment period, respectively. The notification will be sent via e-mail and/or courier on 19 April 2021. Additionally, a link to download an electronic copy of the full draft reports (via AMS Managed File Transfer (MFT) software) will be provided to all commenting authorities by email.

The draft Scoping report will be submitted to the DMRE for review and comment.

Public Scoping Meeting

As part of the amendment to the original application, SLR will hold webinars for the general I&APs in the Scoping phase public review period. These webinars will allow for presentation of the amended Scoping Report. Furthermore, focused group sessions will also be held with the commenting authorities to present the findings of the Scoping Report. The presentation from the webinar and focussed group meetings will be made available to all stakeholders via access on the SLR website and the registered IAPs will be notified of the availability of the presentation.

9.4.4 Land Claims

The Land Claims Commissioner was consulted to verify if any land claims have been lodged on the farms on which the project activities are located. No claims have been lodged on these farms. Refer to Appendix C for a copy of the correspondence received from the Land Claims Commissioner in July 2020.

9.5 SUMMARY OF ISSUES RAISED BY I&APS

The key issues that are identified through the public participation process and need to be addressed during the EIA phase have been included in the Final Scoping Report. These issues were identified through the engagement with stakeholders via the methods described in the preceding sections.

All comments and detailed responses to the issues raised will be included in the Comments and Response Report for the Final Scoping Report.

Table 9-2: Summary of Issues and Comments Raised By I&APS

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
Hauman Louis	Private	15 August 2020	How will contamination be limited by the new plan? How will the new plan affect the groundwater in the long run? How will evaporation be limited with the new plan?	A groundwater specialist study will be undertaken as part of the EIA process, Issues raised relating to Groundwater will be addressed and included in the EIA Report. During the public participation process for the Impact Assessment Phase we will be able to respond in detail to your queries.	Section 10.4
Natasha Higgitt	South African Heritage Resources Agency	17 August 2020	As the proposed development is undergoing an EA Application process in terms of the National Environmental Management Act, 107 of 1998 (NEMA), NEMA Environmental Impact Assessment (EIA) Regulations as amended, it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is done as per section 38(3) and 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA) as required by section 24(4)b(iii) of NEMA. This must include an archaeological component, palaeontological component, and any other applicable heritage components. The HIA must be conducted as part of the EA Application in terms of NEMA and the NEMA EIA Regulations. SAHRA requests that an assessment of the impacts to heritage resources that complies with section 38(3) of the NHRA as required	Noted, a heritage impact assessment will be conducted by a qualified heritage specialist as part of the EIA process. The HIA will be made available to SAHRA and to the public for review during the public participation process for the Impact Assessment Phase. Any impacts will be identified and addressed with in the Environmental Management Program.	Section 10.4

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
			by section 38(8) of the NHRA and section 24(4)b(iii) of NEMA be conducted as part of the EA process. The assessment must include an assessment of the impact to archaeological and palaeontological resources. The assessment of archaeological resources must be conducted by a qualified archaeologist and the report comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports (see www.aSapa.co.za or www.aphp.org.za for a list of qualified archaeologists). The proposed development is located within an area of moderate to high Palaeontological Sensitivity as per the SAHRIS Palaeo-Sensitivity map. As such, a desktop Palaeontological Impact Assessment (PIA) must be undertaken by a qualified palaeontologist. The report must comply with the 2012 Minimum Standards: Palaeontological Components of Heritage Impact Assessments (see https ://www.palaeosa.org/heritage-practitioners.html for a list of qualified palaeontologists). Any other heritage resources as defined in section 3 of the NHRA that may be impacted, such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed. Further comments will be issued upon receipt of the NEMA EA documents inclusive of appendices.		
Gabaitumele Mantwa	Openserve	19 August 2020	Our Client (Openserve)'s infrastructure is affected by this proposal and the route is marked in PINK on attached sketch as accurately as possible. We did our utmost to ensure that we indicate our route as accurate as possible and should you discover any of our cables that is not on the sketch please stop and contact us immediately to arrange	Noted, Openserve's infrastructure adjacent to the project footprint will be taken into consideration during project planning and	Section 9.6.13 and Appendix C

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
			a site meeting. In the event that our cables are exposed and damaged/stolen by a third party the damages will be repaired at the customer's account. Please make use of pilot holes in order not too damage our infrastructure. Therefore, any damages occurred during construction of work will be repaired at the customer's account. On completion of this project, please certify that all requirements as stipulated in this letter have been met. Please note that should any of our Client (Openserve) infrastructure has to be relocated or altered as a result of your activities the cost for such alterations or relocation will be for your account in terms of section 25 of the Electronic Communications Act. Mr Vivian Groenewald must be contacted at telephone number 054 338 6501/081 362 6738, 2 (Two) weeks prior to commencement of proposed work. It's important that all services are shown on site before construction starts. Approval of the proposed route is valid for six months. If construction has not yet commenced within this period, then the file must be resubmitted for approval. Any changes / deviations from the original planning during or prior to construction must immediately be communicated to this office. Please notify this office and forward an as built plan, within 30 days of completion of construction. Mr Vivian Groenewald must be contacted at telephone number 054 338 6501/081 362 6738, 2 (Two) weeks prior to commencement of proposed work. It's important that all services are shown on site before construction starts.	execution. UMK has contacted Openserve and requested the coordinates of these cables so that any impact to the cables can be confirmed and addressed.	
Gabaitumele Mantwa	Openserve	19 August 2020	We acknowledge receipt of your application. Our reference: WI0119-20 for further enquiries.	Noted, thank you for the acknowledgement letter.	Appendix C

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
Montshusi Tshekedi		20 August 2020	Please register Tshekedi "Montshusi & Tshifiwa Nemakhavhani" from KMR as I&AP party.	Noted, you have been added to the project database.	Appendix C
Aaron Magonono	Department of Human Settlement, Water and Sanitation	08 September 2020	Please include me on the meeting. (Webinars organised by SLR to present the findings of the Scoping Report.)	Noted, a meting invite was forwarded to the stakeholder. The webinar was held but the stakeholder did not attend. The presentation from the webinar was made available to all stakeholders via access on the SLR website and the registered IAPs were notified of the availability of the presentation.	Appendix C
Tshifhiwa Nemakhavhani	Kudumane Manganese Resources	07 September 2020	I will attend (the webinar organised by SLR to present the findings of the Scoping Report.)	Noted, a meeting invite was forwarded to the stakeholder. The webinar was held but the stakeholder did not attend. The presentation from the webinar was made available to all stakeholders via access on the SLR website and the registered IAPs were notified of the availability of the presentation.	Appendix C

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
Natasha Higgit	South African heritage Resources Agency	18 September 2020	A draft Scoping Report (DSR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2014 EIA Regulations for activities that trigger the Mineral and Petroleum Resources Development Act, 2002 (MPRDA)(As amended). The proposed amendments include the extension of the EME workshop, development of hard park areas, expansion of the road truck staging area, development of Barlows Store, pit expansion and the establishment of four Waste Rock Dumps. The DSR notes heritage desktop reports are being conducted (see page 9-4 of the DSR) and will be submitted during the EIA phase of the application. SAHRA notes the pending heritage reports. Further comments will be issued upon receipt of the heritage reports and the NEMA EIA documents inclusive of appendices. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	Noted, the Draft Environmental Impact Assessment Report, inclusive of the Heritage Impact Assessment will be submitted to SAHRA for comment.	Appendix C
Sharon Clark	South32	08 September 2020	Please note I would like to attend the 10h00 session on 17 September 2020.	Noted, a meeting invite was forwarded to the stakeholder. The webinar was held but the stakeholder did not attend. The webinar presentation was made available to all stakeholders via access on the SLR website. All	Appendix C

Interested and affected party	Organisation	Date comment received	Issues raised	Response provided by SLR unless otherwise indicated in brackets	Section and paragraph reference in this Scoping Report where the issues/comments and or responses were incorporated
				registered IAPs were notified of the availability of the presentation.	

9.6 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITE

The baseline information is aimed at providing the reader with a perspective on the existing status of the biophysical, cultural, and socio-economic environment. Baseline information for this Scoping Report draws extensively on information contained in reports from previous studies conducted at the UMK Mine. Information has also been drawn from current specialist studies, where available. More detailed information will be provided in the EIA report, once the specialist studies commissioned for this project have been concluded.

9.6.1 Geology

Introduction and link to Impact

Geology and associated structural features provide a basis from which to understand:

- The potential for sterilisation of mineral reserves;
- The geochemistry and related potential for the pollution of water from waste rock dumps; and
- The potential for geological lineaments such as faults and dykes. Faults, dykes, and other lineaments can act as preferential flow paths of groundwater, which can influence the dispersion of potential pollution plumes from waste rock dumps.

Geological processes also influence soils forms (see Section 9.6.4) and the potential for palaeontological resources (see Section 9.6.12).

Data Source

Information in this section was sourced from the 2017 EMPr Amendment Report (SLR, March 2017), the 2020 UMK Water Balance and Geochemical Modelling Study (SLR, July 2020a) and 2020 UMK Waste Rock Dump Design (SLR, July 2020b).

Discussion

Regional and Local Geology

The UMK Mine is located on the Kalahari Manganese Field (KMF). Three beds of manganese ore are interbedded with the Banded Iron Formation (BIF) of the Hotazel Formation (Transvaal Supergroup). The mine is exploiting the manganese from the lower most bed. The BIF of the Hotazel Formation is underlain by basaltic lava of the Ongeluk Formation (Transvaal Supergroup) and directly overlain by dolomite of the Mooidraai Formation (Transvaal Supergroup). The Transvaal Supergroup is overlain unconformably by the Olifantshoek Supergroup that consists of arenaceous sediments, typically interbedded shale, quartzite, and lavas overlain by coarser quartzite and shale. The Olifantshoek Supergroup is overlain by Dwyka Formation, which forms the basal part of the Karoo Supergroup and in turn is typically covered by sands, claystone and calcrete of the Kalahari Group.

The manganese resource is hosted by the Hotazel Formation and consists of three ore bodies (Lower, Middle and Upper) that are intercalated with BIF and rhythmites. The Lower manganese orebody varies in thickness from 5 to 40 m and contains the highest manganese grades. It is the main ore horizon that is mined.

The Middle orebody has a maximum of 2 m thickness, is poorly mineralised and is considered uneconomic. The Upper orebody is moderately mineralised and is stockpiled at the mine for possible future use. The dominant ore minerals are braunite and hausmanite. The ore is carbonate rich and sulphide minerals are rare.

The overburden consists of the 0-84 m thick dolomites of the Mooidraai Formation, which overlies the Hotazel Formation. Above the dolomites is the Dwyka Group, which consists of glacial diamitites/tillites that vary in thickness from 0 m to 90 m. These are covered by 30-100 m thick gravels, clays, calcretes and aeolian sands of the Kalahari Group. The Mooidraai Formation and upper parts of the Hotazel Formation have been eroded in the southern portion of the mine area.

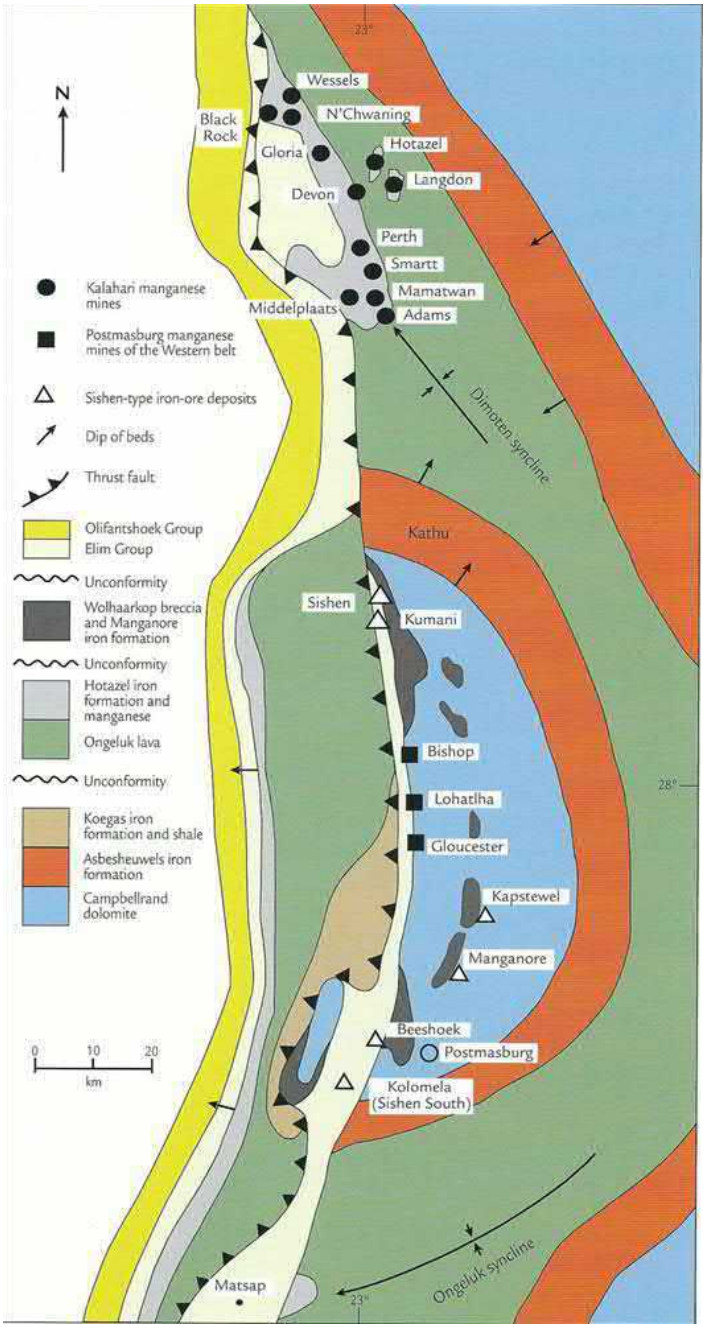


Figure 9-1: Geology of the Kalahari Manganese Fields (SLR, July 2020a)

9.6.2 Topography

Introduction and link to Impact

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

- The flow of surface water, and in many cases, also groundwater;
- The depth of soils and the potential for soil erosion, for example, in the case of steep slopes soils are shallower and more prone to erosion;
- The type of land use, for example flat plains are more conducive to crop farming; and
- The aesthetic appearance of the area.

Topography can also influence climatic factors such as wind speeds and direction, for example, wind will be channelled in between mountains and along valleys. Changes in the topography caused by the mining activities could therefore alter all of the above-mentioned aspects of the environment. Project-related activities have the potential to alter the topography of the site through the establishment of additional infrastructure.

Data sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

The topography of the Kalahari Manganese Field ("KMF") is predominately flat lying at 1100m elevation, with relatively low relief. The area is characterised by several vegetated northwest and southwest trending red sand dunes, up to 10m in height, up to 200m wide and tens of kilometres in length. The regional drainage pattern is broadly northwards but water-flow in the streams is generally very rare. The topography of the mining area is also relatively flat and therefore it is expected that the climate of Kuruman is predominately representative of the surrounding mining area.

9.6.3 Climate

Introduction and link to Impact

Climate can influence the potential for environmental impacts and related design associated with mining projects. Specific issues are listed below:

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

This section provides a brief description of the climatic environment. More detailed information will be provided in the EIA and EMPr report.

Data sources

Information in this section was sourced from the 2017 EMPr Amendment Report and the SLR Pit lake Study.

Discussion

Regional climate

The project area falls within the Northern Steppe Climatic Zone, as defined by the South African Weather Bureau. This is a semi-arid region characterised by seasonal rainfall, hot temperatures in summer, and colder temperatures in winter (SLR, March 2017). The Mine is characterised by hot summers and cool winters with rain generally occurring in the form of thunderstorms that last for short periods at a time during rainy periods. High evaporation rates reduce infiltration, while rainfall events can increase the erosion potential and the formation of erosion gullies.

Rainfall

Monthly rainfall data and evaporation data for the Milner weather station is summarised in Table 9-3. Rainfall depth frequency data is summarised in Table 9-4**.** The average rainfall at the Milner weather station is 343 mm per annum. Given the Milner weather station is only 3.6km from the mine site, similar rainfall levels can be expected at the mine. The average evaporation rates recorded at the Milner weather station are 1971mm per annum.

Table 9-3: Summary of Monthly Rainfall Data (SLR, March 2017)

Month	Rainfall (mm)	Evaporation (mm)
	Milner – 393083_W	WR90
January	58.6	233
February	58.2	185
March	66.1	170
April	33.5	127
May	15.5	100
June	5.9	77
July	2.4	88
August	4	124
September	5.6	172
October	17.8	218
November	29.1	233
December	46.4	244
Annual	343.1	1971

Table 9-4: Rainfall Frequency Depth (AECOM, September 2017)

Rainfall Frequency Depth							
Return Period (years)	1:2	1:5	1:10	1:20	1:50	1:100	1:200
Rainfall Depth (mm)	48	68	82	97	116	131	148

Evaporation

Monthly evaporation was used in the model. The mean annual Symons-pan evaporation for quaternary catchment D41K within which the mine is located, is estimated to be averaging 1,972mm (WR90). Mean monthly evaporation values for this catchment are presented in Table 9-5.

Table 9-5: Mean Monthly Evaporation (SLR, July 2020A)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
S-pan Evaporation	277	210	193	144	115	91	106	154	213	270	248	295
Open Water Evaporation	233	185	170	127	100	77	88	125	173	218	233	245

Temperature

The regional average daily maximum temperature varies between 27°C and 31°C in January and in July it is approximately 19°C. The regional average daily minimum temperature is about 16°C in January and in July it is roughly 1°C.

Wind

The prevailing wind direction at the project site is in a north easterly direction with significant winds also blowing from the north and northwest. The strongest winds up to 10m/s primarily during the summer.

9.6.4 Soils and land capability

Introduction and link to Impact

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

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

Soil forms rather slowly by the breaking down of rock material and is therefore viewed as a non-renewable resource. Soil determines the type of land use the area is suitable for, for example, soil with low nutrients may not be able to support unassisted crop farming.

Soil resources are vulnerable to pollution, erosion (wind and water) and compaction, which could be caused by project-related activities.

The baseline soil information will be used to identify sensitive soil types, to guide the project planning in order to avoid sensitive soil types where possible, to determine how best to conserve the soil resources in the area and allow for proper rehabilitation of the site once mining ceases. The land capability of an area is based on the soil properties and related potential to support various land use activities. Mining operations have the potential to significantly transform the land capability.

A brief description of the soil types and land capability in the project area is provided below. More detailed information will be provided in the EIA and EMPr Report.

Data sources

Information in this section was sourced from the 2020 Soil and Agricultural Assessment Report.

Discussion

Soils

The project area consists of three different soil forms (Table 9-6), these includes two natural soil forms with undisturbed soil horizon (Ermelo and Hutton) as well as soil that has undergone significant changes as a result of mining activities in the area (Technosols).

Table 9-6: Soil Forms Within the Project Area

Soil Form	Description
Ermelo	Bleached to slightly chromic sandy topsoil that is underlain by yellow-brown apedal subsoil that is deeper than 1.5m. This is the most dominant soil form within the UMK Mining Right Area.
Hutton	Consist of an orthic A horizon on a red apedal B horizon overlying unspecified material with subsoil that is deeper than 1.5m without signs of wetness. Hutton soil forms are preferred by *Vachellia erioloba* (camel thorn) as it allows the tap root of these trees to grow down to deeply in search of water stored below the surface.
Technosols	The existing mining activities in UMK area that has already impacted on the *in situ* soil profiles include stripping and stockpiling of topsoil, compaction of haul road areas, erection of site offices and other buildings including a mechanical workshop. the entire area consists of possible four different type of Technosols. These are Transported Technosols (Witbank form), Chemically Polluted Technosols (Industria), Hydric Technosols (Stilfontein) and Anthropogenic Open Excavation Technosols (Cullinan).

Land Capability

The project area can be divided into two land capability classes i.e. 1398 ha of grazing land capability and 793 ha of wilderness land capability. The deeper soils of the Hutton and Ermelo forms could have arable land capability and could also be suitable for irrigated crop production. However, due to unfavourable climatic conditions and lack of irrigation water, the land capability of the project area is that of extensive grazing. All areas of the Technosol soil group where the original soil profiles are currently compromised by either storage of topsoil and waste rock or alternatively mining infrastructure, falls into the category of wilderness land capability.

9.6.5 Biodiversity

Introduction and link to Impact

Biodiversity refers to the flora (plants) and fauna (animals). According to the International Union for Conservation of Nature (IUCN) (2011), biodiversity is crucial for the functioning of ecosystems which provide us with products and services which sustain human life. Healthy ecosystems provide us with oxygen, food, fresh water, fertile soil, medicines, shelter, protection from storms and floods, stable climate, and recreation.

Data sources

Information in this section was sourced from the 2020 UMK Biodiversity and Freshwater Assessment Report.

Discussion

The project area falls within the Kathu Bushveld, which is characterised by open savannah with *Camel Thorn*, *Vachellia erioloba* (formerly known as *Acacia erioloba*) and Shepherds Tree, *Boscia albitrunca* as the prominent trees. The shrub layer contains the Grey Camel Thorn, *Vachellia haematoxylon* (formerly known as *Acacia haematoxylon*) Black thorn *Senegalia mellifera,* (formerly known as *Acacia mellifera*) Blue bush, *Diospyros lycioides* and *Lycium hirsutum*. The grass layer is very variable.

The project area has been disturbed by the existing mine. The vegetation within the site displays various slight structural changes and dominance in woody vegetation. The distinct broad vegetation communities identified within the project area are listed below:

- Vachellia haematoxylon Savannah;
- Vachellia mellifera Mixed Woodland;
- Vachellia erioloba Savannah;
- Riverine Vegetation;
- Tarchonanthus camphorates - Vachellia karroo Scrub; and
- Tarchonanthus camphoratus – Schmidtia pappophoroides Scrub.

A few of the dominant tree species present within these habitats includes *Vachellia erioloba, Vachellia. haematoxylon* and *Boscia albitrunca* which are protected in terms of the National Forests Act of 1998.

Based on the bird species identified on-site, the project site hosts both grassland and bushveld bird species. Red data bird species that are likely to occur within the project area include the Martial Eagle, Secretary bird and the Ludwig's Bustard. The loose sandy soils which occurs over a large portion of the study site, makes these areas suitable for burrowing mammals. Species such as, Suricate, Common Mole Rat, and ground squirrels were observed on site. During the site visit a fairly large group of Kudu were observed. Other than direct sightings, other observations such as droppings and tracks from animals such as warthog were noted and, the tell-tale signs of porcupine were also observed.

Summary of environmental sensitivities within the project area

- Kathu bushveld is classified as least threatened (target 16%), however this vegetation type is not conserved in any statutory conservation areas and more than 1% has already been transformed, threats are from mining and to a lesser extent heavy grazing pressure;
- The project area falls within the Griqualand West Centre (GWC) of Endemism. The GWC is considered a priority in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood;
- The project area does not fall into any biodiversity priority areas and is therefore not deemed a risk for mining;
- The UMK mine does not fall within a National Protected Area Expansion Strategy 2008 focus area but is located near an area identified as a potential protected area for the eastern Kalahari bushveld;
- The project area is not considered a threatened ecosystem in terms of NEM:BA and does not fall within a Freshwater Ecosystem Priority Area (NFEPA);
- The project area does not fall within a critical biodiversity area as identified in the Northern Cape Critical Biodiversity Areas project 2016;
- There are no identified NFEPA wetlands within the study area;
- The project area and surrounding area does not fall within an Important Bird and Biodiversity Area (IBA). IBAs are sites of international significance for the conservation of the world's birds and other biodiversity.

It should be noted that a large section of this property has already been disturbed by the mining activity which has resulted in some disturbance to the faunal population on site.

9.6.6 Surface water

Introduction and link to Impact

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

As a baseline, this section provides a brief description of surface water resources in the project area in order to facilitate an understanding of the hydrological catchments within which the mine is located and the status of surface water resources in the project area.

Data sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

Regional hydrology

The project area is located in the Gamagara catchment of the Orange Basin which includes quaternary catchments D41J and D41K. The Mine is located in quaternary catchment D41K. Catchments identified in the project area include the Gamogara, Witleegte and Vlermuisleegte catchments.

The project area is drained by the Gamogara and two of its tributaries, namely the Witleegte and Vlermuisleegte. All three watercourses are non-perennial, ephemeral and highly seasonal.

Local hydrology

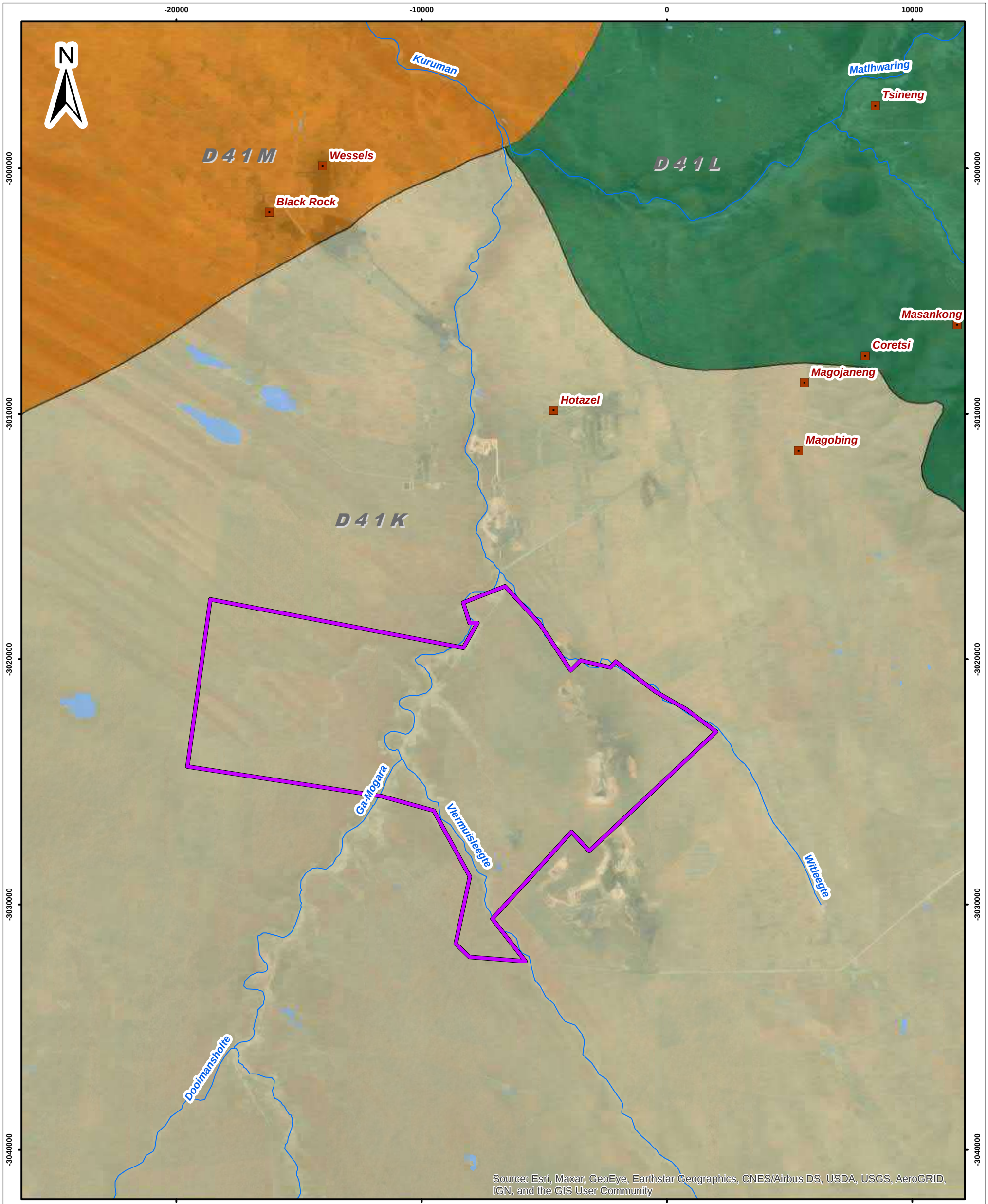
The Gamogara and Vlermuisleegte watercourses are situated about 7km to the west and south west, respectively, of the mine. The Witleegte forms the north eastern boundary of the UMK mining right area. The Witleegte and Vlermuisleegte both drain in a north westerly direction towards the Gamogara. The Gamogara then flows in a northerly direction and feeds into the Kuruman River approximately 15km downstream of the project site. The Gamogara is characterised by very gentle gradients and sandy soils, with the end result that only fairly heavy rain will induce any significant surface runoff.

Surface water quality

Three UMK pit lake water assessment point (J & D-block and Treepit) data sets were used to compare the current pit water quality with the modelled pit waters. The results are presented in Appendix D.

Surface water users

No reliable water use is possible from any of the watercourses (Gamogara, Witleegte, Vlermuisleegte) due to the highly seasonal river flow.



Legend

- Towns / Villages
- UMK Mining Right Area
- Rivers - Perennial
- Wetlands

Quaternary Catchments

- D41M
- D41L
- D41K

0 2 4 Kilometers

Scale: 1:150 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, Lo23

UNITED MANGANESE OF KALAHARI

Figure 9-2
Catchments

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.21002.00036 | 2021/03/17

9.6.7 Groundwater

Introduction and link to Impact

Groundwater is a valuable resource and is defined as water which is located in cavities and fractures of rock formations in the lithosphere. Understanding the geology of the area provides a basis from which to understand the occurrence and distribution of groundwater resources. Project-related activities such as the expansion of the opencast mining areas, the handling, storage, and disposal of mineralised and non-mineralised wastes, have the potential to impact on groundwater resources, both to the environment and third-party users, through dewatering and pollution.

As a baseline, this section provides a brief description of the pre-mining groundwater conditions to facilitate an understanding of the potential for dewatering cones of depression and pollution plumes to occur as a result of project-related activities.

Data sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

Local geohydrology

The main regional aquifer is the deep fractured aquifer, consisting of the weathered Dwyka tillite and the Mooidraai Formation dolomite. The Kalahari sand and the sediment beds that overlie the low permeability Dwyka tillite is also considered under certain circumstances as an aquifer. The aquifers are classified as poor to minor aquifers. Borehole yields in the deeper aquifer are low however, structural features such as faults and fractures can produce relatively high yielding boreholes.

The water management area under which this site falls is the Lower Vaal, within which the major rivers are the Harts, Malopa and Vaal. It falls into quaternary catchment D41K.

The non-perennial drainage line Gamagara River is located approximately 2 km to the west of the site, and the non-perennial drainage line Witleegte Stream is located approximately 1 km to the northeast of the site. Drainage from the site is likely to flow in a westerly direction following the local topography. Currently, no water is discharged from the site into regional water resources.

Typically, there are no influence on the groundwater level by the presence of the non-perennial streams, as groundwater levels do not become shallower with the presence of the stream. This indicates that the stream is not fed by baseflow from the aquifer (AGES, 2007).

Prior to mining, regional groundwater flow at the site was from southwest to northeast towards the Gamagara River with the average water level in the area approximately 25 metres below ground level (mbgl) (AGES, 2007).

Groundwater users

The majority of the groundwater in the broader region is used to supply drinking water for cattle and in some instances supply water for domestic use.

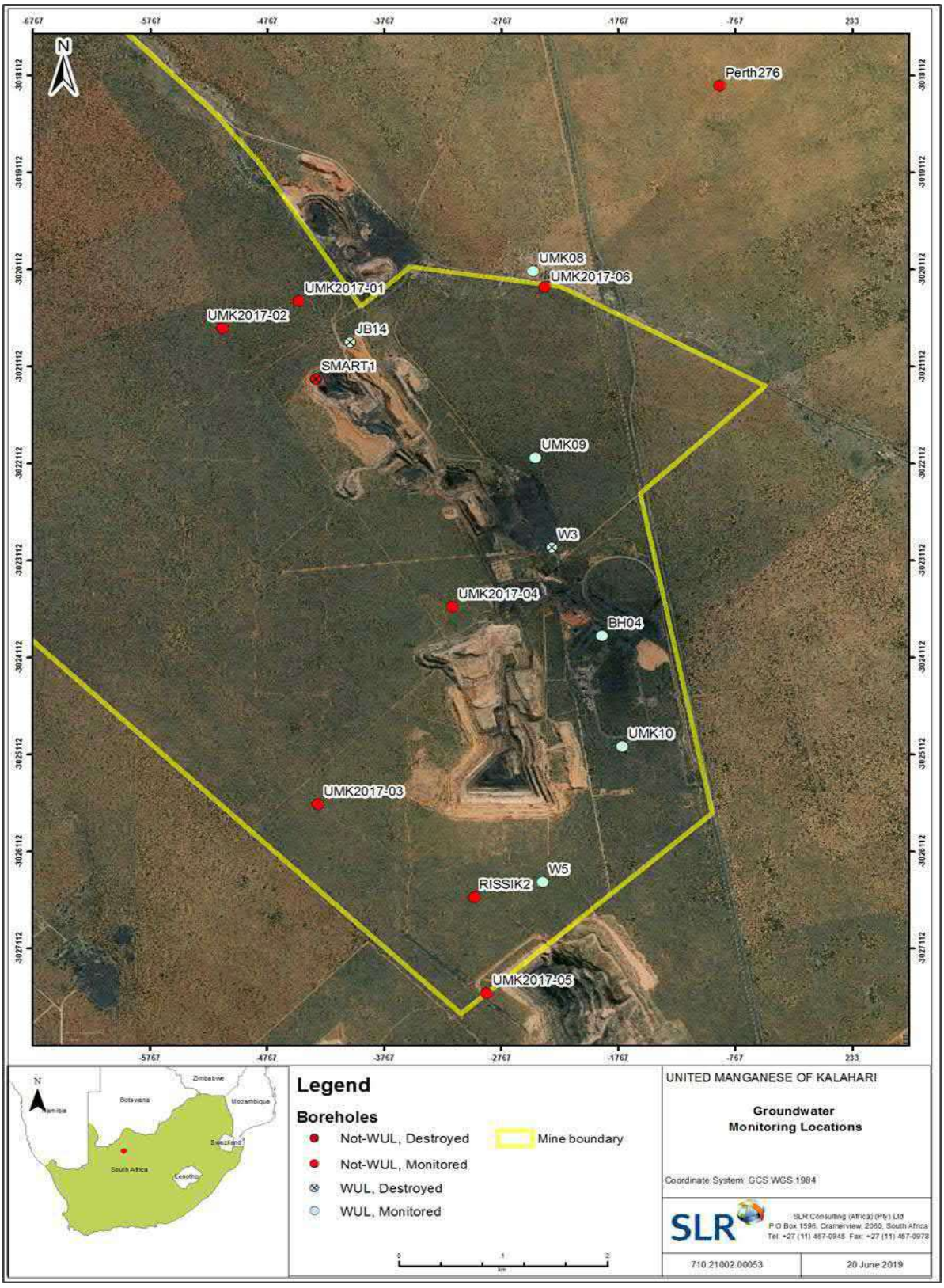


Figure 9-3: Borehole Sampling Location Diagram (SLR, July 2020a)

9.6.8 Air Quality

Introduction and link to Impact

A change in ambient air quality can result in a range of impacts, which in turn, may cause a disturbance to nearby receptors. As a baseline, this section provides a short description of existing conditions in the area from which to measure changes as a result of the project. More detailed information will be provided in the EIA and EMPr.

Data sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

Existing emission sources

Neighbouring land-use in the area surrounding the project area comprises predominantly of farming and mining activities. These land-uses contribute to baseline pollutant concentrations via the following sources:

- Existing mining operations comprising underground and opencast mining operations, stockpiles and tailings dams, an ore reduction facility, and a sintering plant;
- Fugitive sources including vehicle entrainment of dust from local paved and unpaved roads, veld fires, wind erosion from open areas and dust generated by agricultural activities;
- Vehicle tailpipe emissions from public roads (minor source given relatively low vehicle activity rates in the region);
- Household fuel combustion (particularly wood and paraffin);
- Rail-related emissions with diesel locomotives being used to transport ore from mines in the area; and
- Regionally transported aged aerosols (particulates).

Potential receptors

Potential receptors could include the following:

- Residential settlements in the towns of Hotazel (located 8 km to the north) and Black Rock (located 20 km to the north west);
- Scattered farmsteads around the project area; and
- The natural environment.

9.6.9 Socio-economic

Introduction and link to Impact

Mines and related projects have the potential to result in both positive and negative socio-economic impacts. The positive impacts are usually economic in nature with mines contributing directly towards employment, procurement, skills development, and taxes on a local, regional, and national scale. In addition, mines indirectly contribute to economic growth in the local and regional economies because the increase in the number of income-earning people has a multiplying effect on the trade of other goods and services in other sectors.

The negative impacts can be both social and economic in nature. In this regard, mines can cause: -

- Influx of people seeking job opportunities which can lead to increased pressure on basic infrastructure and services (housing, health, sanitation, and education), informal settlement development, increased crime, introduction of diseases and disruption to the existing social structures within established communities; and

- A change to not only pre-existing land uses, but also social structure associated with these land uses and way of life.

To understand the basis of these potential impacts, a baseline situational analysis is described below.

Data Sources

Information in this section was sourced from Joe Morolong Local Municipality Integrated Development Plan of 2017 and StatsSA.

Discussion

UMK is located in the John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality of the Northern Cape Province. The nearest community to the mine is the town Hotazel, located approximately 10 km north of the UMK Mine. The Hotazel community has a population of 1 755, this population is low when compared to the local municipality population of 89 531 and the Northern Cape Province population of 1 145 861. This provides an indication of the remoteness of the project area.

The socio-economic environment within the John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality can be summarised as follows:

- Significant numbers of the population within the district and local municipalities have received no schooling or only limited primary education;
- The average number across the regions profiled of people completing high school education were relatively consistent; however, there is greater disparity when considering Grade 12 education, further education and training and tertiary education;
- The education profile within Hotazel is more positive in terms of the percentage of the population that have received further education and tertiary education when compared to the district and local municipalities.
- Majority of the population within the John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality are not economically active, while 48% of the Hotazel population is employed;
- There is a large dependency on subsistence agriculture, the public sector, seasonal workers, and employment in the mining sector;
- The population profile of the John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality demonstrates a consistent average household size of four people per household despite the significant decline in population numbers between the regional levels;
- The local community of Hotazel has an average of three members per household. These results are relatively typical of rural or semi-rural developing communities, however the low household density within Hotazel may be attributed to the fact that the town is largely a mining community established for and servicing surrounding mines;
- The most dominant type of dwelling utilized within the John Taolo Gaetsewe District Municipality, the Joe Morolong Local Municipality and Hotazel is a formally constructed house or brick structure. Traditional dwellings (e.g. huts/ structures made of traditional material) are the second highest used dwelling type in the district and local municipalities. No traditional dwellings are located within the town of Hotazel; rather the second highest used dwelling type is flats; and
- Hotazel is well formalised in terms of basic services. This may be attributed to the Hotazel area being more urbanized having been developed and supported by surrounding mines in recent years.

9.6.10 Visual Aspects

Introduction and link to Impact

Mining projects have the potential to alter the landscape character of an area through the establishment of both temporary and permanent infrastructure. As a baseline, this section provides an understanding of the currently approved visual character of the project area against which to measure potential change as a result of project infrastructure and activities. More detailed information will be provided in the EIA and EMPr.

Data source

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

The UMK mine is located within the flat open plains of the Kalahari. The site is rural in nature in that it is sparsely populated with farmhouses scattered throughout the area. The main land use in the area is game and cattle farming. The project site is located within an area known as the manganese belt and as such the sense of place and natural visual character of the area has been altered by the presence of mining operations.

The mine is visible to the naked eye from the R380 road between Kathu and Hotazel. The R380 is directly adjacent and to the east of the site. From higher vantage point such as the Kurumanheuwels, the mine may be visible. The mine is to be however visible to people travelling along sections of the main roads (surfaced and gravel) that border the project area. The mine is also visible to residents and workers on adjacent farms and mines.

9.6.11 Noise

Introduction and link to Impact

Noise generating activities associated with mining projects may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby potential receptors. As a baseline, this section provides a short description of the currently approved baseline conditions in the area from which to measure changes as a result of project-related noise.

Data Sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

Existing sources of noise include mining operations, localised traffic and trains, farming activities and natural sounds. To determine pre-mining noise levels, noise measurements were taken at two potentially sensitive sampling points in the project area, namely at the Perth farmhouse (MP1) and the Steyn farmhouse (MP2), over a 24-hour period. Based on the measured results, ambient noise levels varied from 39dBa during the day (06h00 to 22h00) to 33 dBs at night (22h00 to 06h00) which is typical for a rural area (SLR, March 2017).

9.6.12 Heritage/cultural and palaeontological resources

Introduction and link to Impact

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

Paleontological resources are fossils and the remains or traces of prehistoric life preserved in the geological (rock stratigraphic) record. They range from the well-known and well publicised (such as dinosaur and mammoth bones) to the more obscure but nevertheless scientifically important fossils (such as palaeobotanical remains, trace fossils, and microfossils).

Paleontological resources include the casts or impressions of ancient animals and plants, their trace remains (for example, burrows and trackways), microfossils (for example, fossil pollen, ostracodes, and diatoms), and unmineralised remains (for example, bones of Ice Age mammals) (SLR, March 2017).

Data Sources

Information in this section was sourced from the 2017 EMPr Amendment Report.

Discussion

Heritage resources identified in the project area are listed below:

- Remains of mining activities relating to the Perth and Smartt manganese mines; and
- Occurrences of stone tools dating from the Middle to Late Stone Ages.

The mining remains can be considered to be of low importance or insignificant as the remains do not possess any uncommon, rare or endangered aspects of South Africa's natural or cultural heritage; do not have the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage; do not have any importance in demonstrating a high degree of creative or technical achievement at a particular period; and are not yet 60 years old. The Stone Age occurrences to the north and northwest of the project area have a medium to high significance but are not expected to be affected by the project.

Fossil resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval.

9.6.13 Current land uses

Introduction and link to Impact

Mining projects have the potential to affect land uses both on the project site and in the surrounding areas. This can be caused by physical land transformation and/or through direct or secondary impacts.

To understand the basis of the potential land use impacts, a brief baseline situational analysis is described below. More detailed information will be provided in the EIA and EMPr.

Data source

Information in this section was sourced from the 2017 EMPr Amendment Report and available baseline information.

Discussion

Mineral/prospecting rights

UMK holds the mining rights (NC 30/5/1/2/3/2/1(113) MR) on the farm portions outlined in Table 9-7 below.

Existing environmental authorisations in terms of NEMA

UMK holds an environmental authorisation (NC/KGA/HOT7/15/2006) in terms of NEMA on the farm portions outlined in Table 9-7 below.

Surface right owner within the project area

The surface right owners within the project area are outlined in Table 9-7 below. There are also various servitudes (including a powerline and roads) throughout the study area.

Table 9-7: Landowners Located Within the Project Area

Relevant farms	Relevant portion	Landowner
Rissik 330	Portion 1 (Eastern portion)	Theresia Steyn
	Portion 1 (Western portion)	South 32
Rissik 330	Remaining extent (RE) (Eastern portion)	Theresia Steyn – Gideon Poolman Familie Trust
	RE (Western portion)	South 32
Rissik 330	Portion 2	Transnet
Smartt 314	RE	Terra Nominees (Pty) Ltd
Smartt 314	Portion 1	Transnet
Botha 313	The farm	Terra Nominees (Pty) Ltd

Land claims

As part of the project's public consultation process, the Department of Rural Development and Land Reform: Land Claim Commissioner was contacted in July 2020 to confirm if any land claims have been lodged on any of the farms located within the project area. No land claims have been lodged on the farms located within the project area.

Agriculture and associated farmsteads

With reference to Figure 9-4, the nearest towns / residential areas to the UMK include:

- The Black Rock mining community located approximately 20 km north west of the UMK Mine;
- Hotazel situated approximately 15 km north of the UMK Mine;
- Kuruman located approximately 75 km south-east of the UMK Mine;
- Deben situated approximately 40 km to the South west of the UMK mine; and
- Kathu located approximately 45 km to the south of the UMK Mine.

Surrounding mining companies

Existing mining operations in the area include:

- The Nchwaning/Black Rock Mine (Assmang (Pty) Ltd) – Located north west of the UMK Mine;
- The Sebilo Mine (Sebilo Resources (Pty) Ltd) – Located north west of the UMK Mine;
- The Gloria Mine (Assmang (Pty) Ltd) – Located north of the UMK Mine;
- The Wessels Mine (South32) – Located north of the UMK Mine;
- The Tshipi Borwa Mine (Tshipi é Ntle Manganese Mining (Pty) Ltd) – located south of the UMK Mine.
- The Kalagadi Mine (Kalagadi Manganese (Pty) Ltd) – Located north west of the UMK Mine;
- The Kudumane Mine (Kudumane Manganese Resources (Pty) Ltd) – Located north of the UMK Mine;
- The old Hotazel Mine (dormant/closed) – Located north of the UMK Mine;
- The old Devon mine (dormant/closed) – Located north of the UMK Mine;
- The old York Mine (dormant/closed) – Located north of the UMK Mine;
- The dormant / temporarily closed Middelplaats Mine – Located south of the UMK Mine; and
- The Mamatwan Mine (Hotazel Manganese Mines (Pty) Ltd) – Located south of the UMK Mine.

Solar plant

The Adams Solar Plant (Adams Solar PV Project Two (Pty) Ltd), owned by Enel Green Power (Pty) Ltd, is situated east of the UMK Mining Right boundary and approximately 2.5 km south east of the UMK mine (Figure 9-4 and Figure 9-5). The Adams Solar Plant will aid the new renewable generation capacity of the national grid. According to the strategy, 8.4 GW of new generation capacity in South Africa will be obtained from the Adams Solar Plant over the next twenty years.

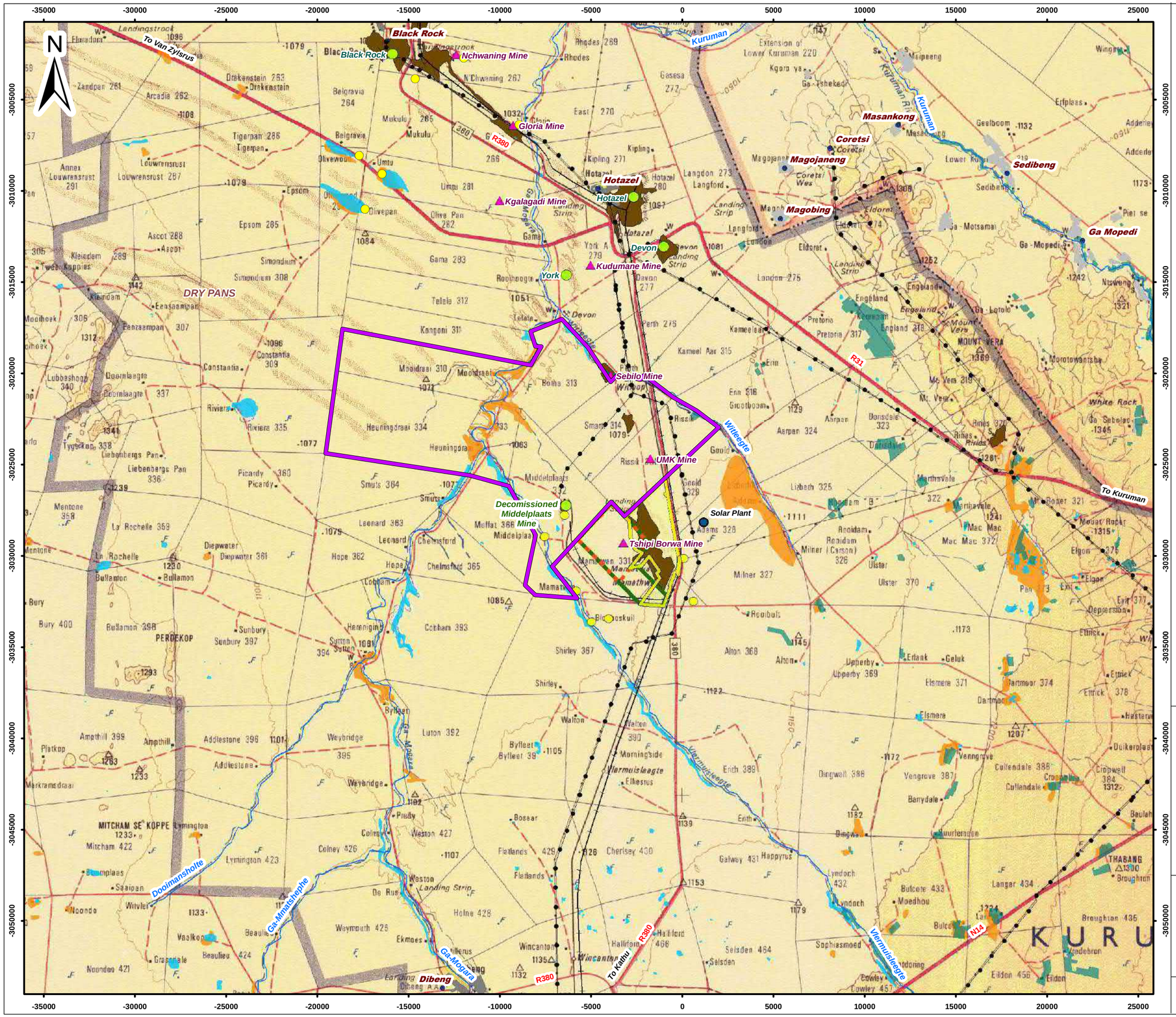
Regional powerline infrastructure

Two Eskom power lines (and the associated Eskom servitudes) occur in the project area. The first line enters the project site from the north and then traverses the centre of the project area in a south-westerly direction. This line supplied power to the old Middelplaats Mine on the farm Middelplaats 332. The second line cuts across the north eastern corner of the project site on the farm Smartt 314.

Local Road Network

Existing roads within the vicinity of the UMK Mine include:

- The R380 provincial tar road directly adjacent and to the east of UMK Mine;
- The D3340 gravel road along the north eastern boundary of the project area;
- A gravel road along the north western boundary of the project area between Dibeng and the R31; and
- Gravel roads and several dirt tracks within the project boundary.



UNITED MANGANESE OF KALAHARI

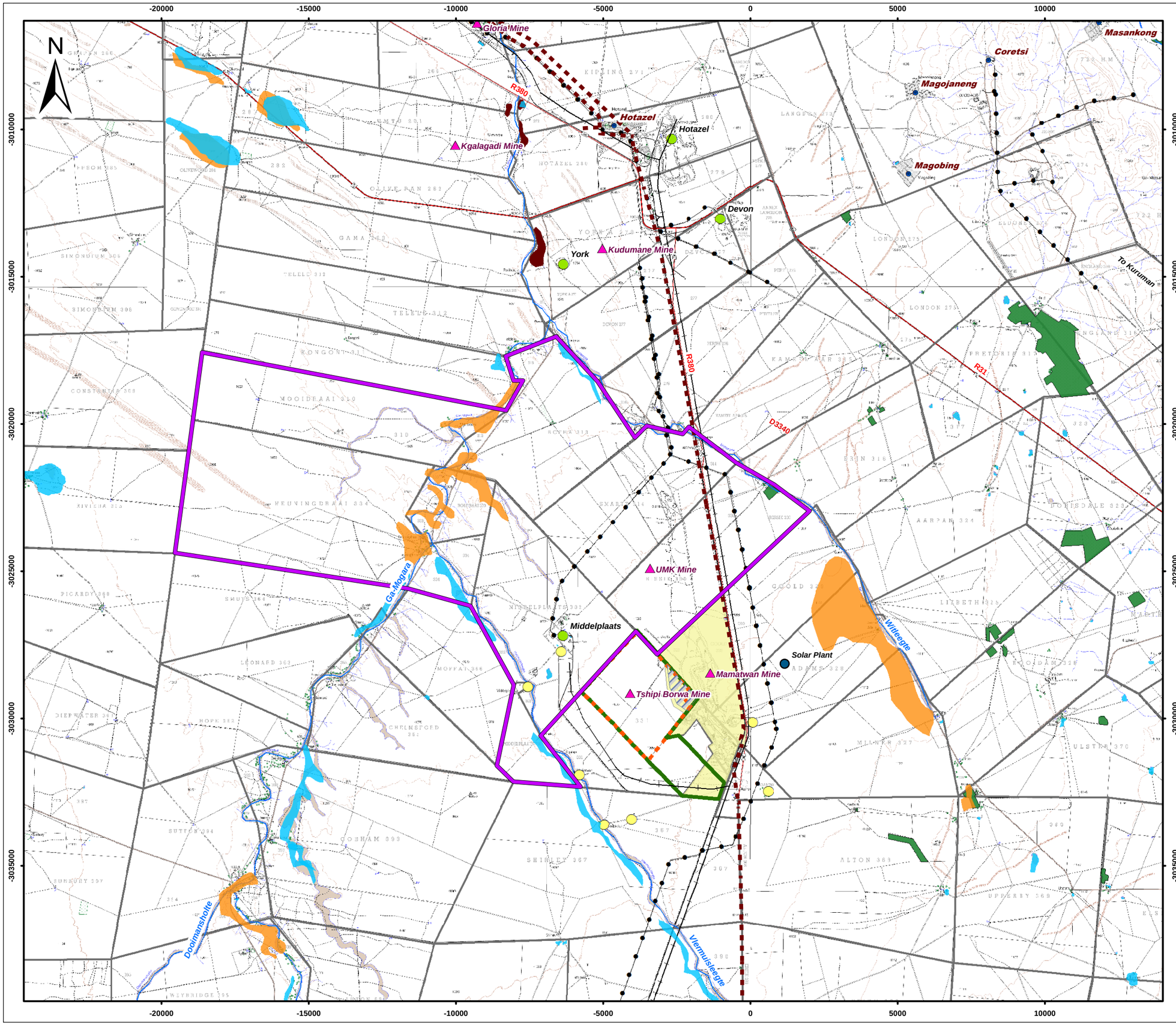
Figure 9-4

Regional Land Use Map

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.21002.00055

2020/09/08



Legend

- UMK Mining Right Area
- Mamatwan Mining Right Area
- Tshipi Mining Right Area
- Tshipi Surface Use Area
- Boundary Pillar
- Solar Plant
- Operating Manganese Mines
- Closed/Dormant Mines
- Potential Receptors
- Main Roads
- Rivers and Streams
- Powerline
- Railway
- Sedibeng Vaal-Gamagara Pipeline
- Cultivated Land ***
- Degraded: thicket & bushland (etc) *
- Wetlands (NFEPA)
- Historical Borrow Pits ***

Note:
* Sourced from SANBI
*** Sourced from 1: 50 000 Topographical Maps

0 1 2 Kilometers

Scale: 1:80 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

UNITED MANGANESE OF KALAHARI

Figure 9-5

Local Land Use

SLR Consulting (Africa) (Pty) Ltd
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Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.21002.00055

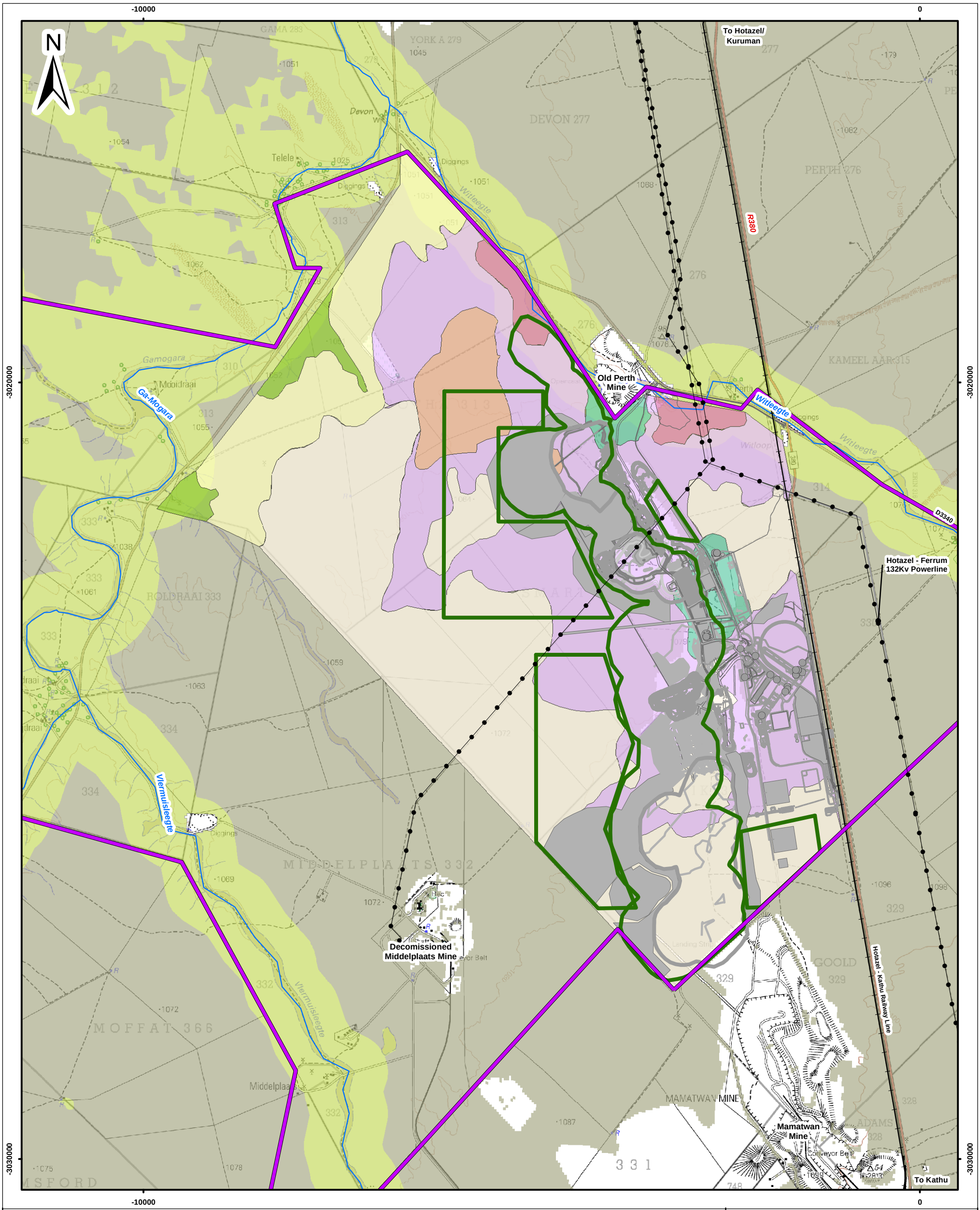
2020/09/08

9.6.14 Description of Specific Environmental Features and Infrastructure on the Site

The environmental features in the project area are described in Section 6.4.1 above. However, the notable environmental features are the Witleegte Spruit on the north-eastern boundary, and the Gamogara River on the north-western boundary of the UMK Mine. Infrastructure within and close to the project area is discussed in Section 9.6.13 above. The notable infrastructure within the project area is the Eskom power line that traverses the project site in a north easterly-south-westerly direction.

9.6.15 Environment and Current Land Use Map

A map illustrating the key features of the current environment and land use is included in Figure 9-6 .



Legend

- UMK Mining Right Area
- Proposed changes to the layout or operations
- As per the approved infrastructure/facilities layout
- Main Roads
- Railway Line
- Power Line
- Rivers and Streams

Critical Biodiversity Areas

- Ecological Support Area
- Other Natural Areas

Vegetation

- ***Vachellia erioloba*** Savannah
- ***Vachellia haematoxylon*** Savannah
- ***Senegalia mellifera*** Mixed Woodland
- ***Schmidtia kalihariensis – Prosopis glandulosa*** Shrubland
- Secondary Vegetation
- ***Tarchonanthus camphoratus – Vachellia karroo*** Scrub
- ***Tarchonanthus camphoratus – Schmidtia pappophoroides*** Scrub

UNITED MANGANESE OF KALAHARI

Figure 9-6

Key Environmental Features

SLR Consulting (Africa) (Pty) Ltd
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Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

710.21002.00055	2020/09/08

9.7 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The method to be used for the assessment of impacts is set out in Table 9-8 This assessment methodology enables the assessment of environmental impacts including: cumulative impacts, the intensity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

Table 9-8: SLR Impact Assessment Methodology

PART A: DEFINITIONS AND CRITERIA*		
Definition of SIGNIFICANCE		**Significance = consequence x probability**
Definition of CONSEQUENCE		**Consequence is a function of intensity, spatial extent, and duration**
Criteria for ranking of the INTENSITY of environmental impacts	**VH**	Severe change, disturbance, or degradation. Associated with severe consequences. May result in severe illness, injury, or death. Targets, limits, and thresholds of concern continually exceeded. Substantial intervention will be required. Vigorous/widespread community mobilization against project can be expected. May result in legal action if impact occurs.
	H	Prominent change, disturbance, or degradation. Associated with real and substantial consequences. May result in illness or injury. Targets, limits, and thresholds of concern regularly exceeded. Will definitely require intervention. Threats of community action. Regular complaints can be expected when the impact takes place.
	M	Moderate change, disturbance, or discomfort. Associated with real but not substantial consequences. Targets, limits, and thresholds of concern may occasionally be exceeded. Likely to require some intervention. Occasional complaints can be expected.
	L	Minor (Slight) change, disturbance, or nuisance. Associated with minor consequences or deterioration. Targets, limits, and thresholds of concern rarely exceeded. Require only minor interventions or clean-up actions. Sporadic complaints could be expected.
	VL	Negligible change, disturbance, or nuisance. Associated with very minor consequences or deterioration. Targets, limits, and thresholds of concern never exceeded. No interventions or clean-up actions required. No complaints anticipated.
	VL+	Negligible change or improvement. Almost no benefits. Change not measurable/will remain in the current range.
	L+	Minor change or improvement. Minor benefits. Change not measurable/will remain in the current range. Few people will experience benefits.
	M+	Moderate change or improvement. Real but not substantial benefits. Will be within or marginally better than the current conditions. Small number of people will experience benefits.
	H+	Prominent change or improvement. Real and substantial benefits. Will be better than current conditions. Many people will experience benefits. General community support.
	VH+	Substantial, large-scale change or improvement. Considerable and widespread benefit. Will be much better than the current conditions. Favourable publicity and/or widespread support expected.
Criteria for ranking the DURATION of impacts	**VL**	Very short, always less than a year. Quickly reversible
	L	Short-term, occurs for more than 1 but less than 5 years. Reversible over time.
	M	Medium-term, 5 to 10 years.
	H	Long term, between 10 and 20 years (likely to cease at the end of the operational life of activity).
	VH	Very long, permanent, +20 years (Irreversible, Beyond closure).
Criteria for ranking the EXTENT of impacts	**VL**	A part of the site/property.
	L	Whole site.
	M	Beyond the site boundary, affecting immediate neighbours.
	H	Local area, extending far beyond site boundary.

	VH	Regional/National

PART B: DETERMINING CONSEQUENCE							
INTENSITY = VL							
DURATION	Very long	**VH**	**Low**	**Low**	**Medium**	**Medium**	**High**
	Long term	**H**	**Low**	**Low**	**Low**	**Medium**	**Medium**
	Medium term	**M**	**Very Low**	**Low**	**Low**	**Low**	**Medium**
	Short term	**L**	**Very low**	**Very Low**	**Low**	**Low**	**Low**
	Very short	**VL**	**Very low**	**Very Low**	**Very Low**	**Low**	**Low**
INTENSITY = L							
DURATION	Very long	**VH**	**Medium**	**Medium**	**Medium**	**High**	**High**
	Long term	**H**	**Low**	**Medium**	**Medium**	**Medium**	**High**
	Medium term	**M**	**Low**	**Low**	**Medium**	**Medium**	**Medium**
	Short term	**L**	**Low**	**Low**	**Low**	**Medium**	**Medium**
	Very short	**VL**	**Very low**	**Low**	**Low**	**Low**	**Medium**
INTENSITY = M							
DURATION	Very long	**VH**	**Medium**	**High**	**High**	**High**	**Very High**
	Long term	**H**	**Medium**	**Medium**	**Medium**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	**Medium**	**High**	**High**
	Short term	**L**	**Low**	**Medium**	**Medium**	**Medium**	**High**
	Very short	**VL**	**Low**	**Low**	**Low**	**Medium**	**Medium**
INTENSITY = H							
DURATION	Very long	**VH**	**High**	**High**	**High**	**Very High**	**Very High**
	Long term	**H**	**Medium**	**High**	**High**	**High**	**Very High**
	Medium term	**M**	**Medium**	**Medium**	**High**	**High**	**High**
	Short term	**L**	**Medium**	**Medium**	**Medium**	**High**	**High**
	Very short	**VL**	**Low**	**Medium**	**Medium**	**Medium**	**High**
INTENSITY = VH							
DURATION	Very long	**VH**	**High**	**High**	**Very High**	**Very High**	**Very High**
	Long term	**H**	**High**	**High**	**High**	**Very High**	**Very High**
	Medium term	**M**	**Medium**	**High**	**High**	**High**	**Very High**
	Short term	**L**	**Medium**	**Medium**	**High**	**High**	**High**
	Very short	**VL**	**Low**	**Medium**	**Medium**	**High**	**High**

VL	**L**	**M**	**H**	**VH**
A part of the site/ property	Whole site	Beyond the site, affecting neighbours	Extending far beyond site but localised	Regional/ National
EXTENT				

PART C: DETERMINING SIGNIFICANCE

PROBABILITY (of exposure to impacts)	Definite/ Continuous	**VH**	**Medium**	**Medium**	**High**	**Very High**	**Very High**
	Probable	**H**	**Low**	**Medium**	**Medium**	**High**	**Very High**
	Possible/ frequent	**M**	**Low**	**Low**	**Medium**	**Medium**	**High**
	Conceivable	**L**	**Very Low**	**Low**	**Low**	**Medium**	**Medium**
	Unlikely/ improbable	**VL**	**Negligible**	**Very Low**	**Low**	**Low**	**Medium**
			VL	**L**	**M**	**H**	**VVH**
			CONSEQUENCE				

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
Very High	Potential fatal flaw unless mitigated to lower significance.
High	It must have an influence on the decision. Substantial mitigation will be required.
Medium	It should have an influence on the decision. Mitigation will be required.
Low	Unlikely that it will have a real influence on the decision. Limited mitigation is likely required.
Very Low	It will not have an influence on the decision. Does not require any mitigation
Negligible	Inconsequential, not requiring any consideration.

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

9.8 POTENTIAL IMPACTS AND RISKS WHICH HAVE INFORMED THE IDENTIFICATION OF EACH ALTERNATIVE

This section provides a list of potential impacts on environmental and socio-economic aspects that have been identified in respect of each of the project activities identified. The 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 environmental and social impacts) are also provided in accordance with the DMRE report template.

In accordance with the DMRE report template this section requires a discussion of the potential impacts taking into consideration any project related alternatives (no alternatives assessed for this project). The potential impacts associated with the project phases (construction, operations, decommissioning and closure) have been identified and described. In the absence of specialist studies, the assessment conclusions are conservative. It follows that the assessment provided below is a preliminary assessment which will be refined/ amended in the EIA phase with specialist input, as appropriate. The section below also references studies that are required to provide the necessary additional information to assess the impacts during the EIA phase.

9.8.1 Issue: Loss of soil and land capability through contamination

Mining projects in general have the potential to damage soil resources through contamination. A loss of soil resources would result in a decrease in the natural rehabilitation and future land use potential. Soil resources are likely to be disturbed through removal, erosion, and compaction, as well as chemical pollution from fuel spillages which can result in a loss of soil functionality as an ecological driver.

Although, the existing mining activities have already disturbed soils and related land capability, further disturbance will be experienced as a result of the proposed infrastructure changes. This could present additional soil contamination risk during construction and operation. In the unmitigated scenario the intensity of soil chemical pollution as a result of pollutants leaching into subsurface soil horizons where waste rock is stockpiled, is considered to be medium. This results in a moderate deterioration of the soil resource. This impact will be localised within the site boundary. The duration of this impact remains high in the mitigated and unmitigated scenario with the probability of the impact possible. Given that the end land-use will remain the same, the

significance of this impact is expected to be moderate to low in the unmitigated scenario and can be reduced to very low with implementation of a soil management plan.

The soil and land capability impact assessment will be conducted by Terra Africa. This assessment will provide for management and mitigation measures to address impacts on soils and land capability.

The additional work required to address this issue is described in Section 10.4 of this Scoping Report.

9.8.2 Issue: Loss of soil and land capability through physical disturbance

Topsoil is a resource of high value as it is a non-renewable growth medium containing a gene bank of vegetation seeds and other organisms. Soil is the key to re-establishing post closure land capability and can be disturbed through removal, erosion and compaction which may result in a loss of soil functionality as an ecological driver. The proposed infrastructural changes have the potential to disturb soils and related land capability. Some stripping and stockpiling of soil resources has taken place on site to support the establishment of the mine. The proposed infrastructural changes will require the disturbance of additional areas.

In the absence of soil conservation and management measures, the project impact on soils and related land capability will be moderate as soils will be lost to the area of disturbance. This will compromise the soil functionality and may result in soil erosion. The loss of soil and related land capability within the project footprint is long term and will continue after the life of the mine. The duration of this impact can be reduced to medium with mitigation as most of the soil can be conserved and used for rehabilitation. The potential loss of soil and land capability through physical disturbance will be localised within the project area. The significance of this impact is moderate in the unmitigated scenario and can be reduced to low with mitigation.

The soil and land capability impact assessment will be conducted by Terra Africa. This assessment will provide for management and mitigation measures to address impacts on soils and land capability.

The additional work required to address this issue is described in Section 10.4 of this Scoping Report.

9.8.3 Issue: Physical destruction and general disturbance of biodiversity

Areas of ecological sensitivity include functioning biodiversity areas with species diversity and associated intrinsic value. Linkages between these areas have value because of the role they play in allowing the migration or movement of flora and fauna between the areas, which is a key function for a broader ecosystem. The transformation of land for any purpose increases the destruction of the site-specific biodiversity, the fragmentation of habitats, reduces its intrinsic functionality and reduces the linkage role that undeveloped land fulfils between different areas of biodiversity importance. Parts of the project area has been transformed to support the establishment of the UMK mine. The proposed infrastructural changes can destroy biodiversity through additional loss of natural vegetation, additional loss of protected flora and faunal species of conservation concern, Intentional/accidental killing of fauna and sedimentation and contamination of freshwater ecosystems.

The proposed infrastructural changes have the potential to contribute to transformation of biodiversity if not managed. The project footprint for the waste rock dumps, product stockpile and truck staging area fall within areas of moderate to high ecological sensitivity. This is attributed to the presence of the number of protected trees species that occur within them. It should be noted that these ecological sensitive areas comprise of isolated pockets of biodiversity areas which do not provide ecological linkages required to support conservation.

Taking the above into consideration, the severity moderate in the unmitigated scenario where rehabilitation has not been implemented effectively and reduced low in a mitigated scenario. The loss of biodiversity and related functionality is long term and will continue after the life of the project. This impact will be localised within the project footprint with the probability of the impact possible. The significance of this impact is expected to be moderate in the unmitigated scenario and can be reduced to low with a comprehensive rehabilitation plan.

The terrestrial and aquatic biodiversity impact assessment will be conducted by Ecological Management Services. This assessment will provide for management and mitigation measures to address biodiversity impacts.

The additional work required to address this issue is also described in Section 10.4 of this scoping report.

9.8.4 Issue: Alteration of natural drainage patterns

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Rainfall and surface water run-off at the UMK mine are collected in areas that have been designed with water containment infrastructure as required by legislation. The potential to alter the drainage of surface water through the establishment of additional infrastructure. Rainfall and surface water run-off will be collected in all areas that have been designed with water containment infrastructure. The collected run-off will therefore be lost to the catchment and can result in the alteration of drainage patterns. In order to comply with legislation for water containment infrastructure as part of the proposed surface infrastructure changes, additional stormwater management is needed.

During the construction, operational and decommissioning phase, these activities will continue until such time as mine infrastructure can be removed and/or the project areas are rehabilitated. During the closure phase, rehabilitation will allow for the restoration of drainage patterns and surface run-off as far as possible.

When considering the loss of run-off to the catchment as a result of containment infrastructure in context of the existing mining operations, the severity of the impact could be moderate to low in the unmitigated scenario and depends on the amount of run-off lost from the catchment. This can be reduced to very low with mitigation measures.

The surface water impact assessment will be conducted by SLR. This assessment will provide for management and mitigation measures to address surface water impacts.

The additional work required to address this issue is described in Section 10.4 of this Scoping Report.

9.8.5 Issue: Pollution of surface water resources

The stormwater management infrastructure contains dirty water during construction, operation, and closure. Rainfall and surface water run-off are collected in areas that have been designed with water containment infrastructure. The collected run-off as a result of the proposed infrastructural changes will therefore be lost to the catchment.

The proposed infrastructural changes present additional potential pollution sources in the form of runoff from exposed areas (i.e., stripped areas, waste rock dumps, product stockpiles and accidental leaks from vehicles and fuel storage areas) which could contain contaminants. In the unmitigated scenario the intensity is expected to be moderate, depending on the water quality of the run-off water. This could be reduced to low with mitigation measures that focussed on water containment and clean water diversion from the proposed infrastructural changes. In the unmitigated scenario pollution events can extend beyond the life of the mine. With mitigation, pollution events can be prevented or mitigated. The Witleegte river (Class B, largely natural) is located in close proximity to the proposed truck staging area road. The overall significance in the unmitigated scenario could be moderate and reduced to low with mitigation.

The surface water impact assessment will be conducted by SLR. This assessment will provide for management and mitigation measures to address surface water impacts.

The additional work required to address this issue is described in Section 10.4 of this Scoping Report.

9.8.6 Issue: Contamination of groundwater affecting third party use

Mining projects generally present a number of pollution sources that can have a negative impact on groundwater quality if unmanaged in all project phases. Various pollution sources exist on site as the mine is operational: fuel and lubricants, sewage, mine residue, dirty water circuit, chemicals, non-mineralised waste.

The establishment of the proposed surface infrastructure such as the additional waste rock dumps, product stockpile and sewage plant upgrade at the UMK mine present additional potential pollution sources. Seepage from the waste rock dumps and product stockpiles could contain contaminants. In the unmitigated scenario the intensity is expected to be moderate, depending on the seepage water quality. This could be reduced to low with mitigation measures which focussed on managing seepage, groundwater monitoring and containing contaminated run-off water. In the unmitigated scenario pollution events can extend beyond the life of mine. With mitigation, pollution events can be prevented or mitigated within the life of mine. Groundwater pollution could extend beyond the site boundary and affect the current third-party water user in the unmitigated scenario. The overall significance in the unmitigated scenario could be moderate and reduced to very low with mitigation.

The groundwater impact assessment will be conducted by SLR. This assessment will provide for management and mitigation measures to address groundwater impacts.

The additional work required to address this issue is described in Section 10.4 of this Scoping Report.

9.8.7 Issue: Decrease in ambient air quality

Mining projects present a number of air pollution sources that can have a negative impact on ambient air quality and surrounding land uses in all phases. Pollution sources include land clearing activities, materials handling, wind erosion from stockpiles, wind erosion of disturbed areas, vehicle movement along unpaved roads, dust generation from crushing and screening plants and gas emissions mainly from vehicles and generators. From construction and operation perspective, the proposed project could present additional dust generation sources.

Dust generated at these sources could have a negative impact on ambient air quality and could result in nuisance impacts as well as health impacts for the nearby receptor, if unmanaged. This is a high intensity in the unmitigated scenario and can be reduced with measures to control dust. Without mitigation the duration of the impact could extend beyond closure. However, if the stockpiles, disturbed areas, dust generation from crushing and screening plants are properly rehabilitated and re-vegetated, dust should no longer be generated at these sites.

With mitigation, the duration of impact will therefore be limited to construction and operational phases. The potential impact could extend off site in both the mitigated and unmitigated scenarios. The overall significance of this impact is expected to be moderate to low in the unmitigated scenario and can be reduced with mitigation.

9.8.8 Issue: Increase in disturbing noise levels

Mining activities and infrastructure have the potential to cause an increase in ambient noise levels that may cause a disturbance to nearby sensitive receptors during all phases prior to closure. The current ambient noise levels at the UMK mine are related to mining activities at UMK Mine (and neighbouring mines), handling and processing of mineral resources, traffic on mine roads. The establishment of additional surface infrastructure and waste rock dumps will not result in significant changes to the noise emission sources within the UMK mine. The impact is therefore insignificant in the context of the existing cumulative noise impacts of the mine and will not be assessed further.

9.8.9 Issue: Alteration of the visual environment affecting sense of place

Mining infrastructure has the potential to alter the landscape character of an area through the establishment of infrastructure. It is however important to note, that that the establishment of infrastructure as a result of the proposed surface infrastructural changes will be absorbed by the existing mining infrastructure on site. The establishment of additional surface infrastructure dumps will not result in significant changes to the visual

impacts of the UMK mine during construction and operation. The impact is therefore insignificant in the context of the existing cumulative impacts of the mine and will not be assessed further.

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

There are a number of activities/infrastructure in all phases prior to closure that have the potential to remove, damage or destroy heritage/cultural resources, either directly or indirectly, and result in the loss of the resource for future generations. In the unmitigated scenario the severity is medium. With mitigation measures in place that aim to minimise the disturbance of heritage/cultural sites, the severity is reduced to low. If the heritage/cultural resources are removed, damaged, or destroyed the impact duration is long term. In the mitigated scenario the duration reduces to less than the project life. The spatial scale will be localised to the site boundary in both the unmitigated and mitigated scenarios. The significance of the impact is medium and can be reduced to low with mitigation with a reduction on probability.

The heritage impact assessment will be conducted by HCAC Heritage Consultants. This assessment will provide for an emergency extraction plan and management & mitigation measures to address heritage impacts.

The additional work required to address this issue is also described in Section 10.4 of this scoping report.

9.8.11 Issue: Positive socio-economic impact (economic impact)

In the broadest sense, all mining activities contribute towards a positive economic impact in all phases. Mining has a positive net economic impact on the national, local, and regional economy. Direct benefits are derived from wages, taxes, and profits. Indirect benefits are derived through the procurement of goods and services, and the increased spending power of employees.

The proposed project will allow for the creation of limited short-term employment during the construction phase primarily. During the operation, decommission and closure phases, the proposed project allows for the continuation of the current employment opportunities which will continue to support UMK's contribution to the positive net economic impact on the national, local, and regional economy.

The direct benefits from the proposed project would be derived from limited short-term employment during construction and continuation of the current employment opportunities in all operation, decommission. This is considered to be a negligible and positive severity as the limited job opportunities are not anticipated to result in noticeable change to that of the current situation at the UMK mine. The unmitigated enhanced intensity is likely to be very low and would occur over the short-term having an impact on the local area. The probability is conceivable. The overall unmitigated enhanced significance is therefore very low. With the implementation of enhancement measures the significance could increase to low.

9.8.12 Issue: Negative socio-economic impact (inward migration)

Mines tend to bring with them an expectation of employment in all proposed project phases prior to closure. This expectation can lead to the influx of job seekers to an area which in turn increases pressure on existing communities, housing, basic service delivery and raises concerns around safety and security. The proposed project is located within an existing mining operation and will result in limited short-term employment opportunities during construction, therefore negative project-related socio-economic impacts including inward migration, which could place additional pressure on housing and municipal services, are not expected to occur.

9.8.13 Issue: Sterilisation of a mineral resource

Mineral resources can be sterilized and/or lost through the deposition of minerals onto waste disposal facilities such as waste rock dumps. The intensity of sterilising mineral resources is considered to be high because of the associated potential economic value that is lost when sterilisation occurs. If sterilisation of a resources occurs it is likely that the related impact would extend beyond the life of mine and extend beyond the site boundary if one considers the economic nature of the impact.

Without mitigation the probability is definite, and the associated significance is very high. In the mitigated scenario, with planning and co-ordination to prevent the unacceptable sterilisation of resources the impact can be reduced.

9.8.14 Issue: Hazardous excavations and infrastructure that pose a safety risk to third parties and animals

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. The existing mining related activities have altered the natural topography and in turn creates the potential risk of injury and/or death to both third parties and animals. The proposed project is located within an existing mining footprint and does not present any new infrastructure or activities that differ from those already approved. Further to this, the footprint of the proposed project is within a restricted area with enforced health and safety policies. This impact has therefore been rated as being Insignificant and has not been assessed further.

9.8.15 Issue: Change in current land use

Mining and project related activities and infrastructure may have an impact on land uses within and surrounding the project area in all phases. Land use within UMK Mine includes existing mining activities and associated infrastructure. The surrounding land uses includes mining operations, agriculture, isolated farmsteads, infrastructure, and solar plant. Given that the land use within the proposed project is limited to mining as a result of the existing mining operations, the proposed project will not result in changes to the current land use. This impact has therefore been rated as being Insignificant and has not been assessed further.

9.8.16 Issue: Disturbance to third party road users by project related traffic

An increase in traffic as well as the use of these roads by heavy vehicles may result in a decrease in road service and safety levels. Traffic impacts are expected from construction through to the end of the decommissioning phase when trucks, buses, and private vehicles make use of the public transport network surrounding the project area. The key potential traffic related impacts are on road capacity and public safety when additional traffic is added to the existing transport network. During the construction, operation, and decommissioning phases of the project there could be a slight increase in traffic from delivery of construction materials, private vehicles making use of the public roads and contractors to the site. The volumes, frequency and duration of construction and decommissioning traffic is likely to be immaterial as compared to the current baseline and any impact would be negligible. This impact has therefore been rated as being Insignificant and has not been assessed further.

9.9 POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK FOR THE PREFFERED ALTERNATIVE

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

Table 9-9: Possible Management Actions and the Anticipated Level of Risk

Activity **Whether Listed or Not Listed**	**Potential Impact**	**Possible Mitigation**	**Potential for Residual Risk**
New Infrastructure to be established on site in support of the current mining operations.			
Waste rock dumps, sand stockpiles and product stockpiles	• Loss of soil resources through physical disturbance • Loss of soil resources through contamination • Physical destruction of biodiversity • Contamination of surface water resources • Alteration of natural drainage patterns • Contamination of groundwater affecting third party use. • Reduced ambient air quality. • Increase in disturbing noise levels. • Alteration of the visual environment • Loss of or damage to heritage and/or paleontological resources • Change in land use • Positive socio-economic impact (economic impact) • Negative socio-economic impact (inward migration)	• Continued implementation of soil conservation management plan and waste management plan • Continued implementation of biodiversity controls and management plan • Continued use of stormwater controls and/or implementation of new controls • Continued use of groundwater controls and groundwater monitoring • Continued implementation of air emission controls and monitoring • Continued implementation of noise controls • Continued implementation of visual controls • Implement chance find procedure • Continued implementation of procurement and employment policies and procedures • Continued use of access controls • Closure planning to incorporate rehabilitation objectives • Implementation of an emergency response procedures when required • Implementation of a grievance procedure	Possible for waste rock dumps that remain in perpetuity.
Engineering salvage yard (temporal and permanent)			Unlikely
Solar equipped boreholes and associated storage tanks			Unlikely
Parking area, tyre fitting bay, workshop/ tyre centre and oil storage and explosive depo and associated service roads.			Unlikely
Truck staging area			Unlikely

Activity Whether Listed or Not Listed	Potential Impact	Possible Mitigation	Potential for Residual Risk
	• Hazardous excavations and infrastructure that pose a safety risk to third parties and animals • Sterilisation of mineral resources • Change in land use.		
Upgrade of existing approved infrastructure			
Prentec Sewage Plant	• Contamination of groundwater affecting third party use. • Positive socio-economic impact (economic impact)	• Continued use of groundwater controls and groundwater monitoring • Continued implementation of procurement and employment policies and procedures • Implementation of an emergency response procedures when required • Implementation of a grievance procedure.	Unlikely
Existing weigh bridge and associated access road			Unlikely
Expansion of existing approved infrastructure			
Product stockpile	• Loss of soil resources through physical disturbance • Loss of soil resources through contamination • Physical destruction of biodiversity • Contamination of surface water resources • Alteration of natural drainage patterns • Contamination of groundwater affecting third party use. • Reduced ambient air quality. • Increase in disturbing noise levels. • Alteration of the visual environment • Loss of or damage to heritage and/or paleontological resources	• Continued implementation of soil conservation management plan and waste management plan • Continued implementation of biodiversity controls and management plan • Continued use of stormwater controls and/or implementation of new controls • Continued use of groundwater controls and groundwater monitoring • Continued implementation of air emission controls and monitoring • Continued implementation of noise controls • Continued implementation of visual controls • Implement chance find procedure • Continued implementation of procurement and employment policies and procedures • Continued use of access controls • Closure planning to incorporate rehabilitation objectives	Unlikely
Modular Crusher plant			Unlikely

Activity Whether Listed or Not Listed	Potential Impact	Possible Mitigation	Potential for Residual Risk
	• Change in land use • Positive socio-economic impact (economic impact) • Negative socio-economic impact (inward migration) • Hazardous excavations and infrastructure that pose a safety risk to third parties and animals • Sterilisation of mineral resources • Change in land use.	• Implementation of an emergency response procedures when required • Implementation of a grievance procedure	
Relocation of approved surface infrastructure			
Approved dirty water dams/pollution control ponds	• Loss of soil resources through physical disturbance • Loss of soil resources through contamination • Physical destruction of biodiversity • Contamination of surface water resources • Alteration of natural drainage patterns •	• Continued implementation of soil conservation management plan and waste management plan • Continued implementation of biodiversity controls and management plan • Continued use of stormwater controls and/or implementation of new controls • Continued use of groundwater controls and groundwater monitoring	Unlikely
132 KV powerline from current location to its old location			Unlikely

9.10 OUTCOME OF THE SITE SELECTION MATRIX

Not applicable. The mine is already authorised and operating, and the closure options must take place at the mine location.

9.11 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

See Section 9.3..

9.12 THE PREFERRED ALTERNATIVE

See Section 9.3.

10. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

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

10.1 EIA OBJECTIVES

The main objectives of the EIA phase will be to:

- Assess the potential cultural, heritage, socio-economic and biophysical impacts of the project;
- Identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts;
- Liaise with I&APs including 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 EMPr and a conceptual closure/decommissioning plan; and
- Provide measures for ongoing monitoring (including environmental audits) to ensure that the project plan and proposed mitigation measures are implemented as outlined in the detailed EIR.

10.2 ALTERNATIVES TO BE CONSIDERED

The alternatives and the site layout considered during Scoping are detailed in the Section 9.3.

10.3 ASPECTS TO BE ASSESSED AS PART OF THE EIA PROCESS

This section lists the environmental aspects that will be considered in the Environmental Impact Assessment phase. These are as follows:

Table 10-1: Environmental Aspects to be Considered in the EIA Phase

Aspect	Specialist Study
Soil, Land Use, Land Capability and Land Potential Assessment	The soil, land use, land capability and land Potential Specialist Study will be conducted by Terra Africa
Biodiversity – terrestrial and aquatic	The terrestrial and aquatic study will be conducted by Ecological Management Services.
Surface Water Assessment	The surface water assessment will be conducted by SLR.
Groundwater	The groundwater specialist study will be conducted by SLR.
Air Quality	Impact is expected to be low in terms of dust generation. No additional study is anticipated.
Visual	Impact is expected to be low and no additional study is anticipated.
Heritage and Palaeontology	The heritage impact assessment will be conducted by HCAC Heritage Consultants.
Closure study and Financial Provision	The Closure and Financial Provision Study will be conducted by SLR.

The assessment of these aspects, as well as those to be assessed by specialists (see following Section) and the determination of detailed management and mitigation measures will be undertaken by SLR and provided in the EIA report.

10.4 ASPECTS TO BE ASSESSED BY SPECIALISTS

The aspects to be assessed by the various specialists on the preferred alternative are included in Table 10-2. Each specialist study will undertake the following steps:

- Identify specific issues of concern through an understanding of the project and the sensitivity of the affected environment as well as review of all issues raised by stakeholders;
- Interact with other specialists, where required, to ensure the integration of issues of concern and appropriate assessment;
- Define relevant laws and regulations that apply to the specific specialist study;
- Define the baseline environment through review of available information from past studies and additional field studies, where required;
- Assess the direct, indirect, and cumulative impacts;
- Provide mitigation measures to reduce impacts to an acceptable level i.e. residual impact. Where necessary provide recommendations to address residual impacts i.e. biodiversity offsets; and
- Where required, provide detailed monitoring plans.

Table 10-2: Plan of Study for Aspects to be Assessed by Specialists

Specialist Study	Plan of Study
Soil, Land Use, Land Capability and Land Potential Assessment	• The study will be conducted by Terra Africa and will focus on the following: • A desktop review of existing soil and climatic databases, to establish broad baseline conditions and areas of environmental sensitivity and sensitive agricultural areas; • Assess spatial distribution of various soil types within the focus areas; • Identify restrictive soil properties on land capability under prevailing conditions; • Compile various maps depicting the on-site conditions, soil types and land capability based on desktop review of existing data; • A soil classification survey to classify soil into soil forms within the focus areas and zones of influence; • Subsurface soil observations and sampling undertaken by means of a manual bucket hand auger; • Classify the dominant soil types according to the South African Soil Classification System (Soil Classification Working Group, 2018); • Compile a report presenting the results of the desktop study and a description of the findings during the field assessment; and • Provide recommended mitigation measures and management practices to implement in order to comply with applicable legislations.
Biodiversity – terrestrial and aquatic	• The study will be conducted by Ecological Management Services and will focus on the following: • Biodiversity assessment • Review available information and documentation relating to the proposed development; • A comprehensive investigation will be undertaken to identify potential floral species of special concern, this includes all IUCN listed species, TOPS listed species and species listed in schedule 1

Specialist Study	Plan of Study
	and 2 of the NCNCA. These will be identified through the SANBI POSA database as well as other available literature and confirmed on site. • A single field survey and literature review of the property to determine vegetation type and distribution. The survey will be undertaken to identify potential floral species of special concern. • A single field survey and literature review to determine what red data faunal species could potentially occur within the study site. The habitat requirements of each red data species that could potentially occur on-site will be compared with the vegetation description. No onsite trapping of faunal species will be undertaken. • Once the overall potential for occurrence of each red data species has been identified, each habitat type (based on the vegetation description and any factors identified as relevant to fauna) will be ranked in terms of conservation importance, as well as ecological sensitivity. • The sites importance in terms of regional sensitivity will also be assessed • The report and survey will comply with the NEMA Appendix 6 requirements. • Freshwater Assessment • Review available information and documentation relating to the proposed development; • A site visit and assessment of the site; • Determine the Present Ecological State (PES) & Ecological Importance and Sensitivity (EIS) of the Witleegte watercourse • Determine the impacts in terms of the characteristics of the Witleegte ecosystem affected and associated with the proposed development; • Describe and assess the significance of the proposed development on the ecosystem; • Recommend mitigation measures to minimize the potential negative impacts on freshwater ecosystems.
Surface Water Assessment	The surface water assessment will be conducted by SLR and will focus on the following: • Undertake a baseline and situational analysis including: o Characterisation of rainfall, evaporation data and design storm intensities; o Characterisation of the baseline hydrology of the site; o Review of available water quality data; and o Review of topographical and geotechnical conditions, existing and future layout based on information provided by the client as well as findings from the site visit • Development of a conceptual stormwater management plan, including: o Clean and dirty water classification, catchment delineation and stormwater routing; o Hydraulic calculations through peak flow estimation for conveyance infrastructure and hydraulic sizing of the channels, kerbs, culverts, and silt traps; o Sizing of Pollution Control Dams (PCDs) based on a daily time step model; and o Conceptual designs for stormwater infrastructure including channels, culverts, kerbing, silt traps, PCDs, spillways etc. • Recommendations for further work to develop the detailed designs for the stormwater infrastructure. • Development of a Dynamic Water Balance through a daily time step water balance model for the major water components of the mine. • Development of a daily salt balance model for the major water components of the mine. • Present a qualitative assessment of the significance of the impact of the project on the baseline surface water environment, a range of mitigation measures to minimise said impacts, and recommendations on monitoring. • Compile a specialist report, including management and mitigation measures.
Groundwater	The groundwater specialist study will be conducted by SLR and will focus on the following: • Review all existing hydrogeological data:

Specialist Study	Plan of Study
	○ this includes monitoring data and baseline hydrogeology (water levels and water quality); ○ review previous studies that were undertaken for the UMK Mine, including the groundwater model report and all groundwater monitoring data; ○ examine new infrastructure map and determine possible source term sites; ○ extract all pertinent data and compile the Conceptual Hydrogeological Model. • Groundwater numerical modelling: ○ Based on the source term derived from the geochemical study, the existing groundwater numerical model will be updated; ○ Model results will inform the EIA and WULA regarding whether or not there is any potential of groundwater contamination. • The groundwater study will include a geochemical and waste assessment to inform the contamination potential of any residues/discards generated by the project. The waste assessment will be undertaken in terms of the National Norms and Standards (Regulation 635 and 656 of 2013). • Identification of mitigation/management measures and updates to the existing monitoring programme (where required). • Compile a specialist hydrogeological report.
Heritage and Palaeontology	The heritage impact assessment will be conducted by HCAC Heritage Consultants and will focus on the following: • Assessment of the proposed development footprint to understand the heritage character of the project area through a brief desktop study and a field survey • Determination of the impact of the proposed project on non-renewable heritage resources and • Compile a specialist report, including management and mitigation measures.
Closure study and Financial Provision	The Closure and Financial Provision Study will be conducted by SLR and will focus on the following: • Update of the closure plan: ○ Update the closure strategy, closure objectives and mechanisms, design principals and motivations for achieving the closure objective. ○ Update environmental risk assessment to incorporate risks. ○ Assess any long-term latent impacts and mitigation strategies (to be informed by specialist input). ○ Update future monitoring, auditing, and reporting procedures. • Update of the closure liability calculations: ○ Updates quantities and cost estimate associated with the closure activities (based on latest mine plan) as per the Financial Provisioning Regulations (GNR1147 of 2015) as amended. ○ Identify any knowledge gaps (to be followed up by future closure plan and closure liability revisions). • Update of preliminary annual rehabilitation plan: ○ Updating the preliminary annual rehabilitation plan as part of the requirements of the anticipated Financial Provisioning Regulations.

10.5 METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS

Refer to sections 9.7 and 10.4.

10.6 METHOD OF ASSESSING IMPACT SIGNIFICANCE

Refer to Section 9.7.

10.7 CONSULTATION WITH THE COMPETENT AUTHORITY

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

10.8 PUBLIC PARTICIPATION PROCESS IN THE EIA

10.8.1 Notification of Interested and Affected Parties

I&APs on the project database will be provided with information in the form of summary documents and will be notified when the EIA report is available for public review via electronic mail, post, WhatsApp and bulk SMS (Section 9.4). I&APs will similarly be invited to attend a virtual public feedback meeting during the EIA phase, if required.

10.8.2 Details of the Engagement Process to be Followed

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

- Notify I&APs of acceptance of Scoping Report;
- Ongoing receipt and collation of issues and concerns from I&APs;
- Maintenance of a register for I&APs;
- Providing an electronic copy of the EIA report on the SLR website and a data free portal;
- Distribution of a Non-Technical Summary to I&APs in English and Afrikaans;
- I&APs will be provided with a 30-day review period in line with the EIA Regulations;
- Collect and respond to issues in a Comments and Responses Report; and
- Notify I&APs of the decision taken by DMRE and applicable appeals processes.

10.8.3 Information to be Provided to Registered Interested and Affected Parties

The following information will be included in the EIA report and made available for public review:

- Detailed description of the proposed project;
- A site layout;
- Details of the Listed Activities requested for authorisation in terms of MPRDA, NEMA and NEM:WA;
- Scale and extent of activities requested for authorisation in terms of MPRDA, NEMA and NEM:WA;
- The duration of the activities;
- An assessment of the biophysical and socio-economic impacts identified during the S&EIA process, with input from I&APs, regulatory authorities, and specialists;
- Responses to issues and comments from I&APs;
- Copies of the specialist reports undertaken for the proposed project; and
- An EMPr, with detailed management measures and mitigation to reduce and control environmental and socio-economic impacts.

Once the DMRE has issued a decision on the application, SLR would, on behalf of the applicant, inform registered I&APs of the decision and the opportunity for appeal.

10.9 TASKS TO BE UNDERTAKEN DURING THE EIA

A description of the tasks that will be undertaken during the EIA phase is provided in Table 10-3: EIA Tasks

. A preliminary schedule for the EIA phase that aligns with regulatory timeframes is included.

Table 10-3: EIA Tasks

Phase	EAP activity	Opportunities for Consultation and Participation	
		Competent Authorities	**I&APs, State Departments and Organs of State**
Specialist Assessments and Input	EAP to manage specialist activities and receive inputs for EIA report. Specialists to be kept informed of issues raised throughout the EIA process.		
EIA Phase	Assess environmental impacts and compile EIA report		
	Provide EIA report to I&APs and authorities for review.	Review of EIA report (30 days). Comments to EAP	Review of EIA report (30 days). Comments to EAP
	I&AP consultations	Meetings with authorities if required.	Public Feedback Meeting if required. Focused consultation with I&APs if required.
	Collate and respond to comments and finalise EIA Report		
Authority review and Authorisation Phase	EIA Report to DMRE (106 days from acceptance of Scoping Report).	DMRE to acknowledge receipt of EIA report (10 days).	Review of EIA report Comments to CA
		DMRE review (107 days).	
		Environmental Authorisation Granted / Refused.	Notifications to I&AP's regarding environmental authorisation (granted or refused).
Decision	Notifications to I&AP's regarding environmental authorisation (granted or refused).		
Appeal Phase	EAP to provide guidance regarding the appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations, 2014

10.10 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS

See Section 9.9. It should be noted that this table has been compiled with the information currently in hand and will be refined during the EIA phase.

11.OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional requests for information have been received to date.

12.OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) & (B) OF THE ACT

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

12.1 DEFF SCREENING TOOL

This section has informed the outcomes of Section 9.8

As of 4 October 2019, it is compulsory to use DEFF online screening tool. The report generated by the DEFF screening tool was attached to the NEMA application for the proposed project as included in Appendix B. The screening tool report outlines specialist studies that need to be considered as part of the proposed project. In this regard, the table below outlines the specialist studies identified in the screening tool report along with an explanation pertaining to the applicability of these specialist studies in relation to the proposed project.

Table 12-1: DEA Screening Tool Results

Theme	Sensitivity	Requirements	Comment
Agriculture	Medium	The screening tool protocol specifies that, for sites of medium significance, an **Agricultural Compliance Statement** is required.	A soil and agricultural potential study will be carried out.
Archaeological and Cultural Heritage	Not specified in the screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	A cultural heritage and archaeology survey will be carried out.
Palaeontology	Medium	As no assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	A palaeontological study will be carried out.
Terrestrial Biodiversity	Low to Very High	The screening tool protocol specifies that, for sites of high significance, a **Terrestrial Biodiversity Impact Assessment** is required.	A Biodiversity and Freshwater Assessment study will be carried out.
Aquatic Biodiversity	Very High	The screening tool protocol specifies that, for sites of low significance, an **Aquatic Biodiversity Impact Assessment** is required.	
Animal Species Assessment	Low	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.

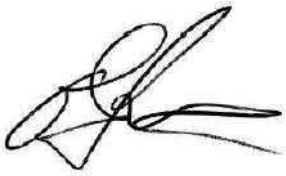
Theme	Sensitivity	Requirements	Comment
Plant Species	Low	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.
Ambient Air Quality	Not specified in screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.
Noise	Not specified in screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.
Hydrology	Not specified in screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	A surface water model and stormwater management plan will be carried out.
Landscape/Visual	Not specified in screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.
Traffic	Not specified in screening tool report	As no specific sensitivity/assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and comply with Appendix 6 of the EIA Regulations	No specialist study required in terms of the Scoping Investigation of potential impacts.
Civil Aviation	High	The proposed project will not present any tall structures that could influence flight paths. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.
Climate	Not specified in screening tool report	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.
Defence	Low	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.
Geotechnical	Not specified in screening tool report	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.

Theme	Sensitivity	Requirements	Comment
Health	Not specified in screening tool report	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.
Radioactivity	Not specified in screening tool report	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.
Seismicity	Not specified in screening tool report	Not applicable to the project activities. No further investigation is proposed.	No specialist study required in terms of the Scoping Investigation of potential impacts.

13. UNDERTAKING BY THE EAP

I, Sharon Meyer, 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;
- 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; and
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.



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Sharon Meyer	Ed Perry
(Signature of Environmental Assessment Practitioner	(Reviewer)
28 April 2021	28 April 2021
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Date	Date

14.REFERENCES

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