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Applicant: Kudumane Manganese Resources (Pty) Ltd

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SCOPING REPORT FOR THE ADDITIONAL PLANNED INFRASTRUCTURE AND MINING AREAS AT KUDUMANE

April 2014

SCOPING REPORT

Submitted with due regard to

consultation with communities and interested and affected parties

as required in terms of Regulation 49 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources

and

as required in terms of Regulation 28 of the National Environmental Management Act (Act 107 of 1998).

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SCOPING REPORT FOR THE ADDITIONAL PLANNED INFRASTRUCTURE AND MINING AREAS AT KUDUMANE

CONTENTS

INTRODUCTION.....	I
1 THE METHODOLOGY APPLIED TO SCOPING.....	1-1
1.1 HISTORICALLY DISADVANTAGED COMMUNITIES	1-2
1.2 HISTORICALLY DISADVANTAGED COMMUNITY LAND OWNERSHIP	1-2
1.3 DEPARTMENT OF LAND AFFAIRS INTEREST	1-2
1.4 LAND CLAIMS.....	1-2
1.5 RELEVANT TRADITIONAL AUTHORITY.....	1-2
1.6 LANDOWNERS.....	1-2
1.7 LAWFUL OCCUPIERS	1-3
1.8 OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED	1-3
1.9 RELEVANT LOCAL MUNICIPALITY	1-4
1.10 OTHER STAKEHOLDERS	1-4
1.11 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPS	1-5
2 DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT.....	2-1
2.1 AGREEMENT ON EXISTING STATUS OF ENVIRONMENT	2-1
2.2 EXISTING STATUS OF THE CULTURAL ENVIRONMENT	2-1
2.3 EXISTING STATUS OF THE HERITAGE ENVIRONMENT	2-1
2.4 EXISTING STATUS OF CURRENT LAND USES AND THE SOCIO-ECONOMIC ENVIRONMENT	2-3
2.4.1 CURRENT LAND USES	2-3
2.4.2 MINERAL/PROSPECTING RIGHTS	2-4
2.4.3 SOCIO-ECONOMIC PROFILE	2-4
2.5 EXISTING STATUS OF RELEVANT INFRASTRUCTURE	2-5
2.5.1 COMMUNITIES AND COMMUNITY STRUCTURES IN THE VICINITY	2-5
2.5.2 MINING STRUCTURES AND WARD COUNCILLOR CONSULTATION	2-5
2.5.3 TRANSPORT INFRASTRUCTURE.....	2-6
2.5.4 POWERLINES.....	2-6
2.5.5 WATER PIPELINE	2-6
2.6 EXISTING STATUS OF THE BIOPHYSICAL ENVIRONMENT	2-6
2.6.1 GEOLOGY	2-7
2.6.2 TOPOGRAPHY.....	2-8
2.6.3 CLIMATE	2-9
2.6.4 SOIL AND LAND CAPABILITY	2-11
2.6.5 BIODIVERSITY.....	2-12
2.6.6 HYDROLOGY (SURFACE WATER).....	2-15
2.6.7 GROUNDWATER.....	2-18
2.6.8 AIR QUALITY	2-19
2.6.9 NOISE	2-21
2.6.10 VISUAL ASPECTS.....	2-21
2.7 RELEVANT ADDITIONAL INFORMATION	2-22
3 IDENTIFICATION OF THE ANTICIPATED IMPACTS	3-1
3.1 PROJECT DESCRIPTION.....	3-1
3.1.1 CONSTRUCTION PHASE	3-3
3.1.2 CONSTRUCTION PHASE FACILITIES	3-3
3.1.3 CONSTRUCTION PHASE ACTIVITIES.....	3-4

3.1.4	OTHER CONSTRUCTION SUPPORT SERVICES	3-4
3.1.5	CONSTRUCTION PHASE TIMING	3-6
3.1.6	OPERATIONAL PHASE	3-9
3.1.7	OPERATIONAL PHASE MINING METHOD	3-9
3.1.8	MINERAL PROCESSING	3-15
3.1.9	OTHER SUPPORT SERVICES	3-16
3.2	RELEVANT NEMA LISTED ACTIVITIES	3-22
3.3	EQUATOR PRINCIPLES.....	3-29
3.3.1	IFC PERFORMANCE STANDARDS FOR SOCIAL AND ENVIRONMENTAL SUSTAINABILITY	3-31
3.3.2	IFC ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES (GENERAL & MINING)	3-32
3.3.3	WORLD BANK ENVIRONMENTAL HEALTH AND SAFETY GUIDELINE FOR MINING AND MILLING	3-32
3.4	CONFIRMATION OF IAP CONSULTATION AND AGREEMENT ON POTENTIAL IMPACTS.....	3-32
3.5	POTENTIAL CULTURAL ENVIRONMENT IMPACTS	3-32
3.6	POTENTIAL HERITAGE ENVIRONMENT IMPACTS.....	3-32
3.6.1	ARCHAEOLOGICAL, HERITAGE AND CULTURAL RESOURCES	3-32
3.6.2	PALAEONTOLOGICAL RESOURCES	3-33
3.7	POTENTIAL SOCIO-ECONOMIC ENVIRONMENT IMPACTS	3-33
3.7.1	LAND USE	3-33
3.8	POTENTIAL IMPACTS ON EMPLOYMENT OPPORTUNITIES, COMMUNITY HEALTH, COMMUNITY PROXIMITY AND LINKS TO THE SOCIAL AND LABOUR PLAN	3-35
3.8.1	POSITIVE AND NEGATIVE SOCIO-ECONOMIC IMPACTS.....	3-35
3.9	POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS	3-36
3.9.1	GEOLOGY	3-36
3.9.2	TOPOGRAPHY.....	3-36
3.9.3	SOIL AND LAND CAPABILITY	3-37
3.9.4	FAUNA AND FLORA (NATURAL PLANT AND ANIMAL LIFE)	3-37
3.9.5	HYDROLOGY (SURFACE WATER).....	3-38
3.9.6	GROUNDWATER.....	3-38
3.9.7	AIR QUALITY.....	3-39
3.9.8	NOISE	3-40
3.9.9	VISUAL ASPECTS.....	3-40
3.10	POTENTIAL CUMULATIVE IMPACTS	3-40
4	PROJECT ALTERNATIVES	4-1
4.1	LAND USE ALTERNATIVES	4-1
4.2	LAND DEVELOPMENTS WHICH MAY BE AFFECTED BY THE PROPOSED PROJECT	4-1
4.3	PROJECT ALTERNATIVES AND IAP PROPOSALS TO ADJUST PROJECT PLAN.....	4-1
4.3.1	INFRASTRUCTURE LAYOUT ALTERNATIVES	4-1
4.3.2	IAP PROPOSALS TO ADJUST THE PROJECT PLAN	4-2
4.4	THE “NO-GO” OPTION	4-2
4.5	PROJECT PLAN	4-2
4.5.1	AVOIDANCE OF POTENTIAL IMPACTS	4-3
5	DESCRIPTION OF THE PROCESS OF ENGAGEMENT OF IAPS, INCLUDING THEIR VIEWS AND CONCERNS.....	5-1
5.1	INFORMATION SHARING	5-1
5.1.1	DATABASE	5-1
5.1.2	BACKGROUND INFORMATION DOCUMENT (BID)	5-1
5.1.3	NOTIFICATION	5-1
5.1.4	SCOPING MEETINGS - IAPS.....	5-2
5.1.5	REVIEW OF THE DRAFT SCOPING REPORT	5-2
5.2	IAPS CONSULTED DURING SCOPING PHASE	5-3
5.3	IAP VIEWS ON EXISTING ENVIRONMENT	5-3

5.4	IAP VIEWS ON POTENTIAL IMPACTS	5-3
5.5	OTHER IAP CONCERNS.....	5-3
5.6	MEETING MINUTES AND RECORDS OF CONSULTATIONS.....	5-4
5.7	IAP OBJECTIONS	5-4
6	FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY	6-1
6.1	FURTHER INVESTIGATIONS.....	6-1
6.1.1	GEOLOGY	6-1
6.1.2	TOPOGRAPHY.....	6-1
6.1.3	SOIL AND LAND CAPABILITY	6-1
6.1.4	LAND USE	6-1
6.1.5	NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)	6-2
6.1.6	HYDROLOGY (SURFACE WATER).....	6-2
6.1.7	GROUNDWATER.....	6-3
6.1.8	AIR QUALITY	6-3
6.1.9	NOISE	6-3
6.1.10	VISUAL ASPECTS	6-4
6.1.11	ARCHAEOLOGICAL, CULTURAL AND HERITAGE RESOURCES	6-4
6.1.12	PALAEONTOLOGICAL RESOURCES.....	6-5
6.1.13	TRANSPORT SYSTEMS	6-5
6.1.14	SOCIO-ECONOMIC ISSUES	6-5
6.2	METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES	6-6
6.3	METHODOLOGY FOR THE ASSESSMENT OF PROJECT ALTERNATIVES	6-7
6.3.1	ASSESSMENT OF THE “NO-GO OPTION”	6-7
6.3.2	ASSESSMENT OF PROJECT ALTERNATIVES	6-7
6.4	ENGINEERING DESIGN.....	6-7
6.5	CLOSURE COST ESTIMATE	6-8
6.6	PLAN OF STUDY FOR THE EIA PHASE.....	6-8
6.6.1	EIA PHASE OBJECTIVES.....	6-8
6.6.2	EIA PROJECT TEAM.....	6-8
6.6.3	EIA AND EMP PHASE ACTIVITIES AND TIMING	6-9
6.6.4	STAGES OF CONSULTATION WITH THE COMPETENT AUTHORITY IN EIA PHASE	6-10
6.6.5	PUBLIC INVOLVEMENT PROCESS IN EIA PHASE.....	6-10
7	IDENTIFICATION OF THE REPORT	7-1
8	SUMMARY AND CONCLUSIONS.....	8-1
9	REFERENCES	9-1

LIST OF FIGURES

FIGURE 1: REGIONAL SETTING.....	V
FIGURE 2: LOCAL SETTING	VI
FIGURE 3: CURRENT GROUNDWATER AND AIR QUALITY MONITORING POINTS	2-17
FIGURE 4: INFRASTRUCTURE AS APPROVED IN THE EXISTING EIA/EMP	3-7
FIGURE 5: PROPOSED INFRASTRUCTURE LAYOUT AS PER CURRENT EIA/EMP	3-8

LIST OF TABLES

TABLE 1: LEGAL FRAMEWORK.....	III
TABLE 2: LAND OWNERS IN THE PROJECT AREA	1-3
TABLE 3: LANDOWNERS ADJACENT TO THE PROJECT AREA.....	1-3
TABLE 4: DETAILS OF SOUTH AFRICAN WEATHER SERVICES STATION USED	2-9
TABLE 5: MONTHLY EVAPORATION FOR KURUMAN WEATHER STATION.....	2-10
TABLE 6: BIRD SPECIES OF CONSERVATION CONCERN POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA.....	2-13
TABLE 7: MAMMAL SPECIES OF CONSERVATION CONCERN POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA.....	2-14
TABLE 8: NON-MINERALISED WASTE MANAGEMENT FOR THE CONSTRUCTION PHASE.....	3-5
TABLE 9: DATA THAT PROVIDES PERSPECTIVE ON THE MAGNITUDE OF THE OPERATIONS AS PER APPROVED AND CHANGED SCOPE	3-9
TABLE 10: YORK OPEN PIT PARAMETERS	3-11
TABLE 11: DATA THAT PROVIDES PERSPECTIVE ON THE MAGNITUDE OF THE OPERATIONS FOR THE ADDITIONAL MINING AREAS IN COMPARISON TO THE APPROVED INFRASTRUCTURE	3-13
TABLE 12: HOTAZEL, KIPLING AND DEVON OPEN PIT PARAMETERS.....	3-14
TABLE 13: MINERAL PROCESSING ACTIVITIES.....	3-16
TABLE 14: SEWAGE TREATMENT PROCESS.....	3-18
TABLE 15: NON-MINERALISED WASTE MANAGEMENT FOR OPERATIONS	3-20
TABLE 16: PREVIOUSLY APPROVED NEMA ACTIVITIES	3-24
TABLE 17: RELEVANT NEMA ACTIVITIES CURRENTLY BEING APPLIED FOR.....	3-25
TABLE 18: EQUATOR PRINCIPLES.....	3-29
TABLE 19: THIRD PARTY STRUCTURES WITHIN THE VICINITY OF THE PROPOSED PROJECT AREA	3-34
TABLE 20: CRITERIA FOR ASSESSING IMPACTS	6-6
TABLE 21: PROPOSED EIA TEAM.....	6-8
TABLE 22: EIA AND EMP ACTIVITIES AND TIMING	6-9

LIST OF APPENDICES

APPENDIX A: PROOF OF NEMA APPLICATION	A
APPENDIX B: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS	B
APPENDIX C: IAPS DATABASE	C
APPENDIX D: ISSUES AND CONCERNS REPORT	D

ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
ABC	Acid Base Accounting
ADT	Articulated Dump Trucks
ARD	Acid Rock Drainage
BID	Background information document
CEC	Cation Exchange Capacity
CO	Carbon Monoxide
CD	Compact Disc
DAFF	Department of Agriculture, Forestry and Fisheries
dBA	A-weighted decibel
ENC	Department of Environment and Nature Conservation
DMR	Department of Mineral Resources
DPWRT	Department of Public Works, Roads and Transport
DRDLR	Department of Rural Development and Land Reform
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental impact assessment
EMP	Environmental management programme
EMS	Environmental Management Services
GGP	Gross Geographic Product
GN	General Notice
Ha	Hectares
IAPs	Interested and/or affected parties
IUCN	International Union for Conservation of Nature
IWWMP	Integrated Waste & Water Management Plan
Km	Kilometres
Kv	Kilovolts
m	Meters
MAMSL	Metres above mean sea level
mm	Millimetres
MPRDA	Mineral and Petroleum Resources Development Act
MR	Mining Right
NEMA	National Environmental Management Act
NEM:WA	National Environmental Management: Waste Management Act
NGO	Non-government organisation
NOx	nitric oxide and nitrogen dioxide
NP	Neutralising Potential
°C	Degrees Celsius
PrSciNat	Registered professional in natural science
ROM	Run-of-mine
SACNSP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SAWS	South African Weather Service
SLR	SLR Consulting (Africa) (Pty) Ltd
SMS	Short Message Service
SO ₂	Sulphur Dioxide
TDS	Total dissolved solids
TSF	Tailings Storage Facility
WESSA	Wildlife and Environmental Society of South Africa
WRD	Waste Rock Dump

Acronyms / Abbreviations	Definition
WULA	Water Use License Application

INTRODUCTION

Introduction to the proposed project

Kudumane Manganese Resources (Pty) Ltd (Kudumane), a South African mining company holds a mining right on the farms York A 279 (York) and Telele 312 (Telele) located approximately 3 km south west of the town of Hotazel in the John Taolo Gaetsewe District Municipality in the Northern Cape. Refer to Figure 1 and Figure 2 for the regional and local settings respectively.

The Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) submitted as part of the approved mining right application covers the opencast mining and infrastructure on the farm York and underground mining on the farm Telele under the DMR authorisation (NC 30/6/1/2/2/268 MR). In broad terms the approved EIA/EMP included the establishment of an opencast and future underground mining operation, associated residue handling and disposal facilities, a crushing and screening plant, water management facilities, rail and road transport infrastructure and various support infrastructure and services.

Kudumane now wishes to expand its mining operations and applied for a new mining right to include the farms Kipling 217 (Kipling), Devon 277 (Devon) and Hotazel 280 (Hotazel). In addition to adding new mining rights to its existing mining rights areas, Kudumane intends to establish additional infrastructure to what has already been approved.

Kudumane submitted a new mining right application for the inclusion of additional mining areas on the farms Kipling, Devon and Hotazel in November 2013. The application was accepted by the Department of Mineral and Resources (DMR) on 5 December 2013. In line with the requirements of the MPRDA, an environmental impact assessment has to be undertaken and an EMP submitted in support of the mining right application. In this regard, Kudumane will undertake an environmental impact assessment to amend its approved EMP to incorporate these additional mining areas and associated infrastructure. In line with this, a consolidated scoping report and EIA/EMP report will be submitted in support of both the new mining right application as well as the amendment to the existing mining right. The proposed additional infrastructure on the existing mining rights area (namely York and Telele) as well as the proposed additional mining rights areas (Devon, Hotazel and Kipling) is outlined below:

The following infrastructure is proposed on the additional planned mining rights areas (DMR reference number NC 30/5/1/2/2/10053MR):

- Devon: mining and removal of manganese ore from the historical pit and tailings storage facility (TSF);
- Hotazel: opencast activities which will include haul roads and utilisation of the existing road network; conveyor system to York; and
- Kipling: The pit located on the farm Hotazel may in future extend onto Kipling

Kudumane will furthermore amend its EMP to make provision for the additional infrastructure which is proposed within the existing mining rights area. The following is planned on the existing mining rights area (DMR reference number NC 30/6/1/2/2/268 MR):

- Telele: underground mining related surface infrastructure, which could include a ventilation shaft, mine shaft and conveyor system; and
- York : additional surface infrastructure including WRDs and stockpile area

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants has been appointed to manage the environmental authorisation processes.

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

Brief project motivation (need and desirability)

The extension of the mining right area and proposed change to surface infrastructure layout will optimise the extraction of the mineral resources at Kudumane. This will increase the expected operational phase workforce to approximately 1000 people. The proposed changes to the mine will benefit society and the surrounding communities both directly and indirectly by extending the life of mine, generating additional employment (as well as job continuity) and extracting additional resources. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees.

Legal Framework

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

- Environmental authorisation from the Northern Cape Department of Environment and Nature Conservation (DENC) in terms of National Environmental Management Act (NEMA) (Act 107 of 1998) (NEMA). The proposed project incorporates several listed environmental activities. An application was submitted by SLR to DENC and was accepted by the department (Appendix A). The applicable list of activities is provided in Section 3.2. The EIA regulations being followed for this project are Regulation 544, 545 and 546 (2010 EIA Regulations).
- An environmental decision from the Department of Mineral Resources (DMR) in terms the EIA/EMP report which will be submitted. A single scoping report and EIA/EMP report supporting the new mining right application and associated infrastructure as well as the changes proposed within the existing mining rights area will be submitted to the DMR for decision making. This approach will have to be confirmed by the DMR.

- A water use license from the Department of Water Affairs (DWA) in terms of the National Water Act (NWA) 36 of 1998. The applicable water uses in terms of Section 21 of the NWA include (a) (c) (g) (i) and (j). It should be noted that a WULA was submitted to the DWA in 2006 to cater for water uses associated with the existing approved EIA and EMP report.
- The approval of a biodiversity offset programme by the Department of Forestry and Fisheries (DAFF) and DENC. With the establishment of the approved infrastructure, the removal of protected trees (10107 *Acacia erioloba* and 8738 *Acacia haemotoxylon*) triggered the implementation of a biodiversity off-set project in terms of the internal DAFF guidelines. Additionally, Kudumane has committed to a voluntary biodiversity offset as part of the approved EIA/EMP.

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

This document has been prepared strictly in accordance with the DMR Scoping Report template format, and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the MPRDA. In addition, this report complies with the requirements of the National Environmental Management Act (NEMA) (Act 107 of 1998). The relevant criteria are indicated in Table 1.

TABLE 1: LEGAL FRAMEWORK

Reference in scoping report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 28 of Regulation 543 of 18 June 2010
Introduction	-	Details of the environmental practitioner who prepared the report, including relevant expertise to carry out scoping procedures.
Introduction	-	Identify all legislation and guidelines that have been considered in preparing the scoping report.
Section 6	Describe the methodology applied to conduct scoping.	-
Section 1 and Appendix B	Describe the process of engagement of identified interested and affected parties (IAPs), including their views and concerns.	Details of the public participation process conducted in terms of Regulation 28(a), including: notification of IAPs, proof of notification, IAP register/database, summary of issues raised by IAPs.
Section 2	Describe the existing status of the environment prior to the mining operation.	Description of the environment that may be affected by the activities.
Section 3.1	Describe the most appropriate procedure to plan and develop the proposed operation.	A description of the proposed activities, a description of the property on which the activity is to be undertaken, and the location of the activity on the property.
Section 4.1 and 4.5	Identify and describe reasonable land use or development alternatives to the proposed operation. Describe the consequences of not proceeding.	A description of any feasible and reasonable alternatives that have been identified.
Section 3	Identify and describe the anticipated environmental, social and cultural impacts, including cumulative effects where applicable.	A description of the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activities. A description of environmental issues and potential impacts, including cumulative impacts.

Reference in scoping report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 28 of Regulation 543 of 18 June 2010
Section 6	Describe the nature and extent of further investigations required in the environmental impact assessment report.	Information on the methodology that will be adopted in assessing the potential impacts that have been identified. A plan of study for EIA, including: tasks to be undertaken, specialist reports and processes, consultation of authorities, method of assessing environmental issues and alternatives, the option of not proceeding, proposed public participation process, other information required by the authorities.

Scoping phase objectives

The objectives of the scoping phase are to understand the proposed project, identify and describe potential environmental and social impacts, and to set out any related terms of reference for further investigations that will enable the meaningful assessment of all relevant environmental and social issues. The terms of reference for further investigations are included in Section 6.1.

Scoping team

Caitlin Hird (author and project manager) has approximately three years of relevant experience. Suan Mulder (project manager and reviewer) has approximately 17 years of relevant experience. Brandon Stobart (project reviewer) has over 15 years of relevant experience and is registered as an environmental assessment practitioner with the interim certification board.

Neither SLR or any specialists which are being used as sub-consultants have any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

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FIGURE 1: REGIONAL SETTING

FIGURE 2: LOCAL SETTING

1 THE METHODOLOGY APPLIED TO SCOPING

The scoping process was conducted in accordance with the requirements of the legal framework outlined in Table 1 of the Introduction to this report and involved the following steps:

- Key team members conducted a site visit at the developing Kudumane Manganese Mine
- Available studies and reports covering the Kudumane Mine were reviewed
- A project description was drafted in consultation with the client
- Potential positive and negative impacts were identified by considering the project description and site conditions
- Interested and affected parties (IAPs) were identified, notified of the proposed project and consulted (the consultation process is outlined in Section 5 of this report)
- The relevant authorities were identified, notified of the proposed project and consulted (the consultation process is outlined in Section 5 of this report)
- The SLR environmental team identified the investigations required to assess the potential positive and negative impacts (the terms of reference are included in Section 6 of this report)
- A Scoping Report was compiled.

The main sources of information used to develop this report are discussed below.

As part of the existing EIA/EMP reports (Metago 2010 and DMR reference: NC 30/6/1/2/2/268 MR) various specialist studies were commissioned to cover the Kudumane site. The following studies were completed and have been used to inform this report:

- *Geology section of the project feasibility study* (SRK, 2010)
- *Soils and land capability report* (ARC-Institute for Soil, Climate and Water, 2009)
- *Traffic assessment* (Siyazi, 2010)
- *Flora and fauna study* (Environmental Management Services, 2009)
- *Hydrological assessment and Surface water management plan* (Metago, 2010)
- *Water balance* (Metago, 2010)
- *Groundwater assessment* (Water Geosciences Consulting, 2010)
- *Geochemistry study* (Metago, 2010)
- *Air quality study* (Airshed Planning Professional, 2010)
- *Archaeological assessment* (African Heritage Consultants, 2009)
- *Palaeontological risk assessment* (Clarens Dinosaur Hunting expeditions, 2009)
- *Social impact assessment* (Metago: Strategy 4 Good, 2009)

In addition, the following information was used:

- *Kudumane Manganese Mine: Integrated Waste and Water Management Plan* (SLR, 2012)
- *Traffic impact assessment: Kudumane Manganese Resources (Pty) Ltd* (Siyazi, 2013)

- *Palaeontological Impact Assessment for a manganese mine: Farms Kipling 271, Hotazel 280 and Perth 276 in the John Taolo Gaetsewe District Municipality in the Northern Cape* (GSPD, 2013)

1.1 HISTORICALLY DISADVANTAGED COMMUNITIES

There are no historically disadvantaged communities as defined in the DMR Guideline within close proximity to the project area. Communities closest to the Kudumane Project area include (refer to locality map Figure 2):

- Hotazel (± 3 km to the north-east of the proposed mine);
- Kuruman (± 50 km south east); and
- Kathu (± 50 km south).

There are sparsely situated residences and farmhouses on the surrounding farms. These are owned/occupied by farmers, farm workers and people that work on the mines in the region. Many of these are not occupied.

1.2 HISTORICALLY DISADVANTAGED COMMUNITY LAND OWNERSHIP

None of the surface right areas is owned by historically disadvantaged communities. Refer to Table 2 for details of landowners.

1.3 DEPARTMENT OF LAND AFFAIRS INTEREST

The Northern Cape Department of Rural Development and Land Reform and (DRDLR), formerly known as the Department of Land Affairs has been identified as an IAP and has been consulted. Proof of consultation is attached in Appendix A.

1.4 LAND CLAIMS

SLR has consulted DRDLR, and according to the Department, land claims have been lodged on the farms Hotazel (Portion 2 and 3) and Kipling (Portion 0) (Appendix A) within the project area

1.5 RELEVANT TRADITIONAL AUTHORITY

Not applicable.

1.6 LANDOWNERS

The owners reflected on title deed are listed in Table 2 below.

TABLE 2: LAND OWNERS IN THE PROJECT AREA

Farm Name	Portion Number	Title deed number	Landowner (as at March 2014)
Kipling 271	0	T953/1968	Assmang Ltd
Hotazel 280	0	T3049/2010	Hotazel Manganese Mines (Pty) Ltd
	2	T1414/1991	Telkom SA (Ltd)
	3	T643/2009	Samancor Manganese (Pty) Ltd
York A 279	0	T2968/2007	Jansen Jacobus Petrus
	1 (excluded)	T2426/2010	Hotazel Manganese Mines (Pty) Ltd
	2	T650/2011	Kudumane Manganese Resources (Pty) Ltd
	3	T838/1963	Transnet Ltd
	4	T382/1964	Transnet Ltd
	6	T521/1992	Transnet Ltd
	8	T1475/1997	Frederick Eduard Jacobs
Devon 277	0	T3044/2012	Kudumane Manganese Resources (Pty) Ltd
	1	T1050/1992	Transnet Ltd
Telele 312	0	T740/1973	Assmang Ltd
	1	T19/2013	Kudumane Manganese Resources (Pty) Ltd

1.7 LAWFUL OCCUPIERS

Kudumane is the legal owner of portion 2 of York , Portion 0 of Devon, Portion 1 of Telele. See Table 2 above for details of landowners in the project area.

1.8 OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED

This section briefly discusses whether or not other persons' (including those on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed mining operation.

Other parties that may be directly affected include the landowners on the adjacent properties (as listed in Table 3 below) and the associated farm workers.

TABLE 3: LANDOWNERS ADJACENT TO THE PROJECT AREA

Farm Name	Portion number	Title deed number	Landowner (as at May 2013)
Gasesa 272	RE	T175/2010	Tsineng Communal Property Association (Local Authority)
	1	T145/1931	Tsineng Communal Property Association (Local Authority)
East 270	0	T791/2002	Nicolaas Jacobus Pretorius
	2	T993/1972	Nicolaas Jacobus Pretorius
Langdon 278	0	T1459/2001	Dawid Hermanus Fourie
London 275	1	T1236/2001	KLK Landbou Ltd
Botha 313	0	T2386/1996	Terra Nominees (Pty) Ltd
Kongoni 311	0	T2309/2010	Amari Manganese (Pty) Ltd
	1	T818/1957	Amari Manganese (Pty) Ltd
Gama 283	1	T2793/2010	Amari Manganese (Pty) Ltd

Farm Name	Portion number	Title deed number	Landowner (as at May 2013)
Olive Pan 282	0	T2793/2010	Amari Manganese (Pty) Ltd
Umtu 281	0	T2793/2010	Amari Manganese (Pty) Ltd
Gloria 266	0	T1488/2011	Ntsimbintle Mining (Pty) Ltd
	1	T506/1966	Assmang Ltd
Perth	0	G30/1950	Eben Zikmann Anthonissen
	1	T985/1955	Transnet

Other parties that may be affected by the project that have been identified to date include:

- downstream water users;
- surrounding mining operations;
- surrounding communities on non-adjacent properties (including land owners and land users); and
- Hotazel town residents (located within close proximity to the Hotazel pit)

1.9 RELEVANT LOCAL MUNICIPALITY

The Joe Morolong Local Municipality is the relevant local municipality.

1.10 OTHER STAKEHOLDERS

The relevant government departments, agencies and institutions responsible for the various aspects of the environment, land and infrastructure that may be affected by the proposed project are listed below:

Regulatory authorities:

- Department of Mineral Resources (DMR);
- Department of Water Affairs (DWA);
- Department of Environment and Conservation (DENC);
- South African Heritage Resource Agency (SAHRA);
- Department of Agriculture, Forestry and Fisheries (DAFF);
- The Northern Cape Department of Rural Development and Land Reform and (DRDLR);
- Department of Public Works, Roads and Transport (DPWRT);
- John Taolo Gaetsene District Municipality;
- Joe Morolong Local Municipality; and
- Ward councillors (Ward 4).

Non-governmental Organisation (NGO):

- Wildlife and Environmental Society of South Africa (WESSA)

Service providers:

- Eskom;

- Telkom;
- Transnet; and
- Sedibeng water

Other:

- KLK Boerdery

A public involvement database has been developed for the project and is provided in Appendix C. The database has been developed through a deeds search of the relevant properties and immediately adjacent portions of land, social scans including site visits in the surrounding area, networking and direct consultation with IAPs. The database will be updated on an on-going basis throughout the environmental process.

1.11 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPs

Proof that the landowners, lawful occupiers and IAPs were notified of the project is provided in Appendix A.

2 DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT

This section has been compiled using studies completed by various specialists for the approved EIA/EMP (Metago, 2010), specialist studies completed for the current Scoping Report and EIA/EMP as well as information from the recent site visits by SLR personnel. This baseline information is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment. Detailed information will be provided in the EIA/EMP report.

2.1 AGREEMENT ON EXISTING STATUS OF ENVIRONMENT

Information on the existing status of the environment was provided to IAPs in the Background Information Document (BID) and also during the scoping meetings, as per the minutes attached in Appendix B. IAPs will also have the opportunity to review this scoping report which includes details of the existing status of the environment. Issues raised during the review of the Scoping Report will be provided to the relevant decision-making departments, as required.

2.2 EXISTING STATUS OF THE CULTURAL ENVIRONMENT

The existing status of the cultural environment that may be affected by the proposed project is described in the section below. The term 'cultural resource' is a broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practise, belief or social interaction. They can be, but are not necessarily identified with defined locations. Heritage resources are considered to be cultural resources, therefore these resources are dealt with together in the section below.

2.3 EXISTING STATUS OF THE HERITAGE ENVIRONMENT

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

Paleontological resources are fossils, the remains or traces of prehistoric life preserved in the geological (rock 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). Paleontological resources include the casts or

impressions of ancient animals and plants, their trace remains (for example, burrows and trackways), microfossils (for example, fossil pollen, ostracodes, and diatoms), and unmineralised remains (for example, bones of Ice Age mammals).

Information in this section was sourced from the heritage specialist study conducted by African Heritage Consultants (2009) and a palaeontological risk assessment conducted by Clarens Dinosaur Hunting Expeditions (2009). The findings of this palaeontological specialist study have been verified by the recent palaeontological assessment undertaken by GSPD Consulting (2013). An additional heritage impact assessment will be undertaken by PGS Grave Solutions as part of the EIA/EMP.

The project has the potential to disturb both the surface (through establishment of infrastructure) as well as soils and rock layers below the surface (through excavations for foundations and underground mining). In this regard, heritage and paleontological resources could be disturbed or destroyed. As a baseline, this section identifies the presence of heritage and paleontological resources and their conservation significance.

The proposed mining area forms part of the Manganese deposits of the Hotazel area north of Kuruman. It is a very arid region with extremely low rainfall and no permanent water sources. Resources of historical importance are therefore mostly restricted to relatively recent farming and mining activities. Stone age artefacts also occur in the region (particularly near drainage lines) due to the historical presence of southern African hunter-gatherer communities typical of arid northern Cape landscape. Limited palaeontological resources were identified during the Palaeontological Impact Assessment and field work undertaken by GSPD Consulting (March 2013). The study concluded that no evidence of fossils were found in either of the red claystone, conglomeratic limestone, calcareous sandstone or sand dunes of the Cretaceous to Tertiary Kalahari Formation. Moreover, only two "pseudo-bone" remains were recorded in the site work carried out in 2011. The Proterozoic aged Hotazel Formation contains microstromatolite structures and due to the lack of outcrops in the area, these were only visible in borehole core samples.

2.4 EXISTING STATUS OF CURRENT LAND USES AND THE SOCIO-ECONOMIC ENVIRONMENT

Projects of this nature have the potential to influence current land uses both on the site (through land development) and in the surrounding areas (through direct or secondary positive and/or negative impacts). In addition, mining projects have the potential to influence various aspects of the socio-economic profile of a community. As a baseline, this section provides a brief description of the existing land tenure, land uses on site, and the current socio-economic status of the region that may be affected by the proposed project. This section provides the context within which potential impacts on land uses and existing social and economic activity will be experienced.

2.4.1 CURRENT LAND USES

Regionally, the project area falls within a rural setting characterised by farms, mining and associated communities and supportive networks/activities. Land use within the project area (various portions of the farms Hotazel 280, Kipling 271, Devon 277, Telele 312 and York A 279) is a mixture of natural bushveld and farming activities such as livestock grazing and game farming. It should be noted that on the 23rd January 2012, the John Taolo Gaetsewe Municipality issued a zoning certificate which zoned York A 279 as a "special zone for the purposes of mining and related activities" (see Appendix B).

The Hotazel Town Planning Board indicated, on 12 February 2014 that future town planning will extend onto the farm Hotazel 280 and in this regard, housing development will encroach towards mining activities at the Hotazel open pit. Kudumane and BHP Billiton are currently in discussions in this regard with the possibility that a portion of Hotazel 280 (that which is in question for the housing development) be transferred to Kudumane in return for a portion of the land on the farm Kipling so that the proposed development plans can continue towards Kipling.

The Kudumane Manganese mine commenced with bulk sampling activities which were authorised under the prospecting right NC30/5/1/1/2/034PR. These activities expanded to full scale mining activities with the authorisation of the mining right in 2013

Overall, surface rights in the region are held by mining companies, parastatals such as Transnet as well as private owners. See Table 2 for surface rights owners in the project area. Persons on the surrounding properties may be impacted upon by the proposed project. The potential positive and negative impacts are described in section 3.7 of the scoping report.

The socio-economic profile is provided in section 2.4.3 below.

2.4.2 MINERAL/PROSPECTING RIGHTS

Existing mining rights:

Kudumane holds an approved mining right (NC30/5/1/2/2/0268 MR) on the remaining extent and Portion 1 of the farm Telele and on the remaining extent and Portion 2 of the farm York. Kudumane furthermore holds a prospecting right (Reference no NC30/5/1/1/2/034PR) over the farms Kipling , Devon, Hotazel, Perth 276 (Perth) and Telele.

Mining right application:

In November 2013 Kudumane submitted a mining right application for the inclusion of additional mining areas on the farms Kipling, Devon and Hotazel. The application was accepted by the Department of Mineral and Resources (DMR) on the 5th of December 2013 (DMR reference number NC 30/5/1/2/2/10053MR). No rights will be applied for on the farm Perth.

In line with the requirements of the MPRDA, an environmental impact assessment has to be undertaken and an EMP submitted in support of the mining right application. In this regard, Kudumane will undertake an environmental impact assessment to incorporate these additional mining areas and associated infrastructure.

2.4.3 SOCIO-ECONOMIC PROFILE

The district municipality (John Taolo Gaetsewe District Municipality) is comprised of three local municipalities: the Gamagara, Ga-Segonyana and Joe Morolong Local Municipality. The proposed project area falls within the Joe Morolong Local Municipality. As of 2009, the John Taolo Gaetsewe District Municipality has a population of 189 540 living in approximately 190 settlements most of which are small scattered villages. The key demographic challenges within the district include: widespread female-headed households, a very young population resulting in high dependency ratios, extensive reliance on public social safety nets/grants, and a high unemployment rate and associated poverty levels. Only 14 % of the population in the John Taolo Gaetsewe District Municipality have a Matric as their highest level education, and 25 % of the population has no education at all. The relatively high illiteracy level in the district remains a challenge (TWP, May 2012).

The industries present in the district include agriculture, mining/quarrying, manufacturing, electricity/gas/water, construction, wholesale/retail, transport/communication, business/government services and community services. Economic developments, as well as employment opportunities in the John Taolo Gaetsewe District are clustered around Kuruman and the mining towns of Hotazel, Kathu and Black Rock.

Compared to the district and other local municipalities, the John Taolo Gaetsewe District Management Area shows significantly higher percentage of households with basic services such as electricity, water and sewage (90-95%). This can be attributed to the large percentage of the district municipality's population residing in mining towns or on privately owned farms. Overall however, water scarcity in the district is an endemic problem, which affects service delivery, current medical facilities are inadequate and unable to serve all residents, there is a shortage of health workers to provide quality care, more schools are needed to accommodate the growing population, most households, schools and clinics receive below-standard sanitation services, provincial and local roads (and pavements) are in need of upgrading and maintenance, formal waste removal services are provided mostly only in larger towns, and the majority of residents currently qualify for free basic services yet it is not known whether the public sector will be able to sustain its current commitments (TWP, May 2012).

2.5 EXISTING STATUS OF RELEVANT INFRASTRUCTURE

This section describes the existing status of any infrastructure that may be affected by the proposed project.

2.5.1 COMMUNITIES AND COMMUNITY STRUCTURES IN THE VICINITY

With reference to Figure 1 and Figure 2, the nearest residential centres are the Hotazel town (situated (± 3 km to the north-east of the project area), Kathu (± 50 km south of the project area) and Kuruman (± 50 km south-east of the project area). Due to the lack of available water in the area, no formal settlements are located in immediate proximity to the project area. There are sparsely situated residences and farmhouses on the surrounding farms. These are owned and/or occupied by farmers, farm workers of people that work on the mines in the region. Many of these dwellings are not occupied.

As indicated in Section 2.4.3 above, the Hotazel Town Planning Board has suggested that future town planning will extend onto the farm Hotazel 280 and in this regard, housing development will encroach towards mining activities at the pit. Kudumane and BHP Billiton are under discussions in this regard and in order to ensure that the proposed development plans can continue onto Kipling.

2.5.2 MINING STRUCTURES AND WARD COUNCILLOR CONSULTATION

There are several mining-related activities located in the vicinity of the Kudumane Manganese Mine, however it should be noted that these mines are all in excess of 7 km from the proposed project area. (refer to Figure 1):

Operational mines within 15 km of the Kudumane project area include Assmang's Gloria and Nchwaning mines (exclusively underground), which are located approximately 7 km and 12 km north of the Kudumane project area respectively. BHP Billiton's Wessels mine (exclusively underground), is located

approximately 15 km north-north west of site. The United Manganese of the Kalahari (UMK) Mine (opencast) is located approximately 10 km south-west of the proposed project area and Samancor's Mamatwan mine and Tshipi Borwa Mine (opencast) both located 15 km south of the Kudumane project area. There are also several closed/dormant manganese mines within proximity to the project area. These include the Hotazel mine, Annex Langdon-Devon mine, and the Perth and Smart mines.

The landowners and users at the proposed project site are located within the Joe Morolong Local Municipality boundary, into the jurisdiction of ward 4 and therefore the councillor of this ward is being consulted.

2.5.3 TRANSPORT INFRASTRUCTURE

Existing transport infrastructure within the project area includes (refer to Figure 2):

- the tarred R31 between Kuruman and Hotazel;
- the R380 between Kathu and Hotazel;
- the D3336 road which runs through the project area (linking the R31 and the project site). A portion of this road has been closed.
- the D3340 dirt road which branches off the D3336 road to the south of the site and runs past UMK mine towards the R380;
- various un-tarred farm access roads; and
- a railway line connecting Kathu, Mamatwan and Hotazel runs along the eastern boundary of the site, parallel to the R380.

2.5.4 POWERLINES

Existing powerlines within the project area includes (refer to Figure 2):

- a 11 KVa powerline which passes to the east of the site along the R380 road; and
- Umtu line "Turn Line" with a maximum transmission capacity of 150 MVa

2.5.5 WATER PIPELINE

Existing pipelines within the project area includes (refer to Figure 2):

- Sedibeng Khathu main line; and
- Internal network feeding off the Sedibeng Main line.

2.6 EXISTING STATUS OF THE BIOPHYSICAL ENVIRONMENT

This section describes the existing status of the biophysical environment that may be affected by the proposed project.

2.6.1 GEOLOGY

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

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

All of these aspects will be considered in the EIA. However, a basic description of the following aspects is provided below:

- regional geology; and
- potential for acid generation.

Soil types are discussed in section 2.6.4, groundwater in section 2.6.7 and paleontological resources in section 2.3

Information in this section was sourced from the Geology section of the project feasibility study (SRK, 2010) and the results for the geochemistry study conducted by Metago (2010) for the original approved EIA/EMP.

Regional Geology

The world's largest land based sedimentary manganese deposit is contained in the Kalahari Manganese Field, situated 47 km north-west of Kuruman in the Northern Cape. The Kalahari Manganese Field comprises five erosional, or structurally preserved, relics of the manganese bearing Hotazel Formation of the Paleoproterozoic Transvaal Supergroup. These include the Mamatwan-Wessels deposit (also known as the main Kalahari Basin), the Avontuur and the Leinster deposits, and the Hotazel and Langdon Annex/Devon deposits.

Within the main Kalahari Basin (from which the resources will be mined) is the largest of the five deposits in the Kalahari Manganese Field, comprising a basin with a strike length of approximately 56 km and a width varying between 5 and 20 km. The Kudumane project area is located towards the southern end of the basin. The resource is split by a pair of dykes, with the main resource located to the north of the dykes. South of the dyke, the resource is down-faulted by between 30 m and 60 m, and to a large extent eroded by younger Dwyka glacial activity. The resource is partially bound on the down dip side by the York farm western boundary and the GaMogara River, while a portion of the resource extends at depth onto the neighbouring farm Telele.

Potential for acid generation

Acid base accounting (ABA) tests were conducted for the 2010 EIA/EMP to establish the potential for such acid conditions to arise. ABA tests assess acid generating potential (AP) and acid neutralising potential (NP), and hence establish acid rock drainage potential (ARD). The ABA test results indicate that the materials tested display a very strong neutralising potential, thus illustrating an extremely low potential for acid conditions to occur. In addition to these criteria, a material with a sulphur content (measured as sulphide not total sulphur) of less than 0.25 % is considered non-acid generating. More detailed information will be provided in the EIA/EMP report.

2.6.2 TOPOGRAPHY

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

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

Changes in the topography caused by the mining activities could therefore alter all of the above-mentioned aspects of the environment. Project-related activities have the potential to alter the topography of the site through the establishment of both temporary (such as the shafts and support facilities) and permanent infrastructure (such as the residue facilities).

Information in this section was sourced from topographical maps, a land survey of the project area conducted by Kudumane, the previous EIA/EMP report (Metago, 2010) as well as the IWWMP (Metago 2011). This section provides brief description of the site topography to facilitate an understanding of the topographical features relevant to the project site and surrounding area from which to measure potential change. More detailed information will be provided in the EIA.

The topographical relief of the area is regarded as relatively flat with a gentle slope towards the west. The elevation of the project area is roughly 1040 m above mean sea level (mamsl). The non-perennial GaMogara runs through the project area, the flow of which follows the topography of the area. The highest topographical features near the mine are the Mamatwan waste rock dumps approximately 0.2 km south-east of the site. The proposed project area borders the old Hotazel and Devon mines to the west and the old York mine which is situated within the project area. These mines and associated infrastructure have significantly altered the topography.

2.6.3 CLIMATE

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

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

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

Information in this section was sourced from the original EIA/EMP report (Metago, 2010) and supplemented with readily available information from the nearest DWA weather station.

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.

Weather stations

Climatic data for weather recording stations near the site was obtained from the South African Weather Service (SAWS). Table 4 below presents the monthly totals of rainfall at the nearby Milner and Kuruman stations (18 km and 55 km away from site respectively). The mean annual rainfall measured at the Milner and Kuruman weather station ranges between 362 and 466 mm respectively. Rainfall is typically in the form of thunderstorms during the summer months from October to March. The peak rainy period occurs between the month of January and March. Rainfall is erratic and may vary from year to year.

TABLE 4: DETAILS OF SOUTH AFRICAN WEATHER SERVICES STATION USED

	South Africa Weather Stations	
	Milner	Kuruman
Station number	393083 W	393806
Latitude (South)	27° 22'	27° 26'
Longitude (East)	23° 02'	23° 27'
Altitude (m)	1118	1320
Length of data record available	67 year record (Rainfall)	54 year record (Rainfall, temperature, humidity, hail, fog, thunderstorms data available) 2001 to 2005 (Surface wind data)
Distance from the mine	18 km	55 km
Rainfall (mm)		
January	66.1	85.6

February	61.4	82.9
March	66.4	86.5
April	35.5	45.1
May	16.1	21.5
June	6.0	7.4
July	1.9	2.8
August	4.2	9.8
September	6.2	7.8
October	19.0	26.3
November	32.0	45
December	46.8	44.9
Annual	361.6	465.7

Rainfall and evaporation

Mean annual precipitation at the Milner and Kuruman weather station ranges between 362 and 466 mm respectively (see Table 4 above). Due to the semi-arid nature of the region, evaporation rates are high. With reference to Table 5 below which shows the monthly evaporation data for the Kuruman weather station, mean evaporation is higher than mean rainfall, making the project area a net water loss area (WR2005 (2009)).

TABLE 5: MONTHLY EVAPORATION FOR KURUMAN WEATHER STATION

Month	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 (SAWS).

Wind

In general, the wind tends to blow from the north and north-east. Further wind data will be included in the EIA/EMP report once the air quality impact modelling is completed during the EIA/EMP phase.

2.6.4 SOIL AND LAND CAPABILITY

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

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

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

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

The baseline soil information will be used to identify sensitive soil types, to guide the project planning in order to avoid sensitive soil types where possible, to determine how best to conserve the soil resources in the area and allow for proper rehabilitation of the site once mining ceases.

The land capability of an area is based on the soil properties and related potential to support various land use activities. Mining operations have the potential to significantly transform the land capability.

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

Information in this section draws upon the findings of the specialist soils and land capability baseline study conducted for the 2009 EIA/EMP by ARC Institute for Soil, Climate and Water.

The land type survey of the region indicates that the project area falls within land type Ah5, which comprises structureless, deep (> 1200 mm), sandy, red and yellow soils of the Hutton and Clovelly forms with a high degree of homogeneity of soil properties. Despite the deep, friable and well drained nature of the soils, the low Cation exchange capacity (CEC) values and low clay content of the soils coupled with low annual rainfall and hot temperatures in the area, means this area has a low potential for arable agriculture and that the area is best suited for extensive grazing. Indeed, no evidence of any arable cultivation is present and most of the farming enterprises in the vicinity are either game or cattle farms.

2.6.5 BIODIVERSITY

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. Biodiversity therefore has a direct impact on human health when considering (IUCN, 2011):

- biodiversity is essential to global food security and nutrition and also serves as a safety-net to poor households during times of crisis;
- increased diversity of genes within species e.g. as represented by livestock breeds or strains of plants, reduces risk from diseases and increases potential to adapt to changing climates;
- more than 70,000 plant species are used in traditional and modern medicine; and
- the value of global ecosystem services is estimated at \$16-\$64 trillion.

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

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

A brief description of fauna and flora and fauna in the project area is provided below. More detailed information will be provided in the EIA.

Information in this section was sourced from the specialist biodiversity study conducted by Ecological Management Services (EMS, 2009) for the original EIA/EMP (Metago, 2010).

Flora (Natural plant life)

Baseline information in this section was sourced from the Draft Biodiversity Action Plan compiled by EMS (October 2012).

The project area falls within the Kathu Bushveld and Gordonia Duneveld. The Kathu Bushveld is open savannah with *Acacia erioloba* (Camel thorn), *Diospyros lycioides* (Karoo bluebush), and *Lycium hirsutum* (River honey-thorn) dominating the shrub layer and a highly variable grass layer. The Gordonia duneveld typically occurs on the undulating dunes, and consists of open shrubland with grasslands on the ridges and *acacia haematoxylon* (Grey camel thorn) on the dune slopes. *Acacia mellifera* (Black

thorn) is prominent on the lower slopes and *Rhigozum trichotomum* (Three thorn) is found between the dunes.

No Red List plant species were recorded during the field survey however there are a number of protected tree species which are found on site. The affected tree species include *Acacia erioloba* (Camel thorn), *acacia haematoxylon* (Grey camel thorn) and *Bosica Albitrunca* (Shepherd's Tree). These tree species are protected in terms of the National Forests Act of 1998 (Act 84 of 1998).

Fauna (Natural animal life)

Very little evidence of wild faunal populations was evident during the field survey of the project area, mostly due to disturbances caused by general farming practices and related habitat transformation in the area. No Red Data terrapin, tortoises, snakes, lizards, or amphibians were identified as occurring in the quarter degree square within which the project area is located, based on the distribution maps available in the South African Red Data Books. A number of red data mammals and birds could however occur on site and/or within the wider area.

The species that either have the potential to occur on site, or that were identified on site, during the specialist assessment are listed in Table 6 and Table 7 below.

TABLE 6: BIRD SPECIES OF CONSERVATION CONCERN POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA

Common name	Scientific name	Conservation status	Suitable habitat Requirements	Potential for occurrence on-site
Martial Eagle	<i>Polemaetus bellicosus</i>	Vulnerable	Woodland, savannah or grassland with clumps of large trees or power pylons for nest sites	High – Nesting habitat in the Acacia Savannah
Ludwig's Bustard	<i>Neotis ludwigii</i>	Vulnerable	Requires semi-arid dwarf shrublands, occasionally visiting the southern Kalahari.	Medium – Moderate to high shrub density throughout the site.
Secretary bird	<i>Sagittarius serpentarius</i>	Near threatened	Requires open grassland with scattered trees, shrubland, open Acacia Savannah.	High – Patches of open savannah will accommodate this species.
African Whitebacked Vulture	<i>Gyps africanus</i>	Vulnerable	Savannah and bushveld. Nest in tall trees (<i>Acacia erioloba</i>).	High - No nest sites were recorded within the planned development area. However the presence of large <i>Acacia erioloba</i> trees (in the <i>Acacia erioloba</i> woodland) presents

				ideal nesting habitat for these birds.
Kori Bustard	<i>Ardeotis kori</i>	Vulnerable	Dry Thornveld grassland, arid scrub requires the cover of some trees	Medium – Moderate to high shrub density throughout the site.
Black stork	<i>Ciconia bigra</i>	Near threatened	Marshes, dams rivers and estuaries, breeds in mountainous regions	Low – No suitable habitat on site, may occur during periods where standing water is present.
Martial Eagle	<i>Polemaetus bellicosus</i>	Vulnerable	Tolerates a wide range of vegetation types such as open grassland, scrub, Karoo and woodland. Requires large trees to provide nest sites.	High – potential for foraging and nesting.
Lesser Kestrel	<i>Falco naumanni</i>	Vulnerable	Open semi-arid grasslands, usually avoids wooded areas.	Low - Area too densely wooded for ideal habitat.

(Source: Ecological Management Services, 2009)

TABLE 7: MAMMAL SPECIES OF CONSERVATION CONCERN POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA

Common name	Scientific name	Conservation status	Suitable habitat Requirements	Potential for occurrence on-site
Dent's Horseshoe Bat	<i>Rhinolophus denti</i>	Near threatened	Limited – Requires substantial cover such as caves and rock crevices.	Very little – Roosting habitat in the form of rock crevices may be available in the old mining area adjacent to the site. However, as the landscape in the area is flat sand veld and does not offer suitable roosting habitat for this species, it is unlikely that this species would have colonised the adjacent mining areas.
Honey badger	<i>Mellivora capensis</i>	Near threatened	High – As they are catholic in habitat requirements, they are likely to occur on-site.	High– Suitable habitat within the study area.
Schreiber's long-fingered bat	<i>Miniopterus schreibersii</i>	Near threatened	Limited – Suitable cover such as caves and mine adits determines	Very little – No caves or mine adits occur on-site. In addition, as the landscape

			distribution.	in the area is generally flat sand veld and does not offer suitable roosting habitat for this species, it is unlikely that this species would have colonised the area.
South African Hedgehog	<i>Atelerix frontalis</i>	Near threatened	High – Require ample groundcover and dry places for nesting.	High to Medium – Suitable habitat available.

(Source: Ecological Management Services, 2009)

It should be noted that the project area has been disturbed by historical mining activities and grazing, and the much of area falls within an area of low sensitivity. Nevertheless, animals of conservation concern do occur in the area and the Ga-Mogara Riverine Environment located along the western boundary of the mine is of high sensitivity. Disturbance to these species and environment must therefore be limited as far as possible.

It should also be noted that an area of 780 ha within the project area has been set aside as part the biodiversity off-set project. . This is shown in Figure 2.

2.6.6 HYDROLOGY (SURFACE WATER)

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Project-related activities have the potential to alter the drainage of surface water through the establishment of both temporary (such as shaft infrastructure and support facilities) and permanent infrastructure (such as residue facilities) and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste (general and hazardous) and mineralised wastes. Key to understanding the hydrology of the site is the climatic conditions of the site (climate is discussed in section 2.6.3). As a baseline, this section provides a brief description of surface water resources in the project area in order to facilitate an understanding of the hydrological catchments that could be affected by the project and the status of surface water resources in the project area. More detailed information will be provided in the EIA.

Information in this section draws upon the findings of the specialist surface water investigations and geochemical analysis of potential mineralised waste studies both conducted by Metago (August 2010).

Drainage and water resources

There are no perennial drainage lines located within or near the project area. The proposed project area is located in the Orange River Basin, in quaternary catchment D41K. With reference to Figure 2, the non-perennial GaMogara river runs through the project area. A tributary of the GaMogara, the non-perennial

Witleegte river joins the GaMogara in the southern reaches of the project area. There is no surface water in the vicinity of the proposed project area and the riverbeds are usually dry except for periods of high rainfall.

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.

FIGURE 3: CURRENT GROUNDWATER AND AIR QUALITY MONITORING POINTS

Surface water users

Due to the ephemeral nature of the drainage lines in the area, there is no third party reliance on surface water. Updated information will however be provided in the EIA.

Wetlands

No wetlands are present within or surrounding the project area.

2.6.7 GROUNDWATER

Groundwater is a valuable resource and is defined as water which is located beneath the surface in rock pore spaces and in the fractures of lithologic formations. Understanding the geology of the area (See Section 2.6.1) provides a basis from which to understand the occurrence of groundwater resources. Project-related activities such as the development of the underground mining areas, the handling, storage and disposal of mineralised and non-mineralised wastes have the potential to impact on groundwater resources, both to the environment and third party users, through dewatering and pollution. As a baseline, this section provides a brief description of the pre-mining groundwater conditions to facilitate an understanding of the potential for dewatering cones of depression and pollution plumes to occur as a result of project-related activities. More detailed information will be provided in the EIA.

Information in this section was sourced from the project hydrocensus conducted as part of the hydrological assessment compiled by Metago (2010) and the groundwater specialist study conducted by Water Geosciences Consulting (2010).

Presence of groundwater

Two distinct aquifers are present in the area: a shallow and a deep aquifer. These aquifers are described below:

Shallow Aquifer: A shallow unconfined aquifer is located at depths between 19 m and 47 m below the surface within porous material of the Kalahari formation. Below this aquifer, where dwyka materials occurs at an average depth of 42 m, groundwater is semi-confined and travels mostly through fractures in the dwyka. Below this layer is an aquiclude which is an impermeable body of rock or stratum of sediment that acts as a barrier to the flow of groundwater.

Deep Aquifer: Located below the Olifantshoek Supergroup aquiclude, within the Hotazel Formation, and where relevant the Mooidraai Formation, lies the deep fractured aquifer. The Hotazel Iron Formation within the project area has an average thickness of 10 m. The lower surface of this formation represents the contact between the Hotazel Iron Formation and the Ongeluk lavas (which acts as an aquiclude). It follows the regional Domiten syncline (strike of fold axis 330°) with the fold axis located to the west of the

proposed mining area. The thickness of this layer varies accordingly from a maximum of 160m to a minimum of 10 m outside the syncline trough.

Groundwater quality and levels

The Kudumane Mine currently monitors groundwater quality on a quarterly basis in accordance with its existing groundwater monitoring programme. Refer to Figure 3 for the position of the groundwater monitoring points. Monitoring results indicate that in general groundwater quality can be regarded as being of moderate quality with only some parameters exceeding the SANS 241 Domestic Water Quality Guidelines. These parameters include Sodium, Manganese and Iron (SLR, 2014).

Groundwater level monitoring results currently indicate a negligible impact on groundwater levels, with only seasonal variations in groundwater levels being recorded. The average groundwater level ranges between 1017.97 mamsl (T2) and 2024.29 mamsl (T4) (SLR, 2014).

Monitoring up to November 2013 only included boreholes to the west of the site. It was determined that additional boreholes were required to monitor groundwater quality to the north, east and south of the site. As of March 2014, four additional boreholes have been included into the monitoring regime to monitor groundwater quality near the pit, and to the north east and east of the pit, greatly increasing the suitability of the monitoring network. It is still recommended that additional boreholes to the south of the site be investigated (SLR, 2014).

Groundwater use

Groundwater users in the area surrounding the project area include domestic, livestock, watering and exploration. The third party borehole in use nearest to the opencast operations (hydrocensus point 27) is located within 500 m of the propose pit on the farm Gama.

2.6.8 AIR QUALITY

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

Information in this section was sourced from the air quality specialist study conducted by Airshed Planning Professionals (September, 2010) for the original EIA/EMP. Dust fallout monitoring is done on a monthly basis.

Ambient air pollutant concentrations within the Hotazel region occur not only due to local sources but also as a result of emissions from various remote sources. The most significant of these sources located within the Hotazel region include:

- fugitive dust emissions from mining, tailings impoundments and mineral processing operations, which are associated with manganese mining operations;
- vehicle tailpipe emissions-significant primary pollutants emitted by motor vehicles include CO₂, CO, hydrocarbons (HCs), NO_x, SO₂, 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.

The results of the dust monitoring programme indicate that in general dust fallout rates monitored along the perimeter of the mine do intermittently reach, but do not exceed the South Africa National Standards (SANS 1929:2011) action industrial range of 600 - 1200 mg/m²/day. In December 2013, the SANS industrial limit of 1200 mg/m²/day was exceeded at the south western boundary monitoring point between Kudumane and the UMK mine. The reason for this exceedance is unknown, however it was during a period of increased dust proliferation over the entire site, and is not indicative of normal conditions. The locations of the dust buckets on site are shown in Figure 3.

2.6.9 NOISE

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

Information in this section was sourced from the original EIA/EMP (Metago 2010) and a site specific noise study conducted by SLR in 2013.

The proposed project site is located in a rural-type area characterised by farms and associated scattered residences with limited traffic on the R380 and R31 road. Accordingly, the ambient noise climate exhibits levels as defined in South African national Standards (SANS) 10103 for rural areas. In this regard, noise levels are expected to be 40dBA and 35dBA for day-time and night-time levels respectively.

It should however be noted that levels of noise generated by specific distant sources, such as mines and roads, vary by a considerable margin with changes in wind direction and temperature profiles in the lower atmosphere.

Potential sensitive receptors include the surrounding communities discussed in section 1.1.

2.6.10 VISUAL ASPECTS

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

Information in this section was sourced observation made during site visits and the original EIA/EMP (Metago 2010). The project area lies in a flat, open area characterised by semi-arid vegetation and ephemeral drainage lines. Livestock and game farms and associated farm settlements are typical of the region. The region to the north and south of the project area is characterised by scattered operational and closed mining operations, and supportive infrastructure such as rail and road networks, power lines and north-west of the project area is the residential and business centre of Hotazel.

Central to the visual character of an area are the concepts of sense of place and scenic quality. Sense of place is informed by the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area which lend that area its uniqueness and distinctiveness. The scenic quality of the project 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 and 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 to the north and south of the project area, the overall scene surrounding the project area is characterised by the GaMogara River channel and associated sand dune, open views with grazing lands and associated activities. The result is a landscape with a fairly strong sense of place and a high to moderate scenic quality.

Potential sensitive receptors include the surrounding communities discussed in section 1.1.

2.7 RELEVANT ADDITIONAL INFORMATION

None.

3 IDENTIFICATION OF THE ANTICIPATED IMPACTS

In order to identify potential impacts an understanding of the proposed activities that will take place is required and as such the project description is provided first in this chapter to provide a reference when discussing the potential impacts. These discussions should be read with the corresponding descriptions of the baseline environment in Section 2 of the scoping report.

Thereafter the potential environmental, social and cultural impacts associated with all the phases (construction, operations, decommissioning and closure) have been conceptually identified and described. In addition to this, reference is made to studies that may be required to further investigate the identified potential impacts to provide the necessary additional information.

In view of the integrated approach with regards to the compilation of this scoping report, this section will specifically distinguish between the following:

- changes to infrastructure associated within the existing mining rights area (DMR reference number NC 30/6/1/2/2/0268 MR); and
- additional mining right areas (DMR reference number NC 30/5/1/2/2/10053MR) , covered in the November 2013 mining rights application, and its associated infrastructure.

It should be noted that the following infrastructure, originally included in the background information document, will no longer be part of the current project scope and has therefore been excluded for the project description:

- sinter plant; and
- accommodation for construction workers.

3.1 PROJECT DESCRIPTION

Existing Mining Rights areas

Kudumane is currently operating under a mining right (NC 30/6/1/2/2/0268 MR) for the remainder and portion 1 of the farm Telele and the remainder and portion 2 of the farm York 279. The mining right was executed on the 26th April 2013. In broad terms the approved mining right and related EIA/EMP (Metago 2010) made provision for 1.9 million tons of run-of-mine (ROM) per annum through opencast mining and 1.7 million tons of run-of-mine (ROM) per annum through underground mining. Allowance was made for a crushing and screening plant, waste rock dumps (WRDs), topsoil stockpiles, manganese ore stockpiles, storage of hazardous substances, sewage treatment facilities, staff accommodation, administration facilities and transport, rail and conveyance infrastructure. The approved infrastructure is outlined in Figure 4.

Prior to the DMR issuing a mining right and approving the EIA/EMP, Kudumane operated under a bulk sample authorisation under its prospecting right (DMR reference number NC/30/5/1/1/2/034PR). This

prospecting right was supported by an approved Environmental Management Plan submitted to the DMR on 16 October 2009) and a Basic Assessment (DENC reference number: NC/JTG/HOT01/2010) that was approved by DENC on the 19th of April 2010.

Some of the infrastructure/facilities which will be constructed were approved as part of the original EIA/EMP. With reference to Figure 4, the following infrastructure as approved in the existing EIA/EMP has already been established:

- York open cast pit;
- topsoil stockpiles, WRDs, ROM and manganese ore stockpiles;
- stockpiling of low-grade ore;
- backfilling of York opencast pit;
- road and rail weigh bridges;
- pit dewatering and abstraction of groundwater;
- power generation facilities;
- piping and water treatment infrastructure;
- facilities associated with the transmission and distribution of electricity (below ground);
- storage and handling of spares and dangerous goods (fuel, lubricants, explosives, etc);
- maintenance and servicing areas;
- change houses and ablution facilities;
- mobile plant lighting;
- temporary waste storage and handling area;
- administration buildings;
- staff parking; and
- security and access control;

The following infrastructure approved as part of the existing EIA/EMP is yet to be established:

- crushing and screening plant for the high grade manganese ore;
- conveyors systems for crushed ore;
- stacker reclaimers and silo for the loading of crushed ore onto rail and road trucks;
- first aid clinic;
- lighting and communication infrastructure;
- infrastructure associated with the underground mining on Telele
- maintenance workshops and washing bays; and
- diesel holding facilities

In addition to the approved infrastructure, Kudumane is also proposing the following changes in infrastructure within the existing mining rights areas:

- Telele – changes to surface infrastructure associated with underground mining; and
- York– additional surface infrastructure (additional WRDs, stockpile area, sewage treatment plants, pollution control dam etc.)

The proposed infrastructure changes are shown in Figure 5. In this regard Kudumane submitted a mining right application to the DMR in November 2013 which was subsequently accepted.

New Mining Rights areas

Kudumane is also proposing the following infrastructure on the additional or new mining rights areas:

- Hotazel and Kipling - new opencast pit and associated infrastructure (WRDs, water management infrastructure, soil and overburden stockpiles) including linear infrastructure connecting the pit with the existing mining operations on York; and
- Devon – mining and removal of manganese ore from the historical pit and tailings storage facility (TSF).

The proposed additional infrastructure and mining areas are shown in Figure 5.

3.1.1 CONSTRUCTION PHASE

3.1.2 CONSTRUCTION PHASE FACILITIES

Existing Mining Rights areas

Changes to the approved infrastructure and activities associated with the existing mining rights areas (York and Telele) will result in the establishment of the following during the construction phase:

- water management infrastructure, some of which was included in the approved EIA/EMP;
- soil and overburden/spoil stockpiles;
- security block;
- change houses;
- internal roads;
- waste management complex;
- sewage treatment plants;
- sewer
- emulsion storage area (200 ton capacity)
- settlement pond;
- refuelling area; and
- pollution control dam.

As included in the approved EIA/EMP, material for the construction of foundations and roads will be sourced from the two old mine waste rock dumps located on York (within the project surface footprint) and Devon (Figure 2).

New Mining Rights areas

The facilities listed below will also be established during the construction phase on the additional mining rights areas (Devon, Kipling and Hotazel):

- additional open pit and associated haul roads on Hotazel, Devon and Kipling;
- water management infrastructure, some of which was included in the approved EIA/EMP;
- soil and overburden/spoil stockpiles;
- access and internal roads; and
- tailings storage facility (TSF).

3.1.3 CONSTRUCTION PHASE ACTIVITIES

The following significant activities will take place during construction:

- selective clearing of vegetation in areas designated for surface infrastructure;
- stripping and stockpiling topsoil and sub-soil;
- construction of shaft portal, ventilation and bulk air cooling shafts from the York pit;
- digging of foundations, trenches, roads and pits;
- preparing residue disposal areas;
- delivery of materials;
- blasting is conducted twice per week;
- general building/construction activities; and
- geotechnical drilling for the site preparations and shaft sinking.

3.1.4 OTHER CONSTRUCTION SUPPORT SERVICES

Construction workforce and housing

The construction phase workforce is expected to be approximately 150 people. No housing is provided on site. Instead construction workers will be accommodated in the nearby communities and towns.

Water Supply and Management

The groundwater quality is not suitable for potable water therefore potable water will be sourced from the Sedibeng Vaal-GaMogara pipeline. Kudumane has a signed contractual agreement with Sedibeng Water for an annual off-take of 40000m³ per annum with a minimum annual stipulated volume of 32 000m³ as a minimum. Water for construction purposes will be sourced from the infrastructures which have already been established on site.

Power Supply

The power requirements for the mine will be 3.6MVA at full production. Diesel generators will be used until Eskom is in a position to supply the required power. Thereafter the diesel generators will be retained as a back-up to Eskom power.

Sewage

Temporary sanitation will be provided to site personnel until the permanent sanitation facilities have been constructed and commissioned. Initially, portable toilets with associated septic tanks will be used. The septic tanks will be emptied on a regular basis by an appointed contractor for disposal at the local municipal sewage treatment works.

Non-mineralised waste management for construction

Waste will be separated at source, stored in a manner that there can be no discharge of contamination to the environment, and either recycled or reused where possible. On site facilities will be provided for sorting and temporary storage prior to removal and disposal to appropriate recycling or disposal facilities off-site.

A waste specification has been developed for the mine and details waste management on site. A summary of this is provided in Table 8 below.

TABLE 8: NON-MINERALISED WASTE MANAGEMENT FOR THE CONSTRUCTION PHASE

Waste type	Waste specifics (example of waste types)	Storage facility	End use
Non-hazardous solid waste	Pallets and wooden crates, rubber, cardboard, paper, cable drums, metal cut-offs, scrap metal, general domestic waste such as food and packaging	Skips in relevant work areas will be provided for different waste types. A waste management contractor will remove skips regularly from the dedicated waste storage area.	Recyclable waste will be sent to a reputable recycling company. The remainder of the waste will be transported by the waste management contractor to an approved facility.
	Building rubble and waste concrete	Designated rubble collection points will be determined to which rubble and concrete will be taken.	Building rubble will be disposed of to a designated waste disposal facility.
Hazardous solid waste.	Hydrocarbon wastes	Waste oil, grease and hydrocarbon contaminated wastes generated by during construction will be stored in drums/tanks in banded areas at key points in work areas. The bunds will be able to accommodate 110 % of the container contents and include a sump and oil trap. The waste management contractor will remove these drums on a regular basis.	Hazardous waste will be disposed of at the permitted hazardous disposal facility off-site.
	Treated timber	Hazardous waste will be	Hazardous waste will be disposed

Waste type	Waste specifics (example of waste types)	Storage facility	End use
	crates, printer cartridges, batteries, fluorescent bulbs, paint, solvents, tar, empty hazardous material containers etc.	separated at source and stored in designated containers in bunded work areas. The waste management contractor will remove these drums regularly.	of at the permitted hazardous disposal site by a waste management contractor.
	Sewage	Sewage will be collected in septic tanks for removal by an appointed contractor.	Sewage effluent will be re-used in the process water circuit. Sewage sludge disposed by an approved service provider at an adequately licenced facility.
Medical waste	Medical waste such as material with blood stains, bandages, etc.	Medical waste will be stored in sealed containers at the first aid station.	Medical waste will be transported by the waste management contractor to a permitted treatment facility.

Concurrent mining operations

As the commencement of mining operations (open pit development) will coincide with the construction phase, permanent offices, workshops, laydown areas will be in place during the construction phase and into the operational phase. The explosive magazines and bulk explosives manufacturing plant will also be commissioned in the construction phase.

3.1.5 CONSTRUCTION PHASE TIMING

Should this project be approved, it is expected that construction activities would commence in 2015. It is envisaged that construction phase will be approximately 24 month to cater for the additional infrastructure and mining areas which are being proposed.

FIGURE 4: INFRASTURE AS APPROVED IN THE EXISTING EIA/EMP

FIGURE 5: PROPOSED INFRASTRUCTURE LAYOUT AS PER CURRENT EIA/EMP

3.1.6 OPERATIONAL PHASE

3.1.7 OPERATIONAL PHASE MINING METHOD

Existing Mining Rights areas

The reef will be targeted via open pit on the farms York and an underground mining operation on the farm Telele as has been approved in the existing EIA/EMP. The depth of the manganese resource at the mining start point is approximately 65 m below surface extending to approximately 170 m or more below surface. Current mining at Kudumane is taking place via the open pit on York.

A permanent access ramp will be developed in the pits to provide access to the underground workings. This will serve a dual purpose, firstly to provide for two-way truck traffic and secondly for the installation of a conveyor as an ore handling strategy.

Ore to the west of the York opencast mining area cannot be viably accessed via opencast mining. In this regard, a fully mechanised underground mining method will be employed. The underground mining area will be a mechanical drill, blast, haul and load operation. This underground mining approach can be typified as bord and pillar mining where faces are advanced in the same direction and similar advancement are done across the bord to create pillars.

A historical open pit exists on the farm York. This pit was mined several years ago by Assmang Ltd and National+ Mining, however, limited manganese reserves still remain in these pits. Kudumane intends to mine the remaining reserves (250 000 tons ore) from these pits in line with the Mine Work Programme.

According to the approved EMP, the York open pit will be active for 13 years and with addition of the Telele underground mine operations, the life of the mine was extended to 30 years.

TABLE 9: DATA THAT PROVIDES PERSEPECTIVE ON THE MAGNITUDE OF THE OPERATIONS AS PER APPROVED AND CHANGED SCOPE

Features		Kudumane Mine – As approved	Kudumane Mine - Proposed changes
Group	Specific		
Mining	Depth	Approximately 650m	Approximately 650m
	Target minerals	Manganese ore	Manganese ore
	Rate	1.9 million tons ROM per annum through opencast mining and 1.7 million tons of run-of-mine (ROM) per annum through underground mining.	Steady state York & Telele: 3million tons per annum ROM
	Life of mine:	York: 13 years – open pit 30 years in total	<ul style="list-style-type: none"> • York: 5-8 years – open pit • York & Telele: 30 years - underground
	Blasting	Open pit operations will require two	Open pit operations will require two

Features		Kudumane Mine – As approved	Kudumane Mine - Proposed changes
Group	Specific		
		blasts per week for each pit.	blasts per week for each pit
Mine residues	Waste rock	The total area of the waste rock stockpile area will be 160 ha with a total storage capacity of approximately 30 million tonnes. Temporary waste rock stockpiles will be established within this area during the roll-over opencast mining process. At closure, two permanent waste dumps will be located within this area. The permanent dumps will have a total area of 126 ha and a final volume of 24.5 million m ³ . A low-grade ore stockpile will be established. This stockpile will remain on site post closure as it may become a saleable resource in the future. The final stockpile will have an area of 61 ha and a volume of 10.2 million m ³	Approximately 190 million tons in total <ul style="list-style-type: none"> York: 143 million tons Telele: 45 million tons
	Tailings	No provision for TSF	TSF will be constructed on Devon as part of the mineral processing facility. Approximately 1102 million tons in total (entire Kudumane operation)
Resource use	Potable water requirements	250m ³ per month	400m ³ per month (entire Kudumane operation)
	Power demand	3.6MVA at full production	30 MVA
Employment	Staff: construction	Approximately 500 jobs	Approximately 150 jobs (entire Kudumane operation)
	Staff: operational	Not stated.	Approximately 1000 permanent jobs at full steady state capacity. (entire Kudumane operation)
	Operating times	Continuous operations are expected once steady state mining is reached	Continuous operations are expected once steady state mining is reached

Opencast mining

An open pit on the farm York was included in the infrastructure which was approved as part of the original EIA/EMP reports (Metago, 2010). The actual extraction of ore started in the open pit. This is a shovel and truck strip mining operation. The open pit will be concurrently backfilled. The open pit mining will continue until 2019. Open pit operations will cease once the underground production reaches a steady state in 2019.

TABLE 10: YORK OPEN PIT PARAMETERS

Parameter	York Pit
Length	1080m
Width	1050m
Depth	150m
Area	101.8ha (1 018 200m ²)
Ore	51.6 million tons
Waste	143 million tons
Pit LOM	4-5 years

Site preparation

Site preparation relevant to the open pit area will include the clearing of vegetation.

Topsoil stripping and stockpiling

Following site preparation, all topsoil and some overburden/waste rock will be removed by means of scrapers, front end loaders or hydraulic excavators and articulated trucks. The topsoil will be stockpiled separately for re-use during pit backfilling and rehabilitation.

Overburden/waste removal

Drilling and blasting of overburden

Once the topsoil and some of the overburden/waste rock has been removed, drilling and blasting methods will be used to loosen the remaining waste rock/overburden and ore. Drilling will be undertaken utilising large diameter blast-hole drills. The holes will then be loaded with emulsion explosives and blasted.

Overburden hauling and dumping – truck and shovel method

Once the overburden has been blasted, it will be loaded into haul trucks, using hydraulic excavators, and taken to the WRDs or used for construction activities.

Ore removal

Drilling and blasting of ore

Drilling will be undertaken utilising large diameter blast-hole drills. The holes will then be loaded with emulsion explosives and blasted.

ROM ore hauling and dumping

The ROM ore will be loaded into haul trucks utilising hydraulic excavators and taken to ROM stockpile for crushing and screening at the plant.

Underground mining

Underground Mining Access

The York open cast pit will extend into the underground operations. These underground workings will be accessed through a portal that has three adits, two of which will be used for intake airways i.e. ore conveyance, personnel and material transport; and a single return airway.

The life of mine of the operation will be extended with the development of the underground workings into the Telele property, which will require the construction of a vertical ventilation shaft.

Mining Methodology

To extract the manganese ore economically with a low risk, a bord and pillar mining method will be utilised. This entails the mining of rooms (bords) leaving pillars intact as a primary support to support the immediate roof. Secondary support will be used in the form of roofbolts into the immediate roof of the bords mined. To maintain high extraction, pillars left behind are to be as small as possible. The underground mining sequence, which will make use fully mechanised equipment, revolves around the following main activities:

Step 1: support of the exposed roof;

Step 2: drilling of the face to a pattern;

Step 3: blasting of the face; and

Step 4: loading and hauling to the plant or tipping, crushing and conveyance to the plant.

ROM ore and waste removal

Ore and waste will be loaded into 30 ton articulated dump trucks (ADTs) or conveyors at the development face or at the loading bay in the production section for transportation to surface. Ore will be dumped on the ROM stockpile in specially designated stockpile areas, to allow for blending, before feed to the plant. Ore from each production face will be placed on a separate ore stockpile. Waste rock will be transported directly to the WRDs by the underground trucks. Due to on reef development minimal waste is envisaged.

Underground storage areas

There will be workshops and fuel storage areas located underground.

New Mining Rights areas

The reef will be targeted via open pits on the farms Hotazel/Kipling and Devon. The two open pit operations at Hotazel/Kipling as well as Devon will be based on conventional open pit mining methods making use of drilling and blasting followed by loading and hauling utilising trucks and shovels. Pit sizing and designs for the Hotazel/Kipling and Devon pits are not yet available as infill drilling and further operations are currently underway. The historical open pit on the farm Devon was mined by Assmang Ltd and National Mining several years ago, however, limited manganese reserves still remain in these pits.

Kudumane intends to mine the remaining reserves (250 000 tons ore) from these pits in line with the Mine Work Programme.

As outlined in the amended Mine Works Programme, which was submitted to the DMR in December 2013, the mining production schedules for the new KMR mining areas are as follows:

- Hotazel: 2015 – 2020 (6 years)
- Kipling: 2021 – 2031 (11 years)

TABLE 11: DATA THAT PROVIDES PERSPECTIVE ON THE MAGNITUDE OF THE OPERATIONS FOR THE ADDITIONAL MINING AREAS IN COMPARISON TO THE APPROVED INFRASTRUCTURE

Features		Kudumane Mine – As approved	Kudumane Mine - Proposed changes
Group	Specific		
Mining	Depth	Approximately 650m	Open pit only
	Target minerals	Manganese ore	Manganese ore
	Rate	1.9 million tons ROM per annum through opencast mining and 1.7 million tons of run-of-mine (ROM) per annum through underground mining.	Steady state Hotazel: 350 000 tons per annum ROM Kipling: 350 000 tons per annum ROM Devon: 350 000 tons per annum
	Life of mine:	York: 13 years – open pit 30 years in total	<ul style="list-style-type: none"> • Hotazel: 5 years – open pit (2015-2019) • Kipling: 13 years – open pit (2022-2033) • Devon: 1 year (2034)
	Blasting	Open pit operations will require two blasts per week for each pit.	Open pit operations will require two blasts per week for each pit
Mine residues	Waste rock	The total area of the waste rock stockpile area will be 160 ha with a total storage capacity of approximately 30 million tonnes. Temporary waste rock stockpiles will be established within this area during the roll-over opencast mining process. At closure, two permanent waste dumps will be located within this area. The permanent dumps will have a total area of 126 ha and a final volume of 24.5 million m ³ . A low-grade ore stockpile will be established. This stockpile will remain on site post closure as it may become a saleable resource in the future. The final stockpile will have an area of 61 ha and a volume of 10.2 million m ³	Approximately 60 million tons in total <ul style="list-style-type: none"> • Hotazel: 15 million tons • Kipling: 36 million tons • Devon: 8 million tons •
	Tailings	No provision for TSF	The TSF will be constructed on Devon, but will form part of the infrastructure associated with the

Features		Kudumane Mine – As approved	Kudumane Mine - Proposed changes
Group	Specific		
			existing mining areas
Resource use	Potable water requirements	250m ³ per month	400m ³ per month (entire Kudumane operations)
	Power demand	3.6MVA at full production	30 MVA
Employment	Staff: construction	Approximately 500 jobs	Approximately 150 jobs (entire Kudumane operations)
	Staff: operational	Not stated.	Approximately 1000 permanent jobs at full steady state capacity. (entire Kudumane operations)
	Operating times	Continuous operations are expected once steady state mining is reached	Continuous operations are expected once steady state mining is reached

Opencast mining

Open pit operations will cease once the underground production reaches a steady state in 2019.

TABLE 12: HOTAZEL, KIPLING AND DEVON OPEN PIT PARAMETERS

Parameter	Hotazel Pit	Kipling Pit	Historical Devon Pit
Length	728m	800m	700m
Width	417m	600m	380m
Depth	80m	100m	60m
Area	24.6ha (246 315m ²)	42.5ha (425 000m ²)	23.1ha (231 000m ²)
Ore	1.5 million tons	4.5 million tons	1.0 million tons
Waste	15 million tons	36 million tons	8 million tons
Pit LOM	6 years	13 years	1 year

Site preparation

Site preparation relevant to the open pit area will include the clearing of vegetation.

Topsoil stripping and stockpiling

Following site preparation, all topsoil and some overburden/waste rock will be removed by means of scrapers, front end loaders or hydraulic excavators and articulated trucks. The topsoil will be stockpiled separately for re-use during pit backfilling and rehabilitation.

Overburden/waste removal

Drilling and blasting of overburden

Once the topsoil and some of the overburden/waste rock has been removed, drilling and blasting methods will be used to loosen the remaining waste rock/overburden and ore. Drilling will be undertaken utilising large diameter blast-hole drills. The holes will then be loaded with emulsion explosives and blasted.

Overburden hauling and dumping – truck and shovel method

Once the overburden has been blasted, it will be loaded into haul trucks, using hydraulic excavators, and taken to the WRDs or used for construction activities.

Ore removal

Drilling and blasting of ore

Drilling will be undertaken utilising large diameter blast-hole drills. The holes will then be loaded with emulsion explosives and blasted.

ROM ore hauling and dumping

The ROM ore will be loaded into haul trucks utilising hydraulic excavators and taken to ROM stockpile for crushing and screening at the plant.

3.1.8 MINERAL PROCESSING

To exploit the deposit, Kudumane intends transporting roughly 350 000 tons of ROM per annum to mobile crushers located on site. During the opencast phase, ROM will be delivered to the plant by trucks and when underground mining takes place, ROM will be transported via conveyor systems. The mineral processing facility forms part of the existing mining rights area. The tailings storage facility is associated with the mineral processing facility on York, even though it will be constructed on the farm, Devon.

An overview and flow diagram of the mineral processing activities is provided in Table 13.

TABLE 13: MINERAL PROCESSING ACTIVITIES

Component	Activities	Inputs/ Outputs	Waste/ emissions
Processing	<p>Crushing & screening</p> <p>ROM will be delivered to the plant by trucks during the opencast phase and via conveyor during underground mining. Processing will consist of two circuits as below.</p> <p>A fixed grizzly will screen out oversize ROM material for breaking down by pickers.</p> <p>Sized material will be screened through a vibrating grizzly. Oversize material will be directed through a crusher.</p> <p>Sized material will then pass through a sizing screen whereby material <6mm will be directed to the relevant product stockpile. Material between 75mm and 6mm will pass through a flopper gate and sizing screen which will sort the material into lots of -75 +6mm, -75 +25mm and -25 +6mm.</p> <p>Dust suppression spraying via macro-nozzles will take place throughout the processing circuit</p>	<p>Equipment</p> <p>Manganese ore</p> <p>Electricity</p> <p>Water</p> <p>Lubricants</p> <p>Spares</p> <p>Graded ore product</p>	<p>Dust</p> <p>Noise</p> <p>Used spare</p> <p>Used lubricants</p>
	<p>Product stockpiles</p> <p>Product will be moved via conveyors to the stockpile area within the railway loading loop for dispatch.</p> <p>Separate stockpiles of -75 +6mm, -75 +25mm, -25 +6mm and -6mm will be established.</p> <p>The product stockpiles will be situated on compacted ground / bunded concrete slabs and platforms.</p> <p>The crushing process will also produce fines (-6mm). These fines will be stockpiled within the product stockpile area for sale to nearby sintering plants and/or for future on-site sintering.</p> <p>Dust suppression spraying via macro-nozzles will take place at the product stockpiles.</p>	<p>Equipment</p> <p>Graded ore product</p> <p>Water</p> <p>Electricity</p>	<p>Dust</p> <p>Noise</p> <p>Used spares</p> <p>Used lubricants</p>
	<p>Loading and dispatch</p> <p>Loading of trains and trucks will done through a stacker reclaimer such that loads can be prepared and loaded according to consumer demand.</p> <p>Dust suppression spraying via macro-nozzles will take place at the product loading facility.</p>	<p>Equipment</p> <p>Graded ore product</p> <p>Electricity</p> <p>Water</p> <p>Fuel</p>	<p>Noise</p> <p>Dust</p> <p>Used spares</p> <p>Used lubricants</p> <p>Exhaust fumes</p>
Tailings	<p>Tailings storage facility</p> <p>The proposed tailings dam (phase 3) will occupy an area of approximately 21.9 ha, and will have a total capacity of 1 610 648 m³.</p>	<p>Equipment</p> <p>Tailings/fines</p> <p>Water</p>	<p>Dust</p> <p>Effluent</p>

3.1.9 OTHER SUPPORT SERVICES

Operational phase workforce and housing

The operational phase workforce is expected to be approximately 100 people. No housing is provided on site. Instead construction workers are accommodated in the nearby communities such as Kathu, Hotazel and Kuruman.

Kudumane has constructed an accommodation facility within a fenced game farm as illustrated in Figure

2. Game on the farm as of 2013 comprises the following:

- Zebra;
- Springbok;
- Black Wildebeest;
- Blue Wildebeest;
- Waterbuck;
- Gemsbok;
- Red Hartebeest;
- Blesbok;
- Steenbok;
- Duiker;
- Eland; and
- Kudu

Life of mine

As outlined in the amended Mine Works Programme, which was submitted to the DMR in November 2013, the mining production schedules for the new KMR mining areas are as follows:

- Hotazel: 2015 – 2020 (6 years)
- Kipling: 2021 – 2031 (11 years)

According to the approved EMP, the York open pit will be active for 13 years and with addition of the Telele underground mine operations, the life of the mine was extended to 30 years.

Transport Systems

Roads and access points

There is an existing network of roads in the project area. Product sent via road will leave the mine via the R31. The delivery of consumables and staff will use the R31 from Kuruman and the R380 from Kathu. The N14 from Gauteng will also be used for both consumables and product. Main access will be achieved via the original gravel road (D3336), which was recently tarred, off the R380/R31 adjacent to the eastern Hotazel access turnoff. A section of the D3336 gravel road which passed through the opencast mining area has been closed (with approval from both DENC and DMR).

Haul roads at open pit operations

Internal haul roads will be constructed for the mining operation and will be used to transport manganese-bearing ore and overburden/waste rock. The haul roads will be constructed from suitably sized and compacted waste rock. These will vary in width up to a maximum width of 25m.

Further transportation systems that also form part of the approved EIA includes the railway line and conveyor system to transport ore to the processing plant as well as various other internal roads.

Water Supply and Management

Due to the expected volume of water ingress into the mine workings, no other options were considered for plant and general dust suppression water. The groundwater quality, however, is not suitable for potable water therefore potable water will be sourced from the Sedibeng Vaal-GaMogara pipeline. Kudumane has a signed contractual agreement with Sedibeng Water for an annual off-take of 40000m³ per annum with a minimum annual stipulated volume of 32 000m³ as a minimum.

No other options are available in this regard.

Power Supply

The power requirements for the mine will be 3.6MVA at full production. Diesel generators will be used until Eskom is in a position to supply the required power. Thereafter the diesel generators will be retained as a back-up to Eskom power.

A substation has been constructed in order to receive power from a regional Eskom powerline (Eskom's planned Kalagadi powerline). The substation will be equipped with transformers and switchgear to enable the voltage from the regional line to be stepped down and internally distributed. The substation will also be equipped with impermeable floors, bunds and collection traps where required to contain any spills of lubricants.

Internal power reticulation (from the diesel generators and the substation) will be by means of a distribution network comprising powerlines and mini substations.

Waste Management

Sewage

The proposed sewage treatment plants are self-contained systems designed for the daily waste from approximately 400 personnel at a combined maximum flow rate of 21 000 litres per day. The plants are capable of handling sewage and wastewater from the plant change house, offices and ablutions and the mining change houses and office areas. The three treatment plants will comprise of typical sewage treatment facility components as detailed in Table 14 below.

TABLE 14: SEWAGE TREATMENT PROCESS

Feature	Detail
Solid trap	Raw sewage and waste water flows into the solids trap, which allows for the regular manual removal of non-sewage items (such as plastic bags) before passing into the aerobic digester. All material screened out of the solids trap will be collected and stored in sealed containers and disposed as hazardous waste in accordance with formal waste management procedure in Table 15.
Anaerobic digester tanks	Within the anaerobic digester tanks, sewage will be mixed with the activated sludge in an oxygen free environment. The micro-organisms within the sludge feed on the organic

Feature	Detail
	pollutants.
Balancing tank	Prior to aerobic biological filtration, the pH of the mixture will be equalized in a 5 000 litre balancing tank.
Aeration tank	Within the 5 000 litre aeration tank, air is bubbled into the body of the liquid and oxidizes the anaerobic bacteria, which settle out of liquid. Aerobic bacteria then feed on the remaining organic pollutants.
Clarifying	In the clarifier, the solids are separated from the water. The sludge will be recirculated to the septic tank. From time to time sludge build up from the system will be removed for disposal at the Hotazel or Kuruman sewage plants.
Disinfectant tank	The clear effluent remaining after the denser particles have settled in the clarifier will overflow into a chlorine contact tank where all remaining bacteria will be killed off, rendering the water safe for use as process and service water.
Sumps and pumping	Because of the flat area on the project site, raw sewage will be collected into transfer sumps from individual source areas. Transfer will be done by submersible pumps.

Non-mineralised wastes

The storage of non-mineralised waste is to comply with the National Norms and Standards for Waste Storage (November 2013) published in terms of Section 19(2) of the National Environmental Management: Waste Act. The publication of the National Norms and Standards for Waste Storage, along with the revision of the Schedule of Waste Management Activities (GN R 921) now means that facilities storing wastes (more than 100 m³ general or 80m³ hazardous waste) do not require a waste management licence. National Norms and Standards for Waste Storage include the following requirements:

- new waste storage facilities be registered with the competent authority prior to construction;
- designs must be undertaken by a registered professional engineer;
- training must be provided to employees working with waste;
- an emergency preparedness plan to be developed and implemented;
- annual inspection of any tanks by registered engineer;
- biennial audits by an independent auditor; and
- rehabilitation plan.

Broadly speaking, waste will be separated at source, stored in a manner that there can be no discharge of contamination to the environment, and either recycled or reused where possible. On site facilities will be provided for sorting and temporary storage prior to removal and disposal to appropriate recycling or disposal facilities off-site.

Hazardous waste includes inter alia: fuels, chemicals, lubricating oils, hydraulic and brake fluid, paints, solvents, acids, detergents, resins, brine, solids from sewerage and sludge. Hazardous waste will be disposed of at appropriately registered hazardous waste disposal sites.

A waste specification has been developed for the mine and details waste management on site. A summary of this is provided in Table 15 below.

TABLE 15: NON-MINERALISED WASTE MANAGEMENT FOR OPERATIONS

Items to be considered		Intentions
General	Specific	
Classification and record keeping	General	The waste management procedure for the proposed mine will cover the storage, handling and transportation of waste to and from the mine. The mine will ensure that the contractor's responsible are made aware of these procedures.
	Waste opportunity analysis	In line with DWAs' strategy to eliminate waste streams in the longer term, the mine will assess each waste type to see whether there are alternative uses for the material. This will be done as a priority before the disposal option.
	Classification	The Waste Management and Classification Regulations (GN R634, 23 August 2013) which were promulgated under the NEM:WA stipulate that all waste generators must subject their waste, except as listed in Annexure 1, to waste classification in accordance with the South African National Standard Globally Harmonized System of Classification and Labelling of Chemicals or SANS 10234.
	Inventory of wastes produced	An inventory of wastes will be compiled and will include estimated quantities of waste. The inventory will be kept up to date.
	Disposal record	Written evidence of safe disposal of waste will be kept.
Waste management facilities	Collection points	Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity and that these are serviced frequently.
	Laydown/salvage areas	During decommissioning and closure, lay down areas for re-usable non-hazardous materials will be established. Mixing of re-usable materials with other wastes, especially hazardous wastes will be prevented.
	General waste	Will be stored in designated skips and removed by an approved contractor for disposal at a licensed facility.
	Scrap metal and building rubble	Care will be taken to ensure that scrap metal and building rubble does not become polluted or mixed with any other waste. The scrap metal will be collected in a designated area for scrap metal (salvage yard). It will be sold to scrap dealers. Building rubble will be used to backfill mining voids
	Hazardous wastes	Medical waste, laboratory chemicals, explosives packaging, used chemicals and chemical containers will be temporarily stored in sealed containers in a bunded store before removal by an approved waste contractor and disposal in a licensed facility.
	Oil and grease	Oil and grease will be collected in suitable containers at designated collection points. The collection points will be bunded and underlain by impervious materials to ensure that any spills are contained. Notices will be erected at each waste oil point giving instructions on the procedure for waste oil discharge and collection. An approved subcontractor will remove oil from site.
	Any soil polluted by a spill	If remediation of the soil <i>in situ</i> is not possible, the soils will be classified as a waste in terms of the Minimum Requirements and will be disposed of at an appropriate permitted waste facility.
	Dried sewage sludge and screenings from the sewage plant	All sludge will be removed from site with the screenings as hazardous waste and disposed at a licensed facility.
Disposal	Off-site waste disposal facilities	Waste will be disposed of at appropriate permitted waste disposal facilities as outlined below. For general waste the closest permitted site is in Kuruman. For hazardous waste the closest permitted site is Holfontein.
Waste transport	Contractor	A qualified waste management subcontractor will undertake the waste transport. The contractor will provide an inventory of each load collected and proof of disposal at a licensed facility.

Items to be considered		Intentions
General	Specific	
Banned practices	Long-term stockpiling of waste	Stockpiling of waste is a temporary measure. Waste stockpiling sites must have an impervious floor, be bunded and have a drainage system for collection and containment of water on the site.
	Burying of waste	No wastes other than mine residues will be placed on site.
	Burning of waste	Waste may only be burned in legally approved incinerators, which includes the explosives wastes destruction bay.

Mineralised waste disposal

Tailings disposal

The proposed tailings dam (phase 3) will occupy an area of approximately 21.9 ha, and will have a total capacity of 1 610 648 m³. The proposed design of the tailings dam will be included in the EIA/EMP.

Waste rock disposal

The total area of the waste rock stockpiles area will be 134.63ha with a total storage capacity of approximately 1102 million tons. .

Disturbance to water courses

As part of the establishment of the Hotazel open pit, the GaMogara River will need to be diverted. A detailed river diversion design will be undertaken and presented in the EIA/EMP report. KMR will furthermore acquire the relevant authorisations from the DWA.

Biodiversity off-set project

The removal of protected trees (10107 *Acacia erioloba* and 8738 *Acacia haemotoxylon*) triggered the implementation of a biodiversity off-set project in terms of the internal DAFF guidelines. The details of the project will be negotiated with the Department of Environmental Affairs and Nature Conservation. Additionally, Kudumane has committed to a voluntary biodiversity off-set as part of the approved EIA/EMP. According the DENC, the following three options could be considered for the establishment of a biodiversity off-set:

- Establish a dedicated area based on the principles of “Like for like” or “better”. This area can be a standalone area but needs to:
 - have the potential to be enlarged;
 - link to areas of higher sensitivity; and
 - be registered as a conservation area within the title deeds.
- Participation in a conservation or protected area project which has already been registered within the region.
- Monetary off-set, where the monetary value will be equal to the cost of land multiplied by the biodiversity sensitivity rating plus the cost of managing the area over life of mine plus initial capital investment. Depending on the sensitivity of the biodiversity of the area, the sensitivity rating can vary from 1 to 10.

Closure

In the 2009 EIA/EMP, the main objective of the rehabilitation actions described was to return the project area to its pre-project state. In this regard, upon closure of the mine:

- no further mining related activities will take place;
- the topography of the area will have been restored to its pre-project state (with the exception of the permanent waste rock dumps and possibly surface water management structures if required);
- topsoil will have been replaced at disturbed areas; and
- disturbed areas will have been re-vegetated.

In the event that water quality monitoring around any waste rock dumps indicates that the dumps are causing pollution, catchment paddocks and soak-aways will be provided to minimise the risk of exposure to wildlife, livestock and humans. These facilities would remain in place at the permanent waste rock dump at closure.

Rehabilitation success will be determined by monitoring trends in soil nutrient levels, soil microbial levels, vegetation cover and vegetation biodiversity levels and comparing data and temporal trends in the data to numerical targets. Rehabilitated areas will be monitored for a minimum period of five years, and managed where necessary so as to ensure the objective of restoring the land to its pre-mining land use capability. This issue will be revisited as part of the detailed closure planning for the project.

3.2 RELEVANT NEMA LISTED ACTIVITIES

Activities covered in the approved EIA/EMP (Metago 2010) in accordance with the National Environmental Management Act, 107 of 1998 (NEMA) are included in Table 16 below. The relevant NEMA listed activities which are currently being applied for and are relevant to the proposed project are listed in Table 14. According to the NEMA EIA Regulations as amended on 29th November 2013, the following activities were incorporated:

Listing notice 1:

- 55A – The construction of sewage treatment facility with capacity of 2000-15000m³/day
- 55B – The expansion of existing sewage treatment facility by 15000 m³/day or more

Listing notice 2:

- 27 – The construction of sewage treatment facility with capacity of -15000m³/day or more

The three sewage treatment plants which are proposed will each have a maximum capacity of 21 m³/day, which is below the threshold given above. Even if all three plants are combined, the total capacity will be 63 m³/day and is therefore still below the threshold. In this regard, it is assumed that the sewage

treatment plants do not trigger any NEMA listed activities with respect to the amendment of November 2013.

TABLE 16: PREVIOUSLY APPROVED NEMA ACTIVITIES

Activity number	Description
Environmental Regulation GN 386	
1b	The aboveground storage of 1000 tons or more, but less than 10 000 tons of ore
1k	(i) The bulk transportation of sewage and water, including stormwater, in pipelines with – An internal diameter of 0.36 metres or more; or (ii) A peak throughput of 129 litres per second or more.
1 l	The transmission and distribution of electricity above ground with a capacity of more than 33 kilovolts and less than 120 kilovolts
1p	The temporary storage of hazardous waste
1s	The treatment of effluent, waste water or sewage with an annual throughput capacity of more than 2000 cubic metres but less than 15 000 cubic metres.
7	The aboveground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1000 cubic metres at any one location or site.
13	The abstraction of groundwater at a volume where, any general authorization issued in terms of NWA 36 of 1998, will be exceeded
14	The construction of a mast of any material or type and of any height, including those used for telecommunication broadcasting and radio transmission, but excluding – (a) mast of 15 m of lower exclusively used (i) by Radio amateurs; or (ii) for lighting purposes (b) flagpoles; and (c) lightning conductor poles
15	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres.
Environmental Regulation GN 387	
1c	The aboveground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous good, in a tank farm.
1f	The recycling, re-use handling, temporary storage or treatment of general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days
1g	The manufacturing, storage or testing of explosives, including ammunition but excluding licensed retail outlets and the legal end use of such explosives.
1h	The manufacturing, storage, or testing of explosives including ammunition, but excluding licensed retail outlets and the legal end use of such explosives.
1l	The transmission and distribution of aboveground electricity with a capacity of 120 kilovolts or more
1p	
1s	Rail transportation, excluding railway lines and sidings in industrial areas and underground railway lines in mines but including – railway lines; stations; or shunting yard.
2	Any development activity, including associated structures and infrastructure where the total area of the development area, is or is intended to be 20 hectares or more
3	The construction of a filling station including associated structures and infrastructure, or any other facility for the underground storage of a dangerous good, including petrol diesel, liquid petroleum gas, or paraffin.
7	Reconnaissance, exploration, production and mining as provided for the Mineral and Petroleum Resources Development Act 2002 (Act 28 of 2002) as amended in respect of such permits and rights
8	In relation to permits and rights granted in terms of 7 above, or any other right granted in terms of previous mineral legislation, the undertaking of reconnaissance exploration, production or any other related activity or operation within an exploration, or mining area, as defined in terms of Section 1 of the Mineral and Petroleum Resources Development Act 2002 (Act 28 of 2002).

TABLE 17: RELEVANT NEMA ACTIVITIES CURRENTLY BEING APPLIED FOR

Activity Number	Listed Activity	Description of activity
Notice 544, 18 June 2010		
9	<p>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water –</p> <p>(i) with an internal diameter of 0.36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more,</p> <p>Excluding where:</p> <p>a. such facilities or infrastructure are for the bulk transportation of water, sewage or storm water, or storm water drainage inside a road reserve; or</p> <p>b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p>	Pipelines longer than 1 000 metres will be established on-site for the bulk transportation of water, storm water and sewage.
10	<p>The construction of facilities or infrastructure for the transmission and distribution of electricity -</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</p>	Establishment of 33 kilovolt powerlines within the project area.
11	<p>The construction of:</p> <p>(i) canals;</p> <p>(ii) channels;</p> <p>(iii) bridges;</p> <p>(iv) dams;</p> <p>(v) weirs;</p> <p>(vi) bulk storm water outlet structures;</p> <p>(vii) marinas;</p> <p>(viii) jetties exceeding 50 square metres in size;</p> <p>(ix) slipways exceeding 50 square metres in size;</p> <p>(x) buildings exceeding 50 square metres in size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more</p> <p>Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	Bridges will be constructed over watercourses within the project area.
12	The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010.	Stormwater dams will be established on-site that will exceed 50 000 cubic metres.
13	The construction of facilities or infrastructure for the storage, and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not	Diesel in excess of 500 cubic meters will be stored on site.

Activity Number	Listed Activity	Description of activity
	exceeding 500 cubic meters.	
22	The construction of a road, outside urban areas, (i) with a reserve wider than 13.5 meters or, (ii) where no reserve exists where the road is wider than 8 meters.	Private roads will be established for mining vehicles
26	Any process or activity identified in terms of Section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	
28	The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	The proposed changes will require an amendment to the water use licence.
37	The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10 % or more- excluding where such expansion: (i) relates to transportation or water, sewage or storm water within a road reserve; or where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.	Existing pipeline infrastructure for the bulk transportation of water will be expanded by more than 1 000 metres.
42	The expansion of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by 80 cubic metres or more.	Existing diesel storage facilities will be expanded
Notice 545, 18 June 2010		
5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. R.544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply	The following will require an amendment to the Water Use License Application that has been submitted to the Department of Water Affairs in terms of the National Water Act, 36 of 1998: new tailings storage facility and waste rock dumps; additional waste rock dumps; additional/expanded sewage treatment plants; changes to the footprint of the historical open pit; and stormwater management facilities.
11	The construction of railway lines, stations or shunting yards, excluding – (i) railway lines, shunting yards and railway stations in industrial complexes or zones; (ii) underground railway lines in a mining area; and additional railway lines within the reserve of an existing railway line	Internal railway lines will be established for the transportation of ore.
15	Physical alteration of undeveloped vacant or derelict land for residential retail, commercial, recreate; except where such physical alteration takes place for:	The footprint of proposed surface infrastructure, including the open pit, waste rock dumps and a shaft complex, will

Activity Number	Listed Activity	Description of activity
	(i) linear development activities; or (ii) agricultural or afforestation where activity 16 in this schedule (R.545) will apply.	exceed 20 hectares.
Notice 546, 18 June 2010		
2	The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic meters; (a) in the Northern cape Province; (iii) Outside urban areas, in: (bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	A reservoir will be established on site
3	The construction of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast: (a) is to be placed on a site not previously used for this purpose, and (b) will exceed 15 metres on height, but excluding attachments to existing buildings and masts on rooftops.	A telecommunications mast will be established on site
4	The construction of a road wider than 4 meters with a reserve less than 13,5 meters; (a) in the Northern cape Province; (ii) Outside urban areas, in: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	Roads will be established on the project site for mine related traffic.
10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces: (ii) Outside urban areas. (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	Diesel storage facilities will be constructed on site
14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation; (a) in the Northern Cape Province; (i) All areas outside urban areas.	The proposed development will require the clearance of an area larger than 5 hectares of indigenous vegetation.
16	The construction of: (iii) buildings with a footprint exceeding 10 square metres in size; (iv) infrastructure covering 10 square metres in size or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. (a) in the Northern Cape Province; (ii) Outside urban areas.	Bridges will be constructed over watercourses within the project area.

Activity Number	Listed Activity	Description of activity
	(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	

3.3 EQUATOR PRINCIPLES

The International Finance Corporation (IFC) is a member of the World Bank Group and is the largest global development institution focussing on the private sector in developing countries. Its standards have become a global benchmark for environmental and social performance. They form the basis for the Equator Principles, a voluntary environmental and social risk-management framework used by several financial institutions worldwide.

The Equator Principles are a framework and set of guidelines for evaluating social and environmental risks in project finance activities and apply to all new projects with a total capital cost of US\$10 million or more, no matter what industry sectors, without geographic requirement. This project could potentially be funded by a financial institution, which subscribes to the Equator Principles. This project will therefore have to comply with the relevant requirements outlined by the IFC and World Bank.

The Equator Principles, outlined in Table 18, were compiled by a group of international banks in 2006 and updated in June 2013, as a benchmark for the financial industry to evaluate and manage the social and environmental impacts of projects financed through institutions which have adopted the principles.

TABLE 18: EQUATOR PRINCIPLES

Equator Principle	High level requirement	Comments in relation to the proposed project.
Principle 1:	<p>Review and Categorisation</p> <p>All projects are categorised based on the magnitude of their potential environmental and social risks and impacts. Category A projects have potential significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented. Category B projects have limited adverse social or environmental impacts, which are site-specific and largely reversible, while Category C projects have minimal social or environmental impacts</p>	The rating is undertaken by the financial institution providing the finance
Principle 2:	<p>Social and Environmental Assessment</p> <p>A social and environmental impact assessment (SEIA) process, relevant to the nature and scale of the project, must be undertaken to address the potential social environmental risks and impacts of the project, incorporating specialist studies where necessary. The assessment is also required to propose relevant mitigation and management measures.</p>	The EIA/EMP report will have to address most of the related issues. Specialist investigations will furthermore address the requirements as outlined in the relevant standards and guidelines. The aspects not covered in the EIA/EMP reports will be covered as part of ongoing environmental, health, safety and social management.
Principle 3:	<p>Applicable Social and Environmental Standards</p> <p>For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).</p>	The EIA/EMP report will have to address most of the related issues as set outlined in the relevant guidelines and standards. The aspects not covered in the EIA/EMP reports will be covered as part of ongoing environmental, health, safety and social management.

Equator Principle	High level requirement	Comments in relation to the proposed project.
	For Projects located in Designated Countries, the Assessment process evaluates compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. Host country laws meet the requirements of environmental and/or social assessments (Principle 2), management systems and plans (Principle 4), Stakeholder Engagement (Principle 5) and, grievance mechanisms (Principle 6).	
Principle 4:	<p>Environmental and Social Management System and Equator Principles Action Plan</p> <p>An action plan, the level of which must be appropriate to the nature and scale of the project, which describes and prioritises the actions needed to implement the mitigation measures, corrective action and monitoring measures necessary to manage the social and environmental risks and impacts identified in the SEIA must be compiled. A social and environmental management system must be established and maintained to implement the action plan and corrective actions required to comply with host country laws and regulations as well as the requirements of the IFC performance standards and guidelines.</p>	Objectives and actions in this regard will be included in the EIA/EMP report. The management recommendations plans in the EIA/EMP report will be integrated into a formal on site management system.
Principle 5:	<p>Stakeholder Engagement</p> <p>Projects which may have a significant adverse impact on local communities are required to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with affected communities and, where relevant, other stakeholders. For projects with potentially significant adverse impacts on affected communities, the client will conduct an informed consultation and participation process. The client will tailor its consultation process to: the risks and impacts of the project; the project's phase of development; the language preferences of the affected communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups. This process should be free from external manipulation, interference, coercion and intimidation.</p>	A stakeholder engagement process will be followed as part of the Scoping and EIA process.
Principle 6:	<p>Grievance Mechanism</p> <p>Consultation, disclosure and community engagement must continue through the construction and operational phases of a project. A grievance mechanism must be established as part of the management system in order to receive and facilitate the resolution of concerns and grievances raised by those affected by the project. The affected communities must be informed about the grievance mechanism process, which must address all concerns promptly and transparently, in a culturally appropriate manner, and must be accessible to all community members.</p>	Objectives and actions in this regard will be included in the scoping and EIA/EMP reports. Provision will be made for the development and implementation of a grievance procedure as part of the site management plan.
Principle 7:	<p>Independent Review</p> <p>An independent social or environmental expert not directly associated with the borrower will review the Assessment, the Action Plan and consultation process documentation in</p>	The EIA/EMP report will be reviewed by independent experts which will be appointed by the financial institution.

Equator Principle	High level requirement	Comments in relation to the proposed project.
	order to assist Financial Institutions' due diligence, and assess Equator Principles compliance	
Principle 8:	<p>Covenants</p> <p>Covenants will be linked to compliance such as to comply with all relevant host country social and environmental laws, regulations and permits in all material respects, etc.</p>	Kudumane will be committed to specified covenants
Principle 9:	<p>Independent Monitoring and Reporting.</p> <p>The project is required to appoint an independent environmental and/or social expert, or to retain qualified and experienced external experts to verify monitoring information which is reported to the financial institution. The project is required to appoint an independent environmental and/or social expert, or to retain qualified and experienced external experts to verify monitoring information which is reported to the financial institution.</p>	Kudumane will implement these measures, if required.
Principle 10	<p>Reporting and transparency</p> <p>Financial institutions which are signatories to the Equator Principles are required to report publically at least annually about their Equator Principle implementation processes and experience. The reports typically include, as a minimum, the number of transactions, project categorisation, and the implementation process.</p>	This principle is relevant to financial institutions (banks) which are signatories to the Equator Principles.

3.3.1 IFC PERFORMANCE STANDARDS FOR SOCIAL AND ENVIRONMENTAL SUSTAINABILITY

The IFC Performance Standards, January 2012, stipulates criteria for the managing of social and environmental risks and impacts and includes the following:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety and Security
- Performance Standards 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage.

The Performance Standards require clients to engage with affected communities through disclosure of information, consultation, and informed participation, in a manner commensurate with the risks to and

impacts on the affected communities. Community engagement should ensure the “free, prior, and informed consultation of affected communities, leading to broad community support for the project”.

3.3.2 IFC ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES (GENERAL & MINING)

The IFC Environmental, Health, and Safety (EHS) Guidelines (2007) are technical reference documents with general and industry specific examples of good international industry practice. The industry sector EHS guidelines, such as the mining guideline (December 2007) were designed to be used together with the General EHS Guidelines document. Where applicable, cognisance will be given to these guidelines during the assessment of impacts and the development of the EMP.

3.3.3 WORLD BANK ENVIRONMENTAL HEALTH AND SAFETY GUIDELINE FOR MINING AND MILLING

The World Bank Environmental Health and Safety Guideline for Mining and Milling – Open pit as well as the World Bank Environmental Health and Safety Guideline for Mining and Milling - Underground (August 1995), was specifically developed for mining and milling activities and is applicable to the Kudumane project. Where applicable, cognisance will be given to these guidelines during the assessment of impacts and the development of the EMP.

3.4 CONFIRMATION OF IAP CONSULTATION AND AGREEMENT ON POTENTIAL IMPACTS

IAPs were provided information on the potential impacts during the public scoping meeting. All of the IAP issues, concerns and objections raised during the scoping meetings have been provided in Appendix A. IAPs will also have the opportunity to review this scoping report.

3.5 POTENTIAL CULTURAL ENVIRONMENT IMPACTS

A list and description of potential impacts identified within the cultural environment is provided below as part of archaeological and heritage impacts.

3.6 POTENTIAL HERITAGE ENVIRONMENT IMPACTS

A list and description of potential impacts identified on the archaeological, heritage and cultural environment is provided below.

3.6.1 ARCHAEOLOGICAL, HERITAGE AND CULTURAL RESOURCES

3.6.1.1 Issue: Loss of or damage to heritage resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
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Discussion

The land use of the project area will be changed during the construction, operation and decommissioning phases of the proposed project. The proposed project area is used for grazing and although some of the proposed surface infrastructure areas will be returned to their current land use after closure, it should be noted that land use will not all be re-instated because some infrastructure such as the additional WRDs and TSF will remain in perpetuity and will therefore not be restored to the same type of grazing even after closure. The additional work required to address this issue is described in section 6.1.4 of the scoping report.

3.7.1.2 Issue: Impacts associated with blasting activities

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
		Not applicable	Not applicable

Discussion

Blasting impacts relating to the proposed project are associated with three pathways: fly rock, vibrations and air blast. Fly rock can harm structures, people and livestock. Vibrations and air blast can damage structures. It is relevant to note that surface blasting will be done to access ore within the open pits and also in order to develop the access to the underground ore. It should however be noted that blasting takes place both on site as well as on operational neighbouring mines and in this regard, blasting related disturbances are common in the area and the impact will be cumulative.

In considering what blast related impacts could be associated with proposed project, the following spatial analysis as shown in Table 19 is relevant.

TABLE 19: THIRD PARTY STRUCTURES WITHIN THE VICINITY OF THE PROPOSED PROJECT AREA

within 500m	500 - 1000m	1000 - 1500m	1500 – 3000m
Fences Potential heritage resources Livestock and herders on surrounding properties Borehole with wind pump	Fences Potential heritage resources Farm storage structure Livestock and herders on surrounding properties D3336 and associated traffic Diversion route and third party traffic	Fences Potential heritage resources Livestock and herders on surrounding properties D3336 and associated traffic Diversion route and third party traffic Access road to the mine and Kalagadi Mine and third party traffic	Fences Potential heritage resources Livestock and herders on surrounding properties D3336 and associated traffic Diversion route and third party traffic Access road to the mine and Kalagadi Mine and third party traffic Hotazel Manganese Mine landing strip

The additional work required to address this issue is described in Section 6.1.4 of the scoping report.

3.7.1.3 Issue: Disturbance of roads by project-related traffic

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
		Insignificant	Not applicable

Discussion

Given that the nature of the proposed project will allow for an increased tonnage of ore to be removed than is currently removed than was done under the bulk sampling activities, there will be an increase in disturbance of roads by project-related traffic due to the vehicle activity required to transport this increased tonnage. It is expected that the total tonnage removed will be 3 million tons per year under full capacity operation. It is envisaged that 80 % of the product will be despatched by rail. Notwithstanding this, vehicle activity on the D3336, the R31 between Kuruman and Hotazel, the R380 between Kathu and Hotazel and the N14 between Gauteng and site will increase as a result of the proposed project. Road traffic will include delivery vehicles, staff and visitors, product transportation as well as mine vehicles on internal roads within the mining operation. The additional work required to address this issue is described in Section 6.1.4 of the scoping report.

3.8 POTENTIAL IMPACTS ON EMPLOYMENT OPPORTUNITIES, COMMUNITY HEALTH, COMMUNITY PROXIMITY AND LINKS TO THE SOCIAL AND LABOUR PLAN

A list of potential impacts (positive and negative) on: employment opportunities, community health, community proximity and links to the Social and Labour Plan, is provided below.

3.8.1 POSITIVE AND NEGATIVE SOCIO-ECONOMIC IMPACTS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The Kudumane project will result in positive socio-economic benefits through wages (both in terms of new employment and employment continuity), taxes, procurement and foreign exchange income. With regards to wage related employment, the impact of increasing the operational work force to 1000 employees will be magnified through the multiplier effect of increased spending power in local and regional economies.

Upon closure, the most significant potential impact will be the loss of income with respect to the local, regional and national economies. Having said this, there may still be some positive impacts through maintenance and aftercare activities and the fact that the mine would have contributed to a greater economic critical mass, skills, and wealth that can be used in other economic opportunities.

There is also the potential for negative socio- economic impacts to occur during the construction and operational phases as a result of the proposed project. These include a potential influx of people into the area in search of work leading to potential informal settlements and associated problems of crime, disease, and social disruption, increased pressure on housing and related services (water, power, sanitation, rubbish removal, schooling) as well as a reduced quality of life for surrounding landowners

The additional work required to address these issues is described in Section 6.1.14 of the scoping report.

3.9 POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS

A list and description of potential impacts identified with the biophysical environment including but not limited to impacts on: flora, fauna, water resources, air and noise etc; is provided below.

3.9.1 GEOLOGY

3.9.1.1 Issue: Loss and sterilisation of mineral resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

By the nature of mining projects the geology is exploited for the target minerals therefore the impact on the geology will be high in all project phases. However no mineral sterilisation is expected as a result of the proposed project. The additional work required to address this issue is anticipated to be a qualitative assessment by SLR as described in Section 6.1.1 of this scoping report.

3.9.2 TOPOGRAPHY

3.9.2.1 Issue: Hazardous excavations and infrastructure

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The construction and operation of the TSF, additional WRDS and other proposed infrastructure will alter the site topography during the construction phase, although it should be noted that the construction of existing infrastructure has already altered the site. Related issues include hazardous excavations and infrastructure which pose a danger to humans and animals, alteration of drainage patterns (discussed under Section 6.1.6) as well as visual impacts (discussed under Section 6.1.10).

Whilst much of the mine related infrastructure will be removed during the decommissioning phase and will therefore no longer present potential hazardous structures, the TSF and additional WRDs will remain in perpetuity. The additional work required to address this issue is described in Section 6.1.2 of this scoping report.

3.9.3 SOIL AND LAND CAPABILITY

3.9.3.1 Issue: Loss of soil and change in land capability through sterilisation, erosion and contamination

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Soil is generally a resource of high value containing a gene bank of seeds of indigenous species. A loss of soil (through sterilisation, erosion or contamination) would generally result in a decrease in the rehabilitation and future land use potential of any land that is disturbed by the project. The proposed project has the potential to damage the soil resource through physical disturbance, and/or contamination, both throughout the life of the mine and post closure. The extension of the mining rights area as well as the development and operation of major infrastructure such as the additional WRDs and TSF will increase the overall footprint of mine infrastructure. The additional work required to address this issue is described in section 6.1.3 of this scoping report.

3.9.4 FAUNA AND FLORA (NATURAL PLANT AND ANIMAL LIFE)

3.9.4.1 Issue: Loss of natural vegetation and animal life

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The extension of the mining rights area as well as the development and operation of additional infrastructure and major components such as the additional WRDs and TSF will increase the overall footprint of mine infrastructure and this has the potential to impact negatively on plant and animal life, including terrestrial and aquatic ecosystems, in the project area and immediate surrounds. This will apply to site clearing and building activities during the construction phase, general mining activities during operations and demolition and rehabilitation during decommissioning. However it is noted that the construction of existing infrastructure has influenced fauna and flora in the project area.

The WRDs and TSF will remain in perpetuity and potentially represents a residual impact. The additional work required to address this issue is described in section 6.1.5 of this scoping report.

3.9.5 HYDROLOGY (SURFACE WATER)

3.9.5.1 Issue: Alteration of surface drainage patterns

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Although Kudumane falls within a dry semi-arid region and there are no naturally occurring perennial surface water resources, as part of the establishment of the Hotazel open pit, the GaMogara River will need to be diverted. A detailed river diversion design will be undertaken and presented in the EIA/EMP report. KMR will furthermore acquire the relevant authorisations from the DWA. The additional WRDs and TSF will not encroach on stream floodlines, however these will remain in perpetuity and represent a potential residual impact on drainage patterns. The proposed additional surface infrastructure may result in further alteration of drainage patterns during construction, operation and decommissioning. The additional work required to address this issue is described in Section 6.1.6 of this scoping report.

3.9.5.2 Issue: Contamination of surface water

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Projects of this nature will generally present a number of pollution sources that can have a negative impact on surface water quality during the construction and operational phases if unmanaged. Site clearing activities for the additional WRDs, proposed TSF and additional mine infrastructure could cause sedimentation of watercourses during the construction phase. Various potential pollution sources could result in contamination of watercourses during the operational phase, such as runoff from the additional WRDs or TSF, and particles from exposed soils in the form of suspended solids. The additional work required to address this issue is described in Section 6.1.6 of this scoping report.

3.9.6 GROUNDWATER

3.9.6.1 Issue: Reducing groundwater levels and availability

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
Not applicable			

Discussion

Groundwater levels could be reduced in the project area by dewatering activities to ensure safe mining conditions. This impact could be significant given the reliance of surrounding residents and ad-hoc farming practices on groundwater. The additional work required to address this issue is included in Section 6.1.7 of this scoping report.

3.9.6.2 Issue: Contamination of groundwater

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Projects of this nature generally present a number of pollution sources that can have a negative impact on groundwater quality throughout the duration of the project. The potential pollution sources associated with the project include: ad-hoc spills, sewage, fuel, lubricants, non-mineralised waste (hazardous and general) and run-off/seepage from the mineralised waste facilities (additional WRDs and TSF).

The additional WRDs as well as the TSF will remain in perpetuity and represent potential residual impacts. The additional work required to address this issue is included in Section 6.1.7 of this scoping report.

3.9.7 AIR QUALITY

3.9.7.1 Issue: Pollution from emissions to air

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Vegetation and topsoil stripping and material handling during the construction of the proposed TSF, and other additional mine infrastructure will generate dust, as will vehicle movement.

Dust sources during the operational phase include the additional WRDs, the TSF, material handling, topsoil stockpiles and vehicle movements on unpaved roads.

Rehabilitation activities will generate dust through vehicle movement and the replacement of topsoil over disturbed areas. Proper management and re-vegetation of the additional WRDs and TSF after closure will prevent dust arising from these facilities, despite their remaining in perpetuity. The additional work required to address this issue is anticipated to be a qualitative assessment by SLR as described in Section 6.1.8 of this scoping report.

3.9.8 NOISE

3.9.8.1 Issue: Increase in disturbing noise levels

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			Not applicable

Discussion

Site clearing and construction activities and vehicle movements for the proposed TSF, and other additional mine infrastructure and activities may increase the ambient noise during the construction phase. However it is noted that current activities on site already generate noise. Blasting and general mining activities associated with the underground mine plan and surface infrastructure plan will also increase ambient noise levels during the operational phase, as will rehabilitation activities due to vehicle movement upon closure. The additional work required to address this issue is anticipated to be a qualitative assessment by SLR as described in Section 6.1.9 of this scoping report.

3.9.9 VISUAL ASPECTS

3.9.9.1 Issue: Negative visual impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The approved Kudumane infrastructure has already had a negative visual impact; however the proposed TSF and additional mining infrastructure will increase this visual impact during construction, operation and decommissioning. The proposed TSF and additional WRDs could represent a potential residual impact as this facility will remain in perpetuity. The additional work required to address this issue is described in Section 6.1.10 of this scoping report.

3.10 POTENTIAL CUMULATIVE IMPACTS

The baseline studies to be undertaken to characterise the existing environment during the EIA Phase will assess the current status of the environment and will therefore take in account existing impacts of activities in the project area and surrounds. By using this as a basis for assessing the impacts of the proposed project, cumulative issues will be considered.

4 PROJECT ALTERNATIVES

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

The main project alternatives to be considered include:

- Alternative land use
- Project alternatives
- The “no-go” alternative

4.1 LAND USE ALTERNATIVES

A list and description of alternative land uses that exist on the property or on adjacent or non-adjacent properties that may be affected by the proposed mining operation is provided below.

The Kudumane Manganese Mine and associated infrastructure has been approved for mining in terms of NEMA and the MPRDA. Given this, although land not occupied for mine infrastructure continues to be used for pre-mining land uses (mainly grazing), no alternative land use is identified at this stage. With the exception of the TSF and the existing historical pit which will be mined no surface infrastructure is planned on Devon and therefore the current surface land use can continue for the foreseeable future. In addition to this the infrastructure on Telele will be mostly associated with the underground mining (which will be accessed via an adit through the York pit).

4.2 LAND DEVELOPMENTS WHICH MAY BE AFFECTED BY THE PROPOSED PROJECT

This section provides a description of land developments identified by the community or IAPs that are in progress and which may be affected by the proposed mining operation.

No land developments have been identified which may be affected by the proposed development.

All objections, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix D.

4.3 PROJECT ALTERNATIVES AND IAP PROPOSALS TO ADJUST PROJECT PLAN

4.3.1 INFRASTRUCTURE LAYOUT ALTERNATIVES

The proposed new surface infrastructure will be located within the mine boundary and/or adjacent to existing mine infrastructure and as a result no alternative sites have been considered.

The proposed underground mining area of Telele is fixed due to geological constraints and as such no alternatives have been considered.

The positions of the additional pits are based on the underlying geology and location of the mineral reef and the additional WRDs will be positioned in proximity to the pits. Alternative WRD/topsoil stockpile positions will be considered during the EIA/EMP phase, with particular consideration being given to the GaMogara River and the potential river diversion required.

An alternative TSF position will also be considered during the EIA/EMP phase.

4.3.2 IAP PROPOSALS TO ADJUST THE PROJECT PLAN

No specific proposals have been raised to date in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and IAPs.

All objections, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix D.

IAPs will have an opportunity to review the scoping report.

4.4 THE “NO-GO” OPTION

This section provides information in relation to the consequence of not proceeding with the proposed mining operation.

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. The assessment of this option requires input from the investigations described in Section 6 so that the full extent of environmental, social and economic considerations can be taken into account.

The method to be used for assessing this option is outlined in Section 6.3 of the scoping report.

4.5 PROJECT PLAN

A description of the most appropriate procedure to plan and develop the proposed project is provided in Section 3.1.

4.5.1 AVOIDANCE OF POTENTIAL IMPACTS

This section provides information on the applicant's response to the findings of the application process and the possible options to adjust the mine project proposal to avoid potential impacts identified in the consultation process.

The 2010 EIA/EMP took into account the recommendations of all of the specialist studies and comments in order to develop the project in a manner which aimed to prevent, minimise and mitigate significant impacts. A detailed EMP was developed in this regard.

The overall project team, which consists of Kudumane, various environmental specialists and SLR, aims to adjust the project plan to accommodate the additional infrastructure and activities proposed in a manner which will prevent impacts to the socio-economic, cultural and biophysical environment. Should any impacts related to the amended project scope be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project.

5 DESCRIPTION OF THE PROCESS OF ENGAGEMENT OF IAPS, INCLUDING THEIR VIEWS AND CONCERNS

5.1 INFORMATION SHARING

This section describes the information provided to the community, landowners and IAPs to inform them in sufficient detail of what the proposed changes to the mining operation will entail on the land, in order for them to assess what impact the operation will have on them or the use of the land.

5.1.1 DATABASE

The project's public involvement database was developed by sourcing IAPs details relating to immediate landowners and adjacent landowners from databases that were previously compiled for the existing Kudumane EIA/EMP. A deed search was undertaken to verify the details of the landowners and adjacent landowners that were identified. In addition to this, the project's public involvement database was supplemented with information on IAPs provided in the scoping meetings. A copy of the project's public involvement database is included in Appendix C.

5.1.2 BACKGROUND INFORMATION DOCUMENT (BID)

A BID was compiled and distributed by hand (at the scoping meetings) and e-mailed and posted to IAPs and authorities on the project's public involvement database. The purpose of the BID was to inform IAPs and authorities about the proposed project, the environmental assessment process, possible environmental impacts, and means of providing input into the environmental assessment process. Attached to the BID was a registration and response form, which provided IAPs with an opportunity to submit their names, contact details and comments on the project. A copy of the BID is provided in Appendix B.

5.1.3 NOTIFICATION

The landowners were informed in writing of the proposed project. Proof of this notification is provided in Appendix B.

Site notices in English and Afrikaans were placed at key conspicuous positions in and around the project site and block advertisements were placed in the Kalahari Bulletin and Kathu Gazette on 31 October and 2 November, 2013, respectively. Photographs of the site notices and copies of the newspaper advertisements are provided in Appendix B.

IAPs were notified of the proposed project and the public meetings in the following manner:

- distribution to background information documents to IAPs;
- advertisements placed in the Kalahari Bulletin and Kathu Gazette (Appendix B);

- site notices placed in and around the project site (Appendix B); and
- notification letters sent to landowners and adjacent landowners.

Authorities were notified of the proposed project and the regulatory authorities meeting in the following manner:

- distribution of background information documents;
- telephonic discussions to notify regulatory authorities of the proposed date for the authorities meeting; and
- formal invitations to the regulatory authorities meeting.

5.1.4 SCOPING MEETINGS - IAPS

The following scoping and regulatory authority meetings were held for the proposed project:

- one authorities meeting was scheduled for the 26th November, 2013 at the Hotazel Recreation Club. No authorities attended this meeting; and
- one public scoping meeting was held on 26th November, 2013 at the Hotazel Recreation Club.

The public scoping meeting provided background information on the potential impacts of the proposed project and the environmental process being followed. The meetings were therefore focussed on:

- informing IAPs about the proposed project;
- informing IAPs about the stakeholder engagement process and how IAPs can have input into the process;
- providing information about the existing status of the environment and obtaining input thereon;
- providing information about the potential impacts of the project and obtaining input thereon; and
- providing an opportunity for IAPs to raise issues and concerns. These issues and concerns have been documented in the Issues and Concerns Report (Appendix B) and used to inform the Plan of Study for the EIA Phase.

Meeting attendance registers, minutes, and the issues and concerns report are provided in Appendix B.

5.1.5 REVIEW OF THE DRAFT SCOPING REPORT

The draft scoping report will be made available for public review from **14 April 2014 to 30 May 2014**. Full copies of the scoping report will be available for public review at the following venues:

- Joe Morolong Local Municipality;
- John Taolo Gaetsewe District Municipality;
- Hotazel and Kathu Public libraries;
- SLR's offices in Johannesburg; and

- Electronically on a CD were made available on request.

Summaries of the draft scoping report (Appendix B) will be sent by post or e-mail to all IAPs and authorities that are registered on the public involvement database. In addition, IAPs will be notified when the draft scoping report is available for review via SMS.

5.2 IAPs CONSULTED DURING SCOPING PHASE

IAPs including the identified landowners, land users or lawful occupiers and other IAPs that are registered on the project database (Appendix B) have been consulted during the scoping phase. The proof of consultation is in the form of signed attendance registers and proof of landowner notification (Appendix B).

5.3 IAP VIEWS ON EXISTING ENVIRONMENT

All views, issues and concerns raised throughout the Scoping Phase with regard to the existing cultural, socio-economic or biophysical environment have been captured into the issues and concerns report provided in Appendix B.

5.4 IAP VIEWS ON POTENTIAL IMPACTS

All views, issues and concerns raised throughout the Scoping Phase on how the existing cultural, socio-economic or biophysical environment could potentially be impacted upon by the proposed mining operation have been captured into the issues and concerns report provided in Appendix B.

5.5 OTHER IAP CONCERNS

All views, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix B. Issues pertained to:

- increase in dust emissions;
- increase in disturbing noise levels;
- surface water quality issues relating to the end use of treated sewage effluent;
- groundwater quantity (relating to the Kathu Grysland reserve, the cumulative effects of dewatering and the capacity of the Sedibeng pipeline);
- blasting activities;
- loss of heritage/cultural resources;
- land use issues pertaining to the encroachment of Kudumane mine towards Hotazel town;
- waste related issues pertaining to the dumping of litter and domestic waste on local roads;

- negative socio-economic issues relating to the influx of people, lack of employment opportunities, and associated crime such as stock-theft and fire hazard posed by job-seekers making fires on roadsides;
- land claim issues pertaining to Hotazel and Kipling

5.6 MEETING MINUTES AND RECORDS OF CONSULTATIONS

Copies of the scoping meeting attendance register and minutes are included in Appendix B, and the issues and concerns report is provided in Appendix B.

5.7 IAP OBJECTIONS

All views, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix B. To date no objections relating to the proposed project have been received.

6 FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY

This section describes the nature and extent of further investigations required in the Environmental Impact Assessment, including any specialist reports that may be required, and sets out the proposed approach to the EIA and EMP phase.

6.1 FURTHER INVESTIGATIONS

The proposed terms of reference for further investigations required for the completion of the EIA study are discussed below. The results of these studies will be collated into a combined EIA and EMP report. It should be noted that this project will have to comply with the relevant requirements outlined by the IFC and World Bank and in this regard all specialists will be undertaken in accordance with these requirements.

6.1.1 GEOLOGY

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

6.1.2 TOPOGRAPHY

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

6.1.3 SOIL AND LAND CAPABILITY

It is proposed that a specialist soils and land capability investigation be undertaken by Gary Paterson of ARC. A previous soils study was undertaken for project area, therefore the relevant soil maps will be updated to incorporate the additional farms.

6.1.4 LAND USE

6.1.4.1 Existing surrounding agricultural and residential uses

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

6.1.4.2 Blasting activities

It is proposed that no further investigations are required. This impact will be assessed qualitatively and detailed management measures will be provided in the EIA and EMP report by SLR.

6.1.4.3 Disturbance of roads by project related traffic

It is proposed that a traffic impact investigation be undertaken by Paul van der Westhuizen of Siyazi Gauteng (Pty) Ltd. The study will have the following objectives:

It is proposed that a traffic impact investigation be undertaken by Paul van der Westhuizen of Siyazi Gauteng (Pty) Ltd. The study will have the following objectives:

- identifying the existing road network in the vicinity of the proposed development;
- characterising the usage and the capacity of the existing road network;
- assessing the impact on the existing road network (including capacity, safety and road routing) of the infrastructure and traffic associated with the proposed project, and
- to have input, together with SLR, into project alternatives and traffic management measures going forward.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.5 NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)

It is proposed that the detailed (flora, fauna and aquatic system) investigation be conducted by Natalie Birch of Environmental Management Services (EMS). The investigation has the following objectives:

- Perform desktop and field investigations to identify and map different habitats, concentrating on areas proposed for new infrastructure
- Assign species to each habitat through various trapping and sampling methods
- Rank each habitat type based on conservation importance (in terms of provincial biodiversity priorities) and ecological sensitivity
- Identify potential impacts (including cumulative) on ecology
- To have input, together with SLR, into project alternatives and ecology management measures going forward

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.6 HYDROLOGY (SURFACE WATER)

It is proposed that a specialist hydrology assessment will be undertaken by Paul Klimczak and Francois Van Heerden of SLR. The study will have the following objectives:

- floodline modelling (flood modelling will need to be updated and extended as the new pit is understood to be in close vicinity to the river);
- basic Site Wide Water Balance for average wet and dry seasons;
- conceptual Stormwater Management Plan;

- identify quantity and quality potential impacts (including cumulative) on surface water resources
- to have input, together with the SLR EIA team, into project alternatives and surface water management measures going forward

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.7 GROUNDWATER

It is proposed that a detailed investigation will be conducted by Rian Titus of SLR. The study will have the following objectives:

- hydrocensus;
- update the Kudumane Mine groundwater model to cater for additional dewatering and pollution impacts related to the proposed project;
- re-assess the potential impacts on groundwater;
- to have input, together with the SLR EIA team, into project alternatives and surface water management measures going forward; and
- assessment of the Kathu Grysland water reserve.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.8 AIR QUALITY

It is proposed that a specialist air quality impact assessment will be undertaken by Matthew Stooling of SLR. The study will have the following objectives:

- define the position of the receptor residences;
- assess the impact of air emissions on sensitive receptors in the area;
- to have input, together with SLR EIA team into project alternatives and air quality management measures going forward.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.9 NOISE

It is proposed that a specialist air quality impact assessment will be undertaken by Darren Laffon-Anthony of SLR. The study will have the following objectives:

- define the position of the receptor residences;
- undertake baseline noise measurements at locations considered to be noise-sensitive, i.e. residential areas, schools, hospitals, etc;
- predict the potential additional impact of noise source on sensitive receptors in the area;
- to have input, together with SLR, into project alternatives and management measures going forward.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.10 VISUAL ASPECTS

It is proposed that a specialist air quality impact assessment will be undertaken by Sarah Planton of SLR. The study will have the following objectives:

- define the visual resource and sense of place of the greater area;
- identify the sensitive receptors/ lines of site;
- determine the cumulative visual impact by simulating the key proposed infrastructure components;
- assess the visual impact;
- to have input, together with SLR, into project alternatives and visual management measures going forward; and

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.11 ARCHAEOLOGICAL, CULTURAL AND HERITAGE RESOURCES

It is proposed that a specialist heritage assessment will be undertaken by Wouter Fourie of PGS. The study will have the following objectives:

- identify and map (through literature review and field work) all archaeological, cultural and heritage resources in the proposed project area;
- assess the significance of the identified resources;
- assess the impact of the proposed project on the heritage resources; and
- have input into proposed management and mitigation measures.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.12 PALAEOLOGICAL RESOURCES

It is proposed that a specialist assessment will be undertaken by Gideon Groenewald of GSPD Consulting. The study will have the following objectives:

- identify and map (through literature review and field work) all paleontological resources in the proposed project area;
- assess the significance of the identified resources;
- assess the impact of the proposed project on the paleontological resources; and
- have input into proposed management and mitigation measures.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.13 TRANSPORT SYSTEMS

It is proposed that a traffic impact investigation be undertaken by Paul van der Westhuizen of Siyazi Gauteng (Pty) Ltd. See Section 6.1.4.3 above.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.1.14 SOCIO-ECONOMIC ISSUES

It is proposed that a socio-economic specialist investigation be undertaken by Ilse Aucamp of PTRESA. The study will have the following objectives:

- update the baseline information from the 2007 study detailing the socio-economic and socio-political background to the area in the vicinity of the proposed project;
- identify and assess potential impacts of a social and economic nature from the proposed changes through investigation with a variety of stakeholders;
- provide input, together with SLR and relevant IAPs into appropriate mitigation measures for each of the identified impacts.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

Strategy for Good will conduct an economic and sustainability assessment to meet the requirements of the DMR EIA and EMP report template. The investigation will include the following tasks:

- economic assessment;
- comparative land use assessment; and
- sustainability analysis.

The assessment and detailed management measures will be provided in the EIA/EMP report by SLR. A copy of the specialist report will be provided in the EIA/EMP.

6.2 METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES

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

TABLE 20: CRITERIA FOR ASSESSING IMPACTS

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

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

SEVERITY = L

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

SEVERITY = M

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

SEVERITY = H

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

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

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

6.3 METHODOLOGY FOR THE ASSESSMENT OF PROJECT ALTERNATIVES

6.3.1 ASSESSMENT OF THE “NO-GO OPTION”

The assessment of the implications of the “No-Go option” will require a comparison between the existing situation without the project and the possible future situation with the project, as assessed in the EIA and EMP report.

6.3.2 ASSESSMENT OF PROJECT ALTERNATIVES

The realistic alternatives and associated assessment criteria for choosing between these alternatives have been discussed in Section 4 of the scoping report. The proposed methodology for the assessment of these alternatives is a relative comparison that also applies the assessment method described above to each of the listed assessment criteria, where possible.

6.4 ENGINEERING DESIGN

The TSF will be designed by an appropriately qualified professional engineer at SLR in accordance with the requirements of Regulation 73 of the Mineral and Petroleum Resources Development Act, 28 of 2002, and Regulation 704 of the National Water Act, 108 of 1998.

6.5 CLOSURE COST ESTIMATE

The Kudumane Manganese Mine closure cost estimate will be updated and revised by SLR using the current DMR model.

6.6 PLAN OF STUDY FOR THE EIA PHASE

6.6.1 EIA PHASE OBJECTIVES

The main objectives of the EIA phase are to:

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

6.6.2 EIA PROJECT TEAM

The proposed EIA project team is outlined in the table below and is similar to the team used for the scoping phase with the inclusion of additional specialists.

TABLE 21: PROPOSED EIA TEAM

Team	Name	Designation	Tasks and roles	Company
Project management	Suan Mulder	Project manager and reviewer	Management of the assessment process and report compilation.	SLR
	Caitlin Pringle	Project manager and author		
	Brandon Stobart	Project reviewer	Report and process review	
Specialist investigations	Gary Paterson	Soils specialist	Soils specialist study	ARC
	Natalie Birch	Ecological specialist	Ecological specialist study and biodiversity off-set	EMS
	Rian Titus	Groundwater specialist	Groundwater specialist study	SLR SA

Team	Name	Designation	Tasks and roles	Company
	Jenny Ellerton	Geochemistry	Geochemical Analysis	SLR
	Paul Klimczak	Engineer and hydrologist	Hydrology and revision of stormwater management plan	SLR
	Matt Stoling	Air Quality specialist	Air Quality specialist study	SLR
	Darren Lafon-Anthony	Noise specialist	Noise specialist study	SLR
	Gerrie Muller	Economic and sustainability specialist	Economic and sustainability analysis	Strategy4Good
	Wouter Fourie	Heritage Resources specialist	Heritage Resources assessment	PGS
	Gideon Groenewald	Palaeontological specialist	Palaeontological specialist study	GSPD Consulting
	Steve van Niekerk	Closure specialist	Closure Costing report	SLR
	Paul van der Westhuizen	Traffic specialist	Traffic specialist study	Siyazi
	Steve Dorman	TSF design engineer	TSF Design report	SLR
	Francois Van Heerden & Paul Klimczak	Specialist engineer and specialist hydrologist	River Diversion Study	SLR
	Sarah Planton	Visual specialist	Visual assessment	SLR
	Ilse Aucamp	Socio-economic specialist	Socio-economic review and social action plan	PTRESA

6.6.3 EIA AND EMP PHASE ACTIVITIES AND TIMING

An overview of the EIA and EMP phase and corresponding activities are outlined in the table below.

TABLE 22: EIA AND EMP ACTIVITIES AND TIMING

Objectives	Corresponding activities and estimated dates
<i>Further investigations (March to July 2014)</i>	
<ul style="list-style-type: none"> Describe the affected environment Define potential impacts Give management and monitoring recommendations 	<ul style="list-style-type: none"> Investigations by technical project team and SLR of issues identified during the scoping stage including investigations into alternatives.
<i>EIA and EMP phase (April to August 2014)</i>	
<ul style="list-style-type: none"> Assessment of potential environmental impacts Design requirements and management and mitigation measures Receive feedback on application 	<ul style="list-style-type: none"> Compilation of draft EIA and EMP report (May 2014 to August 2014). Distribute draft EIA and EMP report to IAPs, DMR and other regulatory authorities for review (August 2014). Public feedback meetings with IAPs (if required) (September 2014). Record comments (October 2014). Forward IAP comments to DMR and submit final report to DENC (December 2014) Notify IAPs of the availability of the final EIA and EMP report Circulate record of decision to all registered IAPs (middle of 2015).

6.6.4 STAGES OF CONSULTATION WITH THE COMPETENT AUTHORITY IN EIA PHASE

Proposed consultation meetings for the EIA phase include:

- A site visit and meeting with DENC, DWA, DMR, DAFF and DRDLR (if requested)
- A general authorities meeting at the end of the EIA phase to present the main findings of the EIA prior to submission of the EIA and EMP report if requested.

6.6.5 PUBLIC INVOLVEMENT PROCESS IN EIA PHASE

The proposed public involvement process can be separated into focussed and general involvement. Each of these is described below:

Focussed involvement

As part of the various investigations that form part of the EIA tasks focussed meetings with certain IAPs will be held, as required. These meetings will be arranged and facilitated by SLR.

General involvement

As with the scoping report, full copies of the EIA and EMP report will be distributed to the agreed venues and summaries will be distributed to registered IAPs. Full copies of the report will also be provided electronically (on a CD) on request.

At the end of the review period, a round of public feedback meetings will be arranged (if required). The purpose of these meetings would be as follows:

- provide IAPs with a final chance to submit comments on the EIA and EMP report; and
- provide IAPs with an opportunity to discuss the outcomes of the EIA and EMP report.

All comments received from IAPs in the review period will be forwarded to the DMR and DENC.

Once the DMR and DENC have issued their respective decisions, the IAPs will be notified by e-mail, and post in accordance with the instructions from the relevant departments.

7 IDENTIFICATION OF THE REPORT

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act as the case may be

Full names and surname	Babra Mudzanapabwe
Identity number	
Signature	

8 SUMMARY AND CONCLUSIONS

The scoping phase has enabled the identification of the main components of the propose project and the associated environmental issues including the terms of reference for investigating and assessing the identified issues. The way forward for the remainder of the scoping phase is as follows:

- distribute the scoping report and a summary thereof for review by the IAPs, the DMR and other regulatory authorities;
- submit a copy of the Scoping Report that went out for public review to DENC for their records;
- receive comments from IAPs and other regulatory authorities;
- following the IAP review process, five copies of the scoping report (with comments and updates as required) will be forwarded by SLR to DENC. It is then expected that the scoping report will be distributed internally by DENC for review and comment;
- receive comments from DENC and DMR and address in EIA phase.

The potential impacts identified in this scoping report will be investigated by SLR and various specialists in the EIA phase.

Caitlin Pringle
Author and project manager

Suan Mulder
Project Manager and reviewer

Brandon Stobart
Reviewer

9 REFERENCES

Airshed Planning Professionals, September 2010: *Air Quality Impact Assessment for the proposed Kudumane Manganese Mining Project located near Hotazel*

EMS, October 2009: *Biodiversity Action Plan for the proposed Kudumane Manganese Mine near Hotazel, Northern Cape*

EMS, October 2012: *Ecological Survey for the proposed Kudumane Manganese Mine near Hotazel, Northern Cape*

GSPD Consulting, March 2013: *Palaeontological Impact Assessment for a Manganese Mine*

Metago, August 2010: *Geochemistry study for the proposed Kudumane mine*

Metago, August 2010: *Hydrological Assessment for the proposed Kudumane Mine*

Metago, September 2010: *Environmental Impact Assessment and Management Report for Kudumane Manganese Resources*

Metago, February 2012: *Intergrated Waste and Water Management Plan for Kudumane Manganese Mine*

SLR, 2014: *Quarterly and Annual Groundwater Quality Report for 2013*

TWP Projects, May 2012: *Lehating Manganese Mine Bankable Feasibility Study*

APPENDIX A: PROOF OF NEMA APPLICATION

APPENDIX B: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS

- Proof of landowner notification
- Site notice in English and Afrikaans, and photographs showing the placement of site notices
- Advertisements placed in Kalahari Bulletin and Kathu Gazette
- Background Information Document
- Meeting invitation sent to IAPs
- Meeting invitation sent to relevant authorities
- Minutes (including presentation) from scoping meeting held with IAPs
- Attendance register from scoping meeting held with IAPs
- Correspondence with relevant authorities

APPENDIX C: IAPS DATABASE

APPENDIX D: ISSUES AND CONCERNS REPORT



RECORD OF REPORT DISTRIBUTION

Project Number:	710.14003.00006
Title:	Scoping report for the additional planned infrastructure and mining areas at Kudumane
Report Number:	1
Proponent:	Kudumane Manganese Resources (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Ntsundeni Ravhugoni	Department of Mineral Resources	1-6	April 2014	C Pringle
Marvin Matthews	Department of Nature Conservation	7 (plus 1 Electronic copy)	April 2014	C Pringle
Dawn Le Fleur/Ester Makungo	Northern Cape Department of Water Affairs	8	April 2014	C Pringle
Jacoline Mans	Northern Cape Department of Agriculture, Forestry and Fisheries	1 Electronic copy	April 2014	C Pringle
Ryan Oliver/Kennith Lembowane	Northern Cape Department of Rural Development and Land Reform (Provincial Office)	9	April 2014	C Pringle
Itumeleng Bulane	Northern Cape Department of Public Works, Roads and Transport	10	April 2014	C Pringle
Katie Smuts	South African Heritage Resources Agency	1 Electronic copy	April 2014	Pringle
Sineo Seleka	Joe Morolong Local Municipality	11	April 2014	C Pringle
Magdalene Schuping	Joe Morolong Local Municipality-Ward 4 Councillor	12		
Klaas Teise	John Taolo Gaetsewe District Municipality	13	April 2014	C Pringle
Thembile Sukazi	Hotazel Library	14	April 2014	C Pringle
Librarian	Kathu Library	15		
Babra Mudzanaphabwe	Kudumane Manganese Resources (Pty) Ltd	16	April 2014	C Pringle
Librarian	SLR's offices in Johannesburg	17	April 2014	C Pringle

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