BASIC ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR THE PROSPECTING RIGHT APPLICATION IN RESPECT OF EERSBEGINT FARM

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002, AS AMENDED

NAME OF APPLICANT: KHWARA MANGANESE (PTY) LTD

TEL NO: 011 483 0840

FAX NO: 086 670 0026

POSTAL ADDRESS: P.O. BOX 652286, BENMORE, SANDTON, GAUTENG

PHYSICAL ADDRESS: 89 CENTRAL STREET, HOUGHTON, 2198

FILE REFERENCE NUMBER SAMRAD: NC30/5/1/1/2/12467PR

SLR Project No.: 720.11033.00002

Report No.: 1

Revision No.: 2

February 2020

DOCUMENT INFORMATION

Title	Basic Assessment and Environmental Management Programme Report for the Prospecting Right Application in respect of Eersbegint Farm
Project Manager	Natasha Smyth
Project Manager Email	nsmyth@slrconsulting.com
Author	Clive Phashe and Natasha Smyth
Reviewer	Edward Perry
Keywords	Khwara, prospecting right, Northern Cape
Status	Final for public and commenting authority review
DEA Reference	N/A
DMR Reference	NC30/5/1/1/2/12467PR
DWS Reference	N/A
Report No.	1
SLR Company	SLR Consulting (South Africa) (Pty)Ltd

REPORT COMPILATION

REPORT COMPILED BY:

Natasha Smyth

REPORT REVIEWED BY:

Edward Perry

BASIS OF REPORT

This document has been prepared by an SLR Group company with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with **Khwara Manganese (Pty) Ltd** (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment. SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

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

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

EXECUTIVE SUMMARY

PROJECT BACKGROUND

Khwara Manganese (Pty) Ltd ("Khwara") proposes to conduct prospecting activities for Iron Ore and Manganese in respect of the Farm Eersbegint 703, Kuruman Registration Division (RD), near Black Rock, in the Joe Morolong Local Municipality, located in the John Taolo Gaetsewe District Municipality, Northern Cape Province. The prospecting activities will include non-invasive and invasive activities. Non-invasive activities will comprise analysing existing core, ground penetrating radar and handheld ground magnetic mapping. Invasive activities would comprise drilling of ten exploration boreholes. The property is 27 km North West of Hotazel. The Regional and Local Settings are presented below as Figure 1 and Figure 2 respectively.

SLR Consulting (South Africa) (Pty) Ltd (SLR), an independent firm of environmental assessment practitioners (EAP's), has been appointed by Khwara to manage the environmental authorisation processes.

SUMMARY OF AUTHORISATION REQUIREMENTS

Prior to the commencement of the proposed project, the following is required:

- An environmental authorisation from the Department of Mineral Resources (DMR) in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA), as amended. The Regulations 982 of 4 December 2014 (Environmental Impact Assessment (EIA) Regulations), as amended. Listed activities in terms of Listing Notice 1 GNR 983 will be triggered as part of the proposed project and as such a Basic Assessment Process (BA) will be followed; and
- A prospecting right from the DMR in terms of Section 16 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002), as amended (MPRDA).

STAKEHOLDER ENGAGEMENT

The stakeholder engagement process commenced prior to the submission of the BAR (Basic Assessment Report) and will be continuous throughout the environmental assessment process. As part of this process, commenting authorities and interested and affected parties (I&APs) will be given the opportunity to submit questions and comments to the project team, and review the background information document (BID) and the BAR. All comments submitted by the commenting authorities and I&APs will be included and addressed in the final BAR.

The initial BAR was distributed for a 30-day comment period from **10 December 2019 to 30 January 2020** in order to provide I&APs with an opportunity to comment on any aspect of the proposed project and the aspects which they want to be covered in the BA process. At the time of distribution of the initial BAR for public review, it was understood that no prospecting related activities would take place within the Kuruman River. Since the distribution of the BAR, it is understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. It follows that prospecting related activities are likely to take place near the Kuruman River. The Kuruman River is located in a Critical Biodiversity Area (CBA), in accordance with local databases. Taking this into consideration, the BAR has been updated to make provision for additional listed activities. As a result of the amendments to the initial BAR, I&APs will be provided with an additional opportunity to review the BAR following the need to apply for additional listed activities.

Copies of the full report will be made available on the SLR website (at https://slrconsulting.com/za/slr-documents/) and at the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Hotazel

Public Library and Kathu Public Library, Black Rock Library. Electronic copies (compact disk) of the report will be made available from SLR, at the contact details provided below.

SLR Consulting (South Africa) (Pty) Ltd
Attention: Clive Phashe

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

Tel: (011) 467 0945
Fax: (011) 467 0978
E-mail:cphashe@slrconsulting.com

IMPACTS AND MANAGEMENT ACTIONS

This section provides a summary of the assessment of the potential impacts of the project and provides measures to prevent or mitigate the impacts, the table below provides a summary of the potential impacts (not ranked in order of importance).

TABLE A – POTENTIAL IMPACT SUMMARY

Aspect	Potential impact	Impact discussion and reference to mitigation measures	Significance	
			Unmitigated	Mitigated
Soil and land capability	Loss of soil resources and land capability through physical disturbance and contamination	Soils play a key role in rehabilitation of disturbed areas and establishing ecosystem functionality. This in turn supports restoring pre-disturbance land uses. Its disturbance and loss should be prevented wherever this is avoidable. Prospecting activities have the potential to damage soil resources through physical disturbance (removal, erosion, compaction) and contamination. Contamination of soil resources would occur through the use and handling of drilling materials and the presence of equipment and machinery on site leaking or spilling hydrocarbons. Additionally, poor waste management practices could result in soil contamination. This could alter the soil composition, negatively impacting on the chemistry of the soils and affecting the use of the soils as part of site rehabilitation during decommissioning. Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the control measures that are planned. Where there are quick reaction times and effective remediation measures applied, the duration and probability of potential impacts reduces. Management actions focus on soil conservation and waste management procedures.	Very low	Insignificant
Biodiversity	General and physical disturbance of biodiversity	Prospecting activities have the potential to destroy biodiversity through physical destruction of habitat and related species which are considered to be significant because of their status, and/or the role that they play in the ecosystem. In addition to this, prospecting activities can also directly disturb vegetation, vertebrates and invertebrates. Without mitigation the impact is expected to have a prominent change to biodiversity habitat and functionality, which can have long terms effects given that the project area is associated with protected trees (Camel Thorn and the Grey Camel Thorn) and areas of high biodiversity importance and sensitivity, particularly along the Kuruman River. Prospecting related activities will require the removal of vegetation as part of site preparation activities and the establishment of access tracks. Prospecting activities can also indirectly impact on the survival of individual plants, vertebrates, and invertebrates. The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground	High	Very low

Aspect	Potential impact	Impact discussion and reference to mitigation measures	Significance	
			Unmitigated	Mitigated
		magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. Prospecting activities could take place within the Kuruman riverbed. Management actions focus on limiting areas of disturbance, avoiding the removal of protected tree species, controlling vehicle movement and implementation of dust control measures.		
Surface water	Alteration of drainage patterns reducing contributions to the catchment	The catchment is large but sparsely vegetated and features freely draining soils which indicates that minor rainfall events would infiltrate to groundwater as opposed to generating significant volumes of runoff. Given this and that each drill site would occupy a relatively small footprint and be of a temporary nature, impacts on the quaternary or local catchment are not expected.	Not applicable	Not applicable
Surface water	Contamination of groundwater resources	Prospecting activities have the potential to contaminate surface water resources. Spills of fuels and lubricants as well as silt runoff and poor waste management could result in contamination of the Kuruman River. Although the location of the boreholes has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. Prospecting activities could take place within the Kuruman riverbed. Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the size of the proposed prospecting activities (provision for the drilling of ten boreholes). Given the drainage patterns of the area and the ephemeral nature of the Kuruman River, the potential for contamination of the Kuruman River is unlikely. Management actions focus on soil management measures and rehabilitation.	Insignificant	Insignificant
Groundwater	Reduction of water availability to third parties through groundwater abstraction	Abstraction of groundwater for prospecting activities has the potential to impact on third-party groundwater users. Where water is sourced from boreholes located on the farm Eersbegint 703, this could affect the water supply of the landowner, where large volumes of water are required, However, it is estimated that a relatively small volume of water (approximately 17 000 litres in total for the duration of drilling at each drill site) would be required. The use of this water would be in consultation and agreement with the landowner. Where water cannot be sourced from boreholes located on the farm, water will be sourced from a nearby town such as Black Rock. Management actions focus on obtaining the necessary General Authorisation for the use of borehole water.	Insignificant	Insignificant

Aspect	Potential impact	Impact discussion and reference to mitigation measures	Significance	
			Unmitigated	Mitigated
Groundwater	Contamination of groundwater	Prospecting activities present potential sources of water contamination. Leakages of fuel or lubricants from prospecting equipment onsite, spillages from the handling of fuel and lubricants, temporary storage of consumables (such as fuels, lubricants) and waste handling and storage (general and hazardous) can result in seepage of contaminants into the groundwater system. Given the nature of prospecting activities, the source of contamination would be temporary; however, the potential contamination could be long-term. Where prospecting takes place near to existing third-party boreholes (used for livestock watering and domestic use), seepage entering the groundwater system could impact on third-party water uses. Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the control measures that are planned. Management actions focus on the implementation of soil management procedures and avoid establishing drill sites close to third party boreholes as far as possible.	Insignificant	No impact
Air quality	Air pollution	Prospecting activities have the potential to contribute to ambient air quality. Site preparation and earthworks could result in air pollution through windblown dust from exposed soils. In addition, vehicle movement along dirt access tracks and the operation of vehicles and machinery (including generator) could result in air pollution from dust and exhaust fumes respectively. The potential for health and nuisance impacts also depends on the wind direction and speed, proximity and sensitivity of receptors and duration of exposure to air pollution sources. Although the location of the drill sites has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River and near to private residences on the adjacent farm Boerdraai 228. Any potential impacts are expected to be of a very short duration and limited to the immediate surrounds of the drilling activities or access tracks. Management actions focus on limiting areas of disturbance to what is absolutely necessary, controlling vehicle speed limits and maintaining equipment in good working order.	Low	Insignificant
Noise	Increase in disturbing noise levels	Prospecting activities have the potential to generate noise through the use of vehicles and machinery and the operation of drill rigs. Prospecting activities will introduce mechanical and vehicle noise sources to an otherwise rural and quiet environment. In the absence of mitigation measures, noise impacts can present a disturbance or be a nuisance to nearby receptors (residence and livestock). Given the relatively small scale	Low	Very low

Aspect	Potential impact	Impact discussion and reference to mitigation measures	Significance	
			Unmitigated	Mitigated
		of the drilling activities, potential impacts are expected to result in a moderate disturbance or nuisance to nearby receptors. Management actions focus on limiting prospecting activities to daytime only and weekdays, limiting vehicle speed and maintaining vehicles in good working order.		
Visual	Negative visual views	Prospecting activities have the potential to alter the visual environment and aesthetics of the site. Prospecting activities will present mechanical structures and activities to an otherwise natural farming landscape characterised by the Kuruman River and open views of the bushveld. Mining related structures do occur in the landscape further south of the proposed project area and the R380 traverses the south western corner of the proposed project area. Given the small scale (provision for ten boreholes) of the project, it is not expected that the visual landscape will be materially altered by the proposed project. Management actions focus on limiting the footprint of disturbance, implementing dust control measures and rehabilitation.	Very low	Insignificant
Heritage/cultural and palaeontological resources	Loss of heritage/cultural and Palaeontological resources	Prospecting related activities have the potential to damage heritage, cultural, and palaeontological resources, if present, either directly or indirectly, and result in the loss of the resource for future generations. Numerous heritage/cultural sites from the Stone Age are located on the farm Eersbegint 703. The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. Management actions focus on avoiding heritage/cultural sites. In the event that this is not achievable the necessary permits need to be obtained. It is considered unlikely that any fossils occur in the project area because the rock is too old and volcanic in origin. Management actions focus on chance find procedures.	Very High	Insignificant
Socio-economic	Inward migration and economic impact	In the broadest sense, prospecting projects contribute towards a positive economic impact through direct benefits derived from wages and taxes. Given that prospecting forms part of exploration, no profits would be derived from the activities. Indirect benefits would be derived through the procurement of goods and services (albeit limited), and the increased spending power of employees. Positive economic impacts have the potential to improve the livelihoods of people benefiting from the project and	Medium positive	Medium positive

Aspect	Potential impact	Impact discussion and reference to mitigation measures	Significance	
			Unmitigated	Mitigated
		contribute to the development and status of a region. Given the relatively small scale and temporary nature of the proposed prospecting activities, and where mitigations measures are applied, negative economic loss associated with existing land uses is not anticipated. Inward migration is not expected as a result of the proposed project and therefore related social ill impacts are not expected. Management actions focus on using local contractors and procurement of local goods and services.		
Land use	Change in land use	Prospecting related activities have the potential to affect land uses both within the project area and in the surrounding areas. This can be caused by physical land transformation and through direct or secondary impacts. The farm Eersbegint 703 is utilised for cattle grazing. In addition to this the owner of the farm resides on the property along with farm workers. Prospecting related activities have the potential to impact on land uses within the project area through the following activities: • Presence of infrastructure that could be hazardous to people and animals; • Noise generation from drilling activities; • Generation of dust; • Visual disturbance; and • Temporary loss of grazing land for the establishment of the drill sites however, this will be limited in extent. Land uses surrounding the project area; on adjacent farms include a combination of isolated farmsteads, a guesthouse facility, and cattle grazing. Prospecting related activities have the potential to impact on these land uses because of impacts from noise, dust generation and negative visual views. Management actions focus on compensation for loss of agricultural land, fencing off each drill site for the safety of cattle and third parties, no contractors residing on property, agreement of state of rehabilitation with landowner and consultation of borehole placement with landowner.	Medium	Insignificant

ENVIRONMENTAL STATEMENT

The assessment of the proposed project presents the potential for negative impacts to occur (in the unmitigated scenario in particular) on the biophysical, cultural and socio-economic environments both on the project site and in the surrounding area. With management actions these potential impacts can be prevented or reduced to acceptable levels.

It follows that provided the Environmental Management Programme (EMPr) is effectively implemented there is no biophysical, social or economic reason why the project should not proceed.

CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
AIP	Alien Invasive Plant
APM	Archaeological, Palaeontological and Meteorites Unit
BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Area
CR	Critically Endangered
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries
DMR	Department of Mineral Resources
DWAF	Department of Water and Forestry
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMF	Environmental Management Framework
EMPr	Environmental Management Programme Report
EN	Endangered
ESA	Ecological Support Area
ESO	Environmental Site Officer
FEPA	Freshwater Ecosystem Priority Area
GA	General Authorisation
GNR	Government National Regulation
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HC	Hydrocarbons
HDPE	High-density polyethylene
I&AP	Interested and Affected Party
IBA	Important Bird Areas
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature

Acronym / Abbreviation	Definition
Khwara	Khwara Manganese Mine (Pty) Ltd
LDV	Light Duty Vehicle
mamsl	meters above mean sea level
MAP	Mean Annual Precipitation
mbgl	Meters below ground level
MPRDA	Mineral and Petroleum Regulation Development Act (Act 28 of 2008)
MRA	Mining Right Area
NCDENC	Northern Cape Department of Environment and Nature Conservation
NCNCA	Northern Cape Nature Conservation Act (Act 9 of 2009)
NCPSPF	Northern Cape Provincial Spatial Development Framework
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NFA	National Forest Act (Act 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area
NPAES	National Protected Area Expansion Strategy
P	Protected
PES	Present Ecological State
PRECIS	Pretoria Computer Information Systems
PVC	Poly Vinyl Chloride
QDS	Quarter Degree Square
RD	Kuruman Registration Division
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SLR	SLR Consulting (South Africa) (Pty) Ltd
VU	Vulnerable

INTRODUCTION

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

PROJECT BACKGROUND

Khwara Manganese (Pty) Ltd ("Khwara") proposes to conduct prospecting activities for Iron Ore and Manganese in respect of the Farm Eersbegint 703, Kuruman Registration Division (RD), near Black Rock, in the Joe Morolong Local Municipality, located in the John Taolo Gaetsewe District Municipality, Northern Cape Province. The prospecting activities will include non-invasive and invasive activities. Non-invasive activities will comprise analysing existing core, ground penetrating radar and handheld ground magnetic mapping. Invasive activities would comprise drilling of ten exploration boreholes. The property is 27 km North West of Hotazel. The Regional and Local Settings are presented below as Figure 1 and Figure 2 respectively.

SLR, an independent firm of Environmental Assessment Practitioners EAPs, has been appointed by Khwara to manage the environmental authorisation processes.

PURPOSE OF THIS REPORT

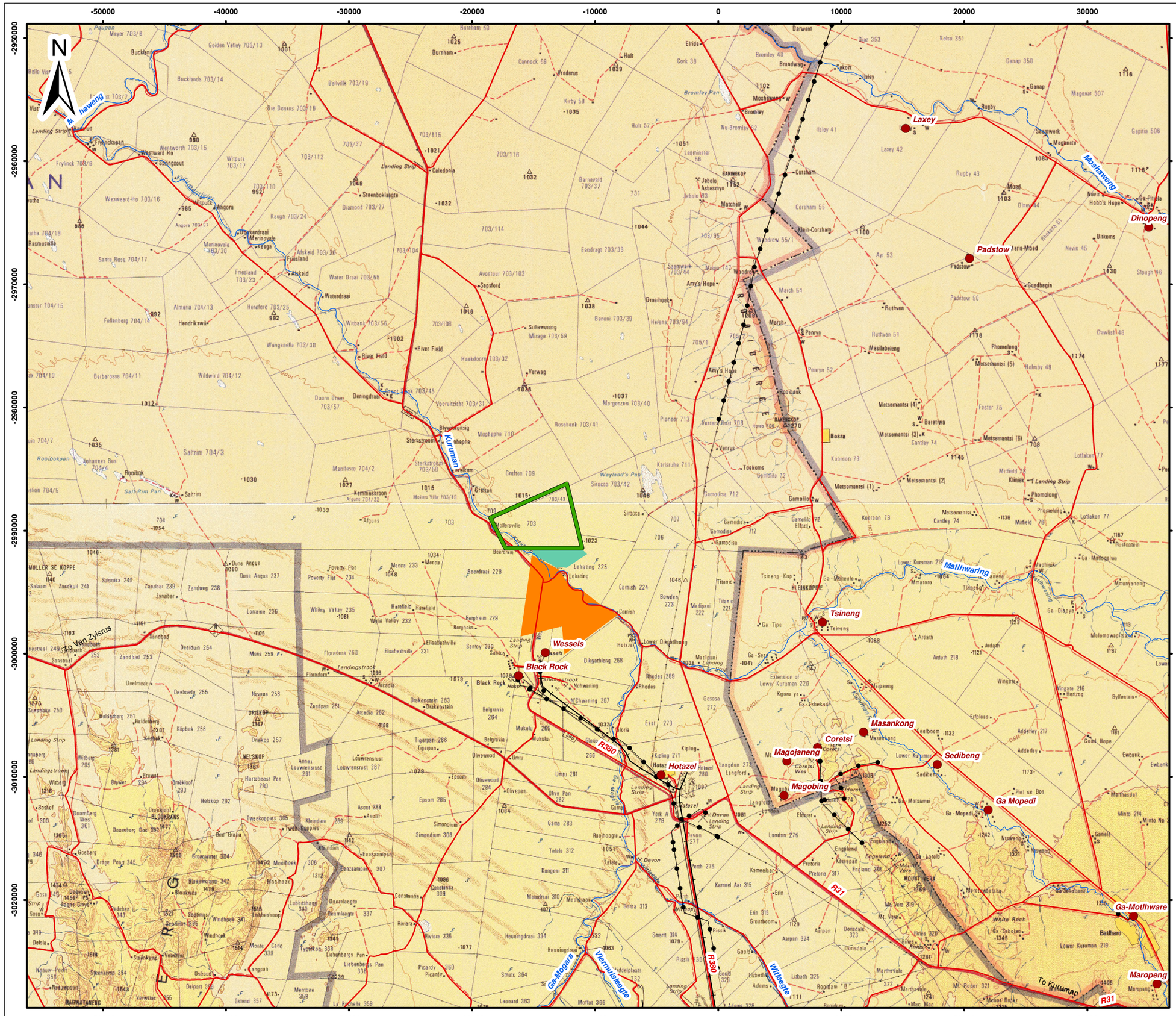
This Basic Assessment Report (BAR) has been compiled and distributed for review and comment as part of a Basic Assessment (BA) process that is being undertaken for the application of a prospecting right in respect of the farm Eersbegint 703, Kuruman RD.

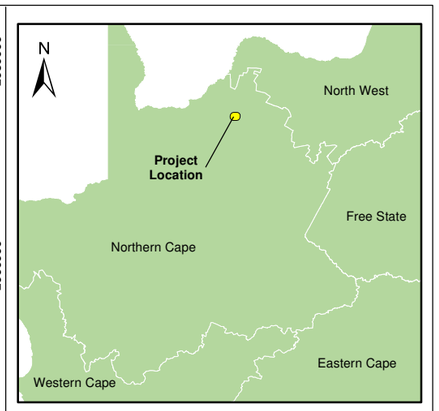
This BAR provides a description of the proposed project and the affected environment, summarises the BA process followed to date, identifies and assesses the key project impacts and presents management and mitigation measures that are recommended to enhance positive and limit negative impacts. Interested and Affected Parties (I&APs) are asked to comment on the BAR. The document will then be updated into a final report, giving due consideration to the comments received. The BAR will be submitted to the DMR for consideration as part of the application for an Environmental Authorisation in terms of Chapter 5 of the NEMA (No. 107 of 1998), as amended.

SUMMARY OF AUTHORISATION REQUIREMENTS

Prior to the commencement of the proposed project, the following is required:

- An environmental authorisation from the DMR in terms of the NEMA, as amended. The Environmental Impact Assessment (EIA) Regulations being followed are GNR 982 of 4 December 2014, as amended. Listed activities in terms of Listing Notice 1 GNR 983 will be triggered as part of the proposed project and as such a Basic Assessment Process will be followed; and
- A prospecting right from the DMR in terms of Section 16 of the MPRDA.





Legend

- Towns
- Railway
- Powerline
- Roads
- Rivers
- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*

** (Still to be Developed)*

0 1.5 3 6 9 Km

Scale: 1 : 300 000 @ A3

Projection: Transverse Mercator

Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

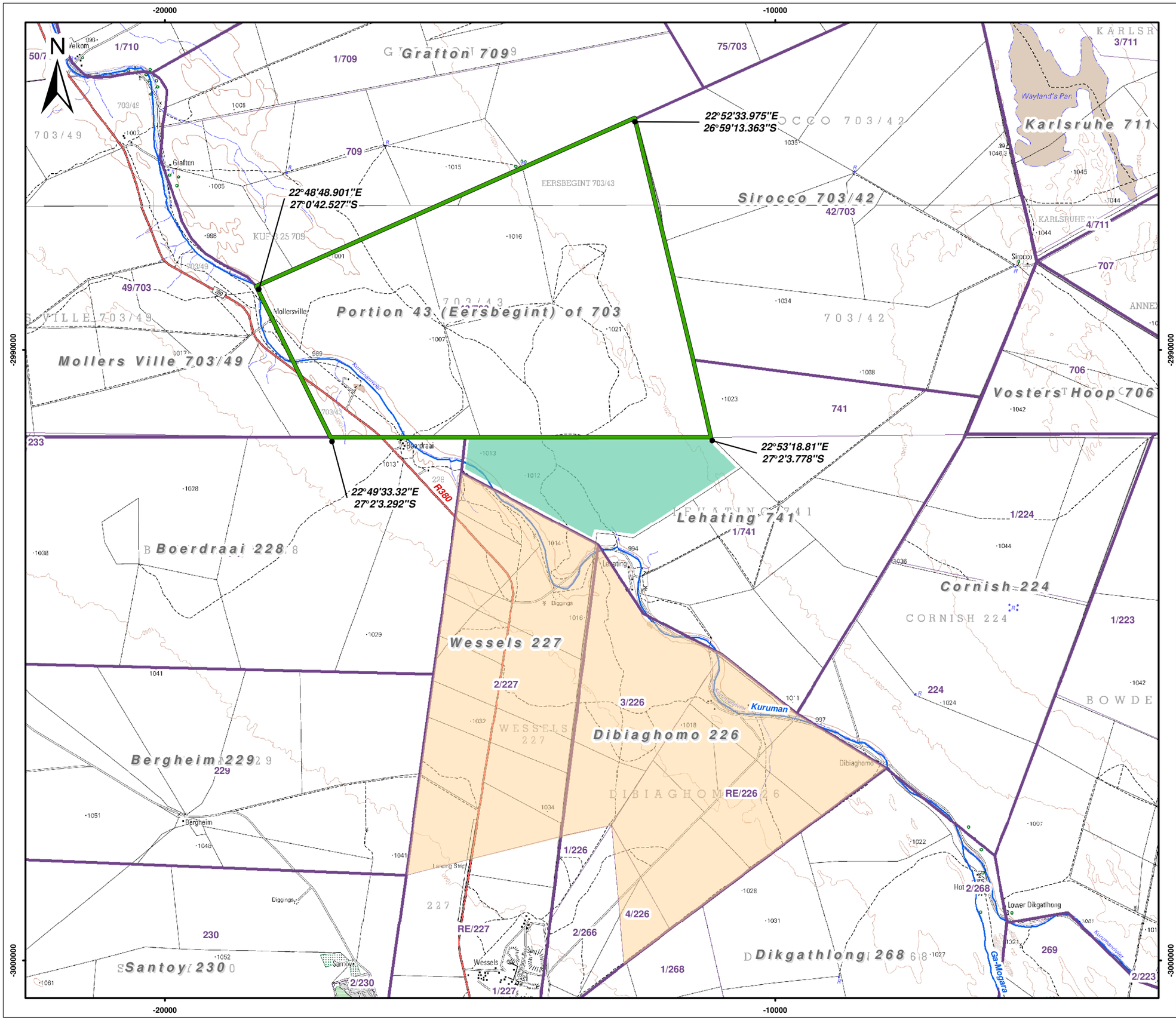
Figure 1

Regional Setting

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

720.11033.00002

2019/12/03



Legend

- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Main Roads
- Rivers and Streams
- 20m Contour Lines
- Farm Boundaries
- Farm Portions

* *(Still to be Developed)*

0 1 2 Kilometers

Scale: 1 : 63 360 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

Figure 2

Local Setting

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

720.11033.00002 | 2019/12/03

TERMS OF REFERENCE

SLR, as the independent EAP, is responsible for undertaking the required environmental regulatory process and conducting the public participation process. The terms of reference for the environmental regulatory process are to:

- Make an application for the Environmental Authorisation of the proposed project in terms of NEMA and the MPRDA;
- Ensure the BA process is undertaken in accordance with the requirements of NEMA, EIA Regulations 2014, and MPRDA;
- Ensure the BA is undertaken in an open, participatory manner to ensure that all potential impacts are identified;
- Undertake a formal 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 all BA documentation; and
- Integrate all the information, including the findings of the specialist studies (where relevant) and other relevant information, into a BAR to allow an informed decision to be taken on the proposed project.

Further to this and in accordance with Appendix 1 of the EIA Regulations 2014 (as amended) and the DMR reporting requirements, the key objectives of this BA process are to:

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with, and responds to, the policy and legislative context;
- Identify the alternatives considered (if any), including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts, which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within the sites, and the risk of impact of the proposed activity, and technology alternatives on these aspects to determine:
  - The nature, significance, consequence, extent, duration, and probability of the impacts occurring; and
  - The degree to which these impacts can be reversed, may cause irreplaceable loss of resources, or can be avoided, managed or mitigated.
- Through the ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites to:
  - Identify and motivate a preferred site, activity, and technology alternative;
  - Identify suitable measures to avoid, manage, or mitigate identified impacts; and
  - Identify residual risks that need to be managed and monitored.

OPPORTUNITY FOR COMMENT

The initial BAR was distributed for a 30-day comment period from **10 December 2019 to 30 January 2020** in order to provide I&APs with an opportunity to comment on any aspect of the proposed project and the aspects which they want to be covered in the BA process. At the time of distribution of the initial BAR for public review, it was understood that no prospecting related activities would take place within the Kuruman River. Since the

distribution of the BAR, it is understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. It follows that prospecting related activities are likely to take place near the Kuruman River. The Kuruman River is located in a critical biodiversity area, in accordance with local databases. Taking this into consideration, the BAR has been updated to make provision for additional listed activities. As a result of the amendments to the initial BAR, I&APs will be provided with an additional opportunity to review the BAR following the need to apply for additional listed activities.

Copies of the full report are available on the SLR website (at https://slrconsulting.com/za/slr-documents/) and at the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Hotazel Public Library, Kathu Public Library, and Black Rock Library. Electronic copies (compact disk) of the report are available from SLR, at the contact details provided below.

All comments and issues received during the review process will be addressed in the BAR submitted to the DMR for decision-making.

SLR Consulting (South Africa) (Pty) Ltd
Attention: Clive Phashe

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

Tel: (011) 467 0945
Fax: (011) 467 0978
E-mail: cphashe@slrconsulting.com

PART A - SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. DETAILS OF THE EAP

1.1 DETAILS OF THE EAP WHO PREPARED THE REPORT

The details of the EAPs that were involved in the preparation of this BAR are provided in Table 1 below.

TABLE 1: DETAILS OF THE EAP

Details	Author	Project manager	Reviewer
Name of the practitioner	Clive Phashe	Natasha Smyth	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	cphashe@slrconsulting.com	nsmyth@slrconsulting.com	eperry@slrconsulting.com

SLR does not have any interest in the proposed project other than fair payment for consulting services rendered as part of the EIA process. An undertaking by SLR is provided in Appendix 1.

1.2 EXPERTISE OF THE EAP

1.2.1 SLR PROJECT TEAM

Natasha Smyth holds a BSc Honours degree in Geography and Environmental Management and has approximately ten years of relevant experience (curriculum vitae attached in Appendix 1).

Clive Phashe holds a BSc Honours degree in Environmental Management and has over two years of relevant experience (curriculum vitae attached in Appendix 1).

Edward Perry holds an MSc degree in Applied Hydrobiology and he has worked in environmental consultancy for over twenty years for a wide range of public and private sector clients (curriculum vitae attached in Appendix 1).

Both Natasha Smyth and Edward Perry have been involved in several impact assessments for large scale mining developments in Southern Africa.

2. LOCATION OF ACTIVITY

2.1 LOCATION OF OVERALL ACTIVITY

A description of the property on which the proposed project is located is provided in Table 2 below.

TABLE 2: DESCRIPTION OF THE PROPERTY

Description	Details
Farm Names	Portion 43 (Eersbegint) of Farm 703
Application area (ha)	Approximately 1 ha
Magisterial district	The project area is located within the Kuruman Magisterial District and in the John Taolo Gaetsewe District Municipality.
Distance and direction from nearest town	The proposed project site is located approximately 27 km north west of the town Hotazel (Refer to Figure 1).
21-digit Surveyor General Code for each farm portion	C04100000000070300043
Co-ordinates:	North western corner: 22°52'33.975"E and 26°59'13.363"S South eastern corner: 22°53'18.81"E and 27°2'3.778"S South western corner: 22°49'33.32"E and 27°2'3.292"S North eastern corner: 22°52'33.975"E and 26°59'13.363"S

2.2 LOCALITY MAP

The regional and local settings are illustrated in Figure 1 and Figure 2, respectively.

3. DESCRIPTION OF THE SCOPE OF THE ACTIVITY

3.1 LISTED AND SPECIFIED ACTIVITIES

The proposed project triggers various activities for which authorisations are required in terms of the NEMA and the MPRDA. The associated listed or specified activities are summarised in the table below. The legislative context pertaining to the relevant listed and specified activities is outlined in Section 4.

At the time of distribution of the initial BAR for public review, it was understood that no prospecting related activities would take place within the Kuruman River. Since the distribution of the BAR, it is understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. It follows that prospecting related activities are likely to take place near the Kuruman River. The Kuruman river is located in a Critical Biodiversity Area (CBA), in accordance with local databases. Taking this into consideration, the BAR has been updated to make provision for additional listed activities. These additional listed activities are included in blue text in the table below.

TABLE 3: PROJECT ACTIVITIES AND ASSOCIATED LISTED ACTIVITIES

Description of the proposed project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice and activity description
National Environmental Management Act (No. 107 of 1998), as amended			
Non-invasive activities (see Table 4 for details).	Not applicable	Not applicable	Not applicable
Invasive prospecting activities (see Table 4 for details).	Approximately 1 ha	X	**NEMA: GNR 983 Listing Notice 1: Activity 20** - Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including - a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource.
	Approximately 1 ha	X	**NEMA: GNR 983 Listing Notice 1: Activity 12 -** The development of - (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs - (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.
	Approximately 1 ha	X	**NEMA: GNR 983, Listing Notice 1: Activity 27** - The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.
	Approximately 1 ha	X	**NEMA: GNR 985 Listing Notice 3: Activity 12** – The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan:

Description of the proposed project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice and activity description
			i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.
	Approximately 1 ha	X	**NEMA: GNR 985 Listing Notice 3: Activity 14** - The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse: Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves;

Description of the proposed project activity	Aerial extent of the activity (ha)	Listed activity (mark with an x)	Listed activity number, applicable listing notice and activity description
			(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.
Decommissioning activities (Table 4 for details).	Approximately 1 ha	X	**NEMA: GNR 983, Listing Notice 1: Activity 22 -** The decommissioning of any activity requiring a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

3.2 DESCRIPTION OF THE ACTIVITIES

This section has been compiled using information provided by the Khwara project team.

3.2.1 PROPOSED PROJECT OVERVIEW

The project will include invasive and non-invasive activities. Non-invasive activities comprise analysing existing core, usage of ground penetrating radar (while traversing the site) and hand-held ground magnetic mapping to provide some detail of the geological structures. Once the non-invasive activities have been completed, the location of the prospecting boreholes (invasive activities) can be sited. It is envisaged that ten prospecting holes will be drilled. The facilities and activities that are required at each of the prospecting drill sites during the construction, operation and decommissioning phases are tabulated below (Table 4).

It is understood that the ore body is anticipated to be towards the south eastern section of the farm Eersbegint 703 near the Kuruman River.

TIMING

Non-invasive activities are anticipated to take approximately 12 months to complete. Invasive activities will be undertaken over a two-year period.

For each drill site the following timing is anticipated:

- Approximately two days to prepare the drill site. This includes activities associated with site preparation (refer to Table 4 below), earth works (refer to Table 4 below), and the establishment of temporary ablution and waste management facilities;
- An average of one month to drill one prospecting borehole to a depth of 300m; and
- Approximately two days to remove equipment and undertake rehabilitation activities at each drill site.

A period of two to three years is usually applied for maintenance and aftercare activities at each drill site (refer to Table 4 below). This would also apply to any access tracks that are created on the farm.

CONTRACTORS AND ACCOMMODATION

It is anticipated that two separate contractors will form part of the drilling team. In this regard, the contractor responsible for the actual drilling will comprise of a team of five individuals. The second contractor will include two geologists. It is important to note that no contractors will reside on the farm for the duration of the prospecting activities. Local contractors will be utilised as far as possible, and therefore it is anticipated that contractors will have their own accommodation.

OPERATION HOURS

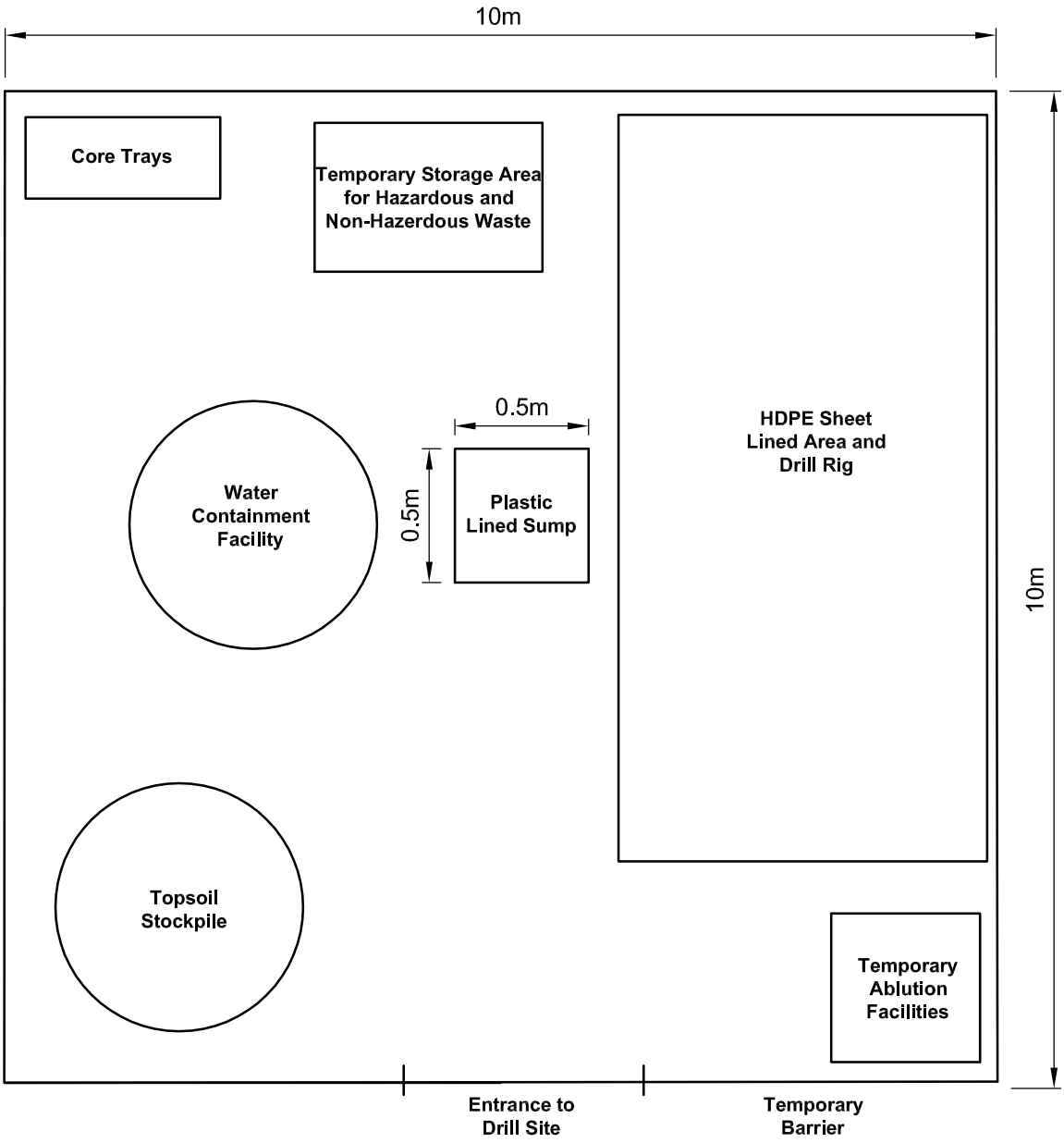
Drilling will only take place during daytime hours and only on weekdays.

TABLE 4: LIST OF PROPOSED PROJECT ACTIONS / ACTIVITIES / PROCESSES TO BE UNDERTAKEN FOR EACH DRILL SITE

Main activity/ process	Sub-activities	Construction Phase	Operation Phase	Decommissioning Phase	Closure Phase
Site preparation	• Vegetation clearing (where required) in accordance with the Department of Agriculture, Forestry and Fisheries (DAFF) guidelines.	At start			
	• The demarcation of the prospecting site.	At start			
	• Erecting fencing.	At start			
Earthworks	• Establishment of a temporary access track.	At start			
	• Excavate water sump, stockpile soil and line with Poly Vinyl Chloride (PVC).	At start			
Prospecting	• Drilling (percussion and diamond core) using drill rig with High-density polyethylene (HDPE) sheet lined area. Drilling will take place to a depth of 300m.		On-going		
	• Log core and place on core trays.		On-going		
	• Send core samples to laboratory for testing.		On-going		
Waste management (general and hazardous waste)	• Establishment and use of temporary ablution facilities for contractors.	At start	On-going	On-going	
	• Empty temporary ablution facilities using contractors. This will be undertaken on a monthly basis.	As required	As required	As required	
	• Collection and temporary storage of general and hazardous waste in suitable containers, stored on an impervious floor with appropriate bunding in case of a leak or spill.	On-going	On-going	On-going	
	• Removal of waste by contractor and return to supplier or disposed of at an appropriately licenced waste disposal site. Waste will be removed daily.	As required	As required	As required	

Main activity/ process	Sub-activities	Construction Phase	Operation Phase	Decommissioning Phase	Closure Phase
Water use and management	• Use of water that is trucked to the drill site with water bowsers. This water will be sourced either from boreholes located on the farm or from a nearby town such as Black Rock.		As required		
	• It is anticipated that a total of 17 000 litres will be required for the drilling at each borehole. This water is stored in the sump and re-cycled in the drilling system.				
	• Contain all drilling water in the PVC lined sump and allow settling – using biodegradable drilling oils.		On-going		
Generator use	• Power will be sourced from a generator mounted to the drill rig.		On-going		
Storage of consumables	• Storage of consumables in dedicated containers on an impervious floor, with containment measures.		On-going		
Transport	• Transport of contractor, equipment and supplies to site. In this regard the following applies: ○ Drilling contractor – One LDV vehicle per day transporting drilling employees and removing waste; ○ Geologist – One LDV vehicle per day; ○ Drill rig – Remains on-site until the drilling is complete, after which it will be moved to the next drill site; and ○ One water bowser – Required once a week.	As required	On-going		
Support services	• Use of site support services such as access and security control and maintenance of security barrier around drill site.		On-going	On-going	
	• Site management activities such as monitoring, inspections, maintenance and continued environmental awareness training and emergency response training.		On-going	On-going	On-going

Main activity/ process	Sub-activities	Construction Phase	Operation Phase	Decommissioning Phase	Closure Phase
	• No maintenance activities will take place on site unless in the case of an emergency. Existing facilities in the nearest town will be used.		As required	As required	As required
Removal of equipment and structures	• Remove oils and silt from PVC lined sump and HDPE sheet lining and dispose of it at an appropriately licenced facility. • Remove water from the sump and dispose of it at an appropriately licenced facility. • Cap, cover and demarcate borehole in consultation with landowner. • Remove structures, equipment and drill rig from the site. • Remove site demarcation.			At end of drilling	
Rehabilitation	• Backfill the sump once it has dried out (dome to allow for subsidence). • Rip and plough compacted areas. • Replace soil over disturbed area. • Re-vegetate disturbed area (where necessary). • Rehabilitate access track in consultation with landowner.			On-going	
Maintenance and aftercare (2 to 3-year period usually applied)	• Monitoring of rehabilitated drill sites and access tracks. • Removal of alien invasive species in areas that have been cleared of vegetation. • Monitor and maintain rehabilitated areas.				As required



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

	CONCEPTUAL LAYOUT OF A DRILLING SITE	08/20019 720.11033.00002	FIGURE 3

4. POLICY AND LEGISLATIVE CONTEXT

This chapter outlines the key legislative requirements applicable to the proposed project and outlines the guidelines, policies and plans that have been taken into account during the BA process.

4.1 LEGISLATIVE CONSIDERATION IN THE PREPARATION OF THE BASIC ASSESSMENT REPORT

In accordance with the EIA Regulations 2014 (as amended) and the DMR BAR template requirements, all legislation and guidelines that have been considered in the BA process must be documented. Table 5 below provides a summary of the applicable legislative context.

TABLE 5: LEGAL FRAMEWORK

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context?
Mineral and Petroleum Resources Development Act (No. 28 of 2002), as amended	Introduction	An outline of the legislation
National Environmental Management Act (No. 107 of 1998), as amended	Introduction, Section 3.1 and Section 4.1.2	The proposed project incorporates activities listed in Government Notice Regulation (GNR) 983 (Listing Notice 1 and Listing Notice 3; as amended) (refer to Table 3). Since the proposed project includes activities listed in Listing Notice 1 and Listing Notice 3, a Basic Assessment Report is required in order for the DMR to consider the application for environmental authorisation.
Regulations 982 of 4 December 2014 (EIA Regulations), as amended		
Northern Cape Critical Biodiversity Areas (2016)	Section 7.4.1.4	Biodiversity was taken into account as part of project planning and in the assessment of potential impacts.
National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA, 2015)		
National Freshwater Ecosystem Priority Area (NFEPA)		
National Biodiversity Assessment (2011)		
National Threatened Ecosystems (2011)		
National Protected Area Expansion Strategy (2009) and the South African Protected Area Database (2016)		
Important Bird Areas (2015)		
Mining and Biodiversity guidelines (2013)		
Griqualand West Centre of Endemism		

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context?
Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA)	Section 26	Obtain a fauna permits in terms of the Northern Cape Nature Conservation Act. No. 9 of 2009 if necessary, for the removal of common indigenous provincially protected and specially protected plant species. A Fauna Permit may be required for felling of trees with active bird nests.
National Forest Act No. 84 of 1998 (NFA)		Obtain protected tree permits from the National Forest Act No. 84 of 1998, if required, prior to destroying or damaging any protected species.
National Heritage Resource Act (No. 25 of 1999)	Section 7.4.1.10, Appendix 3 and **Error! Not a valid result for table.**	Heritage/cultural and palaeontological resources were taken into account as part of project planning and in the assessment of potential impacts.
National Water Act (No. 36 of 1998)	Appendix 3	Where drilling activities take place within the regulated area of the Kuruman River, the necessary General Authorisation will be applied for and obtained prior to drilling commencing. In addition to this, the abstraction of groundwater from boreholes needs to be generally authorised.

4.1.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 AND REGULATIONS (NO. 28 OF 2002)

The MPRDA (No. 28 of 2002), as amended governs the acquisition, use and disposal of 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 on the application of mining, prospecting and closure rights. The DMR 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.

Section 16 of the MPRDA governs the issuing of a prospecting right. Any person who wishes to apply to the Minister for a prospecting right must simultaneously apply for an environmental authorisation and must lodge the application. In this regard, the holder of a prospecting right remains responsible for any environmental liability, pollution, ecological degradation, the pumping and treatment of extraneous water, compliance to the conditions of the environmental authorisation and the management and sustainable closure thereof. Section 20

of the MPRDA states that the holder of a prospecting right may only remove and dispose, for his or her own account, any mineral found by such holder in the course of prospecting operations conducted pursuant to such prospecting right in such quantities as may be required to conduct tests on it or to identify or analyse it.

Upon the lapsing, abandonment or cancellation of the right the holder of a prospecting right must apply for a closure certificate.

4.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998

The NEMA (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 it is a requirement that decisions must take into account 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, 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 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 an EA has been obtained from the competent authority. Such an EA, 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 an EA. The BA 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 triggers activities in terms of Listing Notice 1 (see Table 3) and therefore a BA process is required in order for the DMR to consider the application in terms of NEMA.

4.2 GUIDELINES, POLICIES, PLANS AND FRAMEWORKS

The guidelines, policies and plans listed in Table 6 have been taken into account during the BA process and as part of specialist studies, where applicable.

TABLE 6: GUIDELINE AND POLICY FRAMEWORK

Guideline	Governing body	Relevance
Public participation guideline in terms of NEMA (2017)	Department of Environmental Affairs (DEA)	The purpose of this guideline is to ensure that an adequate public participation process is undertaken during the BA process.
Guideline on need and desirability (2017)	DEA	This guideline informs the consideration of the need and desirability aspects of the proposed project.
Planning for Integrated Mine Closure: toolkit; International Council on Mining and Metals.	International Council on Mining and Metals	This toolkit aims to assist in making decisions based on consideration of closure aspects in a holistic manner.
Joe Morolong Local Municipal Integrated Development Plan (IDP) 2016	Joe Morolong Local Municipality	The Joe Morolong Local Municipality IDP is the principle strategic instrument guiding all planning, management, investment, and development within the province in order to provide best solutions towards sustainable development.
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 cognisance 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 throughout the province.

4.3 LEGISLATIVE BAR REQUIREMENTS

This document has been prepared in accordance with the DMR BAR template format and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the MPRDA. This report also complies with the requirements of the NEMA and Appendix 2 and Appendix 4 of EIA Regulations 2014, as amended (GNR 982).

Table 7 provides a summary of the requirements, with cross references to the report sections where these requirements have been addressed.

TABLE 7: STRUCTURE OF THE BAR

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
Part A of DMR report template	**Appendix 2 of the NEMA regulations, as amended**	**Section/Appendix**
Details of the EAP.	Details of the EAP who prepared the report.	Section 1.1.
Expertise of the EAP.	Details of the expertise of the EAP, including curriculum vitae.	Section 1.2.

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
Location of overall activity.	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 required information is not available, the coordinates of the boundary of the property or properties.	Section 2
Locality plan.	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure 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 2
Description of the scope of the proposed overall activity.	A description of the scope of the proposed activity, including all listed and specified activities triggered. A description of the activities to be undertaken, including associated structure and infrastructure.	Section 3
Policy and legislative context.	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.	Section 4
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 5
Motivation for the overall preferred site, activities and technology alternative.	A motivation of the preferred development footprint within the approved site.	Section 6
A full description of the process followed to reach the proposed development footprint within the site.	A full description of the process followed to reach the proposed development footprint within the approved site.	Section 7
Details of the development footprint alternatives considered.	Details of all the alternatives considered.	Section 7.1
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 7.2
Summary of issues raised by I&APs.	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 7.3
Environmental attributes associated with the alternatives.	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage, and cultural aspects.	Section 7.4

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts including the degree of the impacts.	The impacts and risks identified, 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, or can be avoided, managed, and mitigated.	Section 7.5
Methodology used in determining the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.	The methodology used in determining and ranking the nature, significance, consequences, extent, duration, and probability of potential environmental impacts and risks.	Section 7.6
The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternative will have on the environment and the community that may be affected.	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 7.7
The possible management actions that could be applied and the level of risk.	The possible management actions that could be applied and level of residual risk.	Section 7.8
Motivation where no alternative sites were considered.	The outcome of the site selection matrix. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.	Section 7.9
Statement motivating the alternative development location within the overall site.	A concluding statement indicating the preferred alternatives, including preferred location within the approved site.	Section 7.10
Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout) through the life of the activity.	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structure and infrastructure will impose on the preferred location through the life of the activity including a description of all environmental issues and risks that were identified during the environmental impact assessment process and an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of management actions.	Section 8
Assessment of each identified potentially significant impact and risk.	An assessment of each identified potentially significant impact and risk including cumulative impacts, the nature, significant and consequence of the impact and risk, the extent and duration of the impact and risk, the probability of the impact and risk occurring, the degree to which the impact can be reversed, the degree to which the impact	Section 9

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
	and risk may cause irreplaceable loss of a resources and the degree to which the impact and risk can be mitigated.	
Summary of specialist reports.	Where applicable the summary of the findings and recommendations of any specialist report complying with Appendix 6 of these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.	Section 10
Environmental impact statement.	An environmental impact statement which contains a summary of the key findings of the environmental impact assessment, a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	Section 11
Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr.	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	Section 12
Aspects for inclusion as conditions of authorisation.	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 13
Description of any assumptions, uncertainties and gaps in knowledge.	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and management actions proposed.	Section 14
Reasoned opinion as to whether the proposed activity should or should not be authorised.	Reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 15
Period for which environmental authorisation is required.	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	Section 16
Undertaking.	An undertaking under oath or affirmation by the EAP in relation to the correctness of the information provided in the reports, the inclusion of comments and inputs from stakeholders and I&APs, the inclusion of inputs and recommendations from the specialist reports where relevant and any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by interested or affected parties.	Section 17

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
Financial provision.	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	Section 18
Specific information required by the competent authority.	Any specific information required by the competent authority.	Section 19
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 20
Part B of the DMR report template	**Appendix 4 of the NEMA regulations**	**Section/Appendix**
Details of EAP.	Details of the EAP who prepared the EMPr and the expertise of that EAP to prepare the EMPr, including curriculum vitae.	Section 21
Description of the aspects of the activity.	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 22
Composite map.	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.	Section 23
Description of impact management objectives including management statements.	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including planning and design, pre-construction activities, construction activities, rehabilitation of the environment after construction and where applicable post closure; and where relevant, operation activities.	Section 24 Section 24.1
Impacts to be mitigated in their respective phases.	-	Section 24.6
Impact management outcomes.	A description and identification of impact management outcomes required for the aspects contemplated in paragraph.	Section 25
Impact management actions.	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes be achieved, and must, where applicable, include actions to avoid, modify, remedy, control, or stop any action, activity, or process which causes pollution or environmental degradation; comply with any prescribed environmental management standards or practices; comply with any applicable	Section 26
Financial provision.		Section 27

BAR requirement as per the DMR template	BAR requirements as per the 2014 NEMA regulations, as amended	Reference in this BAR
	provisions of the Act regarding closure, where applicable comply with any provisions of the Act regarding financial provisions for rehabilitation.	
Mechanism for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon.	The method of monitoring the implementation of the impact management actions.	Section 28
	The frequency of monitoring the implementation of the impact management actions.	
	An indication of the persons who will be responsible for the implementation of the impact management actions.	
	The time periods within which the impact management actions must be implemented.	
	The mechanism for monitoring compliance with the impact management actions.	
	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	
Frequency of Submission of Performance Assessment Report	-	Section 28.2
Environmental Awareness Plan.	An environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work; and risks must be dealt with in order to avoid pollution or the degradation of the environment.	Section 29
Specific information required by the competent authority.	Any specific information that may be required by the competent authority.	Section 30
Undertaking.	-	Section 31

5. NEED AND DESIRABILITY OF THE PROJECT

The DEA guideline on need and desirability (GNR 891, 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 – and 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 will need to provide information as to how the development will address the socio-economic impacts of the development, and whether any socio-economic impact resulting from the development impact 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 BAR, the concept of "need and desirability" relates to, amongst others, the nature, scale and location of development being proposed, as well as the wise use of land.

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

- In a South African context, sustainability (or a sustainable society) implies ecological sustainability. 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 projects. 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 its 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 deviation 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, a BAR 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 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 BAR 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.

5.1 ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

Due to the nature of prospecting projects, impacts on; sensitive biodiversity areas, linkages between biodiversity areas and related species, and the role that they play in the ecosystem, are possible, albeit that they are likely to be limited. As part of the project cognisees of biodiversity sensitivity was taking into account as part of the project. In this regard, numerous national and provincial databases were consulted in order to determine the extent of the biodiversity sensitivity associated with the farm Eersbegtint 703 (refer to Section 7.4.1.4). Based on this desktop research, the Kuruman River area, which is located in the south western section of the project area, is considered sensitive for the following reasons:

- This area is considered to be of Highest Biodiversity Importance according to the Mining and Biodiversity Guidelines. A highest biodiversity importance areas has the highest risk for mining, mining is not legally prohibited in these areas, but where there is a very high risk that due to their potential biodiversity significance and importance to ecosystem services (e.g. water flow regulation and water provisioning) that mining projects will be significantly constrained or may not receive necessary authorisations;
- This area falls within a Critical Biodiversity Area 1 (CBA1). A CBA1 area is deemed an irreplaceable site and the most important areas for conservation. According to the biodiversity land management plan, these areas should be maintained in their natural state; and
- According to the National Freshwater Ecosystem Priority Area (NFEPA) Database the Kuruman River is considered to be in a largely natural condition (River Condition and Present Ecological Sate Class B).

As part of the project cognises of these biodiversity sensitivity areas were taking into consideration and was assessed as outlined in Appendix 3. In this regard, mitigation measures focus on avoiding the loss or disturbance of protected species and rehabilitation of drill sites within the riverbed of the Kuruman River will require monitoring.

5.2 PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

Community/society priorities are officially expressed through public documents including the provincial growth and development strategy and SDF documents. In this regard, the priorities of the Joe Morolong Local Municipality's IDP and the John Taolo Gaetsewe District Municipality's 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. 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 (John Taolo Gaetsewe District Municipality, 2016).

Given the small size of the project, additional employment opportunities and negative project-related socio-economic impacts including inward migration are not expected to occur. As a result, the potential for increased economic benefits due to project activities is expected to be negligible.

5.3 RATIONALE FOR THE PROPOSED PROJECT ACTIVITY

Unemployment is a challenge in the Joe Morolong Local Municipality. Positive results from the prospecting activities i.e. undertaking subsequent mining activities may potentially extend several current direct employment opportunities and may have a positive impact on both indirect businesses and employment. A large percentage of these employment opportunities will benefit the surrounding communities.

6. MOTIVATION FOR THE PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVES

No alternatives were considered. Due to the location of the ore body it is not possible to alter the geographic location of the prospecting right activities. It is however understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. Guidance on the siting of drill sites and related mitigation measures is included in the EMPr.

7. FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE

7.1 DETAILS OF THE DEVELOPMENT FOOTPRINT CONSIDERED

No alternatives were considered. Due to the location of the ore body it is not possible to alter the geographic location of the prospecting right activities. It is however understood that the ore body is anticipated to be towards the south eastern section of the farm Eersbegint 703 near the Kuruman River. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. Guidance on the siting of drill sites and related mitigation measures is included in the EMPr.

7.1.1 THE "NO-GO" ALTERNATIVE

The "no-go" alternative would mean that prospecting activities are not undertaken on the Eersbegint 703 farm. This would mean that the current land use continues, potential impacts associated with the prospecting activities wouldn't be realised and the presence of a potential resource would not be identified.

7.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section describes the public participation process undertaken during the BA process. The public participation process was undertaken in accordance with the requirements of Chapter 6 of Regulations 982 of 4 December 2014 (EIA Regulations), as amended. In addition to this, consideration was also given to the public participation guideline in terms of the NEMA (2017).

7.2.1 PUBLIC PARTICIPATION PROCESS UNDERTAKEN

A public participation process was undertaken to inform the BA process. A record of the public participation process undertaken is outlined in Table 8 below. The purpose of the public participation process was to notify landowners, land users and other key stakeholders of the proposed project and to provide them with opportunity to raise any initial issues or concerns regarding the proposed project.

TABLE 8: PUBLIC PARTICIPATION PROCESS UNDERTAKEN AS PART OF THE BAR

Steps	Detail
Notification of the land claims commissioner	The land claims commissioner was consulted in order to verify if any land claims have been lodged on the farm Eersbegint 703. The proof of correspondence is attached in Appendix 2. The land claims commissioner confirmed that there are no land claims associated with the farm Eersbegint 703.
Project database	A project specific database was compiled utilising databases compiled for the Lehating Mine and Khwara Mine projects conducted by SLR. Landowner, land user, commenting authorities, and other I&AP details were verified through telephonic discussions. A copy of the project database is included in Appendix 2.

Steps	Detail
Background Information Document (BID)	A BID was compiled by SLR and distributed to I&APs and commenting authorities registered on the project database on the 19th November 2019. The BID provides: • Information about the proposed project; • Information about the baseline environment of the proposed project area; • Information about the environmental assessment process (BA Process); • Information regarding possible environmental/cultural impacts; and • Information on how I&APs and commenting authorities can have input into the environmental assessment process. A registration and response form was attached to the BID, which provided an opportunity to register as an I&AP and submit comments on the proposed project. Copies of the BID in English and Afrikaans and the proof of distribution are included in Appendix 2.
Site notices	SLR placed laminated site notices (in English and Afrikaans) at key conspicuous positions in and around the Eersbegint 703 farm, as well as in nearby towns on the 21st of November 2019. Additional site notices were place on 18 February 2020 to inform I&APs of the additional listed activities being applied for including the extended public review period. Photographic proof is included in Appendix 2. A map illustrating the location of the site notices is also included in Appendix 2.
Newspaper advertisements	Block advertisements were placed in the Kathu Gazette and the Kalahari Bulletin on 22 November and 28 November 2019 respectively. Additional advertisements were placed in the Kathu Gazette and the Kalahari Bulletin on 14 December 2019 and 12 December 2019 respectively. These additional advertisements were place in order to inform I&APs of the additional listed activities being applied for. Copies of the adverts are included in Appendix 2.
Public review and commenting authority Review of Basic Assessment Report	The initial BAR was made available for public and commenting authority review for 30 days from 10 December 2019 to 30 January 2020. Summaries of the BAR were made available to all I&APs registered on the I&AP database via email, fax, or post. In addition, I&APs were notified when the BAR was available for review via SMS. In addition to this, electronic copies were made available on the SLR website. Commenting authorities received either an electronic copy or a hard copy of the BAR depending on the commenting authorities' preference. Proof is included in Appendix B. **I&APs have been provided with an additional opportunity to review the BAR following the need to apply for additional listed activities.** Following the public and commenting authority review period, the BAR will be updated to include all comments received during the public review and commenting period. This updated report will be submitted to the DMR for decision making purposes.

7.3 SUMMARY OF ISSUES RAISED BY I&APS

A summary of the issues raised by I&APs including a response is provide in Table 9 below. Comments received during the initial public review period are included in blue text below.

TABLE 9: SUMMARY OF ISSUES RAISED BY I&APS

Interested and affected party	Mark with an X if those who must be consulted were in fact consulted	Date comment received	Issues raised	Response provided	Section and paragraph reference in this report where the issues and or responses were incorporated
Interested Parties					
Mike Halliday	X	28 November 2019	Aquila Steel holds a mining right over an area to the North of Eersbegint and has a prospecting right renewal over several farms south of the mining right area up to and including Eersbegint. This renewal is still pending and has not yet been determined.	This information has been noted and has been incorporated into this BAR. Khwara is aware of the pending prospecting right renewal over Eersbegint and is waiting for further guidance from the DMR.	Section 7.4.2.
Gert Otto	X	12 December 2019 and 07 January 2020	I humbly request information regarding the planned exploration activities for that area as we are interested in supplying cleaning and hygiene facilities as per your notification. Will this be on tender or can we discuss and if so, who can be contacted.	Please note that SLR is not responsible for procurement of services. SLR has been appointed by Khwara to manage an environmental authorisation process in support of a prospecting right application. However, your details will be forwarded to Khwara. In addition to this, you have been included onto the project database as part of the environmental authorisation process and will receive further	Not applicable.
Solly Mohanoe	X	12 December 2019	Lesol Mining and Lubricants would like to register as one of the prospective suppliers with the mine. Kindly assist with the registration process.		Not applicable.

Interested and affected party	Mark with an X if those who must be consulted were in fact consulted	Date comment received	Issues raised	Response provided	Section and paragraph reference in this report where the issues and or responses were incorporated
			NB: Please find our company profile attached to this email, should it be that more information or documents are required don't hesitate to contact us.	information as part of the public participation process.	
Nondwe Khayne (Eskom)	X	21 November 2019	I have just received the attached BID document. Eskom is proposing to build a 132kV powerline from the existing Klipkop substation to the new proposed Lehating substation. Please see the EA/layout attached. The above activity might also have an impact on Klipkop-Lehating project.	The proposed prospecting activities will not influence the Eskom Powerline for the Lehating project.	Not applicable.
		21 November 2019	I have just received the attached BID document. Eskom is proposing to build a 132kV powerline from the existing Klipkop substation to the new proposed Lehating substation. Please see the EA/layout attached. Can you please double check if the above proposed activity will not cause impact on the Lehating project		
Commenting authorities					
Jacoline Mans (DAFF)	X	17 January 2020	The proposed invasive prospecting activities consisting of ten exploration boreholes may impact on protected tree species such as *Vachellia erioloba* and *Vachellia haematoxylon*, known to occur in the vicinity of the study site. Number 4.1 of the report,	Section 4.1 has been updated to make reference to both the NFA and the NCNCA.	Section 4.1

Interested and affected party	Mark with an X if those who must be consulted were in fact consulted	Date comment received	Issues raised	Response provided	Section and paragraph reference in this report where the issues and or responses were incorporated
			table 5 refers to the applicable legislation. The NFA and Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA) was not mentioned. Both Acts may be applicable, due to the potential impacts on protected trees and plants known to occur in the region.		
Jacoline Mans (DAFF)	X	17 January 2020	A Flora Permit may be required under the NCNCA for removal of common indigenous, provincially protected and specially protected plant species, such as *Harpagophytum procumbens*, which was mentioned in the report. In addition, a Fauna Permit may be required for felling of trees with active bird nests.	Section 4.1 and Section 26 have been updated to make specific reference to obtain a fauna permit in terms of the NCNCA if necessary, for the removal of common indigenous provincially protected and specially protected plant species, including a Fauna Permit for felling of trees with active bird nests, if required. Section 4.1 and Section 26 also make reference to obtaining tree removal permits, prior to destroying or damaging any protected species.	Section 4.1 and Section 26
Jacoline Mans (DAFF)	X	17 January 2020	The developer must try to avoid impacts on protected trees, especially for placement of temporary infrastructure. Where it is not possible to avoid protected trees, a Forest Act License and/or Flora Permit must be applied for an obtained prior to destroying or damaging any protected species.		
Jacoline Mans (DAFF)	X	17 January 2020	The study site is adjacent to the Kuruman River. The area is of the Highest Biodiversity Importance according to the Mining and Biodiversity Guidelines. Biodiversity sensitivity information was sources from previous EIA's (for the adjacent still to be constructed	This report specifically assesses the impact relating to prospecting activities, however the need for a biodiversity offset has been noted by Khwara as a requirement that	Not applicable.

Interested and affected party	Mark with an X if those who must be consulted were in fact consulted	Date comment received	Issues raised	Response provided	Section and paragraph reference in this report where the issues and or responses were incorporated
			Khwara Mine) and has not been ground-truthed with specialist input. The south-western portion of the site falls in a Critical Biodiversity Area 1 (CBA 1), with the rest in an Ecological Support Area (ESA) and Other Natural Areas. Kindly note that developments in CBA 1 and CBA 2 may require an offset investigation report as part of the Forest Act License and Flora Permit application processes, should prospecting proceeds to full-scale mining in future.	may be needed should a mining right application be applied for.	
Natasha Higgitt (SAHRA)	X	07 January 2020	The SAHRA Archaeological, Palaeontological and Meteorites (APM) Unit requests that a track-log of the survey conducted as part of the HIA be submitted in a revised report	This information has been included in the revised report as **Error! Not a valid result for table.**.	**Error! Not a valid result for table.**.

7.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

7.4.1 BASELINE ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

The baseline information provided here is aimed at giving the reader perspective on the existing status of the biophysical, socio-economic, and cultural environment.

7.4.1.1 TOPOGRAPHY

The topography of an area determines a number of factors including the flow of surface water, and in many cases, also groundwater; the type of biodiversity and land use; the aesthetic appearance of the area and climatic factors such as wind speeds and direction. Changes to topography through the establishment of prospecting related infrastructure and activities may impact on surface water drainage and visual aspects. To understand the basis of potential impacts, a baseline situational analysis is described below.

DATA SOURCES

Information in this section was sourced from site visits undertaken by the SLR EIA team and the review of topographical data.

RESULTS

The proposed project site is relatively flat and slopes gently south westerly towards the Kuruman River. The elevation of the prospecting right area ranges between 1 009 and 1 046 meters above mean sea level (mamsl). The proposed access road junction with the R380 lies at 1 008 mamsl. The lowest point in the prospecting right area is the Kuruman River channel at 997 mamsl.

CONCLUSION

Prospecting related activities and infrastructure have the potential to alter the topography and the natural state of areas through the placement of infrastructure. It is however important to note, that due to the temporary nature of prospecting related activities and the small area of disturbance, the alteration of natural topography is expected to be very limited.

7.4.1.2 CLIMATE

INTRODUCTION AND LINK TO IMPACT

Various aspects of climate influence the potential for environmental impacts and related project design. Specific issues of relevance to prospecting activities are listed below.

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

An overview of climatic data used to inform the prediction of impacts and planning of mitigation measures is provided below.

DATA SOURCES

Various data sources have been used to illustrate the current climate of the area in which the prospecting activities would take place.

DESCRIPTION

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.

Rainfall

The mean annual precipitation (MAP) for the project area is expected to be in the region of 300 mm/year. The mean annual rainfall measured at the nearby Winton (40 km away) and Milner (17 km away) weather stations ranges between 330 mm and 362 mm respectively. Rainfall is typically in the form of thunderstorms during the summer months of October to March. The peak rainy period occurs between the months of January to March. Rainfall is erratic and may vary significantly from year to year. Monthly average rainfall for each month is presented in Table 10 below.

TABLE 10: SUMMARY OF MONTHLY RAINFALL FOR THE PROJECT AREA

Month	Rainfall (mm)	
	Winton - 392148 w	Milner - 393083 w
January	62.1	66.1
February	61.2	61.4
March	58.0	66.4
April	31.8	35.5
May	13.9	16.1
June	4.2	6.0
July	2.5	1.9
August	4.9	4.2
September	6.2	6.2
October	16.2	19.0
November	25.7	32.0
December	43.3	46.8
Annual	330.1	361.6

Evaporation

The WR2005 (2009) shows an average annual evaporation for the project area of greater than 2118 mm (A-Pan estimate). When converting this to an evaporation estimate for a very shallow body of water (e.g. lake) the

equivalent evaporation estimate is 1375 mm. Monthly evaporation data for the proposed project area is provided in Table 11 below. The data shows that the proposed project area is characterised by high evaporation rates that significantly exceed rainfall rates.

TABLE 11: SUMMARY OF EVAPORATION DATA

Months	Mean monthly a-pan evaporation (mm)	Mean monthly lake evaporation (mm)
January	259.0	169.7
February	208.4	144.9
March	161.3	112.1
April	122.3	83.9
May	113.2	76.8
June	82.5	56.1
July	99.1	63.3
August	131.2	81.8
September	188.5	109.9
October	236.3	135.9
November	243.6	157.8
December	272.7	183.3
Total	**2118.1**	**1375.7**

Temperature

The regional average daily maximum temperature varies between 30 °C and 33 °C in January and in July it is approximately 17 °C. The regional average daily minimum temperature is about 15 °C in January and in July it is roughly 0 °C (SLR, September 2013).

Wind

The prevailing wind direction in the project area is in a north easterly direction with significant winds also blowing from the south east. The strongest winds are in excess of 7 m/s primarily during the autumn. During the summer, autumn and winter months, winds from the north-easterly sector dominates. Calm conditions occur the most during summer and autumn months. In spring, wind flow is predominant from the south-south-easterly and southerly sectors, with an increase in frequencies of occurrence of winds greater than 5 m/s being evident. During autumn, the winds blow less frequently from the westerly and south-westerly sectors than in summer and spring (SLR, September 2013).

CONCLUSION

The project area is characterised by dry seasons with heavy thunderstorms that last for short periods at a time. High evaporation rates reduce infiltration rates, while the high rainfall levels can increase the erosion potential and the formation of erosion gullies. The presence of vegetation does however allow for surface infiltration thereby reducing the effects of erosion. The mixing of layers resulting in the formation of temperature inversions,

and the presence of cloud cover limits the dispersion of pollutants. Wind significantly affects the amount of material that is suspended from exposed surface and wind speed determines the distance of downward transport as well as the rate of dilution of pollutants in the atmosphere. The likelihood exists for wind erosion to occur from open and exposed surfaces, with loose fine material, when the wind speed exceeds at least 5.4 m/s. These climatic aspects need to be taken into consideration during operations, rehabilitation, and surface water management planning.

7.4.1.3 SOILS AND LAND CAPABILITY

INTRODUCTION AND LINK TO IMPACTS

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of prospecting operations, soil is even more significant if one considers that prospecting is a temporary land use after which rehabilitation, using soil, is the key to re-establishing land capability and related land uses.

Prospecting projects have the potential to damage the soil resource through physical loss of soil and/or the contamination of soils, thereby impacting on the soils ability to sustain natural vegetation and altering land capability. Contamination of soils may in turn contribute to the contamination of surface and groundwater resources. Loss of the soil resource reduces chances of successful rehabilitation and restoration. To understand the basis of these potential impacts, a baseline situational analysis is described below.

DATA SOURCES

Information was sourced from EIAs undertaken for the Khwara Mine (SLR, September 2017) and the Lehating Mine (SLR, January 2014). Given that the proposed project area is located adjacent to the Khwara and Lehating mine properties, the baseline conditions as presented also apply to the proposed project area.

RESULTS

Soil forms

The soil forms located within the project area include Hutton and Clovelly. These soil types are structureless, deep (>1 200 mm) sandy loamy soils that are characterised by high infiltration rates and low clay content which means that these soils are susceptible to both wind and water erosion. In general, the soil forms located within the project area are difficult to work and have limited utilization potential.

Land use capability

The Hutton and Clovelly soil forms are classified as having a grazing land capability in terms of the Soil, Climate and Water Land Capability Classification System for South Africa (Schoeman et al, 2000).

CONCLUSION

Taking the above into consideration soils located within the project area will require appropriate management measures during construction and operation to prevent the loss of soil resources through pollution and erosion, as soil resources form a crucial role during rehabilitation.

7.4.1.4 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.

Prospecting related activities have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical destruction and/or a range of disturbances.

As a baseline, this section provides an outline of the type of vegetation occurring on site, related habitats and associated fauna.

DATA SOURCES

Information was sourced from the previous EIA and EMPr undertaken for the Khwara Mine (SLR, September 2017), the terrestrial assessment (STS, February 2020a) and the watercourse ecological assessment (STS, February 2020) that was undertaken for the proposed project and included in Appendix 4.

Information pertaining to the terrestrial and aquatic biodiversity was informed through the review of available literature and verified through site surveys. On site surveys focussed on an area in and around the Kuruman River, given that it is likely that prospecting related activities will take place near the Kuruman River.

RESULTS - TERRESTRIAL

Flora (natural plant life)

The western section of the project area falls within the Southern Kalahari Mekgacha vegetation type, while the eastern section of the project area falls within the Kathu Bushveld vegetation type. The distribution of the various vegetation types is illustrated in Figure 4. Based on the site survey, three habitat units were identified in and around the Kuruman River. These include the Southern Kalahari Mekgacha, Kathu Bushveld and the Degraded Habitat units. Refer to Figure 5 for the location of the habitat units. A summary of the habitat units is provided in Table 12 below.

TABLE 12: OVERVIEW OF HABITAT UNITS WITHIN AND SURROUNDING THE KURUMAN RIVER

Habitat units	Overview
Southern Kalahari Mekgacha Habitat Unit	This habitat unit primarily follows the Kuruman River, with tall *Vachellia erioloba* trees forming a prominent belt in places along the riverbank. Portions of the Kuruman River are encroached by the alien invasive species such as the *Prosopis glandulosa* and the indigenous species such as the *Vachellia karroo*.
Kathu Bushveld Habitat Unit	This habitat unit is associated with a variable grass layer and prominent shrub layer with scattered tall *Vachellia erioloba* trees typical of the Kathu Bushveld.
Degraded Habitat Unit	The Degraded habitat unit is limited in extent and includes an informal farmstead together with vegetable patches and kraals, as well as a recently active quarry. These areas, although limited

Habitat units	Overview
	in extent, have been significantly altered, comprising either no vegetation in the case of the quarry or of limited vegetation dominated by alien invasive species. At the time of the assessment the subsistence vegetable patches were not associated with crops but were associated with bare soils. These influences have resulted in habitat disturbance through the establishment and spread of alien invasive species such as *Prosopis glandulosa* as well as bush encroachment by *Vachellia karroo.* Habitat degradation was considered to be most severe within the riparian zone of the Kuruman River, with the habitat northeast of the Kuruman River considered to be mostly intact.

Species of concern noted during the site survey within the respective identified habitat units (STS, February 2020a) or are likely to occur in the proposed project area are tabulated below.

TABLE 13: SPECIES OF CONCERN LOCATED ALONG THE KURUMAN RIVER OR LIKELY TO OCCUR IN THE PROPOSED PROJECT AREA (STS, FEBRUARY 2020A)

Species	Threat Status	Habitat Unit	Possibility of occurrence
NFA			
Vachellia erioloba	LC	Recorded within the Kathu Bushveld and Southern Kalahari Mekgacha	100%
Vechellia haematoxylon	LC	Recorded within the Kathu Bushveld	100%
Boscia albitrunca	LC	Recorded within the Kathu Bushveld	100%
NCNCA			
Harpagophytum procumbens	LC	Suitable habitat within the Kathu Bushveld	80%
Lessertia frutescens subsp. *frutescens*	LC	Recorded within the Kathu Bushveld	100%
Boophone disticha	LC	Suitable habitat within the Kathu Bushveld and Southern Kalahari Mekgacha	60%
Babiana hypogaea	LC	Suitable habitat within the Kathu Bushveld and Southern Kalahari Mekgacha	80%
Boscia albitrunca	LC	Recorded within the Kathu Bushveld	100%
Nerine laticoma	LC	Recorded within the Southern Kalahari Mekgacha	100%
Pergularia daemia	LC	Recorded within the Southern Kalahari Mekgacha	100%
Jamesbrittenia burkeana	LC	Recorded within the Southern Kalahari Mekgacha	100%
Threatened or protected species according to NEM:BA			
Harpagophytum procumbens	LC	Suitable habitat within the Kathu Bushveld	80%

LC- Least threatened

Fauna (natural animal life)

Farming practises, prospecting and mining activities within and surrounding the proposed project area, have disturbed the local faunal population. No species of concern were noted during the site survey. Table 14 below indicates the faunal species of concern that are expected to occur within the proposed project area.

TABLE 14: SPECIES OF CONCERN EXPECTED TO OCCUR WITHIN THE PROPOSED PROJECT AREA (STS, FEBRUARY 2020)

Scientific Name	Common Name	Probability of occurrence %
Mammals		
Otocyon megalotis	Bat-eared fox	70%
Vulpes chama	Cape fox	60%
Mellivora capensis	Honey Badger	70%
Atelerix frontalis	South African Hedgehog	70%
Orycteropus afer	Aardvark	100%
Avifauna		
Ardeotis kori	Kori Bustard	70%
Polemeatus bellicosus	Martial Eagle	60%
Aquila rapax	Tawny Eagle	60%
Reptiles		
Python natalensis	African Rock Python	60%
Chamaeleo dilepis	Common flap-neck chameleon	65%
Invertebrates (particularly arachnids)		
Genus: *Ceratogyrus, Harpactira* and *Pterinochilus*	Baboon Spiders	80%
Opistophthalmus ater	Steinkopf Burrowing Scorpion	60%
Opistophthalmus carinatus	Burrowing scorpion	80%
Opistophthalmus wahlbergii	Burrowing scorpion	90%

Terrestrial site sensitivity

The section below provides information on the sensitivity of the proposed project area based on existing national and provincial databases. In this regard, Table 15 summarises the sensitivity of the proposed project area. It is important to note that the sensitivity of the site is based on provincial and national databases only and as such the sensitivity of the project area has not been ground trothed with specialist input. Based on site survey investigations, it is important to note that the floral sensitivity of the site is deemed to be moderately high due to the presence of protected species, predominately the *Vachellia erioloba, Prosopis glandulosa and the Vachellia Karroo* (Southern Kalahari Mekgacha and Kathu Bushveld Habitat Units). Areas where the natural vegetation has been disturbed as a result of existing anthropogenic activities is deemed to be of a low sensitivity (Degraded Habitat Unit).

TABLE 15: SITE SENSITIVITY

Provincial and/or National database	Details
National Threatened Ecosystems (2011)	The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable, or protected. Threatened ecosystems are listed in order to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing threatened ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, BGIS). According to the National Biodiversity Assessment, the south eastern portion of the project area falls within a moderately protected area, whereas the remainder of the project area falls within an area that is currently not protected.
National Protected Area Expansion Strategy (2009) and the South African Protected Area Database (2016)	The goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost effective protected area expansion for ecological sustainability and adaptation to climate change. The NPAES sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. According to the NPAES, the project area is not located within or near any protected area within a 5 km radius.
Important Bird Areas (2015)	According to Birdlife South Africa, the proposed project area does not fall within or near any Important Bird Areas (IBA), which has been highlighted as important conservation areas within South Africa.
Mining and Biodiversity guidelines (2013)	The Mining Biodiversity Guideline (2012) provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. An area in the south western portion of the project area along the Kuruman River is considered to be of Highest Biodiversity Importance according to the Mining and Biodiversity Guidelines as illustrated in Figure 6. A highest biodiversity importance areas has the highest risk for mining, mining is not legally prohibited in these areas, but where there is a very high risk that due to their potential biodiversity significance and importance to ecosystem services (e.g. water flow regulation and water provisioning) that mining projects will be significantly constrained or may not receive necessary authorisations.
Griqualand West Centre of Endemism	The proposed MRA is situated within the Griqualand West Centre of Endemism which is an area with a high concentration of plant species with very restricted distribution. The Griqualand West Centre of Endemism is one of the 85 centres of endemism and one of 14 centres in Southern Africa, and these centres are of global conservation significance. The Griqualand West Centre of Endemism 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. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority. Centres of endemism are important because it is these areas which if conserved would safeguard the greatest number of plant species. Refer to Figure 7.
Draft Northern Cape	The Northern Cape Draft CBA Map identifies biodiversity priority areas, namely, CBAs and

Provincial and/or National database	Details
Critical Biodiversity Area (CBA) map (2016)	Ecological Support Areas (ESAs). These areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species, as well as the long-term ecological functioning of the landscape as a whole. This map updates, revises and replaces all older systematic biodiversity plans and associated products for the province. The south western boundary of the project area falls within a CBA1. The extent of this area follows the path of the Kuruman River. The majority of the remaining project site falls within an ecological support area and other natural areas. Refer to Figure 6. A CBA1 area is deemed an irreplaceable site and the most important areas for conservation. According to the biodiversity land management plan, these areas should be maintained in their natural state.

RESULTS - AQUATIC ENVIRONMENT

THE KURUMAN RIVER FLOWS ACROSS THE SOUTH WESTERN CORNER BOUNDARY OF THE PROPOSED PROJECT AREA SITE. REFER TO TABLE 16 AND

Table 17 for further information pertaining to the Kuruman River.

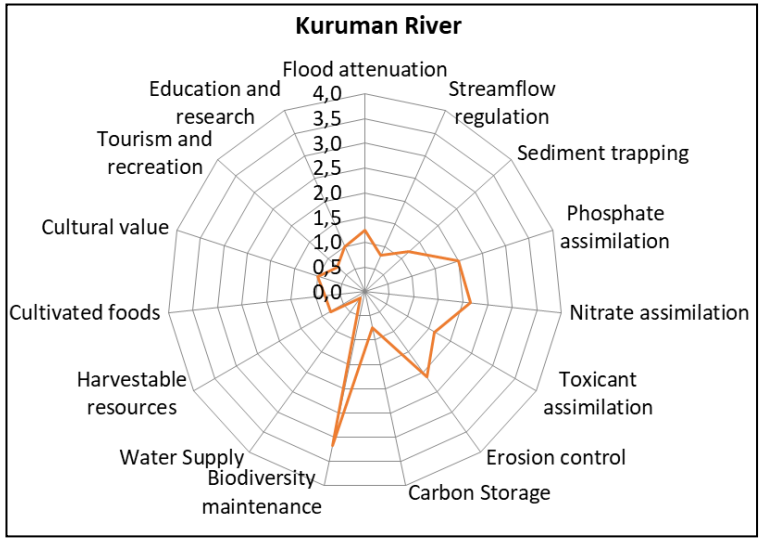
TABLE 16: DESKTOP DATA RELATING TO THE CHARACTERISTICS OF THE KURUMAN RIVER (FEBRUARY 2020)

<table>
<tr><th colspan="2">Aquatic ecoregion and sub-regions in which the farm portion and focus area is located</th><th colspan="2" rowspan="2">Detail of the farm portion and focus area in terms of the National Freshwater Ecosystem Priority Area (NFEPA, 2011) database</th></tr>
<tr><td>Ecoregion</td><td>Southern Kalahari</td></tr>
<tr><td>Catchment</td><td>Orange</td><td rowspan="5">FEPACODE</td><td rowspan="5">The farm portion and focus area are situated within a SubWMA considered a River FEPA. River Freshwater Ecosystem Priority Area (FEPA) achieves biodiversity targets for river ecosystems and threatened fish species and were identified in rivers that, at the time of the NFEPA workshops, were indicated to be in a good ecological condition (A or B ecological category). Although the FEPA status applies to the actual river reach, shading of the whole sub-quaternary catchment reach indicate that that the surrounding land and smaller stream network need to be managed in a way that maintains the good condition of the river reach.</td></tr>
<tr><td>Quaternary Catchment</td><td>D41M</td></tr>
<tr><td>WMA</td><td>Lower Vaal</td></tr>
<tr><td>subWMA</td><td>Molopo</td></tr>
<tr><td colspan="2">Dominant characteristics of the Southern Kalahari (29.01) Aquatic Ecoregion Level 2 (Kleynhans et al., 2007)</td></tr>
<tr><td>Dominant primary terrain morphology</td><td>Plains; moderate relief, Closed Hills, mountains; moderate and high relief.</td><td rowspan="3">NFEPA Wetlands</td><td rowspan="3">According to the NFEPA database (2011) a natural floodplain wetland traverses the focus area. The floodplain wetland is considered natural or good (Class AB).</td></tr>
<tr><td>Dominant primary vegetation types</td><td>Karroid Kalahari Bushveld, Kalahari Mountain Bushveld, Kalahari Plateau Bushveld</td></tr>
<tr><td>Altitude (m a.m.s.l)</td><td>700 - 1500</td></tr>
<tr><td>MAP (mm)</td><td>0 - 500</td><td rowspan="2">Wetland Vegetation Type</td><td rowspan="2">The farm portion and focus area are situated within the Eastern Kalahari Bushveld Group 1 Wetland Vegetation Type considered Least Threatened according to SANBI, 2012 and Mbona et al. (2014),</td></tr>
<tr><td>The coefficient of Variation (% of the MAP)</td><td>30 - 40</td></tr>
<tr><td>Rainfall concentration index</td><td>60 - >65</td><td rowspan="6">NFEPA Rivers</td><td rowspan="6">According to the NFEPA Database the Kuruman River traverses the focus area. According to the NFEPA Database the Kuruman River is classified as a FEPA River and therefore, in terms of the NFEPA Implementation Manual (2011), mining (and/or prospecting) is not considered a compatible land use within 1 km (1000m) of a riverine buffer around a river FEPA. The PES 1999 Classification as well as the NFEPA Database classifies the river as largely natural (Class B).</td></tr>
<tr><td>Rainfall seasonality</td><td>Late Summer</td></tr>
<tr><td>Mean annual temp. (°C)</td><td>16 - 22</td></tr>
<tr><td>Winter temperature (July)</td><td>0 - 22</td></tr>
<tr><td>Summer temperature (Feb)</td><td>16 - >32</td></tr>
<tr><td>Median annual simulated runoff (mm)</td><td><5 – 40</td></tr>
<tr><td colspan="4">National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE)</td></tr>
<tr><td colspan="4">According to the NBA (2018): SAIIAE there are no wetland features associated with the farm portion and focus area, thus corresponding with the NFEPA Database (2011). The NBA (2018) Database indicates the Kuruman River traversing the focus area. Currently the Kuruman River is poorly protected (Ecosystem Protection Level) and it is critically endangered (Ecosystem Threat Status).</td></tr>
<tr><td colspan="4">Detail of the farm portion and focus area in terms of the Northern Cape Critical Biodiversity Areas (2016)</td></tr>
</table>

Critical Biodiversity Area (CBA) Category 1	CBA 1 area areas that are irreplaceable or near-irreplaceable (i.e. high selection frequency) for meeting biodiversity targets. There are no or very few other options for meeting biodiversity targets for the features associated with these areas. The entire focus area is situated within a Category 1 Critical Biodiversity Area (CBA).
Ecological Support Area (ESA)	ESAs are areas which must retain their ecological processes in order to meet biodiversity targets for ecological processes that have not been met in CBAs or protected areas; meet biodiversity targets for representation of ecosystem types or Species of special concern when it's not possible to meet them in CBAs; support ecological functioning of protected areas or CBAs or a combination of these (SANBI, 2017). The majority of the farm portion falls within Ecological Support Areas.
Other Natural Area	ONA consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs (SANBI, 2017). The remaining portions of the farm portion fall within an area classified as "Other Natural Areas".

TABLE 17: SUMMARY OF FIELD ASSESSMENT (STS, FEBRUARY 2020)

Ecological & socio-cultural service provision graph:



<table>
<tr><td rowspan="3">PES discussion</td><td rowspan="3">PES Category: B/C
Riparian IHI: B / VEGRAI: C
As previously noted, literature pertaining to the ecological characteristics of the Kuruman River is limited. Thus, ascertaining reference conditions is difficult, and as noted by Economou (2002), the definition of biological reference conditions is ambiguous in ecological terms and is “usually perceived as the “pristine” state of the environment prior to, or in the absence of, major human disturbances”. Based on available information however, it is likely that the river has remained relatively unimpacted for several decades with the exception of loss of catchment yield and recharge, particularly from the Ga-mogara River, which has been significantly impacted by mining activities, and changes to floral assemblages. Anthropogenic influences which may have bearing on the PES of the system include various farm road crossings which may over time erode, causing hydraulic dysconnectivity between sections of the system, as well as impacts on the riparian vegetation. As discussed previously, it was apparent that bush encroachment has occurred within some sections of the riparian zone, whilst vegetation loss has occurred in others. The dominant encroacher species noted were V. karoo (indigenous) and P. glandulosa (alien). Whilst some management of these species has been undertaken, it does not appear to be extensive. With the exception of the aforementioned road crossings, none of which are considered serious impacts, and some areas of erosion, no obvious alterations to the hydraulic regime were discerned.</td><td>Fatal Flaw?</td><td>Potentially very high impacts</td><td>Photograph notes</td><td>Left: illustration of a section of the reach of the river in the northern portion of the focus area, depicting vegetation loss. The blue arrow indicates the direction of flow (south east to north west). Right: Representative photograph of the reach of the river in the southern portion of the focus area, showing more intact riparian vegetation than that observed in the northern part of the focus area.</td></tr>
<tr><td colspan="4">Watercourse characteristics:
a) Hydraulic regime
The Kuruman River is an episodic drainage system, relying on precipitation. Located in one of the most arid regions of South Africa receiving an average annual rainfall of under 400m, it is rare that sufficient precipitation falls to induce flows in the reaches of the river downstream of the dolomitic springs which feed it. However, it is also important to note that the Ga-Mogara River, a tributary of the Kuruman River, has been impacted by the formation of riverbed swallets (i.e. sinkholes) as a result of dewatering activities by Sishen Mine. These swallets intercept all surface flow in the upper reach of the Ga-Mogara River, preventing recharge of the downstream system – i.e. the Kuruman River. This, in addition to the likely abstraction of water from the Kuruman Eye, be responsible for the highly episodic character of the Kuruman River.

Although some road crossings were observed, these were minor and did not include bridges, therefore even during times of flow are not considered likely to affect hydraulic processes (e.g. by causing turbulent flows, which might typically be expected in a perennial drainage system). Furthermore, because the system is episodic, no abstraction is possible, as local residents are solely reliant on groundwater.</td></tr>
<tr><td colspan="4">b) Water quality
Water quality sampling could not be undertaken at the time of the assessment. Although runoff from the local catchment may potentially contain increased levels of nutrients due to the surrounding agricultural activities (specifically livestock husbandry), it is not likely to contain other pollutants. Additionally, due to the porous nature of the surrounding soils, the volume of stormwater runoff reaching the river is likely to be minimal.</td></tr>
<tr><td>Ecoservice provision</td><td>Intermediate
Although the assessed reach of the Kuruman River is considered important primarily for biodiversity maintenance, ecological and socio-cultural service provision is generally low due to the episodic nature of the system. Minimal opportunity exists for the system to provide services such as flood attenuation, assimilation of excess nutrients or toxicants, or sediment trapping since stormflows are so rarely spread through the watercourse, although aspects such as good vegetation cover throughout the assessed reach increase the potential for these ecological processes to occur in the event of surface flow. Similarly, due to the episodic character of the river, local communities are unable to rely on the river for water, and generally crop cultivation does not take place due to the arid conditions of the region.</td><td colspan="4">c) Geomorphology and sediment balance
Minimal anthropogenic impacts on geomorphological processes were observed during the site assessment. As noted previously the extent and type of the road crossings are not considered a significant impact, and although some trampling is anticipated from increased livestock activity in the area, the calcrete soils associated with the river and its riparian zone are not as susceptible to such impacts as ‘softer’ soils. Erosion was observed in some sections of the system; however, it was not extensive, and was most likely the result of natural processes.</td></tr>
<tr><td>EIS discussion</td><td>EIS Category: Low (DWAF, 1999) /moderate (Rountree & Kotze, 2013)
Two EIS indices were applied: the aquatic index (DWAF, 1999) to assess the instream EIS, and the method advocated by Rountree and Kotze (2013) to assess the EIS of the river in terms of riparian habitat,</td><td colspan="4">a) Habitat and biota
Although very little faunal activity was directly observed (largely due to the high ambient temperatures during the assessment as well as the crepuscular nature of many species), numerous indirect observations of such activity in the form of scat, feathers, quills, burrows and spoor were</td></tr>
</table>

	ecological services and socio-cultural benefits. The instream EIS is low due to the episodic nature of the river which prevents the occurrence of unique or intolerant aquatic biota. However, on a landscape scale and from a biodiversity maintenance perspective, the Kuruman River is deemed to be of moderate EIS.	made. It was apparent that the riparian areas provide valuable refugia, breeding and foraging habitat and connectivity between the neighbouring properties (farm fences crossing the river had clearly been breached by burrowing fauna in several locations). Insectivorous and avifaunal activity within the river and adjacent riparian zone was directly observed at the time of the assessment. Given the arid conditions and the sparse distribution of vegetation in surrounding areas, particularly trees and shrubs which provide roosting habitat as well as shelter from both predators and extreme temperatures, the denser vegetation in the river and associated riparian zone provides essential faunal habitat. The expected loss of recharge to the downstream portions of the Kuruman River (as discussed above), in combination with the naturally arid conditions of the region, may have caused moisture stress, potentially altering the species composition and community structure, and zonation, of the riparian zone.
REC, RMO and BAS Categories	**REC Category: B** **RMO Category: Maintain** **BAS Category: B** As noted in the PES discussion, few modifiers of the system were discerned at the time of the site assessment, with the exception of removal of vegetation and encroachment of both indigenous and alien pioneer species. Under present circumstances, maintenance of the PES and EIS is deemed feasible. However, the proposed prospecting activities carry the potential to greatly alter the PES and EIS of the Kuruman River, especially if prospecting occurs directly within the river.	**Business case, Impact Significance, Conclusion and Mitigation Requirements:** The proposed prospecting activities may potentially result in high to very high impacts on the Kuruman River, depending on the location of the prospecting boreholes. If prospecting occurs directly within the watercourse, potential impacts include loss of instream and riparian habitat, changes to riparian vegetation community composition and structure, and further reduced ecological service provision. Although the Kuruman River has not flowed in a little over thirty years, the possibility of an unexpected flash flood (particularly in the context of changing climatic patterns) cannot be ruled out. Should such an event occur during exploration activities, the impacts of the exploratory drilling on the riverine habitat could potentially be high. Although the results of the impact assessment (refer to section 5) indicate that prior to mitigation, impact significance is likely to be of low to very low levels, this is attributed to the duration and extent of impacts, since the impact intensity is expected to be high/very high. It is strongly recommended the during the planning phase, all exploratory activities are planned to remain outside of the delineated Kuruman River and associated riparian zone, and preferably out of the 1:100-year floodline.

CONCLUSION

Prospecting activities in general have the potential to disturb and/or destroy vegetation, habitat units and related ecosystem functionality including the disturbance of sensitive/ endangered species such as the *Vachellia erioloba, Prosopis glandulosa and the Vachellia Karroo*. The project area includes the NFEPA Kuruman River, which is in a largely natural ecological state although the riparian zone has been impacted in places by loss of, or transformation of the vegetation assemblage. Erosion was also observed in portions of the active channel, and this was attributed to the flood event in 1988, which is the last documented year that the river flowed. Although the Kuruman River is an episodic system and is therefore not necessarily a valuable resource from an anthropocentric perspective, it forms a crucial component of the overall ecology of the area, being a key contributor to biodiversity maintenance as well as providing valuable breeding and foraging habitat and connectivity to surrounding natural areas.

These areas should be avoided as far as possible or where this is not possible mitigation measures formulated to reduce the impacts that the proposed project may have towards these areas.

-30000 -20000 -10000 0

-2980000 -2990000 -3000000

N

Kuruman

Kuruman

R380

Wessels

Black Rock

R31

Ga-Mogara

Ga-Mogara

Legend

- Towns
- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Main Roads
- Powerline

Vegetation 2012

- Gordonia Duneveld
- Kathu Bushveld
- Koranna-Langeberg Mountain Bushveld
- Kuruman Mountain Bushveld
- Kuruman Thornveld
- Southern Kalahari Mekgacha
- Southern Kalahari Salt Pans

NFEPA Rivers (PES1999)

- CLASS B: Largely Natural

** (Still to be Developed)*

0 1 2 4 Kilometers

Scale: 1 : 100 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

Figure 4

Vegetation Types and Aquatic Environment

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

720.11033.00002

2019/12/03

Legend

- Towns
- Proposed Project Area
- Main Roads
- Rivers

Habitat Units

- Kathu Bushveld - Moderately High Sensitivity
- Southern Kalahari Mekgacha - Moderately High Sensitivity
- Degraded - Low Sensitivity

0 250 500 Meters

Scale: 1 : 12 500 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

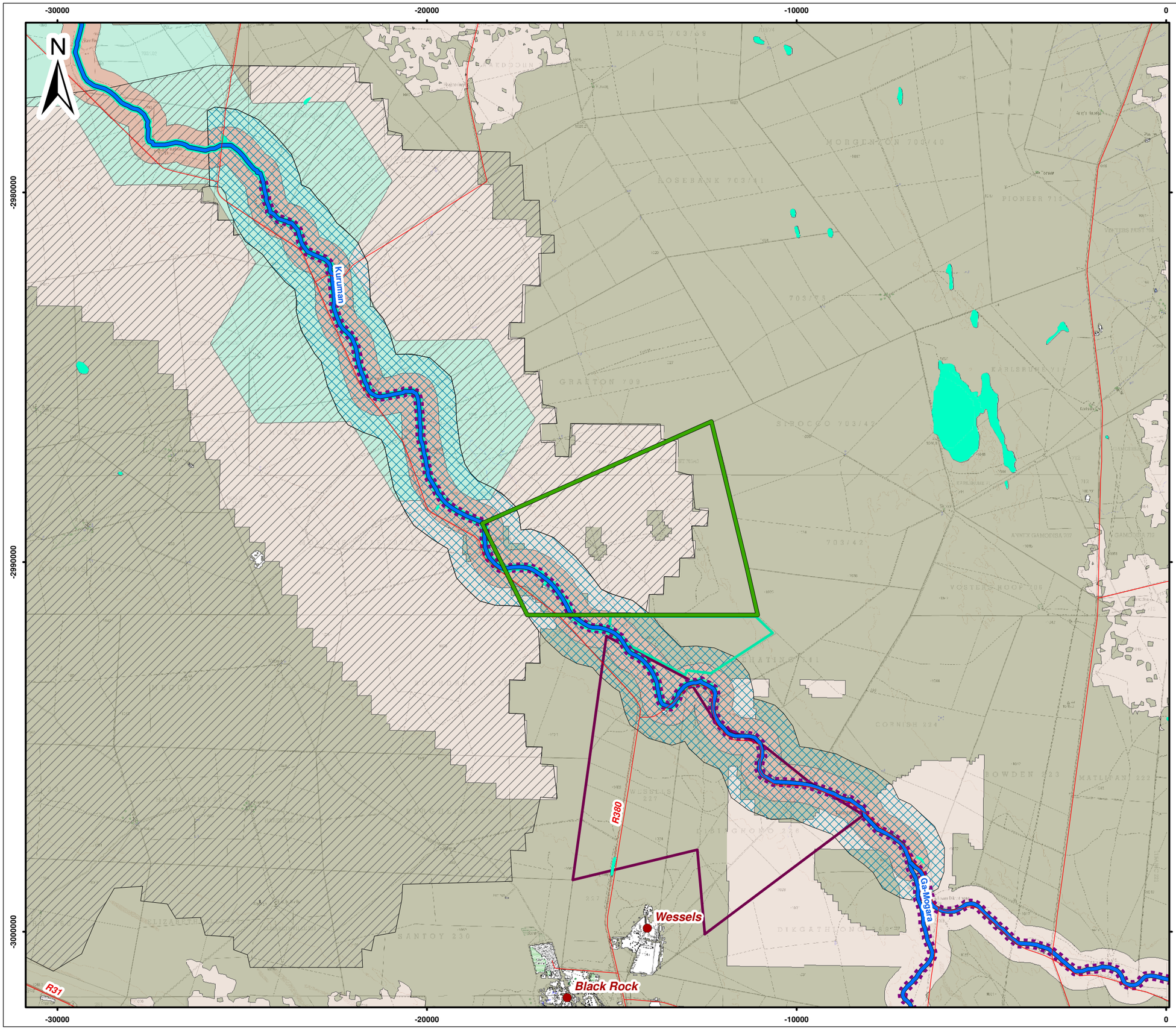
Figure 5

Habitat Units In and Around the Kuruman River (STS, February 2020)

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

720.11033.00002

2020/02/19



Legend

- Towns
- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Main Roads

NFEPA Rivers (PES1999)

- CLASS B: Largely Natural
- 100m River Buffer

NFEPA Wetlands

- Natural

Critical Biodiversity Areas

- Critical Biodiversity Area One
- Critical Biodiversity Area Two
- Ecological Support Area
- Other Natural Areas

Mining Biodiversity

- B. HIGHEST BIODIVERSITY IMPORTANCE - Highest Risk for Mining
- D. MODERATE BIODIVERSITY IMPORTANCE - Moderate Risk for Mining

** (Still to be Developed)*

0 1 2 4 Kilometers

Scale: 1 : 100 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

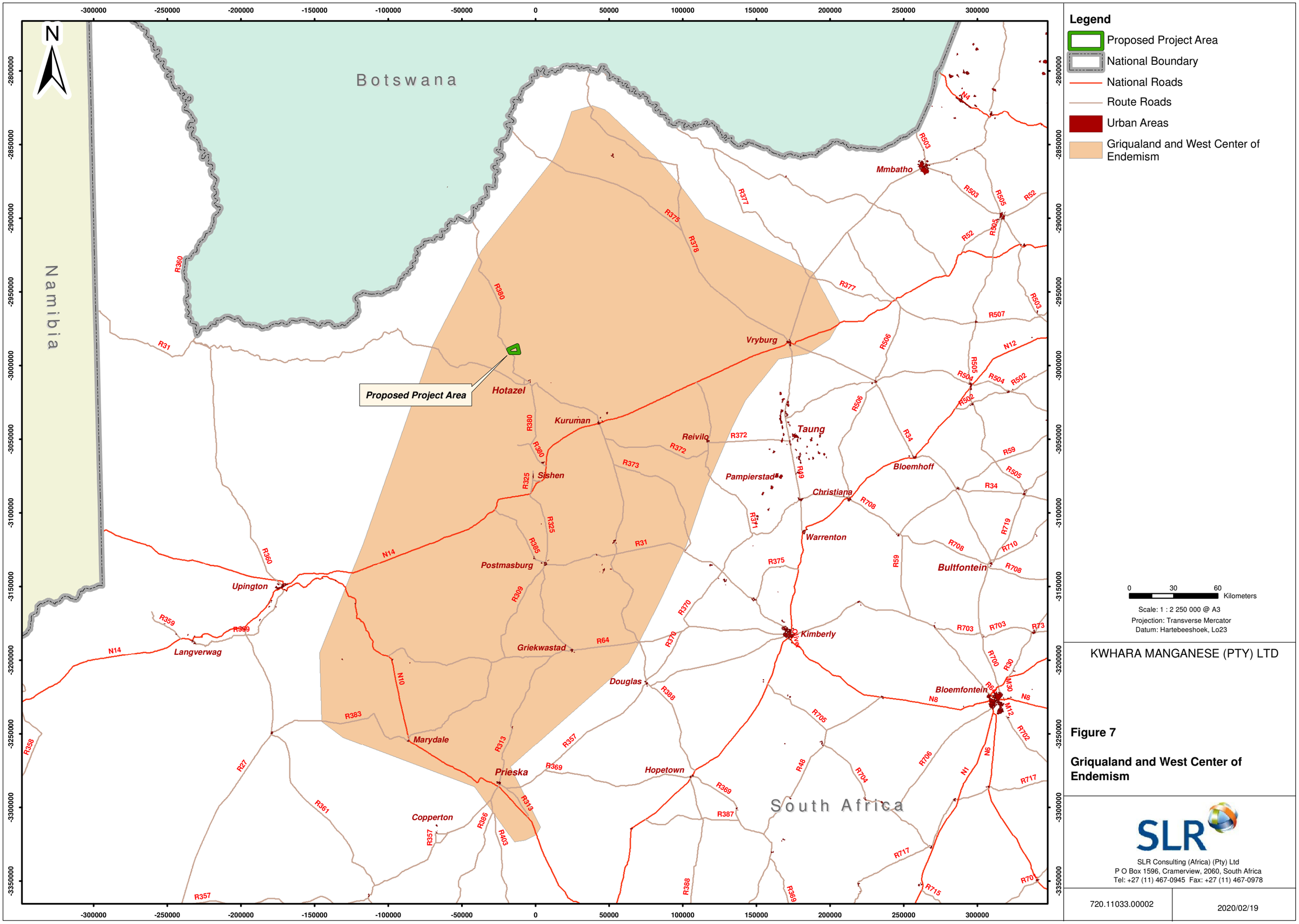
KWHARA MANGANESE (PTY) LTD

Figure 6

Site Sensitivity - Desktop

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

720.11033.00002 | 2020/02/19



Legend

- Proposed Project Area
- National Boundary
- National Roads
- Route Roads
- Urban Areas
- Griqualand and West Center of Endemism

0 30 60 Kilometers

Scale: 1 : 2 250 000 @ A3

Projection: Transverse Mercator

Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

Figure 7

Griqualand and West Center of Endemism

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

720.11033.00002

2020/02/19

7.4.1.5 SURFACE WATER

INTRODUCTION AND LINK TO IMPACT

Surface water resources include drainage patterns and paths of preferential flow of storm water runoff. Prospecting related activities have the potential to alter the drainage of surface water through the establishment of structures and access tracks and/or result in the contamination of the surface water resources through spillages. Spillages could also infiltrate groundwater resources.

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 and the status of surface water resources in the project area.

DATA SOURCES

Information was sourced through site observations and from the previous EIA and EMPr undertaken for the Lehating Mine (SLR, January 2014) and Khwara Mine (SLR, September 2017). Given that the proposed prospecting right area is located adjacent to the Khwara and Lehating mine properties, the baseline conditions as presented also apply to the proposed project area.

RESULT

Regional hydrology

The proposed project area falls within the quaternary catchment D41M which has a gross total catchment area of 2 623 km^2, with a net MAR of 2.05 million cubic meters (mcm).

Local hydrology

The Kuruman River crosses the south western corner of the proposed prospecting right boundary (refer to Figure 6). The Kuruman River is ephemeral in nature and as such will only flow during heavy rain events and may be associated with a perched water body. The river is considered to be in a largely natural condition (see Section 7.4.1.4).

Surface water quality

No water sampling within the proposed project site has been conducted because there are no permanent surface water features. Given this, no surface water quality data is available.

Surface water users

Due to the ephemeral nature of the Kuruman River, there is no third-party reliance on surface water.

Wetlands

No pans are known to occur on the proposed project site and no wetlands according to the NFEPA database occur within the proposed project area. The nearest NFEPA wetland is approximately 4 km north east of the proposed prospecting right boundary.

CONCLUSION

The nature of prospecting is such that it presents the potential for contamination of surface water resources. Therefore, the proposed project must be managed/implemented in a way that contains any contamination at source.

The Kuruman River crosses the south eastern corner of the proposed prospecting right boundary. Given the river's largely natural state a 100 m distance should be maintained between the edge of the river and prospecting activities.

7.4.1.6 GROUNDWATER

INTRODUCTION AND LINK TO IMPACT

Groundwater is a valuable resource and is defined as water which is located beneath the surface in rock pore spaces and in the fractures of lithologic formations. Prospecting activities have potential (albeit limited) to impact on groundwater resources through abstraction (depending on the source of water supply and volume required) and contaminants entering aquifers during the drilling activities operations. This section provides a brief description of baseline groundwater conditions.

DATA SOURCES

Information was sourced through site observations, discussions with the landowner and from the previous EIA and EMPr undertaken for the Lehating Mine (SLR, January 2014) and Khwara Mine (SLR, September 2017). Given that the proposed prospecting right area is located adjacent to the Khwara and Lehating mine properties, the baseline conditions as presented also apply to the proposed project area.

RESULTS

The project area is underlain by a:

- Shallow aquifer made of the Kalahari sand and sediment beds with its associated underlying calcrete layer and low permeability Dwyka clay bed; and
- Deep fractured aquifer formed from the Mooidraai dolomite Formation and Dwyka clay contact which acts as a confining layer.

In terms of the Aquifer Classification Map of South Africa (Matoti and James, 2012), the project area is classified as a poor to minor aquifer region, which implies the following:

- Poor aquifer region: low to negligible yielding aquifer system of moderate to poor water quality; and
- Minor aquifer region: moderately yielding aquifer system of variable water quality.

Groundwater levels range from 20 to 70 m below ground level (mbgl). Groundwater quality results show elevated concentrations of electrical conductivity, total dissolved solids, chloride, fluoride, nitrate, manganese, and selenium when compared to the South African National Standards 241 of 2015. Localised groundwater flow within and around the project area shows a dominant groundwater flow in a north-westerly direction with slight localised groundwater flow towards the Kuruman River.

The majority of boreholes identified in the broader area are prospecting boreholes, however some third-party boreholes were identified that are utilised for domestic purposes or livestock watering. Groundwater is used for domestic and livestock watering purposes in the farm Eersbegint 703. This is based on discussion with the landowner as part of the project. At the time of undertaking the hydrocensus in 2016, this borehole was equipped and could not be sampled.

CONCLUSION

Prospecting related activities presents the potential for the contamination of groundwater resources. Groundwater qualities have been influenced locally by existing mining and farming activities. The project must be implemented and managed in a way that contamination of groundwater resources is prevented as far as possible.

7.4.1.7 AIR QUALITY

INTRODUCTION AND LINK TO IMPACT

A change in ambient air quality due to prospecting activities can result in impacts (albeit limited), which may cause a disturbance to any nearby receptors. A brief description of the existing baseline air quality environment is provided below.

DATA SOURCES

Information was sourced through site observations and from the previous EIA and EMPr undertaken for the Khwara Mine (SLR, September 2017). Given that the proposed project area is located adjacent to the Khwara mine property, the baseline conditions as presented also apply to the proposed project area.

RESULTS

The following sources of emissions were identified as existing contributors to air quality:

- Vehicle tailpipe emissions-significant primary pollutants emitted by motor vehicles include CO^2, CO, hydrocarbons (HCs), NO_x, SO^2, particulate matter, and lead;
- Vehicle entrained dust from paved and unpaved roads;
- Household fuel combustion by means of coal and wood;
- Biomass and veld burning; and
- Various miscellaneous fugitive dust sources, including agricultural activities and wind erosion of open areas.

CONCLUSION

Air quality within and surrounding the proposed project site has been influenced. Prospecting activities have the potential to present an additional source of pollutants (albeit limited) that may influence existing pollutant concentrations. The activities should, therefore, be carefully managed to ensure that contributions from the project remain within acceptable limits at potential receptor sites.

7.4.1.8 NOISE

INTRODUCTION AND LINK TO IMPACT

Prospecting projects may cause an increase in ambient noise levels in and around a project area and this may cause a disturbance to any nearby potential receptors. A brief description of the existing baseline noise environment is provided below.

DATA SOURCES

Information was sourced through site observations and from the previous EIA and EMPr undertaken for the Khwara Mine (SLR, September 2017). Given that the proposed project area is located adjacent to the Khwara mine property, the baseline conditions as presented also apply to the proposed project area.

RESULTS

Based on previous noise investigations in the region, the South African National Standards (SANS 10103, 2008) day-time noise rating of 40 dBA and night-time noise rating of 35 dBA for rural areas is expected to be relevant. Site observation and surrounding land uses confirm the rural nature of the area. It should however be noted that levels of noise generated by specific distant sources, such as mines, prospecting, and traffic roads, vary by a considerable margin with a change in wind direction and temperature profiles in the lower atmosphere.

CONCLUSION

The proposed project is located in an area that has a rural character. The nearest noise sensitive receptor is the farmer that resides on the farm Boerdraai 228 and the farm worker that resides on the farm Eersbegint 703. In addition to this, there are numerous other receptors located on neighbouring farms as described in Section 7.4.2. Prospecting related activities has the potential to increase ambient noise levels within and surrounding the proposed project area. Due to the small scale and short-term nature of the prospecting activities, this is expected to be limited; however prospecting activities should be undertaken in a manner that minimises disturbance due to elevated noise levels.

7.4.1.9 VISUAL

INTRODUCTION AND LINK TO IMPACT

Prospecting activities have the potential to alter the landscape character of a site and the surrounding area through the presence of temporary drilling infrastructure, in particular where these activities will be in close proximity to sensitive receptors. A brief description of the existing visual baseline is provided below.

DATA SOURCES

Information in this section was sourced through observations made during site visits.

RESULTS

The proposed project area lies in a flat, open area characterised by semi-arid vegetation and ephemeral drainage lines. Livestock and game farms and associated isolated farmsteads are typical of the region. Mining, prospecting activities and infrastructure are also evident in the region.

Central to the visual character of an area are the concepts of sense of place and scenic quality. Sense of place is informed by the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area which lend that area its uniqueness and distinctiveness. The scenic quality of the proposed project site and surrounding area is linked to the type of landscapes that occur within an area. In this regard, scenic quality can range from high to low as follows:

- High – these include the natural features such as mountains, koppies, and drainage systems;
- Moderate – these include agricultural activities, smallholdings, and recreational areas; and
- Low – these include towns, communities, roads, railway line, industries, and existing mines.

Although numerous mining related structures dominate the landscape further south of the proposed project area and the R380 traverses the proposed project area in the south west, the overall scene is characterised by the Kuruman River and open views of the bushveld. The result is a landscape with a moderate sense of place and a moderate scenic quality.

CONCLUSION

The project area and surrounds do offer some natural landscapes that have value, although mining and settlement developments have caused deterioration in the visual quality of the overall area. Given the small scale and short-term nature of prospecting activities, it is not expected that the visual landscape will be materially altered by the proposed project; however visual resource management must be considered.

7.4.1.10 HERITAGE/CULTURAL AND PALAEONTOLOGICAL

INTRODUCTION AND LINK TO IMPACT

This section describes the existing status of the heritage and cultural environment located within the proposed project area. 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.

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

DATA SOURCE

Heritage/cultural resources

Information in this section was sourced from the heritage/cultural study (APAC, December 2019 and December 2020) and the paleontological study (Marion Bamford, 2019) undertaken for the proposed project.

RESULTS

Based on field investigations, sixteen (16) Stone Age sites of medium to high heritage/cultural significance were located along the Kuruman River. These included a combination of single or scatters of tools. The location of the heritage/cultural sites are illustrated in Figure 8.

Palaeontological resources

Based on the findings of desktop palaeontological study (Marion Bamford, 2019), the proposed project area lies on the Quaternary aged Kalahari Group Aeolian sands that are very unlikely to preserve fossils because they are windblown (Aeolian) sands. Beneath the sands are likely to be the non-fossiliferous Hotazel Formation manganese and banded iron Formation deposits. It is considered unlikely that any fossils occur in the project area because the rock is too old and volcanic in origin. This is supported by the South African Heritage Resources Information System (SAHRIS) palaeosensitivity map which shows the project area to be moderately sensitive, and that there is very little chance of finding fossils in this area.

CONCLUSION

Numerous heritage/cultural sites associated with the Stone Age are likely to be located along the Kuruman River. It is unlikely that any fossils occur in the proposed project area.

Palaeontological and heritage resources are important to the history of South Africa and are protected by national legislation. It follows that in the event on any chance finds, South African Heritage Resources Agency (SAHRA) needs to be notified and where necessary permits need to be obtained prior to disturbance.

-20000

-2990000

N

Grafton 709

Portion 43 (Eersbegint) of 703

Kuruman

R380

Site 15
Site 16
Site 14
Site 13
Site 2
Site 12
Site 3
Site 1
Site 4
Site 11 (Quarry)
Site 5
Site 6
Site 10 (Includes Pottery)
Site 9
Site 8
Site 7

Mollers Ville 703/49

Boerdraai 228

Lehating 741

Wessels 227

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

-20000

-2990000

Legend

- Heritage Resources
- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Main Roads
- Rivers and Streams
- Farm Boundaries

** (Still to be Developed)*

0 0.5 1 Kilometers

Scale: 1 : 30 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

Figure 8

Heritage Resources

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

720.11033.00002

2020/02/19

7.4.1.11 SOCIO–ECONOMIC

INTRODUCTION AND LINK

Projects have the potential to result in both positive and negative socio-economic impacts. The positive impacts are usually economic in nature with projects contributing directly towards employment, procurement, skills development and taxes on a local, regional and national scale. The negative impacts can be both social and economic in nature and related to a change to existing land uses (with related changes to social structures and way of life).

DATA SOURCE

Information in this section was sourced from the Joe Morolong Local Municipality IDP of 2016 and StatsSA.

RESULTS

The proposed project area is located in the John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality of the Northern Cape Province. The proposed project area is located approximately 27 km north west of the town Hotazel. This is the nearest community to the project. No informal or rural type settlements occur within the surrounding areas.

The Hotazel community has a very low population of 1 755 people 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.

In general, statistics throughout the identified regions indicate poor educational profiles. Significant numbers of the population within the municipalities and province 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 province and district and local municipalities.

The majority of the population within the Northern Cape, 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 Northern Cape Province, 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 the surrounding mines.

The most dominant type of dwelling utilized within the Northern Cape Province, 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 with informal dwellings e.g. shacks, being the second highest dwelling type within the Northern Cape Province. No traditional dwellings are located within the town of Hotazel; rather the second highest used dwelling type is flats.

In general, despite the relatively formalized housing infrastructure, basic service infrastructure appears to be far less formalized when considering the province and municipalities as a whole. In general, 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.

CONCLUSION

Prospecting related projects have the potential to influence socio-economic conditions both positively and negatively. In terms of the proposed project, positive socio-economic influences include contributions in various ways to the local economies while negative socio-economic influences may include inward migration of people with the resultant pressure on basic infrastructure and services, informal settlement development, increased crime, introduction of diseases, and disruption to the existing social structures within established communities.

7.4.2 LAND USES

INTRODUCTION AND LINK

Prospecting activities have the potential to affect land uses both within the proposed project area and in the surrounding areas. This can be caused by physical land transformation and through direct or secondary impacts.

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

DATA SOURCE

Information in this section was sourced from on-site observations and through the review of topographical maps and satellite imagery.

RESULTS

Prospecting rights

It is understood that there is a prospecting right renewal over the farm Eersbegint 703 held by Aquila Steel (S Africa) (Proprietary) Limited that targets the minerals Iron Ore and Manganese Ore. Based on correspondence received from Aquila Steel, it is understood that the prospecting right renewal is still pending with the DMR.

In addition to this, Amari Resources may hold a prospecting right over the farm Boerdraai 228 that also targets the minerals Iron Ore and Manganese Ore. It is unclear what the status of these prospecting rights are and whether or not they have lapsed.

As part of the project, Khwara was able to make contact with a representative of Aquila Steel. To date Khwara has been unable to make contact with a representative from Amari Resources. As part of the processing of the prospecting right application by the DMR, the details around this will be confirmed.

Landowners within and surrounding the proposed project area

Landowner and directly adjacent landowner details are provided in Table 18 below.

TABLE 18: LANDOWNER AND ADJACENT LANDOWNER DETAILS

Farm name	Portion number	Landowner
Landowner		
Eersbegint 703	Whole farm	Hendrik Venter
Directly adjacent landowner		
Wessels 227	Portion 2	Ntsimbintle Mining (Pty) Ltd
	Portion 1	Eskom
	Remaining extent	Hotazel Manganese Mining (Pty) Ltd
Lehating 741	Portion 1	Terra Nominees (Pty) Ltd
	Remaining extent	Waltwyk CC
Boerdraai 228	Whole farm	Gawie Stols
Mollers Ville 703	Whole farm	Mollers Ville Boerdery Trust
Grafton 709	Remaining Extent	Hendrik Venter
	Portion 1	Hendrik Venter
Sirocco 703/42	Whole farm	Tienie Venter

Land claims

According to the Regional Land Claims Commissioner: Northern Cape, no land claims have been lodged on the farm Eersbegint 703. Refer to Appendix 2 for the proof of correspondence received from the department.

Mining companies

Mining companies with existing operations surrounding the project area include (Figure 9 and Figure 10):

- Hotazel Manganese Mines (Pty) Ltd (Wessels Mine) – Located approximately 9 km south from the boundary of the project area;
- Assmang (Pty) Ltd (Nchwaning Mine) – Located approximately 11 km south from the boundary of the project area;
- Assmang (Pty) Ltd (Gloria Mine) – Located approximately 15 km south east from the boundary of the project area;
- Kalagadi Manganese (Pty) Ltd (Kalagadi Mine) – Located approximately 19 km south from the boundary of the project area;

- Kudumane Manganese (Pty) Ltd (Kudumane Mine) – Located approximately 23 km south east from the boundary of the project area;
- Sebilo Resources (Pty) Ltd (Sebilo Mine) – Located approximately 33 km south east from the boundary of the project area;
- United Manganese of Kalahari (Pty) Ltd (United Manganese of Kalahari Mine) – Located approximately 35 km south east from the boundary of the project area;
- Tshipi é Ntle Manganese Mining (Pty) Ltd (Tshipi Borwa Mine) – Located approximately 39 km south from the boundary of the project area; and
- Hotazel Manganese Mines (Pty) Ltd (Mamatwan Mine) - Located approximately 39 km south east from the boundary of the project area.

The approved Lehating Mine (Lehating Mining (Pty) Ltd) is located on the adjacent farm (Portion 1 of Lehating 741). This mine still needs to be established. Similarly, the Khwara Mine (Khwara Manganese Mining (Pty) Ltd) is located on the adjacent farms Wessels 227 and Dibiaghomo 226. The Khwara mine still needs to be established.

Numerous dormant or closed mines are also located in the area surrounding the proposed project area. These include the following (Figure 9 and Figure 10):

- The old Hotazel Mine located approximately 21 km south east from the boundary of the project area;
- The old Black Rock Mine located approximately 11 km south from the boundary of the project site;
- The old Devon Mine located approximately 24 km south east from the boundary of the project area;
- The old York Mine located approximately 24 km south southeast from the boundary of the project area; and
- The old Middelplaats Mine located approximately 36 km south southeast from the boundary of the project area.

Solar plant

The Adams Solar Plant (Adams Solar PV Project Two (Pty) Ltd) owned by Enel Green Power (Pty) Ltd is situated approximately 36 km south east from the proposed project area and is located on the farm Adams 328. The Adams Solar Plant will aid the new renewable generation capacity of the national grid and contribute to the 42 % share targeted by the Department of Energy for renewable energy (Integrated Resource Plan, 2010-2030). 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.

Livestock grazing

In terms of the project area; cattle grazing take place on the farm Eersbegint 703. Water for livestock watering is sourced from boreholes. Cattle grazing activities also take place on neighbouring farms.

Communities/towns and isolated farmsteads

The landowner of the farm Eersbegint 703 does not reside on the farm. However, a farm worker looks after the cattle and resides on the property in the old farmhouse. With reference to Figure 10, the farmhouse on the farm Eersbegint 703 is located along the Kuruman River.

The nearest residential areas and isolated farmsteads surrounding the proposed project area include the following (Figure 9 and Figure 10):

- Isolated farmstead located on the farm Boerdraai 228, on the opposite side of the Kuruman River;
- Isolated farmstead and guest house (Mecca guest house) located on the farm Mecca. This farm borders the project area on the south west;
- The landowner and a farm worker that resides on the neighbouring farm Boerdraai 288;
- Isolated farmstead located approximately 9 km south west from the boundary of the project area on the farm Harefield 232;
- Isolated farmstead located approximately 6.7 km south west from the boundary of the project area on the farm Bergheim 229;
- Isolated farmstead located approximately 0.9 km west from the boundary of the project area on the farm Mollers Ville 703;
- Isolated farmstead located approximately 2 km north from the boundary of the project area on the farm Kurf 325;
- Isolated farmstead located approximately 10.8 km north west from the boundary of the project area on the farm Afguns 704;
- The Black Rock community located approximately 9.6 km south from the boundary of the project area;
- Gloria Mine village located approximately 15 km south east from the boundary of the project area;
- The Hotazel town situated approximately 19 km south east from the boundary of the project area;
- Black Rock mine village located approximately 12.5 km south from the boundary of the proposed project area;
- Isolated farmstead located approximately 8 km south east from the boundary of the project area on the farm N'chwaneng 267;
- Isolated farmstead located approximately 17 km south west from the boundary of the project site on the farm Olivewood 284;
- Isolated farmstead located approximately 18 km south from the boundary of the project area on the farm Umtu 281;
- Isolated farmstead located approximately 20 km south west from the boundary of the project site on the farm Olivepan 282;
- The town Kuruman located approximately 72 km to the south east from the boundary of the project area; and
- The town Kathu located approximately 82 km to the south from the boundary of the proposed project area.
- Isolated farmstead located approximately 8 km north west from the boundary of the project area on the farm Voohuitzitch 703;
- Isolated farmstead located approximately 7.6 km north west from the boundary of the project area on the farm Sterkstroom 703;
- Isolated farmstead located approximately 4.7 km north west from the boundary of the project area on the farm Mophephe 710; and
- Isolated farmstead located approximately 3 km north east from the boundary of the project area on the farm Sirocco 703.

No informal settlements are located within the immediate proximity of the proposed project area.

Regional powerline infrastructure

A regional powerline is located approximately 6 km to the west of the proposed project area (Figure 9).

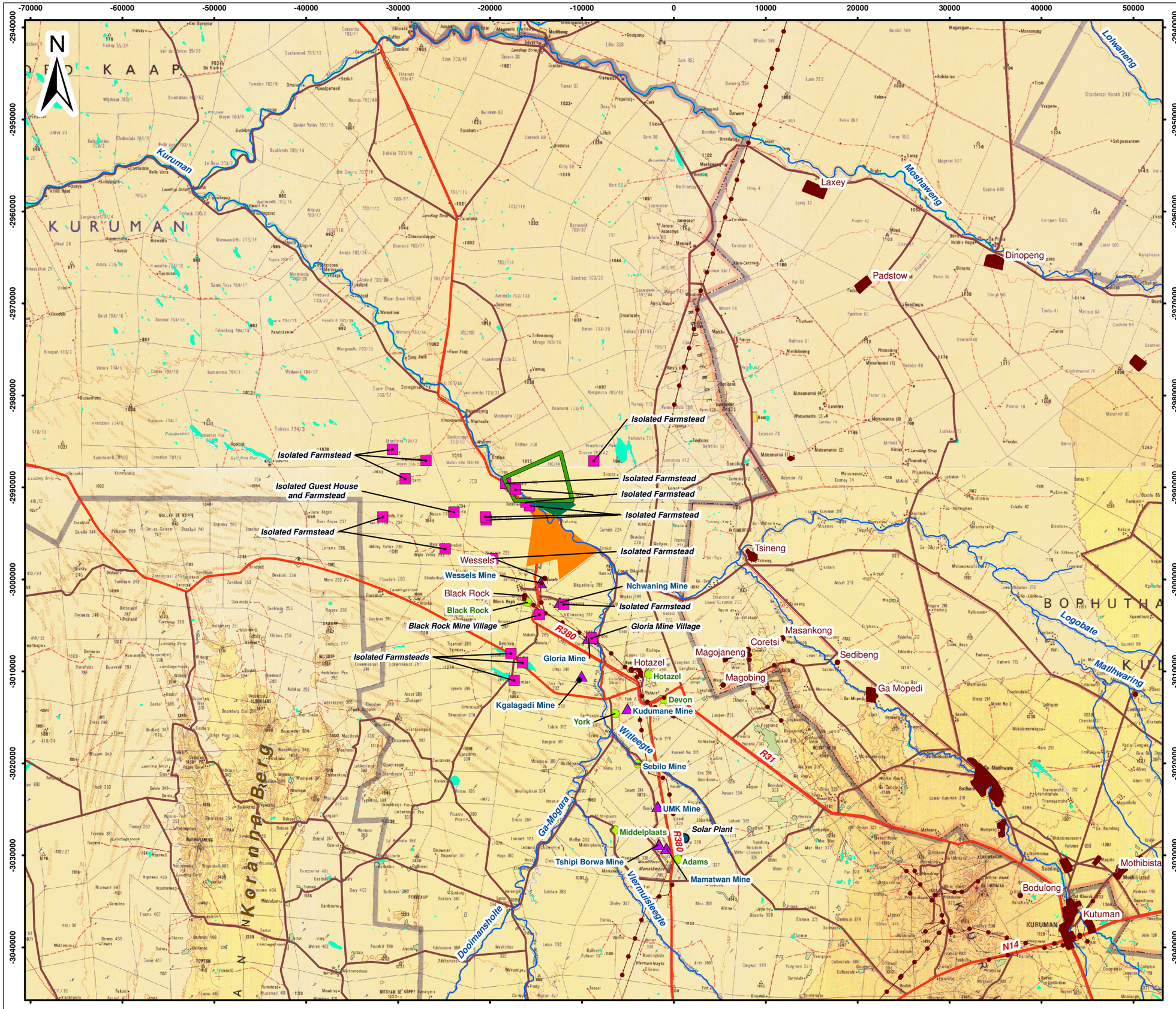
Local Road Network

The R380 that traverses the proposed project site (refer to Figure 10) in the south western corner. This is a gravel road that is in fairly good condition. Any other roads located in the project area are single farm tracks.

The tarred closed section of the R31 that runs between Kuruman and Van Zylsrus is located approximately 10 km south of the proposed project site (Figure 10).

CONCLUSION

There are a number of land uses within and surrounding the project area which may be influenced by the proposed prospecting activities and associated potential environmental impacts.



Legend

- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Receptors
- Solar Plant
- Operating Manganese Mines
- Closed/Dormant Mines
- Urban Areas
- Cultivated Land
- Wetlands

** (Still to be Developed)*

0 4 8 12 Kilometers

Scale: 1 : 400 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

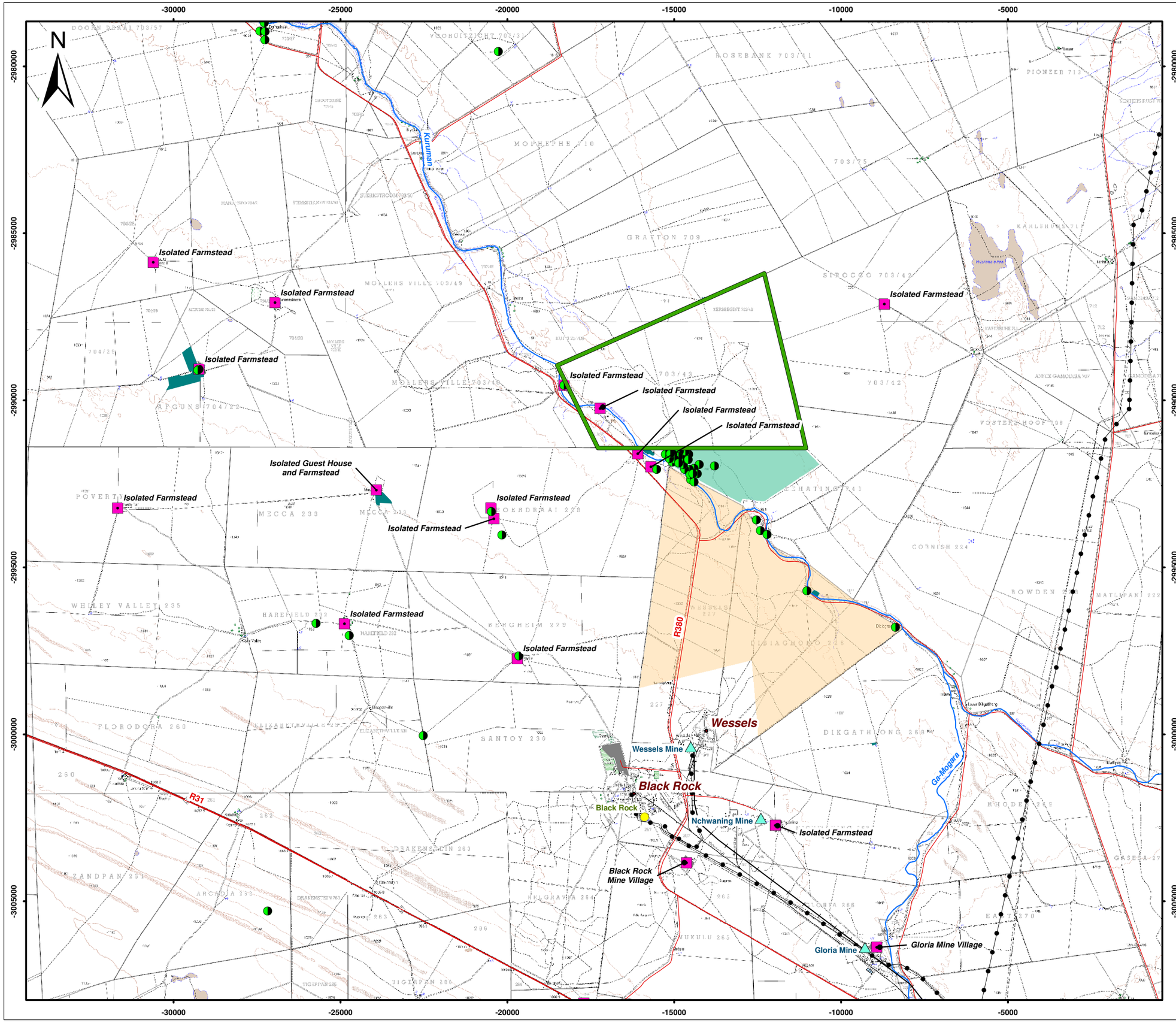
KWHARA MANGANESE (PTY) LTD

Figure 9

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

720.11033.00002 | 2020/02/19



Legend

- Proposed Project Area
- Approved Khwara Mining Rights Area*
- Approved Lehating Mining Rights Area*
- Closed/Dormant Mines
- Operating Manganese Mines
- Receptors
- Hydrocensus Sampling Points
- High Urban Density
- Cultivated Land
- Rivers
- Powerline
- Railway
- Roads

** (Still to be Developed)*

0 2 4 Km

Scale: 1:110 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

KWHARA MANGANESE (PTY) LTD

Figure 10

Local 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

720.11033.00002

2020/02/19

7.4.3 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

The environmental features and infrastructure in the proposed project area are described in Section 7.4.1. In summary:

- Soils are well-drained sandy soils, which allow for high infiltration rates, low organic content and are highly erodible;
- The project area is located within the Kathu Bushveld and the Southern Kalahari Mekgacha vegetation types. Typical protected species include the Camel Thorn and Grey Camel Thorn trees that are associated with these vegetation types. The biodiversity habitat within the vicinity of the Kuruman River is sensitive and is classified as a high biodiversity area in terms of the Mining Biodiversity Guidelines and is deemed an irreplaceable site in terms of the CBA map;
- No wetlands are located within the proposed project area however; the Kuruman River traverses the south western section of the proposed project area. The Kuruman River is deemed largely natural in terms of the NFEPA database. There is no third-party reliance on surface water resources;
- Third party boreholes located on the project site and surrounding farms are utilised for livestock watering and domestic purposes;
- Unlikely that palaeontological resources occur in the project area. Stone Age sites are associated with the farm Eersbegint 703, particularly along the Kuruman River;
- The R380 traverses the project site in the south western section of the farm. The landowner does not reside on the property however, a farm worker does live in the old farmhouse and looks after the cattle; and
- There area surrounding the proposed project area is sparsely populated, with the closest town (Hotazel) located approximately 27 km from the proposed project area.

7.4.4 ENVIRONMENT AND CURRENT LAND USE MAP

A conceptual map showing topographical information as well as land uses on and immediately surrounding the proposed project area is provided in Figure 9 and Figure 10.

7.5 ENVIRONMENTAL IMPACTS AND RISKS

As noted in Section 7.1, no alternatives were considered. Due to the location of the ore body it is not possible to alter the geographic location of the prospecting right activities and as such an assessment of alternatives is not applicable to the project.

7.6 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

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

TABLE 19: IMPACT ASSESSMENT METHODOLOGY

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

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 the 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							
			EXTENT				
			A part of the site/property	Whole site	Beyond the site, affecting neighbours	Local area, extending far beyond site.	Regional/ National
			VL	**L**	**M**	**H**	**VH**
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**

PART C: DETERMINING SIGNIFICANCE							
PROBABILITY (of exposure to impacts)	Definite/ Continuous	**VH**	**Very Low**	**Low**	**Medium**	**High**	**Very High**
	Probable	**H**	**Very Low**	**Low**	**Medium**	**High**	**Very High**
	Possible/ frequent	**M**	**Very Low**	**Very Low**	**Low**	**Medium**	**High**
	Conceivable	**L**	**Insignificant**	**Very Low**	**Low**	**Medium**	**High**
	Unlikely/ improbable	**VL**	**Insignificant**	**Insignificant**	**Very Low**	**Low**	**Medium**
			VL	**L**	**M**	**H**	**VH**
			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 to be required.
Very Low	It will not have an influence on the decision. Does not require any mitigation
Insignificant	Inconsequential, not requiring any consideration.

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

7.7 POSITIVE AND NEGATIVE IMPACTS OF THE PROPOSED ACTIVITY AND ALTERNATIVES

No feasible alternatives exist for the proposed project. Refer to Section 7.1 for further detail.

7.8 POSSIBLE MANAGEMENT ACTIONS THAT COULD BE APPLIED AND THE LEVEL OF RISK

This section requires the identification of possible management actions that could be applied to address issues and concerns raised by I&APs. Further to this, this section indicates the level of risk following the application of management actions. With reference to Section 7.3, the only I&AP comment raised to date pertained to the confirmation that a prospecting right renewal, that is still pending a decision from the DMR, is held by Aquila Steel over the farm Eersbegint 703. This matter needs to be managed with the applicant and the DMR and as such the identification of management actions is not applicable to this issue.

7.9 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

No feasible alternatives exist for the proposed project. Refer to Section 7.1 for further detail.

7.10 STATEMENT MOTIVATING THE PREFERRED ALTERNATIVE

No feasible alternatives exist for the proposed project and as such this section is not applicable. Refer to Section 7.1 for further detail.

8. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE THROUGHOUT THE LIFE OF THE ACTIVITY

8.1 DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY IMPACTS

Biophysical and socio-economic impacts associated with the proposed project were identified through site visits undertaken by SLR and the specialists, together with the specialist studies. As part of the public participation process, I&APs and commenting authorities are being provided with opportunities to provide input into the BA process and comment on the proposed project, including the identification of environmental and socio-economic impacts.

8.2 DESCRIPTION OF THE PROCESS UNDERTAKEN TO ASSESS AND RANK THE IMPACTS AND RISKS

A description of the assessment methodology used to assess the severity of identified 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, is provided in Section 7.6.

8.3 A DESCRIPTION OF THE ENVIRONMENTAL IMPACTS AND RISKS IDENTIFIED DURING THE ENVIRONMENTAL ASSESSMENT PROCESS

Table 20 provides a description of the impacts on environmental and socio-economic aspects in respect of each of the main project actions / activities and processes that will be assessed in Section 9. No alternatives were considered due to the location of the ore body, it is not possible to alter the geographic location of the prospecting right activities. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed.

TABLE 20: LIST OF POTENTIAL IMPACTS AS THEY RELATED TO THE PROPOSED PROJECT

Potential impact	Activity	Project phases
Loss of soil capability through physical disturbance and contamination resources and land	Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
General and physical disturbance of biodiversity	Site preparation Earthworks Waste management Transport Prospecting Generator use	Construction Operational Decommissioning Closure

Potential impact	Activity	Project phases
	Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	
Alteration of natural drainage patterns reducing contributions to the catchment	Not applicable	Not applicable
Contamination of surface water	Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Reduction of water availability to third parties through groundwater abstraction	Water use and management	Construction Operational Decommissioning
Contamination of groundwater resources	Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Air pollution	Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Increase in disturbing noise levels	Site preparation Earthworks Transport Prospecting Generator use Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Negative visual views	Site preparation Earthworks Waste management Water use and management	Construction Operational Decommissioning Closure

Potential impact	Activity	Project phases
	Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	
Loss of heritage/ cultural resources and palaeontological resources	Site preparation Earthworks Transport Prospecting Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Inward migration	Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure
Change in land use	Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Construction Operational Decommissioning Closure

8.4 ASSESSMENT OF THE SIGNIFICANCE OF EACH IMPACT AND RISK AND AN INDICATION OF THE EXTENT TO WHICH THE ISSUES AND RISKS CAN BE AVOIDED OR ADDRESSED BY THE ADOPTION OF MANAGEMENT ACTIONS

The assessment of the significance of potential impacts, including the extent to which impacts can be avoided or mitigated, is included in Section 9.

9. ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

A summary of the assessment of the biophysical and socio-economic impacts associated with the proposed project is provided in Table 21 below.

TABLE 21: ASSESSMENT OF SIGNIFICANT IMPACTS AND RISKS

Activity	Potential impact	Aspects affected	Phase	Significance (Unmitigated)	Management actions type	Significance (Mitigated)	Extent to which the impact can be reversed, avoided or cause irreplaceable loss and the degree to which the impact and risk can be mitigated
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Loss of soil resources and land capability through physical disturbance and contamination	Soil and land capability	Construction Operational Decommissioning Closure	Low	• Manage through erosion control • Manage through limiting areas of disturbance • Manage through maintenance of vehicles and equipment • Control through waste procedures • Control through soil management procedures • Remedy through rehabilitation • Manage through monitoring • Remedy spillages through emergency response procedures (Section 29.2.2)	Insignificant	• Impact can be reversed with mitigation • Definite loss where mitigation measures are not correctly implemented • The impact can be mitigated (high degree)
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	General and physical disturbance of biodiversity	Biodiversity	Construction Operational Decommissioning Closure	High	• Avoidance of protected trees as far as possible • Control through obtaining permits where protected trees cannot be removed • Manage through limiting areas of disturbance • Control through speed limits • Control through dust and noise management • Obtain necessary GA in terms of the NWA • Control through zero tolerance of animal killing or collecting biodiversity • Manage alien invasive species • Manage through monitoring • Remedy through rehabilitation • Remedy through emergency response procedures (Section 29.2.2)	Very low	• Impact can be reversed with mitigation • Definite loss where mitigation measures are not correctly implemented • The impact can be mitigated (high degree)
Not applicable	Alteration of natural drainage patterns reducing contributions to the catchment	Surface water	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of surface water		Construction Operational Decommissioning Closure	Insignificant	• Manage through soil management measures • Remedy through rehabilitation • Remedy through emergency response procedures (Section 29.2.2)	Insignificant	• Impact can be reversed with mitigation • Cannot cause irreplaceable loss of a resource • The impact can be mitigated (high degree)
Water use and management	Reduction of water availability to third parties through groundwater abstraction	Groundwater	Construction Operational Decommissioning	Insignificant	• Obtain necessary GA in terms of the NWA • Control through use of borehole water with farmer consultation • Manage with monitoring	Insignificant	• Impact can be reversed with mitigation • Unlikely to cause irreplaceable loss of a resource • The impact can be mitigated (high degree)

Activity	Potential impact	Aspects affected	Phase	Significance (Unmitigated)	Management actions type	Significance (Mitigated)	Extent to which the impact can be reversed, avoided or cause irreplaceable loss and the degree to which the impact and risk can be mitigated
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of groundwater resources		Construction Operational Decommissioning Closure	Insignificant	• Manage through marking boreholes • Avoid drilling near third party borehole as far as possible • Management through soil management measures	No impact	• Impact can be reversed with mitigation • Definite loss where management measures are not correctly implemented • The impact can be mitigated (high degree)
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Air pollution	Air	Construction Operational Decommissioning Closure	Low	• Manage through limiting surface disturbance • Control through use of existing access tracks as far as possible • Control through prospecting activities within demarcated areas • Manage through soil management measures • Control speed limits • Manage through dust suppression • Manage through vehicle and equipment maintenance • Remedy through addressing complaints	Insignificant	• Impact can be reversed with mitigation • Unlikely to cause irreplaceable loss of a resource • The impact can be mitigated (high degree)
Site preparation Earthworks Transport Prospecting Generator use Removal of equipment and structures Rehabilitation Maintenance and aftercare	Increase in disturbing noise levels	Noise	Construction Operational Decommissioning Closure	Low	• Manage through limiting the use of vehicles and machinery • Control through limiting prospecting activities to daytime hours • Control through speed limits • Manage through vehicle and equipment maintenance • Remedy through addressing complaints	Very low	• Impact can be reversed with mitigation • Unlikely to cause irreplaceable loss of a resource • The impact can be mitigated (high degree)
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Negative visual views	Visual	Construction Operational Decommissioning Closure	Very low	• Manage through soil and air management measures • Control through limiting surface disturbance area • Manage through good housekeeping • Remedy through rehabilitation • Remedy through addressing complaints	Insignificant	• Impact can be reversed with mitigation • Unlikely to cause irreplaceable loss of a resource • The impact can be mitigated (high degree)
Site preparation Earthworks Transport Prospecting Rehabilitation Maintenance and aftercare	Loss of heritage/ cultural resources and palaeontological resources	Heritage/ cultural resources and palaeontological	Construction Operational Decommissioning Closure	Very high (not applicable for palaeontological resources)	• Control through avoidance • Remedy through emergency response procedures (Section 29.2.2)	Insignificant (not applicable for palaeontological resources)	• Impact cannot be reversed if there is a loss of damage of a resource and will cause irreplaceable loss • Impact can be avoided with mitigation • The impact can avoided (high degree)
Site preparation Earthworks Waste management Water use and management	Inward migration and economic impact	Socio-economic	Construction Operational Decommissioning Closure	Medium positive	• Manage through use of local labour where possible • Mange through use of local goods and services	Medium positive	• Impact can be reversed with mitigation • Unlikely to cause irreplaceable loss of a resource

Activity	Potential impact	Aspects affected	Phase	Significance (Unmitigated)	Management actions type	Significance (Mitigated)	Extent to which the impact can be reversed, avoided or cause irreplaceable loss and the degree to which the impact and risk can be mitigated
Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare							• The impact can be mitigated (high degree)
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Change in land use	Land use	Construction Operational Decommissioning Closure	Medium	• Manage through access control with landowner consent • Manage through determining prospecting borehole location with landowners • Remedy through compensation for loss of grazing land • Control through demarcating drill sites • Control through undertaking prospecting activities in demarcated areas • Manage through dust, noise and waste management measures • Remedy through addressing complaints • Remedy through rehabilitation	Insignificant	• Impact can be reversed with mitigation • Definite loss where mitigation measures are not correctly implemented • The impact can be mitigated (high degree)

10. SUMMARY OF SPECIALIST REPORT FINDINGS

The recommendations made by the specialist in support of the proposed project are summarised in Table 22 below.

TABLE 22: SUMMARY OF SPECIALIST RECOMMENDATIONS

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
Palaeontological study (Bramford, November 2019)	• Based on the nature of the project, surface activities may impact upon the fossil heritage only if preserved in the development footprint and this has a low probability. The geological structures suggest that the rocks are either much too old to contain fossils. Furthermore, the surface material to be cored through is loose Aeolian sand and this does not preserve fossils. Since there is an extremely small chance that fossils may have been entrained and transported in the sand and may be disturbed, a Fossil Chance find protocol has been added to this report. If fossils are found and collected, then there will be no impact on the fossil heritage. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low. • Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once coring has commenced then they should be rescued, and a palaeontologist called to assess and collect a representative sample.	X	• Section 7.4.1.10 (Baseline) • Section 26 (management actions)
Heritage/cultural study (Pelser, December 2019)	• In conclusion it is possible to say that the Khwara Manganese (Pty) Ltd's proposed Iron Ore and Manganese prospecting on Portion 43 of the farm Eersbegint 703 was conducted successfully. The prospecting and study area are located in the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality of the Northern Cape Province. The area is situated approximately 27 km north-west of the town of Hotazel.	X	• Section 7.4.1.10 (Baseline) • Section 26 (management actions)

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	• The prospecting activities will include non-invasive and invasive activities. Non-invasive activities will comprise analyzing existing core, ground penetrating radar and handheld ground magnetic mapping. Invasive activities would comprise drilling of ten (10) prospecting boreholes on the Eersbegint farm. The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south-western section of the farm Eersbegint 703 near the Kuruman River. • Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls, while no known sites are known for the specific study area. The assessment of Eersbegint was done at the same time as the one on Boerdraai 228, also for Khwara Manganese (See Report APAC019/119). Access to Eersbegint was limited at the time of the assessment, but the geographical and natural landscape of the study area is similar as the two areas lie directly adjacent to each other. Although sites similar to those on Boerdraai could not be identified and recorded as a result, the findings and resultant recommendations provided are the same. • As with the Boerdraai 228 assessment the study area is fairly large, with large sections covered by dunes and red Kalahari sands. Due to limited access and time constraints a detailed assessment of the study area could not be undertaken. A section of the (dry) Kuruman River runs through the south-western corner of the farm. Similar to Boerdraai this river section also contains open areas and erosion dongas, calcrete outcrops and deposits & sections with concentrations and deposits of river gravels. These areas are the most likely to contain archaeological deposits and material and it is envisaged that the situation here will be similar to that of Boerdraai. Although only 6 Stone Age sites and areas with material were physically recorded in the area during the assessment, there are many more sites and		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	material scattered all over the area of the dry Kuruman riverbed and the associated erosion dongas and calcrete outcrops. Also, some of these sites are eroding out from under the overlying red (Aeolian) Kalahari sands covering large parts of the area. It is therefore expected that many sites and finds are currently invisible to the naked eye, and that suitable mitigation measurements will have to be implemented before and when the proposed prospecting activities commence. • With a fairly large amount of Stone Age artefacts (either single tools or scatters of more dense tools) and sites found in the Boerdraai, the possibility that more similar finds and sites exist in the Eersbegint area is very likely, and recommended mitigation measures to negate the negative impacts of the proposed prospecting activities will be provided further on in the report. Over and above the likely Stone Age sites, recent historical sites such as unrecorded graves and possibly historical homestead remains could also be present on Eersbegint. • The significance of the Stone Age sites and finds in the Boerdraai study area is deemed to be of between Medium and High, and with Eersbegint this will be the same. With the exact positions of the proposed prospecting boreholes on Eersbegint not provided, the cumulative impacts of these activities on any possible sites present in the area would be difficult to determine currently. The following is recommended: ○ It is understood that the ore body is anticipated to be towards the south-western section of the farm Eersbegint 703 near the Kuruman River. The exact locations of the ten (10) prospecting boreholes need to be provided so that these positions can be assessed in detail to determine their potential impacts on any possible sites. ○ In the event that any potential Stone Age sites cannot be avoided by the proposed prospecting activities, the need to obtain a permit for the removal and/or destruction of these sites needs to be discussed with a qualified archaeologist and obtained from SAHRA, if necessary. Linked to this is the completion of a Phase 2		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	HIA that needs to be undertaken by a qualified archaeologist if a permit for removal and/or destruction is required. ○ In the event of a chance find, a qualified archaeologist needs to be contacted. • What is clear from the assessment of the Boerdraai area is that there are numerous archaeological sites and deposits present. Any prospecting activities will negatively impact on these archaeological deposits and the Stone Age record of the area. However, without the details of the location and extent of the proposed boreholes available, the scale of impact on these resources will not be possible to be determined. The mitigation measures proposed above will serve to determine and to minimize these impacts, however. • The subterranean nature of archaeological and/or historical resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward. • Finally, from a Cultural Heritage point of view the proposed prospecting should be allowed to continue taking into consideration the recommended mitigation measures provided above.		
Heritage/cultural study (Pelser, January 2020)	• In conclusion it is possible to say that the Khwara Manganese (Pty) Ltd's proposed Iron Ore and Manganese prospecting on Portion 43 of the farm Eersbegint 703 was conducted successfully. The prospecting and study area are located in the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality of the Northern Cape Province. The area is situated approximately 27 km north-west of the town of Hotazel. • The prospecting activities will include non-invasive and invasive activities. Non-invasive activities will comprise analyzing existing core, ground penetrating radar and handheld ground magnetic mapping. Invasive activities would comprise drilling of ten (10) prospecting boreholes on the Eersbegint farm. The location of the boreholes has not been determined.	X	• Section 7.4.1.10 (Baseline) • Section 26 (management actions)

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south-western section of the farm Eersbegint 703 near the Kuruman River. • Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls, while no known sites are known for the specific study area. The assessment of Eersbegint was done at the same time as the one on Boerdraai 228, also for Khwara Manganese (See Report APAC019/119). Access to Eersbegint was limited at the time of the December 2019 assessment, but the geographical and natural landscape of the study area is similar as the two areas lie directly adjacent to each other. Although sites similar to those on Boerdraai could not be identified and recorded. A physical assessment of Eersbegint was undertaken during January 2020. As with Boerdraai the focus of the fieldwork was on the Kuruman River section as this was the area where sites were expected to be found. This is also the area where it is understood the ore body is anticipated to be (towards the south-western section of the farm near the Kuruman River). • The study area is fairly large, with large sections covered by dunes and red Kalahari sands. A section of the (dry) Kuruman River runs through the south-western corner of the farm. This river section also contains open areas and erosion dongas, calcrete outcrops and deposits & sections with concentrations and deposits of river gravels. These areas were the most likely to contain archaeological deposits and material. • A fairly large amount of Stone Age artefacts (either single tools or scatters of more dense tools) and sites were found in the area and recorded. The possibility that more similar finds and sites exist in the area is very likely. • Although 16 sites and areas with material were physically recorded, there are likely many more sites and material scattered all over the area of the dry Kuruman Riverbed and the associated erosion dongas and calcrete outcrops. Also, some of these sites are eroding out		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report

	from under the overlying red (Aeolian) Kalahari sands covering large parts of the area. It is therefore expected that many sites and finds are currently invisible to the naked eye, and that suitable mitigation measurements will have to be implemented before and when the proposed prospecting activities commence.
	• The significance of the Stone Age sites and finds in the Eersbegint study area is deemed to be of between Medium and High. With the exact positions of the proposed prospecting boreholes on Eersbegint not provided, the cumulative impacts of these activities on the possible sites present in the area would be difficult to determine currently. The following is recommended:
	  ○ That the dry Kuruman Riverbed area located in the south-western corner of the study area be avoided at all costs if possible, by any prospecting activities. This will include the outcrops of river gravels and banks of calcrete deposits.
	  ○ That the exact positions of the 10 prospecting boreholes, once determined, be assessed before prospecting starts for the presence of archaeological deposits and sites. Once this has been done the cumulative impacts of the proposed prospecting can then be determined and Phase 2 mitigating measures be proposed for implementation.
	• What is clear from the assessment is that there are numerous archaeological sites and deposits present in the dry Kuruman Riverbed sections. Any prospecting actions will negatively impact on these archaeological deposits and the Stone Age record of the area. However, without the details of the location and extent of the proposed boreholes available, the scale of impact on these resources will not be possible to be determined. The mitigation measures proposed above will serve to determine and to minimize these impacts, however.
	• Most of the sites found are in and around the dry Kuruman Riverbed section on the farm, similar to those found on Boerdraai. The sites contain scatters of material of varying density, including flake-tools such as scrapers, broken blades, points and waste material. Some cores		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	and core tools were also observed. The Stone Age tools date to the Middle and Later Stone Ages mostly. • A few of the sites or finds are found in and around the large quarry in the area, with some evidence of intact archaeological deposits visible in the stratigraphy of the quarry. "In situ" tools are visible below the red sands just above the underlying calcrete layers which formed the focus of the quarrying. It is therefore likely that similar in situ deposits could be present in the area and it is therefore recommended that once the prospecting trenches and boreholes are finalized that these locations be assessed in detail to provide a way forward in terms of mitigation measures. A single undecorated piece of pottery was also found in the disturbed quarry area and although it could have a more recent origin it is possible that it belongs to the so-called Ceramic Late Stone Age. • Site 16 is represented by a single possibly Earlier Stone Age chopper. This find is evidence that the area might have been utilized during the whole timeframe of the Stone Age (Early to Later) and that the archaeological record here could span between 2 million and 2000 years ago. A possible Acheul handaxe was also recorded on Boerdraai during the December 2019 assessment, strengthening this possibility. • The subterranean nature of archaeological and/or historical resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward. • Finally, from a Cultural Heritage point of view the proposed Potion 43 of Eersbegint 703 prospecting should be allowed to continue taking into consideration the recommended mitigation measures provided above.		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
Biodiversity – Aquatics (STS, February 2020)	• Based on the findings of the freshwater ecological assessment, several recommendations are made to further minimise potential impacts on the freshwater ecology of the area, should the proposed exploration activities proceed, are provided below: ○ As far as possible, prospecting activities should be avoided within the active channel and riparian zone of the Kuruman River or within 32m thereof (i.e. the Zone of Regulation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)). It is recommended that the drill plan be planned to exclude these areas if possible. If not, the necessary approvals will be obtained; ○ No access roads should be planned parallel to the watercourse. All access roads must be planned to access each drill site at 90-degree angles to minimise edge effects on the system. Keep vehicle movements close to the natural contours of the landscape as much as possible; ○ If prospecting within the watercourse cannot be avoided, then it is essential that each drill pad footprint is minimised and does not extend beyond 100m2 per site and that vegetation clearing is limited to essential areas only. Access to any portions of the watercourse within which activities are not taking place are to be strictly 'off-limits' to all personnel and vehicles; ○ A spill prevention and emergency spill response plan should be compiled to guide the proposed exploration activities, and an emergency response contingency plan should be put in place to address clean-up measures should a spill and/or a leak occur; ○ It is essential that a soil management programme is implemented and maintained to minimise erosion and sedimentation; ○ Active re-vegetation of disturbed areas immediately after construction is essential; ○ Implement and maintain an alien vegetation management programme;	X	• Section 7.4.1.10 (Baseline) • Section 26 (management actions)

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ Appropriate waste management at each site is essential. No waste material is to be disposed of within the watercourse or surrounds, and all waste is to be removed from site and disposed of at a licenced disposal facility; and ○ Rehabilitation measures must be developed and implemented at each site. Implementation must be overseen by a suitably qualified Environmental Site Officer with wetland/aquatic experience and the ESO must sign off the rehabilitation before the relevant contractors leave site. A Minimum of two years post-closure monitoring is to be undertaken. Further general management measures include: • **Development and operational footprint:** ○ Sensitivity maps have been developed for the focus area, indicating the watercourses, and their relevant regulatory zones in accordance with NEMA, Regulation GN509 and Regulation GN704, as shown in Figure 11 (Section 4.3.2). It is recommended that these sensitivity maps be considered during all phases of the development and with special mention of the planning of any future infrastructure layout, to aid in the conservation of the watercourse habitat within the focus area; ○ All prospecting footprint areas should remain as small as possible and should not encroach onto surrounding, more sensitive areas. Prospecting must only take place in the demarcated areas. If prospecting is to occur within the watercourse, strict regulation of activities therein must take place, and non-prospecting areas are to be considered off-limits to personnel and vehicles; ○ The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas; ○ Planning of temporary roads and access routes should take the site sensitivity plan into consideration, and wherever possible, existing roads should be utilised. If additional roads are required, then wherever feasible such roads should be		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	constructed a distance from the watercourse areas and not directly adjacent thereto. If crossings are required they should cross the system at right angles, as far as possible to minimise impacts in the receiving environment, and any areas where bank failure is observed due to the effects of such crossings should be immediately repaired by reducing the gradient of the banks to a 1:3 slope and where needed necessary, installing support structures. This should only be necessary if existing access roads are not utilised; ○ All areas of increased ecological sensitivity should be marked as such and be off limits to all unauthorised construction and maintenance vehicles and personnel; ○ Appropriate sanitary facilities must be provided for the life of the proposed project and all waste removed to an appropriate waste facility; ○ All hazardous chemicals should be stored on bunded surfaces and no storage of such chemicals should be permitted within the freshwater buffer zones; ○ No informal fires should be permitted in or near the construction areas; ○ Ensuring that an adequate number of rubbish and "spill" bins are provided will also prevent litter and ensure the proper disposal of waste and spills; and ○ Edge effects of activities, particularly erosion and alien/weed control need to be strictly managed. • **Vehicle access:** ○ All areas of increased ecological sensitivity should be marked as such and kept off limits to all unauthorised construction and maintenance vehicles as well as personnel; ○ It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil; and		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ All spills, should they occur, should be immediately cleaned up and treated accordingly. • **Alien plant species:** ○ Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the project footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled; ○ Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998). Removal of species should take place throughout the construction, operational, closure/decommissioning and rehabilitation/ maintenance phases; and ○ Species specific and area specific eradication recommendations: ▪ Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used; ▪ Footprint areas should be kept as small as possible when removing alien plant species; ▪ No vehicles should be allowed to drive through designated sensitive watercourse areas during the eradication of alien and weed species. • **Freshwater habitat:** ○ Ensure that as far as possible all infrastructure is placed outside of watercourse areas and applicable regulatory zones. A minimum buffer of 100m around all watercourse/freshwater systems should be maintained in line with the requirements of regulation GN704 of the NWA for all non-resource dependent infrastructure. If these measures cannot be adhered to, strict mitigation measures		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	will be required to minimize the impact on the receiving watercourses. Such measures include those stipulated in Section 5 of this report, in addition to the following: ▪ Ensuring that measures are implemented to prevent dirty runoff water entering the watercourse habitat; and ▪ Ensuring that where necessary, exposed soils in the vicinity of watercourse habitat are protected from erosion by means of reinstating natural vegetation following construction. ○ Permit only essential personnel within 100m of the watercourse habitat, if absolutely necessary that they enter the regulatory zone; ○ Limit the footprint area of the construction activities to what is absolutely essential in order to minimise environmental damage; ○ During prospecting, no vehicles should be allowed to indiscriminately drive through the freshwater areas; ○ All waste materials generated during any phase of the proposed activities must be prevented from entering the watercourses; and ○ Implement effective waste management in order to prevent construction related waste from entering the watercourse environments. • **Soils:** ○ To prevent the erosion of soils, management measures may be determined by the site engineer at their discretion and may include mechanisms such as temporary silt traps or hessian curtains. Revegetation with indigenous graminoid species is however recommended for long-term protection of soils and it is suggested that such revegetation of disturbed areas is undertaken concurrently with prospecting; ○ Maintain topsoil stockpiles below 5 meters in height;		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ○ All soils compacted as a result of construction activities falling outside of project footprint areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas; and ○ Monitor all areas for erosion and incision. Any areas where erosion is occurring excessively quickly should be rehabilitated as quickly as possible. • **Rehabilitation:** ○ All soils compacted as a result of construction activities falling outside of project footprint areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. Alien and invasive vegetation control should take place throughout all construction and rehabilitation phases to prevent loss of floral habitat; ○ Edge effects of activities including erosion and alien/ weed control need to be strictly managed in these areas; ○ As far as possible, all rehabilitation activities should occur in the low flow season, during the drier winter months. ○ As much vegetation growth (of indigenous/endemic floral species) as possible should be promoted within the proposed development area in order to protect soils; ○ All alien vegetation in the watercourse areas should be removed from rehabilitated areas and reseeded with indigenous grasses as specified by a suitably qualified specialist (ecologist); ○ All areas affected by prospecting activities should be rehabilitated upon completion of the activities.		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
Biodiversity terrestrial (STS, February 2020a)	• Based on the findings of the biodiversity terrestrial assessment, several recommendations are made to further minimise potential impacts on the terrestrial ecology of the area, should the proposed exploration activities proceed, are provided below: ○ The necessary permits need to be obtained from DEFF and NCDENC prior to the implementation of rescue and relocation activities; ○ No illicit fires must be allowed during the construction and operational phases of the proposed prospecting activities; ○ Minimise loss of indigenous vegetation and faunal habitat where possible through effective planning and limiting the prospecting footprint to what is essential. This is of significance with regard to access roads to the prospecting drill holes. The designs must further adhere to all legislation and all possible precautions taken to prevent potential spills and /or leaks; and ○ Cut vegetation from site clearing to be removed immediately and not allowed to accumulate within surrounding natural habitat. Further general management measures include: • **Development and operational footprint:** ○ Current habitat degradation is considered higher within the area south west of the Kuruman River, with access roads already running along the River. It is recommended if feasible, that prospecting activities be planned within the portion southwest of the Kuruman River utilising the Degraded Habitat first, thereby limiting the number of additional roads that will have to be created for the prospecting activities; and	X	• Section 7.4.1.10 (Baseline) • Section 26 (management actions)

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ Ensure the prospecting footprint area is kept as small as possible in order to minimise loss of floral and faunal habitat and to limit impacts on all floral and faunal species; ○ It is recommended that the prospecting footprint area be demarcated using shade-net fencing, to prevent habitat creep into surrounding natural areas prior to the commencement of a prospecting drill site establishment; and ○ The footprint of daily prospecting activities must be strictly monitored to ensure that edge effects from the prospecting facilities do not affect the surrounding floral and faunal habitat. • **Access:** ○ Natural habitat outside of the direct prospecting footprint areas must be avoided, and no prospecting vehicles, personnel, or any other prospecting-related activities are to encroach upon these areas; ○ It is recommended that existing gravel roads be used for prospecting as far as is possible and sites be planned in consideration of the existing available road network; ○ Where additional roads are required it is recommended that shrubs and trees be cut and not completely removed, and prospecting vehicles drive over herbaceous species, in order to limit disturbance to the area; ○ Vehicles should be restricted to travelling on designated access roads, and no discriminate driving through surrounding natural habitat should be allowed; ○ It is not recommended that any trees taller than 3 m be removed, but that access roads and drill sites be located in such a way to prevent the removal of large indigenous or protected trees; and ○ Any temporary roads should be rehabilitated as soon as they are no longer in use to prevent effects of habitat fragmentation.		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report

	• **Flora**:
	  ○ It is recommended that where colonies of floral species of concern are recorded, prospecting drill sites and access roads be refined to exclude these areas from prospecting, to limit the impact on these individuals;
	  ○ Once prospecting drill sites and access roads have been identified, a detailed walkdown of the footprint areas must be undertaken and all protected floral species marked (on the ground and with GPS locations). Once the locations of floral SCC and protected species have been determined, the footprint of the prospecting activities can be finalised. The walkdown should ideally be undertaken during the summer season (January - March) when most herbaceous floral species will be in flower, and accurate identification will be easier;
	  ○ Once all floral species of concern and NCNCA protected floral species within the development footprint has been identified, a rescue and relocation plan should be designed for herbaceous species – this plan must give guidance on a species level with regards to their relocation potential and requirements. Rescue activities need to take place prior to the commencement of any prospecting activities. Once a drill site has been decommissioned, the rescued species (if they have been kept at a suitable nursery) should be used as part of rehabilitation efforts. Rescue and transplanting of floral species should be overseen by a contractor/ mine employee with assistance from a suitably qualified botanist. The success of rehabilitation actions needs to be monitored quarterly for a minimum period of a year post-relocation.
	  ○ No collection of floral species of concern or medicinal floral species within the focus area or larger region must be allowed by prospecting personnel.		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral species of concern and protected floral species outside of the proposed expansion footprint area. • **Alien invasive plant species (AIP):** ○ Prior to the commencement of prospecting activities, an AIP Management/Control Plan should be compiled for implementation; ○ An Alien and Invasive Plant Management and Control Plan must be designed and implemented in order to monitor and control alien floral recruitment in disturbed areas. The alien floral control plan must be implemented for a period of at least 1 year after decommissioning and closure; ○ Where AIP species are removed as part of prospecting activities, it is recommended that the plant material be immediately removed to a registered waste facility. AIP material should not be allowed to remain on site from where it can readily spread to surrounding natural areas; ○ Of particular importance is the control of *Prosopis glandulosa*, which comprise of a deep-rooted taproot as well as an extensive lateral root system. This species subsequently not only compete with the indigenous *V. erioloba* for deep groundwater but also take-up sparse precipitation within the soil profile. This species also has a high transpiration rate, which further result in a rapid decline of the water table (Schachtschneider and February 2013). The proliferation of these species have the potential to result in significant long-term negative impacts on the surrounding landscape, particularly the NFA protected species V. erioloba and V. haematoxylon, which play a vital role in the ecosystem by providing habitat for a number of floral and faunal species (Seymour &Milton, 2003);		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ The topsoil stockpile should be inspected weekly for establishment of AIP species. Where seedlings are visible, they should be immediately pulled and be disposed of in waste bins; ○ Edge effects of all prospecting activities, such as erosion and alien plant species proliferation, which may affect adjacent Southern Kalahari Mekgacha and Kathu Bushveld Habitat, need to be strictly managed adjacent to the prospecting project footprint areas. Specific mention in this regard is made of Prosopis glandulosa and all Category 1b AIP species, in line with the NEMBA Alien and Invasive Species Regulations (2016); ○ AIP management for construction-phase activities should be focused on limiting their spread, e.g. roadsides (gravel and tarred roads) should be monitored, as they serve as common corridors along which AIP species are introduced and dispersed, and disturbed areas should regularly be monitored for AIP recruitment until successfully rehabilitated; ○ Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it; and ○ Ongoing alien and invasive vegetation monitoring and eradication should take place for all decommissioned areas throughout the prospecting phase for alien vegetation proliferation to prevent spread into surrounding natural area. • **Waste management:** ○ If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line; ○ Spill kits should be kept on site. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised preventing the ingress of hydrocarbons into the topsoil;		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ No dumping of waste on site should take place. As such it is advised that waste disposal containers and bins be provided during the prospecting phase for all prospecting rubble and general waste; and ○ All cleared plant material to be disposed of within a waste disposal container and be removed to a licensed waste facility which complies with legal standards. • **Rehabilitation:** ○ All prospecting footprints and access roads should be rehabilitated in accordance with a rehabilitation plan compiled by a suitable specialist; ○ All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated as per the post-closure objective; and ○ Rehabilitation efforts must be implemented for a period of at least one year after decommissioning. • **Fauna:** ○ Once prospecting drill sites and access roads have been identified, a detailed walkdown of the footprint areas will have to be undertaken and all protected faunal species or their nests/ burrows be marked. Once the locations of faunal species of concern and protected species have been determined, the footprint of the prospecting activities can be finalised. The walkdown should ideally be undertaken during the breeding season of the various faunal species in order more readily identify active nests. ○ Where faunal species of concern are identified within the prospecting footprint, and where it is deemed unfeasible to alter the prospecting footprint to exclude these individuals, they should be rescued and relocated to suitable similar habitat outside of the prospecting footprint once the relevant permits have been obtained.		

Specialist study	Recommendation of specialist	Specialist recommendations that have been included in the BAR (mark with an x)	Reference to applicable section in this report
	○ The rescue and relocation of faunal species of concern should be overseen by a suitably qualified faunal specialist. ○ As far as possible attempts must be made to flush faunal species from the prospecting sites and access routes prior to driving and setting up the drill vehicle. In this instance each site and access route must be thoroughly inspected for small fauna, notably tortoises, snakes and baboon spiders that may be hiding under vegetation which may be crushed/injured by the vehicle. ○ Prohibit trapping or hunting of fauna.		

11. ENVIRONMENTAL IMPACT STATEMENT

11.1 SUMMARY OF KEY FINDINGS

This section provides a summary of the findings of identified and assessed potential impacts on the receiving environment in both the unmitigated and mitigated scenarios, including cumulative impacts. A summary of the potential impacts associated with the preferred alternative in the unmitigated and mitigated scenarios for all project phases is included in Table 23 below.

The assessment of the proposed project presents the potential for negative impacts to occur (in the unmitigated scenario in particular) on the biophysical, cultural and socio-economic environments both on the project site and in the surrounding area. With management actions these potential impacts can be prevented or reduced to acceptable levels.

It follows that provided the EMPr is effectively implemented there is no biophysical, social, or economic reason why the project should not proceed.

TABLE 23: SUMMARY OF POTENTIAL IMPACTS

Aspect	Potential impact	Impact significance of the impact (the ratings are negative unless otherwise specified)	
		Unmitigated	Mitigated
Soil and land capability	Loss of soil capability through physical disturbance and contamination resources and land	Low	Insignificant
Biodiversity	General and physical disturbance of biodiversity	High	Very low
Surface water	Alteration of natural drainage patterns reducing contributions to the catchment	Not applicable	Not applicable
	Contamination of surface water	Insignificant	Insignificant
Groundwater	Reduction of water availability to third parties through groundwater abstraction	Insignificant	No impact
	Contamination of groundwater resources	Insignificant	Insignificant
Air	Air pollution	Low	Insignificant
Noise	Increase in disturbing noise levels	Low	Very low
Visual	Negative visual views	Very low	Insignificant
Heritage/ cultural resources and palaeontological resources	Loss of heritage/ cultural resources and palaeontological resources	Very high (not applicable for palaeontological resources)	Insignificant (not applicable for palaeontological resources)
Socio-economic	Inward migration and economic impact	Medium positive	Medium positive
Land use	Change in land use	Medium	Insignificant

11.2 FINAL SITE MAP

The final site map is included in Figure 3.

11.3 SUMMARY OF THE POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

No site layout or infrastructure locational alternatives were considered. Due to the location of the ore body it is not possible to alter the geographic location of the prospecting right activities. It is however understood that the ore body is anticipated to be towards the south western part of the farm near the Kuruman River. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. Guidance on the siting of drill sites and related mitigation measures is included in the EMPr. This section is therefore not applicable.

12. IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES FOR INCLUSION IN THE EMPR

Based on the outcome of the impact assessment and where applicable the recommendations from specialists the proposed management objectives and outcomes specific to the proposed changes and for inclusion into the environmental management programme are detailed in this section.

12.1 PROPOSED MANAGEMENT OBJECTIVES AND OUTCOMES FOR ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

Specific environmental objectives to control, remedy or prevent potential impacts emanating from the proposed project are provided in Table 24 below.

TABLE 24: ENVIRONMENTAL OBJECTIVES AND OUTCOMES

Aspect	Environmental objective	Outcome
Soil and land capability	To minimise the loss of soil resources and related land capability through physical disturbance, erosion, compaction and soil pollution.	Handle, manage and conserve soil resources to be used as part of rehabilitation and re-establishment of the pre-project land use.
Biodiversity	To prevent the unacceptable disturbance and loss of biodiversity and related ecosystem functionality through physical and general disturbance.	Limit the area of disturbance as far as practically possible. Avoid the loss of protected species.
Groundwater	To prevent contamination of groundwater resources and related harm to water users.	Ensure groundwater quality remains within acceptable limits for both domestic and agricultural purposes.
Air	To prevent air pollution health impacts.	Ensure that any pollutants emitted as a result of the project remains within acceptable limits to prevent health related impacts.
Noise	To prevent public exposure to disturbing noise.	Ensure that any noise generated as a result of the project remains within acceptable limits to avoid the disturbance of third parties.
Visual	To minimise changes to natural topography. To limit negative visual impacts.	Limit the alteration of the topography during prospecting and through rehabilitation. Limit negative visual views.
Heritage and cultural	To minimise the disturbance of heritage resources.	Protect heritage resources where possible. If disturbance is unavoidable, then mitigate impact in consultation with a specialist and the SAHRA and in line with regulatory requirements.
Socio-economic	To enhance positive economic and social impacts.	Ensure that negative socio-economic impacts are managed through suitable communication structures. Ensure that positive socio-economic impacts are enhanced through suitable communication structures.

Aspect	Environmental objective	Outcome
Land uses	To prevent unacceptable negative impacts on surrounding land uses.	Appropriate compensation for temporary loss of grazing land. Undertake activities in a safe manner. Ensure that vegetation successfully re-establishes itself and no residual contamination remains on site, thus allowing pre-project land uses to continue.

12.1.1 IMPACTS THAT REQUIRE MONITORING PROGRAMMES

Outcomes of the environmental objectives are the implementation of monitoring programmes. Impacts that require monitoring include (discussed future in Section 28):

- Soils;
- Biodiversity;
- Groundwater use;
- Air; and
- Land use.

12.1.2 ACTIVITIES AND INFRASTRUCTURE

The source activities of potential impacts which require management are detailed in Section 3.2 and include:

- Invasive prospecting activities:
  - Site preparation
  - Earthworks
  - Prospecting
  - Waste management (general and hazardous waste)
  - Water use and management
  - Generator use
  - Storage of consumables
  - Transport
  - Support services
  - Removal of equipment and structures
  - Rehabilitation
  - Maintenance and aftercare (2 to 3-year period usually applied)

12.1.3 MANAGEMENT ACTIONS

Management actions which will be implemented to control the project activities or processes which have the potential to pollute or result in environmental degradation are detailed in Section 26.

12.1.4 ROLES AND RESPONSIBILITIES

The key personnel to ensure compliance to this BA and EMPr are the contractors' environmental officer and senior geologist. As a minimum, their roles, as they relate to the implementation of monitoring programmes and management activities, include:

- Implementing mitigation measures outlined in the EMPr;
- Undertaking monitoring as outlined in the EMPr;
- Establishing and maintaining good working relations with landowners and land users;
- Facilitating stakeholder communication and maintaining a complaint register; and
- Maintenance of records for auditing purposes.

13. ASPECTS FOR INCLUSION AS CONDITIONS OF THE AUTHORISATION

Management actions including monitoring requirements, as outlined in Sections 26, should form part of the conditions of the environmental authorisation.

With reference to Regulation 26 of GNR 982 of NEMA, additional conditions that should form part of the environmental authorisation that are not specifically included in the EMPr report include compliance with all applicable environmental legislation whether specifically mentioned in this document or not and which may be amended from time to time.

14. ASSUMPTIONS, UNCERTAINTIES, LIMITATIONS AND GAPS IN KNOWLEDGE

This BAR relies on SLR's professional opinion which has been informed by the following:

- The previous Khwara Mine (SLR, September 2017) and the Lehating Mine (SLR, January 2014) EIA reports given that the proposed project area is located adjacent to the Khwara and Lehating mine properties, the baseline conditions are expected to be similar; and
- A site visit completed in November 2019.

14.1 ASSESSMENT

The location of the drill sites has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near private residences and the Kuruman River. The assessment caters for the drilling of ten prospecting boreholes (and related access tracks) and as such the direct disturbance of the drilling activities is anticipated to be relatively small. Should the number of drill sites increase significantly, the potential impacts would need to be re-assessed.

14.2 BIODIVERSITY – TERRESTRIAL

The following assumptions and limitations apply to the terrestrial biodiversity study (STS, February 2020a):

- At the time that this study was conducted, the location of the proposed prospecting sites (including boreholes) and layout of ancillary infrastructure such as access roads, was not provided. Based on the information provided by the EAP, it is the intention of the proponent to focus the prospecting activities within and adjacent to the Kuruman River, and to utilise existing access roads, where feasible. Thus, in line with the precautionary principle, a "worst-case scenario" was assumed when applying the impact assessment, whereby in addition to vegetation clearance for the 10 drill sites, it is envisioned that vegetation clearing for all access roads will also take place;
- The ecological assessment is confined to the focus area (200m on either side of the Kuruman River) and does not include the entire Portion 43 of the Farm Eersbegint 703, nor any of the neighbouring and adjacent properties. The farm portion was however considered as part of the desktop assessment;
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most floral and faunal communities had been accurately assessed and considered utilising available desktop information and findings from the field assessment of limited duration;
- Due to the nature and habits of most faunal taxa, it is unlikely that all species would have been observed during a field assessment of limited duration. Therefore, site observations were compared with literature studies where necessary;
- Sampling, by its nature, means that not all individuals are assessed and identified. Some species and taxa associated with the focus area may have been missed during the assessment; and
- The data presented in this report is based on one site visit, undertaken on the 4th and 5th of February 2020 (summer season). A more accurate assessment would require that assessments take place in all seasons of the year. However, on-site data was significantly augmented with all available desktop data.

Together with project experience in the area, the findings of this assessment are considered to be an accurate reflection of the ecological characteristics of the focus area.

14.3 BIODIVERSITY - AQUATIC

The following assumptions apply to the watercourse assessment undertaken for the proposed project (STS, February 2020):

- The watercourse assessment is confined to the focus area and does not include the neighbouring and surrounding properties outside of the focus area. The general surroundings were, however, considered in the desktop assessment of the focus area;
- With the exception of the Kuruman River, no watercourses within 500m of the focus area were identified using desktop assessment methods. The reach of the Kuruman River located within 500m of the northern portion of the focus area was delineated on a desktop basis using topographic maps and digital satellite imagery, in line with Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998). The reach located on the farm Boerdraai, south of the focus area, was delineated in the field according to the method defined by DWAF (2008). Only the reach located within the focus area was assessed as part of this investigation;
- The watercourse delineation as presented in this report is regarded as the best estimate of the watercourse boundaries based on the site conditions present at the time of assessment and based on the level of field verification possible. However, some limitations in the accuracy of the delineation due to historical and ongoing anthropogenic disturbances, in particular the alteration of the vegetation community composition and topography as a result of historical and current agricultural practices is deemed possible, although every effort has been made to ensure accuracy of the delineation;
- Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the watercourse zones will need to be surveyed and pegged according to surveying principles;
- Aquatic, riparian and terrestrial areas form transitional areas where an ecotone is formed as vegetation species change from terrestrial species to facultative/riparian zone species. Additionally, due to the naturally arid characteristics of the focus area, many species found in the riparian zone occur in terrestrial areas, albeit in diminished abundance and/or structure (e.g. height of individual plants may be greater in the riparian zone than in the adjacent terrestrial areas). Within the transition zone some variation of opinion on the riparian zone boundary may occur, however if the DWAF 2008 method is followed, all assessors should get largely similar results; and
- At the time that this study was conducted, the location of the proposed prospecting boreholes and layout of ancillary infrastructure such as access roads, was not provided. Based on information provided by the EAP, it is the intention of the proponent to focus the prospecting activities within and adjacent to the Kuruman River, and to utilise existing access roads where feasible. Information available at the time of the assessment indicated that a total of ten prospecting boreholes with a total footprint of 10m x 10m (including contractor laydown areas, sanitary facilities etc.) would be established within the focus area. Thus, in line with the precautionary principle, a “worst case scenario” was assumed when applying the impact assessment.

14.4 HERITAGE/CULTURAL STUDY

Although all efforts are made to cover a total area during any assessment and therefore to identify all possible sites or features of cultural (archaeological and/or historical) heritage origin and significance, that there is always the possibility of something being missed. This will include low stone-packed or unmarked graves. This aspect should be kept in mind when development work commences and if any sites (including graves) are identified then an expert should be called in to investigate and recommend on the best way forward (Pelser, January 2020).

14.5 PALAEONTOLOGICAL STUDY

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the manganese deposits, banded iron formation and Aeolian sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The Aeolian sands of the Quaternary period would not preserve fossils (Bramford, October 2019).

14.6 FINANCIAL PROVISION

The following assumptions are made for the development of the closure plan at this stage of the proposed project (SLR, November 2019):

- Khwara will follow and adhere to the commitments made in the BAR;
- Khwara will follow the prospecting plan layout to minimise the potential for additional disturbed areas;
- Runoff water quality from rehabilitated areas will be acceptable and will not require any treatment;
- No consideration of the social closure costs has been included in this report;
- No assessment of any socio-economic/shared value/community-based programmes being implemented and whether these would continue post-closure of the operation; and
- All costs associated with auditing and reporting are presumed to be covered under the operations expenditure of the prospecting right and have not been included in this closure plan.

Where necessary, assumptions will be reviewed during the prospecting operations, and any required technical work conducted in order to reduce information gaps and uncertainty prior to prospecting right closure.

15. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

15.1 REASONS WHY THE ACTIVITY SHOULD BE AUTHORIZED OR NOT

The assessment of the proposed project presents the potential for negative impacts to occur (in the unmitigated scenario in particular) on the biophysical and socio-economic environments both on the project sites and in the surrounding area. With management actions, these potential impacts can be prevented or reduced to acceptable levels. It follows that provided the EMPr is effectively implemented there is no biophysical, social or economic reason why the project should not proceed.

15.2 CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

15.2.1 SPECIFIC CONDITIONS FOR INCLUSION IN THE EMPR

Refer to Section 13.

15.2.2 REHABILITATION REQUIREMENTS

Refer to Section 27.

16. PERIOD FOR WHICH AUTHORISATION IS REQUIRED

The section below provides an indication of the environmental authorisation period relevant to each listed activity. In this regard, and with reference to the table below, environmental authorisation for the listed activities being applied for is required for a period of two (2) years. It is however important to note that the overall project will extend up to a period of four (4) to five (5) years. This is due to the fact that following the decommissioning of each drill site, a typical aftercare and maintenance period of two (2) to three (3) years is required in order for vegetation to re-establish. It is however important to note that the aftercare and maintenance period is dependent on the level of rehabilitation success. All the assumptions associated with aftercare and maintenance is provided in Section 27.

TABLE 25: ENVIRONMENTAL AUTHORISATION PERIOD ASSOCIATED WITH EACH LISTED ACTIVITY

Listed activity number, applicable listing notice and activity description	Number of years
NEMA: GNR 983 Listing Notice 1: Activity 20 - Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including - b) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource.	A total of ten (10) boreholes will be drilled over a period of two (2) years. It follows that environmental authorisation for this listed activity is required for two (2) years as prospecting activities will take place for this duration.
NEMA: GNR 983, Listing Notice 1: Activity 27 - The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The clearance of vegetation will take place at each drill site. Given that prospecting will take place over a period of two (2) years, this listed activity will apply to the proposed project for a period of two (2) years.
NEMA: GNR 985 Listing Notice 3: Activity 12 – The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan: i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	
NEMA: GNR 983 Listing Notice 1: Activity 12 - The development of infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs - (a) within a watercourse; (b) in front of a development setback; or	The clearance of vegetation will take place at each drill site and may be within the Kuruman River or within 32m of the Kuruman River. Given that prospecting will

Listed activity number, applicable listing notice and activity description	Number of years
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	take place over a period of two (2) years, this listed activity will apply to the proposed project for a period of two (2) years.
NEMA: GNR 985 Listing Notice 3: Activity 14 - The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse: <u>Outside urban areas:</u> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; and Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.	
NEMA: GNR 983, Listing Notice 1: Activity 22: The decommissioning of any activity requiring a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	Once drilling at each site is complete, the site will be decommissioned and rehabilitated. Given that prospecting will take place over a period of two (2) years, this listed activity will apply for a period of two (2) years.

17. UNDERTAKING

I, Natasha Smyth, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- The information provided herein is correct;
- Comments and inputs from stakeholders and I&APs have been included and correctly recorded in this report;
- Inputs and recommendations from the specialist reports have been included where relevant; and
- Any information provided to I&APs and any responses to comments or inputs made is correct or was correct at that time.

Signature of EAP

18/02/2020
Date

Signature of commissioner of oath

18/02/2020
Date

Greg Brown CA (SA)
Commissioner of Oaths (RSA)
3rd Floor, Block E, The Pivot
Montecasino Blvd, Fourways

18. FINANCIAL PROVISION

18.1 METHOD TO DERIVE THE FINANCIAL PROVISION

A financial provision has been prepared for the project. This financial provision has been prepared in accordance with GNR 1147 of the National Environmental Management Act (107/1998): Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations, published 20 November 2015 (Financial Provisioning Regulations, 2015). Further detail pertaining to the financial provision amount is provided for in Section 27.

18.2 CONFIRM THAT THE AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE

The amount required in order to manage and rehabilitate the environmental disturbance (as a result of Khwara's activities) is provided for in the operating costs.

19. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

The impacts associated with socio-economic conditions are discussed in Section 26.

Direct socio-economic impacts include:

- Employment and procurement of goods and services (**MODERATE positive**).

Indirect socio-economic impacts include:

- Contamination of surface water resources through spillages and/or runoff (**INSIGNIFICANT** even without mitigation);
- Reduction in groundwater availability to third party users through abstraction (**INSIGNIFICANT** even without mitigation);
- Contamination of groundwater through seepage (**INSIGNIFICANT** even without mitigation);
- Air pollution sources that can have a negative impact on ambient air quality (**LOW** significance without mitigation, **INSIGNIFICANT** with mitigation);
- Increase in disturbing noise levels (**LOW** significance without mitigation, **VERY LOW** with mitigation);
- Visual impacts on receptors caused by activities and infrastructure (**VERY LOW** significance without mitigation, **INSIGNIFICANT** with mitigation); and
- Change in land use through drilling activities (**MEDIUM** significance without mitigation, **INSIGNIFICANT** with mitigation)

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

Not applicable. No national estate will be affected as part of the project.

19.3 DEPARTMENT OF ENVIRONMENTAL AFFAIRS SCREENING TOOL

The Department of Environmental Affairs (DEA) has developed an online screening tool, which is compulsory to use as of 04 October 2019. The report generated by the DEA screening tool was attached to the NEMA application for the proposed project. 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 proposed in the screening tool report along with an explanation pertaining to the applicability of these proposed specialist studies in relation to the proposed project.

TABLE 26: FINDINGS OF THE DEA SCREENING TOOL

Specialist Assessment – Findings of DEA screening tool	Applicability to the proposed project
Agricultural Impact Assessment	Prospecting activities are small scale and short term. Taking this into consideration it is not deemed necessary to prepare an agricultural impact assessment for the proposed project.
Archaeological and Cultural Heritage Impact Assessment	Input from a heritage and palaeontological specialist will be obtained to support the BAR as part of the proposed project. In this regard refer to **Error! Not a valid result for table.** for a copy of this specialist study.
Palaeontology Impact Assessment	
Terrestrial Biodiversity Impact Assessment	Input from a biodiversity specialist was obtained to support the BAR as part of the proposed project. Refer to Appendix 4 for a copy of the specialist studies.
Aquatic Biodiversity Impact Assessment	
Noise Impact Assessment	Prospecting activities are generally not associated with significant noise levels and are temporary in nature. Taking this into consideration it is not deemed necessary to prepare a noise impact assessment for the proposed project.
Radioactivity Impact Assessment	The proposed project is not associated with any radioactivity and as such the need for this study is not deemed necessary.

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

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

PART B - ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

21. DETAILS OF THE EAP

The details of the EAPs who undertook the EIA process and prepared this BAR are provided in Part A, Section 1.

22. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

The activities that are covered in the EMPr are included in Part A, Section 7.

23. COMPOSITE MAP

A composite map superimposed on the environmental sensitive areas of the preferred site is included in Appendix 6.

24. DESCRIPTION OF THE IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENT

24.1 DETERMINATION OF CLOSURE OBJECTIVES

The closure objectives for the project were determined taking into account the existing type of environment as described in Section 7.4, in order to ensure that the closure objectives strive to achieve a condition approximating its natural state as far as possible. Further information pertaining to the closure objectives identified for the project in provided in Section 27.1.1.

24.2 PROCESS FOR MANAGING ANY ENVIRONMENTAL DAMAGE, POLLUTION OR ECOLOGICAL DEGRADATION AS A RESULT OF UNDERTAKING A LISTED ACTIVITY

Refer to Section 26 for management actions identified in order to manage impacts associated with the proposed project.

24.3 POTENTIAL RISK OF ACID MINE DRAINAGE

Prospecting related activities are not associated with acid mine drainage. It follows that this section is not applicable to the proposed project.

24.4 VOLUMES AND RATE OF WATER USE FOR MINING

It is anticipated that a total of 17 000 litres will be required for the drilling at each borehole. This water will be sourced either from boreholes located on the farm or neighbouring farms (in consultation and agreement with the landowner) or from a nearby town such as Black Rock. The water will be trucked to the drill site using a water bowser. The water will be stored in the sump and re-cycled in the drilling system. The sump will be filled at the start of drilling and topped up twice a week.

24.5 HAS A WATER USE LICENCE BEEN APPLIED FOR?

24.5.1 PROSPECTING WITHIN CLOSE PROXIMITY TO A WATERCOURSE

The Kuruman River is located in the south western section of the proposed project area as illustrated in Figure 11. It is understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River.

The location of the prospecting boreholes has not been determined. The exact location of the prospecting boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. Where prospecting activities take place within the regulated area of a watercourse, a General Authorisation for Section 21(c) and (i) water uses in terms of the NWA will be applied for and obtained prior to prospecting commencing.

Of relevance to this project, the regulated area of a watercourse is defined as:

- The outer edge of the 1:100-year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river; or
- In the absence of a determined 1:100-year flood line or riparian area, the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench.

As part of the project the 1:100-year floodline or riparian area was not determined and as such the area within 100m from the edge of the watercourse was identified. This area is illustrated in Figure 6. In this regard, in the event that prospecting activities need to take place in this zone, a General Authorisation in terms of Section 21(c) and (i) water uses in terms of the NWA will need to be obtained.

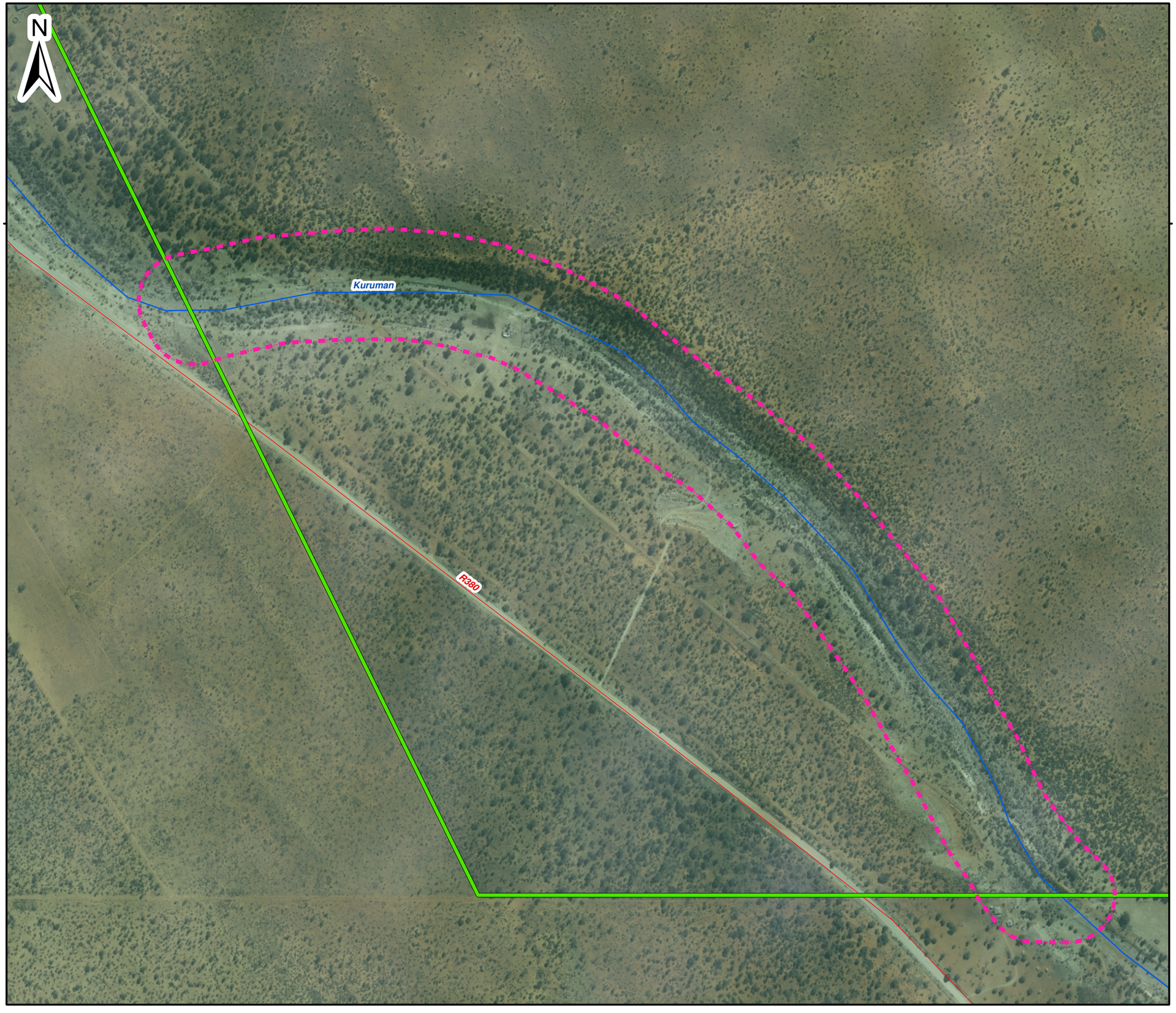
24.5.2 ABSTRACTION OF GROUNDWATER FOR PROSPECTING ACTIVITIES

As part of the project, it is anticipated that water will be sourced from boreholes located on the farm Eersbegint 703 or neighbouring farms. In this regard, it is anticipated that approximately 17 000 litres (17 m^3) in total will be required at each drill site. Where groundwater is abstracted, a General Authorisation for Section 21(a) water uses in terms of the NWA will be applied for and obtained prior to prospecting commencing. In this regard, the following has relevance to the project:

- A person who takes more than 10 cubic metres of water from a groundwater resource per day on average over a year on a property or piece of land must register the water use with the responsible authority;
- No more than 40 000 cubic metres of groundwater may be taken in terms of the general authorisation for the abstraction of groundwater per year on a property; and
- The general authorisation does not apply to the abstraction of groundwater, within a 100 metre radius from the delineated riparian edge of a water course.

As part of the project the area within 100 m from the edge of the watercourse was identified and is illustrated in Figure 11. In this regard, the abstraction of groundwater for prospecting related activities from boreholes located within the 100m buffer zone cannot be generally authorised. It follows that ideally boreholes outside of the 100 m buffer zone should be as water supply boreholes. It is unlikely that the 40 000 cubic metre limits will be exceeded and as such a General Authorisation in terms of the Section 21(a) water use in terms of the NWA will need to be obtained.

FIGURE 11: GENERAL AUTHORISATION AREA



Legend

- Proposed Project Area
- Main Roads
- Rivers and Streams
- 100m From Edge of Water Course

0 25 50 100 150 200 250 Meters

Scale: 1 :8 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

KWHARA MANGANESE (PTY) LTD

Figure 11

General Authorisation Area

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

720.11033.00002	2020/02/19

24.6 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

The assessment of potential impacts is included in Section 9 and Appendix 3. Management actions which will be implemented to avoid and minimise potential impacts are detailed in Section 26. The section below focuses on mitigation measures that are specific to listed activities based on the actions outlined in Section 26.

TABLE 27: MEASURES TO REHABILITATE THE ENVIRONMENT AFFECTED BY THE UNDERTAKING OF ANY LISTED ACTIVITY

Activity (Listed: NEMA)		Phase (specific to listed activity)	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
Number	Description					
GNR 983 Listing Notice 1: Activity 20	Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource.	Operation	Approximately 1ha	All mitigation actions outlined in Table 29 apply.	Refer to Table 29	Refer to Table 29
NEMA: GNR 983 Listing Notice 1: Activity 12	- The development of - (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs - (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Construction	Approximately 1ha	Mitigation actions identified for surface water resources aspects as outlined in Table 29 apply	Refer to Table 29	Refer to Table 29
GNR 983, Listing Notice 1: Activity 27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	Construction	Approximately 1ha	Mitigation actions identified for biodiversity aspects as outlined in Table 29 apply	Refer to Table 29	Refer to Table 29
NEMA: GNR 985 Listing Notice 3: Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan: i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	Construction	Approximately 1ha	Mitigation actions identified for biodiversity aspects as outlined in Table 29 apply	Refer to Table 29	Refer to Table 29
NEMA: GNR 985 Listing Notice 3: Activity 14	The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse: <u>Outside urban areas:</u> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.	Construction	Approximately 1ha	Mitigation actions identified for biodiversity and surface water aspects as outlined in Table 29 apply	Refer to Table 29	Refer to Table 29
GNR 983, Listing Notice 1: Activity 22	The decommissioning of any activity requiring a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	Decommissioning	Approximately 1ha	All mitigation actions outlined in Table 29 apply.	Refer to Table 29	Refer to Table 29

25. IMPACT MANAGEMENT OUTCOMES

Table 28 below provides a description of the outcomes and objective of management actions in order to manage, remedy, control or modify potential impacts. The management actions identified to achieve these outcomes and objectives are described in Section 26.

TABLE 28: DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES

Activity	Potential Impact	Affected Aspect	Phase	Management actions Type	Standard to be Achieved (Impact management outcome/objectives)
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Loss of soil capability through physical disturbance and contamination resources and land	Soil and land capability	Construction Operational Decommissioning Closure	• Manage through erosion control • Manage through limiting areas of disturbance • Manage through maintenance of vehicles and equipment • Control through waste procedures • Control through soil management procedures • Remedy through rehabilitation • Manage through monitoring • Remedy spillages through emergency response procedures (Section 29.2.2)	• Handle, manage and conserve soil resources to be used as part of rehabilitation and re-establishment of the pre-project land use.
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	General and physical disturbance of biodiversity	Biodiversity	Construction Operational Decommissioning Closure	• Avoidance of protected trees as far as possible • Control through obtaining permits where protected trees cannot be removed • Manage through limiting areas of disturbance • Control through speed limits • Control through dust and noise management • Obtain necessary GA in terms of the NWA • Control through zero tolerance of animal killing or collecting biodiversity • Manage alien invasive species • Manage through monitoring • Remedy through rehabilitation Remedy through emergency response procedures (Section 29.2.2)	• Limit the area of disturbance as far as practically possible. • Avoid the loss of protected species.
Not applicable	Alteration of natural drainage patterns reducing contributions to the catchment	Surface water	Not applicable	• Not applicable	Not applicable
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of surface water		Construction Operational Decommissioning Closure	• Manage through soil management measures • Remedy through rehabilitation • Remedy through emergency response procedures (Section 29.2.2)	Soil and land capability outcomes and objectives apply

Activity	Potential Impact	Affected Aspect	Phase	Management actions Type	Standard to be Achieved (Impact management outcome/objectives)
Water use and management	Reduction of water availability to third parties through groundwater abstraction	Groundwater	Construction Operational Decommissioning	• Obtain necessary GA in terms of the NWA • Control through use of borehole water with farmer consultation • Manage with monitoring	• Ensure groundwater quality remains within acceptable limits for both domestic and agricultural purposes.
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of groundwater resources		Construction Operational Decommissioning Closure	• Manage through marking boreholes • Avoid drilling near third party borehole as far as possible • Management through soil management measures	
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Air pollution	Air	Construction Operational Decommissioning Closure	• Manage through limiting surface disturbance • Control through use of existing access tracks as far as possible • Control through prospecting activities within demarcated areas • Manage through soil management measures • Control speed limits • Manage through dust suppression • Manage through vehicle and equipment maintenance • Remedy through addressing complaints	• Ensure that any pollutants emitted as a result of the project remains within acceptable limits so as to prevent health related impacts.
Site preparation Earthworks Transport Prospecting Generator use Removal of equipment and structures Rehabilitation Maintenance and aftercare	Increase in disturbing noise levels	Noise	Construction Operational Decommissioning Closure	• Manage through limiting the use of vehicles and machinery • Control through limiting prospecting activities to daytime hours • Control through speed limits • Manage through vehicle and equipment maintenance • Remedy through addressing complaints •	• Ensure that any noise generated as a result of the project remains within acceptable limits to avoid the disturbance of third parties.
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Negative visual views	Visual	Construction Operational Decommissioning Closure	• Manage through soil and air management measures • Control through limiting surface disturbance area • Manage through good housekeeping • Remedy through rehabilitation • Remedy through addressing complaints	• Limit the alteration of the topography during prospecting and through rehabilitation. • Limit negative visual views.

Activity	Potential Impact	Affected Aspect	Phase	Management actions Type	Standard to be Achieved (Impact management outcome/objectives)
Site preparation Earthworks Transport Prospecting Rehabilitation Maintenance and aftercare	Loss of heritage/ cultural resources and palaeontological resources	Heritage/ cultural resources and palaeontological	Construction Operational Decommissioning Closure	• Control through avoidance • Remedy through emergency response procedures (Section 29.2.2)	• Protect heritage resources where possible. • If disturbance is unavoidable, then mitigate impact in consultation with a specialist and the SAHRA and in line with regulatory requirements.
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Inward migration and economic impact	Socio-economic	Construction Operational Decommissioning Closure	• Manage through use of local labour where possible • Mange through use of local goods and services	• Ensure that negative socio-economic impacts are managed through suitable communication structures. • Ensure that positive socio-economic impacts are enhanced through suitable communication structures.
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Change in land use	Land use	Construction Operational Decommissioning Closure	• Manage through access control with landowner consent • Manage through determining prospecting borehole location with landowners • Remedy through compensation for loss of grazing land • Control through demarcating drill sites • Control through undertaking prospecting activities in demarcated areas • Manage through dust, noise and waste management measures • Remedy through addressing complaints • Remedy through rehabilitation	• Appropriate compensation for temporary loss of grazing land. • Undertake activities in a safe manner. • Ensure that vegetation successfully re-establishes itself and no residual contamination remains on site, thus allowing pre-project land uses to continue.

26. IMPACT MANAGEMENT ACTIONS

Management actions identified to prevent, reduce, control or remedy the assessed impacts are presented in Table 29 below. The action plans include the timeframes for implementing the management actions together with a description of how management actions comply with relevant standards. Management actions and recommendations have been summarised and are included in Table 29 below.

TABLE 29: DESCRIPTION OF IMPACT MANAGEMENT ACTIONS

Activity	Potential Impact	Management actions	Time Period for Implementation	Compliance with Standards
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Loss of soil capability through physical disturbance and contamination resources and land	• Existing access tracks will be used as far as possible; new access tracks will be limited to that which is absolutely necessary to undertake the drilling activities; • Drilling within the regulated area of the Kuruman River will be avoided during predicted rain periods; • Soil (Kalahari Sand) will be removed from the water sump area only, no other stripping of soil will take place; • Soil will be stockpiled in a clearly demarcated area and shown on the site layout. This area will be defined as a no-go area; • Measures will be put in place to minimise erosion (wind and water) of the soil stockpile; • No waste material will be placed on the stockpile; • Equipment movement on top of the soil stockpile will not take place; • Preparation of the drill site will include: an HDPE lined area below the drill rig, an HDPE lined sump, and storage of consumables and waste on impervious floors within bunded and demarcated area(s) to prevent spills to the environment; • Biodegradable drilling oils will be used; • If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation. If in situ treatment is not possible or acceptable then the polluted soil must be removed and disposed at an appropriate, permitted, off-site waste facility; • Maintenance of vehicles, machinery and equipment will be undertaken off-site in a manner that does not contaminate the environment. Where emergency repair is required on-site, a suitable liner will be placed under the equipment and machinery with containment measures for any run-off or spills; • Waste management practises will be implemented for the duration of the prospecting activities; • Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.4) and in agreement with the landowner; and • Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).	• As required • As required • As required • On-going • On-going • On-going • On-going • As required • On-going • As required • On-going • As required	Not applicable
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	General and physical disturbance of biodiversity	• Once the location of the drill sites is known, and prior to establishing the drill site, a biodiversity specialist will be appointed to identify and mark any protected species or areas requiring specific mitigation with regards to biodiversity disturbance; • All protected species will be avoided as far as possible; where this is not possible for the purposes of drilling, a tree permit, fauna permit and/or flora permit will be applied for and obtained prior to destroying or damaging any protected species or active bird nests; • Any new access tracks will be delineated so that no protected trees need to be removed. If additional roads are required, then wherever feasible such roads should be constructed a distance from the watercourse areas and not directly adjacent thereto. If crossings are required they should cross the system at right angles, as far as possible to minimise impacts in the receiving environment, and any areas where bank failure is observed due to the effects of such crossings should be immediately repaired by reducing the gradient of the banks to a 1:3 slope and where needed necessary, installing support structures. This should only be necessary if existing access roads are not utilised; • Where drilling activities take place within the regulated area of the Kuruman River, the necessary General Authorisation will be applied for and obtained prior to drilling commencing. The conditions of the General Authorisation will be complied with. Further to this, Khwara will ensuring that measures are implemented to prevent dirty runoff water entering the watercourse habitat; and that where necessary, exposed soils in the vicinity of watercourse habitat are protected from erosion by means of reinstating natural vegetation following construction; • Current habitat degradation is considered higher within the area south west of the Kuruman River, with access roads already running along the River. It is recommended if feasible, that prospecting	• As required • On-going • On-going • On-going • On-going • On-going	The management action to implement an alien invasive species programme is in accordance with the NEM:BA Alien and Invasive Species Regulations (2014) that requires the control of invasive species. Obtain protected tree permits from the National Forest Act No. 84 of 1998, and plant permits in terms of the Northern Cape Nature Conservation Act. No. 9 of 2009 (NCNcA) if necessary. Obtain a fauna permit for the felling of trees with active bird nests, if required, in terms of the NCNCA. Obtain general authorisation in terms of the NWA.

Activity	Potential Impact	Management actions	Time Period for Implementation	Compliance with Standards
		activities be planned within the portion southwest of the Kuruman River utilising the Degraded Habitat first, thereby limiting the number of additional roads that will have to be created for the prospecting activities; • Where drilling takes place in or near the Kuruman River, as far as possible, all construction activities should occur in the low flow season, during the drier winter months; • Prospecting will only take place within demarcated areas and the clearing of vegetation will be limited as far as possible; • There will be zero tolerance for off-road driving and the killing or collecting of any biodiversity (including wood) by anybody working for or on behalf of Khwara; • Strict speed control measures will apply for all prospecting vehicles; • During prospecting, no vehicles should be allowed to indiscriminately drive through the Kuruman River; • Noise, dust control and waste management measures outlined in this appendix will be implemented; • Cut vegetation from site clearing to be removed immediately and not allowed to accumulate within surrounding natural habitat. • Khwara will manage the spread of alien and invasive species onto and from disturbed areas; and • Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).	• On-going • On-going • On-going • On-going • On-going • On-going • On-going • As required • As required	
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of surface water	• Soil management measures outlined in this appendix will be implemented; • Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner; and • Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).	• On-going • As required • As required	Not applicable
Water use and management	Reduction of water availability to third parties through groundwater abstraction	• Use of borehole water on the farm Where borehole water is used for drilling activities, the necessary General Authorisation will be applied for and obtained prior to the use commencing. The conditions of the General Authorisation will be complied with; and • Use of borehole water on the farm will be done in consultation and agreement with the landowner.	• As required • On-going	Obtain general authorisation in terms of the NWA
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Contamination of groundwater resources	• Prior to drilling the location of third-party boreholes will be marked on a map; • Establishing a drill site close to third-party boreholes will be avoided as far as possible (if a drill site is established close to third-party boreholes, monitoring of third-party boreholes would be required); and • Soil management measures outlined in this appendix will be implemented.	• As required • As required • On-going	Not applicable
Site preparation Earthworks Waste management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Air pollution	• Surface disturbance will be limited to that which is absolutely necessary to undertake the drilling activities; • Existing access tracks will be used as far as possible; new access tracks will be limited to that which is absolutely necessary to undertake the drilling activities; • Prospecting activities will only take place within demarcated areas; • Soil mitigation measures outlined in this appendix will be implemented; • Vehicle speeds along dirt access tracks will be limited to 30 km/h to limit dust generation; • Dust suppression (using methods suitable to the area) will be undertaken on frequently used access tracks; • Vehicles and machinery will be maintained in good working order to limit exhaust emissions; and • Any air pollution related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.	• On-going • On-going • On-going • On-going • On-going • On-going • On-going • As required	Not applicable

Activity	Potential Impact	Management actions	Time Period for Implementation	Compliance with Standards
Site preparation Earthworks Transport Prospecting Generator use Removal of equipment and structures Rehabilitation Maintenance and aftercare	Increase in disturbing noise levels	• The use of vehicles and machinery will be limited to that which is absolutely necessary to undertake the drilling activities; • Drilling will only take place during daytime hours and only on weekdays, given that people reside on the farm; • Vehicle speeds along access tracks will be limited to 30 km/h to limit noise pollution; • Vehicles and machinery will be maintained in good working order to control noise and vibration emission levels; and • Any noise pollution related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.	• On-going • On-going • On-going • On-going • As required	Not applicable
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Negative visual views	• Soil and air pollution measures outlined above will be implemented; • Vegetation surrounding the drill site will be maintained as far as possible; only the bare minimum will be cleared for drilling activities; • The drill site will be maintained and kept clean on an on-going basis; • Rehabilitation of the drill site will be undertaken immediately after drilling has been completed; • Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.4) and in agreement with the landowner; and • Any visual related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.	• On-going • On-going • On-going • As required • As required • As required	
Site preparation Earthworks Transport Prospecting Rehabilitation Maintenance and aftercare	Loss of heritage/ cultural resources and palaeontological resources	• The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. As far as possible all Stone Age Sites need to be avoided. These sites need to be fenced off and no prospecting activities must take place within 20m of the Stone Age sites. In the event that these sites cannot be avoided, the necessary permits will be obtained from SAHRA; and • Prior to the removal or destruction of any heritage, cultural, or palaeontological resources that may be discovered by chance, Khwara will engage a professionally registered heritage and/or palaeontological specialist to make associated recommendations that Khwara will comply with. • If there are any chance finds of heritage/ cultural sites, Khwara will follow the emergency response procedure (Section 29.2.2).	• As required • As required • As required	Compliance with the National Heritage Resource Act, 1999 (No. 25 of 1999) in the event of any chance finds or the need for permits.
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Inward migration and economic impact	• Make use of local contractors as far as possible (for both non-invasive and invasive prospecting activities); and • Procure goods and services locally as far as possible	• As required • As required	Not applicable
Site preparation Earthworks Waste management Water use and management Transport Prospecting Generator use Storage of consumables Removal of equipment and structures Rehabilitation Maintenance and aftercare	Change in land use	• Access to the farm will be done in consultation and agreement with the landowner; • The location of the drill sites has not been determined. This will be done in consultation with the landowner, prior to accessing the farm for drilling purposes. The drill sites and boreholes will be included on a site layout plan. The layout plan will be kept up to date and will reflect planned, completed and rehabilitated drill sites, including access tracks; • The landowner will be compensated for loss of grazing land for the duration of the prospecting activities; • Each drill site will be clearly demarcated and fenced off for the duration of drilling activities to prevent cattle or third-party access; • Prospecting activities will only take place within demarcated areas; • No contractors will reside on the property or access other areas of the farm not demarcated for drilling activities; • Noise, dust control and waste management measures outlined in this appendix will be implemented;	• On-going • As required • As required • On-going • On-going • On-going • On-going	Not applicable

Activity	Potential Impact	Management actions	Time Period for Implementation	Compliance with Standards
		• A complaints register will be maintained for the duration of the prospecting activities. All complaints will be responded to in a timely manner; • Photo records of the drilling activities will be maintained including before, during, after and post-rehabilitation (for the duration of the prospecting right); and • Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner	• As required • On-going • As required	

27. FINANCIAL PROVISION

27.1 DETERMINATION OF THE AMOUNT OF THE FINANCIAL PROVISION

27.1.1 CLOSURE OBJECTIVES DESCRIPTION AND THE ALIGNMENT WITH THE BASELINE ENVIRONMENT

The closure plan objectives and principles for the proposed project include the following:

- That environmental damage is minimised to the extent that it is acceptable to all parties involved;
- That contamination beyond the project area site by surface run-off, groundwater movement and wind will be prevented;
- That prospecting right closure is achieved efficiently, cost effectively, and in compliance with the law;
- That the social and economic impacts resulting from prospecting right closure are managed in such a way that negative socio-economic impacts are minimised; and
- That the land is rehabilitated to achieve an end use of livestock grazing and game farming to the extent reasonably possible.

27.1.2 CONFIRMATION THAT CLOSURE OBJECTIVES HAVE BEEN CONSULTED WITH LANDOWNERS AND I&APS

The closure objectives are outlined in this report which will be made available to I&APs, including landowners for review and comment (Section 7.2).

To date no comments regarding the closure objectives (see Section 27.1.1) have been received from I&APs, including landowners (see Section 7.2 for the details of the public participation process).

27.1.3 REHABILITATION PLAN

It is assumed that five boreholes will be drilled per year. In this regard, the annual rehabilitation plan objectives (according to the Financial Provisioning Regulations, 2015 (GNR 1147)), plan will be to:

- Cap and seal each borehole once it has been completed i.e. capping and sealing of five boreholes per annum;
- Removal of any drilling equipment, chemicals, and waste from each drill site as it is completed i.e. removal from five drill sites per annum;
- Removal and filling of sumps as each borehole is completed i.e. removal and filling of five sumps per annum; and
- Ripping of compacted soils at each drill sites and access track to allow for re-vegetation of the site i.e. ripping of soils at five drill sites and two access tracks per year.

The above activities will take place immediately after prospecting work at each drill site has been completed.

Typically, a period of aftercare and maintenance is applied to each rehabilitated drill site to ensure closure objectives are being met. The aftercare and maintenance activities will include the monitoring of erosion and

vegetation establishment and control and eradication of alien invasive plants. This period of aftercare and maintenance will also form part of the annual rehabilitation plan.

27.1.4 COMPATIBILITY OF THE REHABILITATION PLAN WITH THE CLOSURE OBJECTIVES

It can be confirmed that the rehabilitation plan is compatible with the closure objectives given that the closure objectives were taken into account during the determination of the financial provision. The rehabilitation plan is in line with the minimum requirement of the EMPr.

27.1.5 CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION

The closure cost calculation for the life of the project amounts to **R 138 949.04 (inclusive of VAT)**. The detailed financial provision report is included in Appendix 7.

27.1.6 CONFIRMATION THAT THE FINANCIAL PROVISION WILL BE PROVIDED

The financial provision will be provided in the form of a bank guarantee.

28. MECHANISMS FOR MONITORING COMPLIANCE AND PERFORMANCE AGAINST THE EMPR

28.1 MONITORING OF IMPACTS

As a general approach, Khwara will ensure that the monitoring programmes comprise the following:

- Adherence to a formal monitoring process;
- The amendment of monitoring parameters, where necessary, following the initial monitoring results and in consultation with a specialist and/or the relevant authority;
- The interpretation of data and reporting of trends will be undertaken by an appropriately qualified person and
- Maintenance of all records for the purposes of auditing.

Project-specific monitoring requirements are outlined in Table 30 below.

28.2 FREQUENCY OF PERFORMANCE ASSESSMENT REPORT

Khwara will for the period during which the environmental authorisation and the EMPr is valid, submit environmental audit reports to the DMR.

These audits will focus on Khwara's compliance with the conditions of the environmental authorisation and the commitments in the EMPr. These audits will be undertaken by a qualified independent person and will comply with the relevant NEMA Regulations 2014 (as amended). The frequency of these audits will be undertaken as per requirements set out in the environmental authorisation.

In addition to the above, Khwara will conduct internal management audits against the commitments in the EMPr in accordance with an annual audit plan. These audits will be undertaken on a monthly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

TABLE 30: MONITORING OF COMPLIANCE AND PERFORMANCE

Activity	Impacts requiring monitoring	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time period for management actions
Site preparation Earthworks Waste management Prospecting Storage of consumables Generator use Transport Removal of equipment and structures Rehabilitation Maintenance and aftercare	Soils	• Visual inspections for signs of erosion. Any erosion will be rectified immediately.	Drilling contractors	• Daily during operations. • Bi-weekly post-rehabilitation until such time as vegetation has recovered.
		• Visual inspections of storage areas and lined areas. Any repairs will be undertaken immediately. • Visual inspections for signs of contamination (including littering). Any contamination (including littering) will be cleaned-up immediately.		• Daily during operations.
Site preparation Earthworks Waste management Prospecting Storage of consumables Generator use Transport Removal of equipment and structures Rehabilitation Maintenance and aftercare	Biodiversity	• Visual inspections of any disturbance outside of the demarcated drill site. Any disturbances will be remedied immediately. • Visual inspections of marked protected species for signs of damage. • Monitoring and removal of alien invasive species within prospecting areas and any adjacent areas affected on by prospecting activities.	Drilling contractors	• Daily during operations. • Bi-weekly post-rehabilitation until such time as vegetation has recovered.
Water use and management	Groundwater	• Volume of water abstracted for prospecting activities.	Drilling contractors	• Daily
Site preparation Earthworks Prospecting Generator use Transport Removal of equipment and structures Rehabilitation Maintenance and aftercare	Air	• Visual inspections of dust generation.	Drilling contractors	• Daily during operations. • Bi-weekly post-rehabilitation until such time as vegetation has recovered.
		• Visual inspections of excessive exhaust fumes (from vehicles, machinery and generator).		• Daily during operations.

Activity	Impacts requiring monitoring	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time period for management actions
Rehabilitation Maintenance and aftercare	Land use	• Monitoring of rehabilitated sites in line with rehabilitation plan.	Drilling contractors	• Bi-weekly post-rehabilitation until such time as vegetation has recovered, then monthly.

29. ENVIRONMENTAL AWARENESS AND EMERGENCY RESPONSE

29.1 MANNER IN WHICH APPLICANT INTENDS TO INFORM EMPLOYEES OF THE ENVIRONMENTAL RISKS

This section includes the environmental awareness plan. The plan describes how employees are informed of:

- Environmental risks, which may result from their work and the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment;
- The training required for general environmental awareness; and
- The dealing of emergency situations and remediation measures for such emergencies.

All contractors that conduct work on behalf of Khwara are bound by the content of the EMPr and a contractual condition to this effect will be included in all such contracts entered into by the mine. The responsibility for ensuring contractor compliance with the EMPr will remain with Khwara.

The purpose of the environmental awareness plan is to ensure that all personnel and management understand the general environmental requirements of the site. In addition, greater environmental awareness must be communicated to personnel involved in specific activities, which can have a significant impact on the environment, and ensure that they are competent to carry out their tasks on the basis of appropriate education, training and/or experience.

29.1.1 TRAINING OBJECTIVES OF THE ENVIRONMENTAL AWARENESS PLAN

An environmental awareness plan ensures that training needs are identified, and that appropriate training is provided. The environmental awareness plan communicates:

- The importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
- The significant environmental impacts and risks of individuals work activities and explain the environmental benefits of improved performance;
- The individual's roles and responsibilities in achieving the aims and objectives of the environmental policy; and
- The potential consequences of not complying with environmental procedures.

29.1.1.1 GENERAL CONTENTS OF THE ENVIRONMENTAL AWARENESS PLAN

To achieve the objectives of the environmental awareness plan, the general contents of the training plans are as follows:

- General training plan applicable to all personnel:
  - General understanding of the environmental setting of the site;
  - Understanding the environmental impact of individuals' activities on site;
  - Indicate potential site-specific environmental aspects and their impacts;
  - Identifying poor environmental management and stopping work which presents significant risks; and
  - Reporting incidents.

- Specific training plan:
  - Specific environmental aspects and impacts such as:
    - Importance of biodiversity and protected species;
    - Spillage of hydrocarbons;
    - Poor waste management such as mixing hazardous and general wastes, inappropriate storage and stockpiling of waste;
    - Poor housekeeping practices;
    - Poor working practices; and
    - Excessive noise generation and unnecessary use of hooters.

29.2 MANNER IN WHICH RISKS WILL BE DEALT WITH TO AVOID POLLUTION OR DEGRADATION

29.2.1 ON-GOING MONITORING AND MANAGEMENT ACTIONS

The monitoring programme as described in Section 28 will be undertaken to provide early warning systems necessary to avoid environmental emergencies.

29.2.2 PROCEDURES IN CASE OF ENVIRONMENTAL EMERGENCIES

Emergency procedures apply to incidents that are unexpected and that may be sudden, and which lead to serious danger to employees/contractors, the public and/or potentially serious pollution of, or detriment to the environment (immediate and delayed).

29.2.2.1 GENERAL EMERGENCY PROCEDURE

For all environmental emergencies, Khwara will:

- Cordon off the area to prevent unauthorised access and tampering of evidence;
- Undertake actions defined in the emergency plan to limit/contain the impact of the emergency;
- Take photographs and samples as necessary to assist in investigation;
- Ensure compliance with Section 30 of the NEMA such that:
  - The Environmental specialists, Superintendents and HSE Leads must immediately notify the Director-General (Department of Water and Sanitation (DWS), DMR and Inspectorate of Mines, as appropriate), the South African Police Services, the relevant fire prevention service, the provincial head of DMR, the head of the local municipality, the head of the regional DWS office and any persons whose health may be affected of:
    - the nature of the incident;
    - any risks posed to public health, safety and property;
    - the toxicity of the substances or by-products released by the incident; and
    - any steps taken to avoid or minimise the effects of the incident on public health and the environment.

- Khwara must as soon as is practical after the incident:
  - Take all reasonable measures to contain and minimise the effects of the incident including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;
  - Undertake clean up procedures;
  - Remedy the effects of the incident; and
  - Assess the immediate and long-term effects of the incident (environment and public health).
- Within 14 days Khwara must report to the Director-General DWS and DEA, the provincial head of DMR, the regional manager of the DMR, the head of the local and district municipality, the head of the regional DWS office such information as is available to enable an initial evaluation of the incident, including:
  - The nature of the incident;
  - The substances involved and an estimation of the quantity released;
  - The possible acute effects of the substances on the persons and the environment (including the data needed to assess these effects);
  - Initial measures taken to minimise the impacts;
  - Causes of the incident, whether direct or indirect, including equipment, technology, system or management failure; and
  - Measures taken to avoid a recurrence of the incident.

29.2.2.2 IDENTIFICATION OF EMERGENCY SITUATIONS

The project specific emergency situations that have been identified together with specific emergency response procedures are outlined in Table 31.

TABLE 31: EMERGENCY RESPONSE PROCEDURES

Item	Emergency situation	Response in addition to general procedures
1	Spillage (or seepages) of drilling materials, engineering substances, dirty water and waste	• Where there is a risk that contamination will contaminate the land (leading to a loss of resource), surface water and/or groundwater, Khwara will: ○ Notify residents/users downstream of the pollution incident; ○ Identify and provide alternative resources should contamination impact adversely on the existing environment; ○ Cut off the source if the spill is originating from a pump, pipeline or valve and the infrastructure 'made safe'; ○ Contain the spill (e.g. construct temporary earth bund around source); ○ Absorbent booms will be used to absorb hydrocarbon spills; ○ Pump excess hazardous liquids on the surface to temporary containers for appropriate disposal; ○ Remove hazardous substances from damaged infrastructure to an appropriate storage area before it is removed/repaired; and ○ Major spillages must be reported to the DWS immediately.
2	Uncovering of graves and sites	• Personnel discovering a grave or site will inform the geologist immediately and all work in the vicinity will be stopped immediately; • The environmental department will inform SAHRA and contact an archaeologist and/or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work will resume in this area without the permission from the SAHRA; • If the newly discovered heritage resource is considered significant a Phase 2 assessment may be required; • Should further burial grounds, graves or graveyards be found, the SAHRA Burial Grounds and Graves Unit will be contacted; • Prior to damaging or destroying any of the identified graves, permission for the exhumation and relocation of graves will be obtained from the relevant descendants (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local Police; and • The exhumation process will comply with the requirements of the relevant Ordinance on Exhumations and the Human Tissues Act, 1983 (No. 65 of 1983).

29.2.3 TECHNICAL, MANAGEMENT AND FINANCIAL OPTIONS

Technical, management and financial options that will be put into place to deal with the remediation of impacts in cases of environmental emergencies are described below.

- To prevent the occurrence of emergency situations, Khwara will implement as a minimum the management actions as included in this EMPr;
- Khwara will maintain an environmental management system where all operations identify, report, investigate, address and close out environmental incidents; and
- Where required, Khwara will seek input from appropriately qualified people.

30. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

The financial provision will be updated on an annual basis and submitted to the DMR.

31. UNDERTAKING

I, Natasha Smyth, the Environmental Assessment Practitioner responsible for compiling this EMPr, undertake that:

- The information provided herein is correct;
- Comments and inputs from stakeholders and I&APs have been included and correctly recorded in this report;
- Inputs and recommendations from the specialist reports have been included where relevant; and
- Any information provided to I&APs and any responses to comments or inputs made is correct or was correct at that time.

Signature of EAP

18/02/2020
Date

Signature of commissioner of oath

18/02/2020
Date

Greg Brown CA (SA)
Commissioner of Oaths (RSA)
3rd Floor, Block E, The Pivot
Montecasino Blvd, Fourways

32. REFERENCES

A Pelser Arachaeological Consulting (APAC), Phase 1 HIA report for the proposed prospecting on the farm Eersbegint 703 near Hotazel in the Joe Morolong Local Municipality, Northern Cape Province, December 2019.

A Pelser Arachaeological Consulting, Phase 1 HIA report for the proposed prospecting on the farm Eersbegint 703 near Hotazel in the Joe Morolong Local Municipality, Northern Cape Province, January 2020.

SLR Consulting (Africa) (Pty) Ltd, Environmental Impact Assessment and Environmental Management Programme Report for the Proposed Lehating Mine, January 2014.

SLR Consulting (South Africa) (Pty) Ltd, Environmental Impact Assessment Report and Environmental Management Programme Report for the Proposed Khwara Manganese Mine, September 2017.

SLR Consulting (South Africa) (Pty) Ltd, Financial Provision for the Prospecting Activities on the Farm Eersbegtint 703, Northern Cape, November 2019.

Scientific Terrestrial Services, Watercourse Ecological Assessment as part of the Environmental Impact Assessment and Authorisation Process for the Khwara Manganese Prospecting Rights Application near Hotazel, Northern Cape, February 2020.

Scientific Terrestrial Services, Biodiversity Assessment as part of the Environmental Impact Assessment and Authorisation Process for the Khwara Manganese Prospecting Rights Application near Hotazel, Northern Cape, February 2020a.

Palaeontological Impact Assessment for the propose Prospecting Rights Application by Khwara Manganese (Pty) Ltd on the farm Eersbegint 703, northeast of Hotazel, Northern Cape Province, October 2019.

APPENDIX 1: CURRICULUM VITAE AND EAP REGISTRATION

APPENDIX 2: STAKEHOLDER ENGAGEMENT

- Land claims commissioner letter;
- I&AP Database;
- Background Information Document in English and Afrikaans and proof of distribution;
- Copy of the site notices in English and Afrikaans, the photographic proof of placement and a map illustrating the location of the site notice placement;
- Advertisements placed in the Kathu Gazette and the Kalahari Bulletin;
- Summary of the BAR in English and Afrikaans;
- Proof of distribution of the initial BAR; and
- Copy of correspondence with I&APs.

APPENDIX 3: DETAILED ASSESSMENT OF POTENTIAL IMPACTS

DETAILED ASSESSMENT OF POTENTIAL IMPACTS

The potential impacts described in this appendix have been identified by the EIA project team with input from specialists (where applicable), regulatory authorities and I&APs. The sequence in which these issues are listed are in no order of priority or importance.

The location of the drill sites has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south wester section of the farm Eersbegtint 703 near private residences and the Kuruman River. The assessment below caters for the drilling of ten prospecting boreholes and as such the direct disturbance of the drilling activities is anticipated to be relatively small. Should the number of drill sites increase significantly, the potential impacts would need to be re-assessed.

The potential impacts are rated with the assumption that no mitigation measures are applied and then again with mitigation, unless otherwise stated.

The mitigated assessment assumes that technical design controls, as included in the project scope (see Section 3.2), would be included in the design of the project and implemented when the prospecting activities are established and undertaken.

ISSUE: LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH PHYSICAL DISTURBANCE AND CONTAMINATION

DESCRIPTION OF IMPACT

In the context of prospecting activities, soils play a key role in rehabilitation of disturbed areas and establishing ecosystem functionality. This in turn supports restoring pre-disturbance land uses. Its disturbance and loss should be prevented wherever this is avoidable.

Prospecting activities have the potential to damage soil resources through physical disturbance (removal, erosion, compaction) and contamination. Sources of contamination would mainly exist during the operational drilling phase. Given the type of prospecting activities planned i.e. drilling of boreholes, potential disturbance activities and contamination sources would be temporary in nature, usually existing for a few weeks. Although the activities and sources are temporary in nature, the potential related loss or pollution can have long term effects.

Contamination of soils also has the potential to indirectly impact surface and groundwater resources, through runoff and seepage (see discussion of this impact under the relevant sections in this appendix). Contamination and damage to soil resources could also indirectly impact biodiversity resources (see discussion of this impact under the relevant sections in this appendix).

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Generator use Storage of consumables Transport	Transport Waste management Removal of equipment and structures Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Site preparation and earthworks will require the removal and stockpiling of soil. Vehicle movement and machinery could result in the compaction of soils. In the case of compaction the soils' functionality would firstly be compromised through a lack of rooting ability and aeration, and secondly the compacted soils are likely to erode because with less inherent functionality there would be little chance for the establishment of vegetation and other matter that naturally protects the soils from erosion. Disturbed and exposed soils are susceptible to erosion through the action of wind or water, as a result of the lack of vegetative cover and friability of the soil structure. The erodibility of the soils on site is considered to be high with eroded soils being lost from the area of disturbance.

Contamination of soil resources would occur through the use and handling of drilling materials and the presence of equipment and machinery on site leaking or spilling hydrocarbons. Additionally, poor waste management practices could result in soil contamination. This could alter the soil composition, negatively impacting on the chemistry of the soils and affecting the use of the soils as part of site rehabilitation during decommissioning.

Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the control measures that are planned. Where there are quick reaction times and effective remediation measures applied, the duration and probability of potential impacts reduces.

Physical disturbance and contamination of soil resources through project-related activities is therefore considered to be of **LOW** significance without mitigation and **INSIGNIFICANT** with mitigation (see Table D2 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Existing access tracks will be used as far as possible; new access tracks will be limited to that which is absolutely necessary to undertake the drilling activities;
- Drilling within the regulated area of the Kuruman River will be avoided during predicted rain periods;
- Soil (Kalahari Sand) will be removed from the water sump area only, no other stripping of soil will take place;
- Soil will be stockpiled in a clearly demarcated area and shown on the site layout. This area will be defined as a no-go area;
- Measures will be put in place to minimise erosion (wind and water) of the soil stockpile;
- No waste material will be placed on the stockpile;
- Equipment movement on top of the soil stockpile will not take place;

- Preparation of the drill site will include: an HDPE lined area below the drill rig, an HDPE lined sump, and storage of consumables and waste on impervious floors within bunded and demarcated area(s) to prevent spills to the environment;
- Biodegradable drilling oils will be used;
- If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation. If in situ treatment is not possible or acceptable then the polluted soil must be removed and disposed at an appropriate, permitted, off-site waste facility;
- Maintenance of vehicles, machinery and equipment will be undertaken off-site in a manner that does not contaminate the environment. Where emergency repair is required on-site, a suitable liner will be placed under the equipment and machinery with containment measures for any run-off or spills;
- Waste management practises outlined in Table D1 will be implemented for the duration of the prospecting activities; and
- Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner.

TABLE D1: WASTE MANAGEMENT PRACTISES

Items to be considered		Actions
General	Specific	
Waste management	General	Contractors are responsible for the handling and management of waste and will be made aware of these procedures.
	Collection points	A designated waste collection point will be established within the drill site. Care will be taken to ensure that there will be adequate capacity.
	General waste	Kept in a container prior to removal. No littering will take place.
	Oil and grease	Oil and grease will be collected in suitable containers stored on an impervious floor with appropriate bunding (containment) in case of a leak or spill.
Disposal	Off-site waste disposal facilities	Waste will be disposed of at appropriate permitted waste disposal facilities. Records of waste disposal will be kept for auditing purposes
Waste transport	Contractor	A qualified waste management subcontractor will undertake the waste transport.
Banned practices	Burying of waste	No wastes will be placed on or buried in the ground.
	Burning of waste	No burning of waste will take place on site.

MONITORING

Monitoring will include visual inspections for signs of erosion and contamination (refer to Section 28).

EMERGENCY SITUATIONS

Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).

TABLE D2: IMPACT SUMMARY – LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH PHYSICAL DISTURBANCE AND CONTAMINATION

Issue: Loss of soil resources and land capability through physical disturbance and contamination		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Moderate deterioration (M)	Minor deterioration (VL)
Duration	Short-term (L)	Quickly reversible (VL)
Extent	A part of the site (VL)	Localised (VL)
Consequence	Low	Very low
Probability	Probable	Unlikely
Significance	Low	Insignificant
Nature of cumulative impacts	Minor contribution to cumulative impacts.	
Degree to which impact can be reversed	Reversible with mitigation.	
Degree to which impact may cause irreplaceable loss of resources	Definite loss where mitigation measures are not correctly implemented.	
Degree to which impact can be mitigated	High	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: GENERAL AND PHYSICAL DISTURBANCE OF BIODIVERSITY

DESCRIPTION OF IMPACT

Prospecting activities have the potential to destroy biodiversity through physical destruction of habitat and related species which are considered to be significant because of their status, and/or the role that they play in the ecosystem. In addition to this, prospecting activities can also directly disturb vertebrates and invertebrates.

Given the type of prospecting activities planned such as the drilling of boreholes, the impact would be temporary in nature, usually existing for a few weeks to a few months until rehabilitation of the site is complete. Although the activities are temporary in nature, the potential related destruction and disturbance can have long term effects, particularly in the unmitigated scenario.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Generator use Storage of consumables Transport Support services	Waste management Removal of equipment and structures Rehabilitation Support services	Maintenance and aftercare

IMPACT ASSESSMENT

Areas of high ecological sensitivity are functioning biodiversity areas with species diversity and associated intrinsic value. In addition, some of these areas host protected species. Linking areas, such as the Kuruman River, 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 the broader ecosystem. Prospecting related activities will require the removal of vegetation as part of site preparation activities and the establishment of access tracks.

Prospecting activities can also indirectly impact on the survival of individual plants, vertebrates, and invertebrates through the following activities:

- People may kill various types of species for food or for sport;
- Collection of firewood;
- Veld fires;
- People may illegally collect and remove vegetation, vertebrate and invertebrate species;
- Noise and vibration pollution from vehicle movements and the drill rigs, which may scare off vertebrates and invertebrates. In some instances, the animals may be deterred from passing close to noisy activities which can effectively block migration paths. In other instances, vertebrates and invertebrates that rely on vibration and noise senses to locate and hunt prey may be forced to leave the vicinity of noisy, vibrating activities;
- The presence of vehicles in the area can cause road kills especially if drivers speed, or where animals are unable to move out of the way;
- General litter; and
- Alien invasive species that will present an undesirable plant community at closure resulting in a low faunal species abundance and diversity.

The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south western section of the farm Eersbegtint 703 near the Kuruman River. Prospecting activities could take place within the Kuruman riverbed.

Without mitigation prospecting activities are expected to result in a prominent change to biodiversity habitat and functionality, which can have long terms effects given that the project area is associated with protected trees (Camel Thorn and the Grey Camel Thorn) and areas of high biodiversity importance and sensitivity, particularly along the Kuruman River. Any impacts will extend beyond the site boundary as biodiversity processes are not confined to the project area. In the absence of mitigation measures, impacts would definitely occur. With mitigation measures that avoid the loss or disturbance of protected species and inform the drilling activities on site, the severity, duration and probability of potential impact reduces. Prospecting and subsequent rehabilitation of drill sites within the riverbed of the Kuruman River will require monitoring.

General and physical disturbance of biodiversity is therefore considered to be of **HIGH** significance without mitigation and **VERY LOW** with mitigation (see Table D3 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Once the location of the drill sites is known, and prior to establishing the drill site, a biodiversity specialist will be appointed to identify and mark any protected species or areas requiring specific mitigation with regards to biodiversity disturbance;
- All protected species will be avoided as far as possible; where this is not possible for the purposes of drilling, a tree permit, fauna permit and/or flora permit will be applied for and obtained prior to destroying or damaging any protected species or active bird nests;
- Any new access tracks will be delineated so that no protected trees need to be removed. If additional roads are required, then wherever feasible such roads should be constructed a distance from the watercourse areas and not directly adjacent thereto. If crossings are required they should cross the system at right angles, as far as possible to minimise impacts in the receiving environment, and any areas where bank failure is observed due to the effects of such crossings should be immediately repaired by reducing the gradient of the banks to a 1:3 slope and where needed necessary, installing support structures. This should only be necessary if existing access roads are not utilised;
- Where drilling activities take place within the regulated area of the Kuruman River, the necessary General Authorisation will be applied for and obtained prior to drilling commencing. The conditions of the General Authorisation will be complied with. Further to this, Khwara will ensuring that measures are implemented to prevent dirty runoff water entering the watercourse habitat; and that where necessary, exposed soils in the vicinity of watercourse habitat are protected from erosion by means of reinstating natural vegetation following construction;
- Current habitat degradation is considered higher within the area south west of the Kuruman River, with access roads already running along the River. It is recommended if feasible, that prospecting activities be planned within the portion southwest of the Kuruman River utilising the Degraded Habitat first, thereby limiting the number of additional roads that will have to be created for the prospecting activities;
- Where drilling takes place in or near the Kuruman River, as far as possible, all construction activities should occur in the low flow season, during the drier winter months;
- Prospecting will only take place within demarcated areas and the clearing of vegetation will be limited as far as possible;
- There will be zero tolerance for off-road driving and the killing or collecting of any biodiversity (including wood) by anybody working for or on behalf of Khwara;
- Strict speed control measures will apply for all prospecting vehicles;
- During prospecting, no vehicles should be allowed to indiscriminately drive through the Kuruman River;
- Noise, dust control and waste management measures outlined in this appendix will be implemented;
- Cut vegetation from site clearing to be removed immediately and not allowed to accumulate within surrounding natural habitat.
- Khwara will manage the spread of alien and invasive species onto and from disturbed areas; and
- Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3).

MONITORING

Monitoring will include visual inspections (Section 28).

EMERGENCY SITUATIONS

Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).

TABLE D3: IMPACT SUMMARY – GENERAL AND PHYSICAL DISTURBANCE OF BIODIVERSITY

Issue: General and physical disturbance of biodiversity		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Prominent change (H)	Minor deterioration (L)
Duration	Long term (H)	Medium-term (M)
Extent	Beyond the site boundary (M)	Beyond the site boundary (M)
Consequence	High	Medium
Probability	Definitely	Possible
Significance	High	Low
Nature of cumulative impacts	Minor contribution to cumulative impacts	
Degree to which impact can be reversed	Reversible with mitigation.	
Degree to which impact may cause irreplaceable loss of resources	Definite loss where mitigation measures are not correctly implemented.	
Degree to which impact can be mitigated	High	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: ALTERATION OF DRAINAGE PATTERNS REDUCING CONTRIBUTIONS TO THE CATCHMENT

DISCUSSION

The catchment is large but sparsely vegetated and features freely draining soils which indicates that minor rainfall events would infiltrate to groundwater as opposed to generating significant volumes of runoff. Given this and that each drill site would occupy a relatively small footprint and be of a temporary nature, a loss of contribution of water flows to the quaternary or local catchment is not expected.

ISSUE: CONTAMINATION OF SURFACE WATER

DESCRIPTION OF IMPACT

Prospecting activities have the potential to contaminate surface water resources. Given the type of prospecting activities planned i.e. drilling of boreholes, potential contamination sources would be temporary in nature, usually existing for a few weeks. Although the activities and sources are temporary in nature, the potential related pollution can have long term effects.

Contamination of surface water resources could also indirectly impact biodiversity resources (see discussion of this impact under the relevant sections in this appendix).

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Generator use Storage of consumables Transport	Transport Waste management Removal of equipment and structures Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Spills of fuels and lubricants as well as silt runoff and poor waste management practices present sources of contamination during the construction and operational phases. In the absence of remediation measures, contaminated soil would present a source of contamination post-drilling, during decommissioning and closure.

Although the location of the boreholes has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegtint 703 near the Kuruman River. Prospecting activities could take place within the Kuruman riverbed. Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the size of the proposed prospecting activities (provision for the drilling of ten boreholes). Given the drainage patterns of the area and the ephemeral nature of the Kuruman River, the potential for contamination of the Kuruman River is unlikely.

Where drilling considers rainfall patterns, there are quick reaction times and effective remediation measures applied, the probability of potential impacts occurring further reduces. In addition, rehabilitation of the drill sites is planned as part of the standard operating procedure for prospecting activities.

Contamination of surface water resources through project-related activities is therefore considered to be **INSIGNIFICANT** even without mitigation (see Table D2 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Soil management measures outlined in this appendix will be implemented; and
- Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner.

MONITORING

No monitoring requirements identified due to the ephemeral nature of the Kuruman River.

EMERGENCY SITUATIONS

Major spillage incidents will be handled in accordance with the emergency procedure (refer to Section 29.2.2).

TABLE D4: IMPACT SUMMARY – CONTAMINATION OF SURFACE WATER

Issue: contamination of surface water		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Minor change (L)	Negligible change (VL)
Duration	Long-term (H)	Short-term (L)
Extent	A part of the site boundary (VL)	A part of the site boundary (VL)
Consequence	Low	Very low
Probability	Unlikely	Unlikely
Significance	Insignificant	Insignificant
Nature of cumulative impacts	Negligible.	
Degree to which impact can be reversed	Reversible with mitigation.	
Degree to which impact may cause irreplaceable loss of resources	None.	
Degree to which impact can be mitigated	High.	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: REDUCTION OF WATER AVAILABILITY TO THIRD PARTIES THROUGH GROUNDWATER ABSTRACTION

DESCRIPTION OF IMPACT

Abstraction of groundwater for prospecting activities has the potential to impact on third-party groundwater users.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
			-
Water use and management	Water use and management	Water use and management	Not applicable

IMPACT ASSESSMENT

Where water is sourced from boreholes located on the farm Eersbegtint 703, this could affect the water supply of the landowner, where large volumes of water are required, However, it is estimated that a relatively small volume of water (approximately 17 000 litres in total for the duration of drilling at each drill site) would be required. The use of this water would be in consultation and agreement with the landowner. Where water cannot be sourced from boreholes located on the farm, water will be sourced from a nearby town such as Black Rock.

A reduction of water availability to third parties through groundwater abstraction is assessed to be **INSIGNIFICANT** even without mitigation. With mitigation, impacts are not expected to occur (see Table D5 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Use of borehole water on the farm Where borehole water is used for drilling activities, the necessary General Authorisation will be applied for and obtained prior to the use commencing. The conditions of the General Authorisation will be complied with; and
- Use of borehole water on the farm will be done in consultation and agreement with the landowner.

MONITORING

Monitoring will include recording the quantity of water used for drilling activities (Section 28).

EMERGENCY SITUATIONS

None identified.

TABLE D5: IMPACT SUMMARY – REDUCTION OF WATER AVAILABILITY TO THIRD PARTIES THROUGH GROUNDWATER ABSTRACTION

Issue: Reduction of water availability to third parties through groundwater abstraction		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Negligible change (VL)	No impact expected.
Duration	Very short (VL)	
Extent	A part of the site (VL)	

Issue: Reduction of water availability to third parties through groundwater abstraction		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Consequence	Very Low	
Probability	Unlikely (L)	
Significance	Insignificant (VL)	
Nature of cumulative impacts	Due to the small scale of the project the cumulative impact is insignificant.	
Degree to which impact can be reversed	Reversible with mitigation.	
Degree to which impact may cause irreplaceable loss of resources	Unlikely where mitigation measures are not correctly implemented.	
Degree to which impact can be mitigated	High.	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: CONTAMINATION OF GROUNDWATER RESOURCES

DESCRIPTION OF IMPACT

Prospecting activities present potential sources of water contamination. Due to the nature of prospecting, these activities are temporary, usually existing from a few weeks. Although the sources are temporary in nature, the potential related contamination can have long term effects.

Potential impacts on biodiversity have been assessed under the issue of general and physical disturbance of biodiversity. This section focuses on potential livestock and human health impacts as a result of contamination of groundwater resources.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Waste management Transport	Prospecting Waste management Generator use Storage of consumables Transport	Transport Waste management Removal of equipment and structures Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Leakages of fuel or lubricants from prospecting equipment on site, spillages from the handling of fuel and lubricants, temporary storage of consumables (such as fuels, lubricants) and poor waste management practises can result in seepage of contaminants into the groundwater system.

Given the nature of prospecting activities, the source of contamination would be temporary; however, the potential contamination could be long-term. Where prospecting takes place near to existing third-party boreholes (used for livestock watering and domestic use), seepage entering the groundwater system could impact on third-party water

uses. It is understood that boreholes are located on the farm Eersbegint 703, through consultation with the landowner.

Although contaminant events are possible, it is expected that the scale and frequency of contaminant events would be relatively low given the control measures that are planned. Where there are quick reaction times and effective remediation measures applied, the duration and probability of potential impacts on groundwater resources reduces.

Contamination of groundwater affecting third party users is assessed to be **INSIGNIFICANT** without mitigation. With mitigation, impacts are not expected to occur (see Table D6 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Prior to drilling the location of third-party boreholes will be marked on a map;
- Establishing a drill site close to third-party boreholes will be avoided as far as possible (if a drill site is established close to third-party boreholes, monitoring of third-party boreholes would be required); and
- Soil management measures outlined in this appendix will be implemented.

MONITORING

No monitoring requirements identified.

EMERGENCY SITUATIONS

None identified.

TABLE D6: IMPACT SUMMARY – CONTAMINATION OF GROUNDWATER AFFECTING THIRD-PARTY USERS

Issue: Contamination of groundwater affecting third-party users		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Negligible change (VL)	No impact expected.
Duration	Long term (H)	
Extent	A part of the site (VL)	
Consequence	Low	
Probability	Unlikely	
Significance	Insignificant	
Nature of cumulative impacts	Due to the small scale of the project the cumulative impact is insignificant.	
Degree to which impact can be reversed	Reversible with mitigation.	
Degree to which impact may cause irreplaceable loss of resources	Definite loss where mitigation measures are not correctly implemented.	
Degree to which impact can be mitigated	High.	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: AIR POLLUTION

DESCRIPTION OF IMPACT

Prospecting activities have the potential to contribute to ambient air quality. Given the type of prospecting activities planned i.e. drilling of boreholes, potential sources such as vehicles and machinery would be temporary in nature, usually existing for a few weeks at a time. Sources associated with dust generation would also be temporary in nature, but existing for a few months at a time.

Air pollution related impacts on biodiversity have been discussed under their relevant sections in this appendix and therefore this section focuses only on the potential for human health impacts.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Transport	Prospecting Transport Generator use	Removal of equipment and structure Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Site preparation and earthworks could result in air pollution through windblown dust from exposed soils. In addition, vehicle movement along dirt access tracks and the operation of vehicles and machinery (including generator) could result in air pollution from dust and exhaust fumes respectively. In the absence of mitigation measures, air quality impacts can present both health and nuisance impacts to nearby receptors.

The severity or intensity of impacts is associated with the concentration of emissions over a period of time. Given the relatively small scale of the drilling activities, potential impacts are expected to result in a moderate disturbance or nuisance.

The potential for health and nuisance impacts also depends on the wind direction and speed, proximity and sensitivity of receptors and duration of exposure to air pollution sources. Although the location of the drill sites has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River and near to private residences. Any potential impacts are expected to be of a very short duration and limited to the immediate surrounds of the drilling activities or access tracks.

Given the above and the semi-arid nature of the prospecting area, the probability of impacts occurring in the unmitigated scenario is considered probable. With mitigation that controls and limits the release of particulates and emissions to the environment, the severity and probability of impacts reduces.

Air pollution through project-related activities is therefore considered to be of **LOW** significance without mitigation and **INSIGNIFICANT** with mitigation (see Table D7 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Surface disturbance will be limited to that which is absolutely necessary to undertake the drilling activities;
- Existing access tracks will be used as far as possible; new access tracks will be limited to that which is absolutely necessary to undertake the drilling activities;
- Prospecting activities will only take place within demarcated areas;
- Soil mitigation measures outlined in this appendix will be implemented;
- Vehicle speeds along dirt access tracks will be limited to 30 km/h to limit dust generation;
- Dust suppression (using methods suitable to the area) will be undertaken on frequently used access tracks;
- Vehicles and machinery will be maintained in good working order to limit exhaust emissions; and
- Any air pollution related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.

MONITORING

Monitoring will include visual inspections for signs of air pollution (Section 28).

EMERGENCY SITUATIONS

None identified.

TABLE D7: IMPACT SUMMARY – AIR POLLUTION

Issue: Air pollution		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Moderate change (M)	Minor change (L)
Duration	Very short term (VL)	Very short term (VL)
Extent	A part of the site (VL)	A part of the site (VL)
Consequence	Low	Very Low
Probability	Probable (H)	Conceivable (L)
Significance	Low	Insignificant
Nature of cumulative impacts	Minor contribution to cumulative impacts.	
Degree to which impact can be reversed	Mainly reversible with mitigation	
Degree to which impact may cause irreplaceable loss of resources	Unlikely to cause irreplaceable loss of a resource	
Degree to which impact can be mitigated	High	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: INCREASE IN DISTURBING NOISE LEVELS

DESCRIPTION OF IMPACT

Prospecting activities have the potential to generate noise through the use of vehicles and machinery e.g. the operation of drill rigs. Given the type of prospecting activities planned such as drilling of boreholes, potential noise pollution from sources such as vehicles and machinery would be temporary in nature, usually existing for a few weeks at a time.

The assessment below focuses on impacts on humans and livestock. Noise disturbance impacts to biodiversity are discussed under the relevant section of this appendix.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Transport	Prospecting Generator use Transport	Removal of equipment and structure Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Prospecting activities will introduce mechanical and vehicle noise sources to an otherwise rural and quiet environment. In the absence of mitigation measures, noise impacts can present a disturbance or be a nuisance to nearby receptors (residence and livestock).

The severity or intensity of impacts is associated with the level of noise emissions. Given the relatively small scale of the drilling activities, potential impacts are expected to result in a moderate disturbance or nuisance to nearby receptors.

The potential for impacts also depends on climatic conditions, proximity and sensitivity of receptors and duration of exposure to noise pollution sources. Although the location of the drill sites has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River and near to private residences. Any potential impacts are expected to be of a very short duration and limited to the immediate surrounds of the drilling activities or access tracks.

Given the above, the probability of impacts occurring in the unmitigated scenario is considered probable. With mitigation that controls and limits the noise levels, the severity and probability of impacts reduces.

Air pollution through project-related activities is therefore considered to be of **LOW** significance without mitigation and **VERY LOW** with mitigation (see Table D7 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- The use of vehicles and machinery will be limited to that which is absolutely necessary to undertake the drilling activities;
- Drilling will only take place during daytime hours and only on weekdays, given that people reside on the farm;
- Vehicle speeds along access tracks will be limited to 30 km/h to limit noise pollution;
- Vehicles and machinery will be maintained in good working order to control noise and vibration emission levels; and
- Any noise pollution related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.

MONITORING

No monitoring requirements identified.

EMERGENCY SITUATIONS

None identified.

TABLE D8: IMPACT SUMMARY – NOISE POLLUTION

Issue: Noise Pollution		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Moderate change (M)	Minor change (L)
Duration	Very short term (VL)	Very short term (VL)
Extent	A part of the site (VL)	A part of the site (VL)
Consequence	Low	Very Low
Probability	Probable (H)	Possible (M)
Significance	Low	Very Low
Nature of cumulative impacts	Minor contribution to cumulative impacts.	
Degree to which impact can be reversed	With the application of appropriate mitigation measures the impact can be reversed.	
Degree to which impact may cause irreplaceable loss of resources	Unlikely to cause irreplaceable loss of a resource.	
Degree to which impact can be mitigated	High.	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: NEGATIVE VISUAL VIEWS

DESCRIPTION OF IMPACT

Prospecting activities have the potential to alter the visual environment and aesthetics of the site. Given the type of prospecting activities planned (i.e. drilling of boreholes) potential visual pollution would be temporary in nature, usually existing for a few weeks. Visual impacts caused by unsuccessful rehabilitation could extend post closure.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Water use and management Storage of consumables Transport	Removal of equipment and structure Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Prospecting activities will present mechanical structures and activities to an otherwise natural farming landscape characterised by the Kuruman River and open views of the bushveld. Mining related structures do occur in the landscape further south of the proposed project area and the R380 traverses the south western corner of the proposed project area.

Given the small scale (provision for ten boreholes) of the project, it is not expected that the visual landscape will be materially altered by the proposed project.

Although the location of the drill sites has not been determined the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River and near to private residences. The presence of prospecting facilities and structures could be visible from the residences on the farm as well as tourists travelling along the R380. Prospecting activities are however temporary and of short duration. In the absence of rehabilitation measures, clearing land and drilling activities can leave a scar on the landscape. With appropriate rehabilitation this can be remedied and quickly reversed.

The visual impact due to project-related activities is therefore considered to be of **VERY LOW** significance without mitigation and **INSIGNIFICANT** with mitigation (see Table D9 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Soil and air pollution measures outlined above will be implemented;
- Vegetation surrounding the drill site will be maintained as far as possible; only the bare minimum will be cleared for drilling activities;
- The drill site will be maintained and kept clean on an on-going basis;
- Rehabilitation of the drill site will be undertaken immediately after drilling has been completed;

- Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner; and
- Any visual related complaints will be registered and responded to. Where additional mitigation is required, this will be implemented.

MONITORING

No monitoring requirements identified.

EMERGENCY SITUATIONS

None identified.

TABLE D9: IMPACT SUMMARY – VISUAL POLLUTION

Issue: Visual Pollution		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Minor change (L)	Minor change (L)
Duration	Long term (H)	Very short term (VL)
Extent	A part of the site (VL)	A part of the site (VL)
Consequence	Low (L)	Very Low (VL)
Probability	Possible (M)	Conceivable (L)
Significance	Very Low	Insignificant
Nature of cumulative impacts	Minor contribution to cumulative impacts.	
Degree to which impact can be reversed	With the application of suitable (and successful) mitigation measures, the visual impact can be reversed altogether.	
Degree to which impact may cause irreplaceable loss of resources	Unlikely to cause irreplaceable loss	
Degree to which impact can be mitigated	High	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: LOSS OF HERITAGE/CULTURAL AND PALAEONTOLOGICAL RESOURCES

DESCRIPTION OF IMPACT

Prospecting related activities have the potential to damage heritage, cultural, and palaeontological resources, if present, either directly or indirectly, and result in the loss of the resource for future generations.

IT IS CONSIDERED UNLIKELY THAT ANY FOSSILS OCCUR IN THE PROJECT AREA BECAUSE THE ROCK IS TOO OLD AND VOLCANIC IN ORIGIN. POTENTIAL IMPACTS ON PALAEONTOLOGICAL RESOURCES IS THEREFORE NOT ASSESSED FURTHER. THE ASSESSMENT FOCUSES ON POTENTIAL HERITAGE AND CULTURAL RESOURCES AND IS INFORMED BY A PHASE 1 HERITAGE IMPACT ASSESSMENT (SEE APPENDIX 4: TERRESTRIAL AND AQUATIC BIODIVERSITY STUDIES

Appendix 5).

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Transport	Prospecting	Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Numerous Stone Age heritage/cultural sites are expected to be located on the farm Eersbegint 703, particularly along the Kuruman River (Section 7.4.1.10).

The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. It is however understood that the ore body is anticipated to be towards the south western section of the farm Eersbegint 703 near the Kuruman River.

Without mitigation, prospecting activities are expected to have a severe change to heritage/cultural resources where these sites are damaged and/or lost. Any damage and/or loss of a heritage/cultural resources are permanent and will extend beyond the site boundary into effected community (particularly with grave sites). With mitigation measures focussed on avoidance of cultural/heritage sites, the severity, duration and probability of the potential impact reduces.

The loss of heritage/cultural resources is therefore considered to be of **VERY HIGH** significance without mitigation and **INSIGNIFICANT** with mitigation (see Table D10 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- The location of the boreholes has not been determined. The exact location of the boreholes will be decided on once the ground penetrating radar and handheld ground magnetic mapping have been completed. As far as possible all Stone Age Sites need to be avoided. These sites need to be fenced off and no prospecting activities must take place within 20m of the Stone Age sites. In the event that these sites cannot be avoided, the necessary permits will be obtained from SAHRA; and
- Prior to the removal or destruction of any heritage, cultural, or palaeontological resources that may be discovered by chance, Khwara will engage a professionally registered heritage and/or palaeontological specialist to make associated recommendations that Khwara will comply with.

MONITORING

No monitoring requirements identified.

EMERGENCY SITUATIONS

If there are any chance finds of heritage/ cultural sites, Khwara will follow the emergency response procedure (Section 29.2.2).

TABLE D10: IMPACT SUMMARY – LOSS OF HERITAGE/CULTURAL RESOURCES

Issue: Loss of heritage/cultural resources		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Sever change (VH)	Negligible (VL)
Duration	Very long (VH)	Short term (L)
Extent	Beyond the site boundary (M)	Beyond the site boundary (M)
Consequence	Very high	Low
Probability	Definite	Unlikely
Significance	Very high	Insignificant
Nature of cumulative impacts	Due to the small scale of the project the cumulative impact is insignificant.	
Degree to which impact can be reversed	Cannot be reversed if there is a loss or damage of a cultural/heritage resource	
Degree to which impact may cause irreplaceable loss of resources	Definite loss where mitigation measures are not correctly implemented.	
Degree to which impact can be mitigated	High – heritage/cultural sites can be avoided.	
Residual impacts	With mitigation, no residual impacts are expected.	

ISSUE: INWARD MIGRATION AND ECONOMIC IMPACT

DESCRIPTION OF IMPACT

In the broadest sense, prospecting projects contribute towards a positive economic impact (both directly and indirectly). Positive economic impacts have the potential to result in positive social impacts. Inward migration in search of employment opportunities could result in social ills.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Water use and management Transport	Waste management Removal of equipment and structure Rehabilitation	Maintenance and aftercare

IMPACT ASSESSMENT

Prospecting is predicted to have a direct positive economic impact for the duration of the prospecting activities (for both non-invasive and invasive activities). The proposed prospecting project would provide a contract opportunity

for a drilling company. Where the contractor company is sourced from the Northern Cape area, this would result in a local positive socio-economic impact through wages and taxes. Given that prospecting forms part of exploration, no profits would be derived from the activities. In addition, indirect benefits would be derived through the procurement of goods and services (albeit limited), and the increased spending power of contractors. Where these are sourced locally, this would also contribute to an increased local socio-economic impact.

Positive economic impacts have the potential to improve the livelihoods of people benefiting from the project and contribute to the development and status of a region.

Given the relatively small scale and temporary nature of the proposed prospecting activities, and where mitigation measures are applied, negative economic loss associated with existing land uses is not anticipated.

Given the relatively small scale of the prospecting activities, impacts associated with inward migration of people in search of employment opportunities and related social ills are considered unlikely.

The overall significance is likely to be a **MEDIUM positive** without and with mitigation (see Table D11 below).

MITIGATION

The mitigation measures outlined below will be applied to the prospecting activities:

- Make use of local contractors as far as possible (for both non-invasive and invasive prospecting activities); and
- Procure goods and services locally as far as possible.

MONITORING

No monitoring requirements identified.

EMERGENCY SITUATIONS

None identified.

TABLE D11: IMPACT SUMMARY – POSITIVE SOCIO-ECONOMIC IMPACT

Issue: Positive socio-economic impact		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Moderate improvement (M+)	Moderate improvement (M+)
Duration	Short-term (L)	Short-term (L)
Extent	Local area (H)	Local area (H)
Consequence	Medium	Medium
Probability	Definite (H)	Definite (H)
Significance	Medium (M+)	Medium (M+)
Nature of cumulative impacts	Due to the small scale of the project the cumulative impact is insignificant.	

Degree to which impact can be reversed	Reversible with mitigation.
Degree to which impact may cause irreplaceable loss of resources	Unlikely.
Degree to which impact can be mitigated	High.
Residual impacts	With mitigation, no residual impacts are expected.

ISSUE: CHANGE IN LAND USE

DESCRIPTION OF IMPACT

Prospecting related activities have the potential to affect land uses both within the prospecting right area and in the surrounding areas. This can be caused by physical land transformation and through direct or secondary impacts.

LINK TO PROJECT SPECIFIC ACTIVITIES/INFRASTRUCTURE

The project specific activities associated with this impact and associated project phases are tabulated below.

Construction	Operational	Decommissioning	Closure
Site preparation Earthworks Waste management Transport	Prospecting Waste management Water use and management Generator use Storage of consumables Transport Support services	Waste management Removal of equipment and structure Rehabilitation Support services	Maintenance and aftercare

IMPACT ASSESSMENT

In terms of the project area, the farm Eersbegint 703 is utilised for cattle grazing. In addition to this, a farm worker resides on the property, near the Kuruman River in the south western corner of the farm (refer to Figure 10). Prospecting related activities have the potential to impact on land uses within the project area through the following activities:

- Presence of infrastructure that could be hazardous to people and animals;
- Noise generation from drilling activities;
- Generation of dust;
- Visual disturbance; and
- Temporary loss of grazing land occupied by the drill sites however, this will be limited in extent.

Land uses surrounding the project area; on adjacent farms include a combination of isolated farmsteads, a guesthouse facility, and cattle grazing. Prospecting related activities have the potential to impact on these land uses through impacts from noise, dust generation and negative visual views.

Without mitigation, the impact associated with the change of land use is expected to have a prominent change, particularly for residence on the farm Eersbegint 703. Even without mitigation, some of these impacts will only last

for the duration of the prospecting activities e.g. noise from drilling and generation of dust using access tracks. However, without mitigation, some impacts on land use can be long term, such as dust generation particularly where rehabilitation of the drill sites has not been implemented correctly and vegetation has not been allowed to re-establish. This impact could extend beyond the site boundary and may influence land uses on surrounding farms.

In the mitigated scenario where mitigation measures identified for individual impacts are correctly implemented and given the temporary nature and small scale of the project the change to land use is expected to be minor, as the severity, duration, and probability of the impacts are reduced. The change in land use is therefore considered to be of **MEDIUM** significance without mitigation and **INSIGNIFICANT** with mitigation (see Table D12 below).

MANAGEMENT ACTION

The mitigation measures outlined below will be applied to the prospecting activities:

- Access to the farm will be done in consultation and agreement with the landowner;
- The location of the drill sites has not been determined. This will be done in consultation with the landowner, prior to accessing the farm for drilling purposes. The drill sites and boreholes will be included on a site layout plan. The layout plan will be kept up to date and will reflect planned, completed and rehabilitated drill sites, including access tracks;
- The landowner will be compensated for loss of grazing land for the duration of the prospecting activities;
- Each drill site will be clearly demarcated and fenced off for the duration of drilling activities to prevent cattle or third-party access;
- Prospecting activities will only take place within demarcated areas;
- No contractors will reside on the property or access other areas of the farm not demarcated for drilling activities;
- Noise, dust control and waste management measures outlined in this appendix will be implemented;
- A complaints register will be maintained for the duration of the prospecting activities. All complaints will be responded to in a timely manner;
- Photo records of the drilling activities will be maintained including before, during, after and post-rehabilitation (for the duration of the prospecting right); and
- Rehabilitation of the site will be done in line with the closure objectives and rehabilitation plan (refer to Section 27.1.3) and in agreement with the landowner.

TABLE D12: IMPACT SUMMARY – CHANGE IN LAND USE

Issue: Change in land use		
Phases: All		
Criteria	**Without Mitigation**	**With Mitigation**
Severity	Moderate change (M)	Minor deterioration (L)
Duration	Long term (H)	Short term (L)
Extent	Beyond the site boundary (M)	A part of the site (VL)
Consequence	Medium	Low
Probability	Probable	Conceivable
Significance	Medium	Insignificant

Nature of cumulative impacts	Due to the small scale of the project the cumulative impact is insignificant.
Degree to which impact can be reversed	Reversible with mitigation.
Degree to which impact may cause irreplaceable loss of resources	Definite loss where mitigation measures are not correctly implemented.
Degree to which impact can be mitigated	High
Residual impacts	With mitigation, no residual impacts are expected.

APPENDIX 4: TERRESTRIAL AND AQUATIC BIODIVERSITY STUDIES

APPENDIX 5: HERITAGE/PALAEONTOLOGICAL

- Heritage/cultural study – December 2019;
- Heritage/cultural study – January 2020; and
- Palaeontological study

APPENDIX 6: COMPOSITE MAP

APPENDIX 7: FINANCIAL PROVISION

AFRICAN OFFICES

South Africa

CAPE TOWN
T: +27 21 461 1118

FOURWAYS
T: +27 11 467 0945

SOMERSET WEST
T: +27 21 851 3348

Namibia

WINDHOEK
T: + 264 61 231 287

Issued By