Applicant: Lehating Mining (Pty) Ltd

DMR Reference Number: NC30/5/1/2/2/10028 MR

DENC Reference Number: NC/EIA/JTG/JOEL/LEH2/2012

DEA Reference Number: awaiting confirmation

SCOPING REPORT FOR THE PROPOSED LEHATING MANGANESE MINE NEAR HOTAZEL

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 PROPOSED LEHATING MANGANESE MINE NEAR HOTAZEL

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ACCRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
BFS	Bankable Feasibility Study
BID	Background information document
^{O}C	Degrees Celsius
CEC	Cation exchange capacity
DAFF	Northern Cape Department of Agriculture, Forestry and Fisheries
dBA	A-weighted decibel
DDF	Depth-duration-frequency
DEA	Department of Environmental Affairs
DENC	Northern Cape Department of Environment and Nature Conservation
DLRRD	Northern Cape Department of Land Reform and Rural Development
DMR	Department of Mineral Resources
DTRPW	Northern Cape Department of Transport, Roads and Public Works
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EAPSA	Environmental assessment practitioner of Southern Africa
EIA	Environmental impact assessment
EMD	Delta Electrolytic Manganese Dioxide
EMP	Environmental management programme
GDP	Gross domestic product
IAPs	Interested and/or affected parties
IUCN	International Union for Conservation of Nature
JMLM	Joe Morolong Local Municipality
JTGDM	John Taolo Gaetsewe District Municipality
km^2	Square kilometres
LOM	Life of mine
LSA	Late Stone Age
m	Meters
mamsl	Meters above mean sea level
m^2	Square meter
m^3	Cubic meter
MAP	mean annual precipitation
MAR	Mean annual runoff
mbgl	Metres below ground level
Mn	Manganese
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEMA: WA	National Environmental Management: Waste Management Act
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act
ROM	Run-of-mine
RP	Return periods
SAHRA	South African Heritage Resources Agency
SANS	South African national Standards
SAWS	South African Weather Service
SLR	SLR Consulting (Africa) (Pty) Ltd
TME	Trackless Mining Equipment
UMK	United Manganese of the Kalahari
WRD	Waste Rock Dump
WUL	Water Use Licence

INTRODUCTION

Introduction to the proposed project

Lehating Mining (Pty) Ltd (Lehating) proposes to develop a new underground manganese mining operation near Black Rock in the Joe Morolong Local Municipality, located in the John Taolo Gaetsewe District Municipality, Northern Cape Province. The proposed mine will be located on Portion 1 of the farm Lehating 741, with site access to be attained through the northern section of Portion 2 of the farm Wessels 227. The regional and local settings are presented in Figure 1 and Figure 2, respectively. The proposed project will involve: site access; establishment of a main access shaft and mine ventilation shaft; on-surface crushing and screening of manganese ore; stockpiling of product; waste rock and tailings disposal; water abstraction; and associated support infrastructure and services.

Brief project motivation (need and desirability)

The proposed Lehating Mine project is located in the Joe Morolong Local Municipality where the employment rates are very low (TWP, May 2012). It is expected that underground mining will create several hundred direct employment opportunities and will have a positive impact on both indirect businesses and employment. A large percentage of these employment opportunities will benefit the surrounding communities. A portion of the unskilled and semi-skilled labour is likely to be sourced from the mine's neighbouring communities and within the Joe Morolong Local Municipality. In addition to employment, Lehating will contribute to the surrounding communities through implementation of socio-economic development projects as well as skills development, as stipulated in its social and labour plan.

The proposed Lehating Mine could also benefit the South African economy as the manganese ore produced at the mine will be exported thus bringing foreign revenue, which will contribute to South Africa's gross domestic product (GDP). The anticipated market prices in the medium and long-term are considered to be favourable for project development. The mine also creates an additional tax base, therefore further contributing to the South African economy.

Legal Framework

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

- An environmental decision from the Department of Mineral Resources (DMR) in terms of the Mineral and Petroleum Resources Development Act (MPRDA), (Act 28 of 2002); and
- Environmental authorisation from the Northern Cape Department of Environment and Nature Conservation (DENC) in terms of the National Environmental Management Act (NEMA), (Act 107 of 1998). The proposed project incorporates several listed environmental activities (refer to Section 3.2) which require environmental authorisation prior to their commencement. A copy of the application and department acknowledgment of receipt is included in Appendix A.

The proposed project will also require authorisation for various water uses from the Department of Water

Affairs (DWA) in terms of the National Water Act (NWA), (Act 36 of 1998). The proposed project incorporates various water uses identified in the NWA including (but not limited to) taking water from a water resource, storing water, altering banks of watercourse, removing, discharging or disposing of water found underground, disposing of waste or water containing waste, and mine dewatering. The Water Use Licence (WUL) will be submitted following the EIA process.

Various activities may trigger the application of a waste license from the Department of Environment Affairs (DEA) in terms of the National Environmental Management Act: Waste Act (NEM:WA), (Act 59 of 2008). The NEM:WA application will be submitted to the relevant department following the Scoping Report distribution, and related notifications in the form of advertisements and site notices, will be published.

It is expected that any 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 environmental impact assessment and the environmental management programme report.

Overview of environmental assessment process

Prior to the commencement of the proposed project, an environmental assessment process must be followed. This environmental assessment process comprises of three phases: an application phase, scoping phase and Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) phase. SLR Consulting (Africa) (Pty) Ltd (SLR) is the independent firm of consultants that has been appointed by Lehating to undertake the environmental assessment and related processes.

This document has been prepared in accordance with the DMR Scoping Report template format, and was informed by the guidelines published by the DMR. This is in accordance with the requirements of the Mineral and Petroleum Resources Development Act, (Act 28 of 2002). In addition, this report also complies with the requirements of the National Environmental Management Act, (Act 107 of 1998). Table 1 below provides a summary of this combined legal framework with reference to relevant sections of this Scoping Report.

TABLE 1: SCOPING REPORT REQUIREMENTS (MPRDA) AND LEGAL FRAMEWORK

Reference in scoping report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 29 of Regulation 385 of 21 April 2006
Introduction		Details of the environmental practitioner who prepared the report, including relevant expertise to carry out scoping procedures.
Introduction and Section 1	Describe the methodology applied to conduct scoping.	Identify all legislation and guidelines that have been considered in preparing the scoping report.
Section 5 and appendices	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 Interested and Affected Parties (IAPs), proof of notification, IAP register/database, and summary of issues raised by IAPs.

Reference in scoping report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 29 of Regulation 385 of 21 April 2006
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. Activities that are relevant to NEMA are outlined in sub-sections 3.2.
Section 4	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 3.4, 3.5, 3.6, 3.7, 3.8 and 3.9	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.
Sections 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.

Stages of the combined environmental process being followed and corresponding activities up to and including scoping are outlined in Table 2. Details on the proposed EIA/EMP amendment phase are included in Section 6 of the scoping report.

TABLE 2: ENVIRONMENTAL PROCESS BEING FOLLOWED UP TO AND INCLUDING SCOPING

Objectives	Corresponding activities
Project initiation and application phase (March 2012 – October 2012)	
• Notify the decision making authorities of the proposed project. • Initiate the environmental impact assessment process.	• DMR application for mining right submitted on 25 October 2012. • NEMA application for the listed activity was submitted to DENC on 21 August 2012. Application acknowledged on 3 October 2012. • Mining Right application submitted on 25 October 2013. Application was acknowledged on 4 March 2013.
Scoping phase (October 2012 - April 2013)	

Objectives	Corresponding activities
• Identify interested and/or affected parties (IAPs) and involve them in the scoping process through information sharing. • Identify potential environmental issues associated with the proposed project. • Identify any fatal flaws. • Determine the terms of reference for the EIA.	• Notify IAPs of the project and environmental assessment process (social scans, distribution of background information document s (BIDs), newspaper advertisements, telephone calls and site notices) in October and November 2012. • Public scoping meetings (November 2012). • Record keeping of all comments received (September 2012 to March 2013). • Compile scoping report including a description of environmental issues and terms of reference for further investigations. • Distribute scoping report to DMR, IAPs and other regulatory authorities for review (April 2013). • Record comments (April - May 2013). • Forward scoping report including IAP comments to DENC (May 2013).

Scoping team

SLR is an independent firm of consultants that has been appointed by Lehating to undertake the environmental assessment. Brandon Stobart, Victoria Tucker and Suan Mulder comprise the SLR team whom are the responsible SLR environmental assessment practitioners (EAPs) for managing the project and compiling the final report. Brandon Stobart, Victoria Tucker and Suan Mulder do not have any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

The designations of the environmental scoping team are as follows:

- Brandon Stobart – project reviewer
- Victoria Tucker – project manager
- Suan Mulder – project assistant

Technical input was provided by:

- Nico Hager – Lehating Mining director and project manager
- Charles Sambo – Lehating Mining CEO
- Paul Jackson – TWP Projects (Pty) Ltd, project feasibility study team leader
- Paul Carlisle – Carlisle & Associates, consulting civil/structural engineers

TABLE 3: SCOPING ENVIRONMENTAL PROJECT TEAM

Team	Name	Designation	Tasks and roles	Company
Project management	Brandon Stobart	Project reviewer	Process management, stakeholder engagement, and report compilation.	SLR Consulting (Africa) (Pty) Ltd
	Victoria Tucker	Project manager		
	Suan Mulder	Stakeholder engagement assistant	Assistance with public participation process	
Proposed specialist team	Hanlie Liebenberg-Enslin	Air quality and noise specialist	Air quality and noise assessment	Airshed Planning Professionals (Pty) Ltd

Team	Name	Designation	Tasks and roles	Company
	Garry Paterson	Soil and land capability specialist	Soil and land capability assessment	ARC-Institute for Soil, Climate & Water
	J. Reyneke and Theo Rossouw	Groundwater specialist	Groundwater assessment	SLR Consulting (South Africa) (Pty) Ltd
	Jenny Ellerton	Geochemical specialist	Acid Rock Drainage and Geochemical report	SLR Consulting (Africa) (Pty) Ltd
	Mark Bollaert	Surface water specialist	Surface water and floodline assessment	SLR Consulting (Africa) (Pty) Ltd
	Natalie Birch	Biodiversity specialist	Biodiversity assessment	Ecological Management Services
	Wouter Fourie	Heritage specialist	Heritage and culture assessment	Professional Grave Solutions (Pty) Ltd
	Paul van der Westhuizen	Traffic specialist	Traffic impact assessment	Siyazi Gauteng
	Gerrie Muller	Economic specialist	Economic impact assessment	Strategy4Good

Contact details for responsible parties

Details of the applicant are provided in the table below.

Project applicant:	Lehating Mining (Pty) Ltd
Contact person:	Mr Nico Hager
Postal address:	12 Kareekraal Avenue, Eldoraigne Ext 3 0157
Telephone No:	+ 27 10 591 3233 and 083 453 6621
E-mail Address:	nhager@lehating.com

FIGURE 1: REGIONAL SETTING

FIGURE 2: LOCAL SETTING

1 THE METHODOLOGY APPLIED TO SCOPING

This section presents the approach and methodology used to identify potential environmental and social impacts and project alternatives associated with the project.

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

- key team members conducted a site visit to the project area;
- available studies and reports conducted for the feasibility study were reviewed;
- preferred and alternative infrastructure sites were identified in consultation with the technical team;
- a project description was drafted in consultation with the applicant and technical team;
- potential positive and negative impacts were identified by considering the project description and site conditions;
- interested and affected parties, including the relevant authorities, were identified and notified of the proposed project and consulted (the consultation process is outlined in Section 5 of this report);
- The SLR environmental team identified further investigations required to investigate the positive and negative impacts identified with input from IAPs and the relevant authorities, and drafted terms of reference for these studies; and
- A scoping report was compiled.

The main sources of information used to develop this report are listed below:

- Design reports for the Bankable Feasibility Study (BFS) compiled for the project by TWP Projects (Pty) Ltd (TWP, 2012);
- various baseline specialist investigations which were completed and incorporated as part of the BFS report;
- the social scan and various site visits conducted by the SLR team during the BFS and initial scoping phase;
- regional geological maps;
- topographical maps (1:50 000 scale); and
- satellite imagery (Google Earth).

1.1 RELEVANT COMMUNITIES

The communities, as defined in the DMR Guideline, closest to the proposed project (Figure 1) are listed below:

- permanent farm homesteads, the closest of which are on Portion 0 of Lehating 741 and Portion 0 of Boerdraai 228 - approximately 1.6km and 3.2km respectively from the main shaft site;
- land users (grazing rights) on Portion 1 of Lehating 741 and Portion 2 of Wessels 227;

- farm workers on surrounding farms, the closest of which is Dawid Polelo on Portion 2 of Wessels 227 – approximately 2km from the main shaft site;
- temporary prefab accommodation compound rented by mines in the region for workers, on Portion 0 of Dibiaghomo 226 - approximately 3.8km south of the main shaft site and approximately 3.2km from the access corridor;
- Black Rock mining community – approximately 10km south of the main shaft site; and
- Hotazel mining community – approximately 19km southeast of the main shaft site.

1.2 COMMUNITY LAND OWNERSHIP

No community landownership exists within the project area. Surface rights of the project area are currently held by mining companies as detailed in Section 1.6.

1.3 DEPARTMENT OF LAND AFFAIRS INTEREST

The Northern Cape Department of Land Reform and Rural Development (DLRRD), formerly known as the Department of Land Affairs, has been identified as an interested and affected party and has been consulted. Proof of consultation is attached in Appendix B.

1.4 LAND CLAIMS

SLR has consulted the DLRRD, and the project team is aware of a land claim on Portion 1 of Lehating 741. In this regard, a response from the DLRRD was received on the 14th of November 2012. As there is a recognised official land claim, the claimants will be included in the EIA process accordingly.

1.5 RELEVANT TRADITIONAL AUTHORITY

Not applicable.

1.6 LANDOWNERS

The regional and local project area are shown in Figure 1 and Figure 2 respectively. Title deed owners identified by the applicant are listed in the table below (Table 4).

TABLE 4: RELEVANT PROPERTIES AND SURFACE OWNERS

Farm name	Portion number	Title Deed Number	Registered Landowner
Lehating 741	Portion 1	T628/1995	Terra Nominees (Pty) Ltd - contact person: Dineo Peta
Wessels 227	Portion 2	T904/2011	Ntsimbintle Mining (Pty) Ltd – contact person: Jeff

Farm name	Portion number	Title Deed Number	Registered Landowner
			Leader and Justin Pitt

1.7 LAWFUL OCCUPIERS

Grazing rights on Portion 1 of the farm Lehating 741 and Portion 2 of the farm Wessels 227 are held by Mr R. van der Walt and Mr W. Strauss, respectively.

1.8 OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED

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

TABLE 5: LANDOWNERS ADJACENT TO THE PROJECT AREA

Farm name	Portion	Registered Landowner
Wessels 227	Portion 0	Hotazel Manganese Mines Pty Ltd
Wessels 227	Portion 1	Eskom Holdings
Dibiaghomo 226	Portion 0	Joseph van der Walt
Dibiaghomo 226	Portion 1	Hotazel Manganese Mines Pty Ltd
Dibiaghomo 226	Portion 2	Hotazel Manganese Mines Pty Ltd
Dikgathlong 268	Portion 0	Gawie Stols
Dikgathlong 268	Portion 1	Hotazel Manganese Mines Pty Ltd
Dikgathlong 268	Portion 2	Anna Williamson
N'Chwaning 267	Portion 0	Engela Elizabeth Reynecke
N'Chwaning 267	Portion 1	Assmang Mining
N'Chwaning 267	Portion 2	Eskom Holdings
N'Chwaning 267	Portion 4	Assmang Mining
N'Chwaning 267	Portion 5	Telkom S A Ltd
N'Chwaning 267	Portion 7	Delta EMD
Rhodes 269	Portion 0	Nicky Pretorius
East 270	Portion 0	Nicky Pretorius
East 270	Portion 1	Nicky Pretorius
East 270	Portion 2	George Smit
Cornish 225	Portion 0	V-C Lamprecht Trust
Cornish 225	Portion 1	V-C Lamprecht Trust
Bowden 223	Portion 0	Moshaweng Plaaslike Municipaliteit
Bowden 223	Portion 1	Kobus Grobler
Bowden 223	Portion 2	Moshaweng Plaaslike Municipaliteit
Mathlapani 222	Portion 0	Rian van der Westhuizen
Mathlapani 222	Portion 1	Rian van der Westhuizen
Titanic 221	Portion 0	Nico Kruger
Vostershoop 706	Portion 0	V-C Lamprecht Trust

Farm name	Portion	Registered Landowner
Annex Gamodisa 707	Portion 0	Jan van Straten
Gamodisa 712	Portion 0	Department of Land Affairs
Gamodisa 712	Portion 2	Department of Land Affairs
Karlsruhe 711	Portion 0	Karlsruhe Trust
Karlsruhe 711	Portion 1	Karlsruhe Trust
Karlsruhe 711	Portion 2	Karlsruhe Trust
Karlsruhe 711	Portion 3	Karlsruhe Trust
Karlsruhe 711	Portion 4	Martinus Venter
Sirocco 703	Portion 42	Martinus Venter
Rosebank 703	Portion 43	Karlsruhe Trust
Morgenzon 703	Portion 42	Karlsruhe Trust
Eersbejint 703	Portion 43	Saltrim Ranches
Grafton 709	Portion 0	Saltrim Ranches
Grafton 709	Portion 1	Carel Reynecke
Mollersville 703	Portion 49	Mollersville Boerdery
Boerdraai 228	Portion 0	Gawie Stols
Mecca 233	Portion 0	Mecca Trust
Bergheim 229	Portion 0	Manganese Mines of South Africa
Harefield 232	Portion 0	Joseph van der Walt and Willem van der Walt
Santoy 230	Portion 0	Johan Lamprecht
Belgravia 264	Portion 0	Assmang Mining

1.9 RELEVANT LOCAL MUNICIPALITIES

The project area falls within the Joe Morolong Local Municipality and the John Taolo Gaetsewe District 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)
- Northern Cape Department of Environment and Nature Conservation (DENC)
- Department of Water Affairs (DWA)
- South Africa Heritage Resource Agency (SAHRA)
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Department of Rural Development and Land Reform (DRDLR)
- Department of Environmental Affairs (DEA);
- Northern Cape Department of Transport, Roads and Public Works (DTRPW).

Local authorities:

- John Taolo Gaetsewe District Municipality (JTGDM)
- Joe Morolong Local Municipality (JMLM)

Ward councillors and other parties:

- Ward councillor for Ward 4 (Magdalene Schuping)
- Parastatals such as Eskom and Telkom
- NGO's; and
- Surrounding mines and other industry.

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 ongoing basis throughout the environmental process.

1.11 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPS

Landowners, lawful occupiers and IAPs were notified through the distribution of the background information document either by hand, email or fax. Notices of the proposed project were also placed at conspicuous locations within and surrounding the proposed project area as well as at the nearest urban centers and in newspapers. Further detail on the process followed was provided in Section 5. Proof that the landowners, lawful occupiers and IAPs were notified of the project is provided in Appendix B.

2 DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT

This section has been compiled using information sourced from the baseline environmental studies conducted during the BFS stage of the project. Information was also sourced from relevant site visits conducted 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 and EMP report.

2.1 AGREEMENT ON EXISTING STATUS OF ENVIRONMENT

IAPs were provided an opportunity to input on the existing status of the environment during the scoping meetings. In this regard, no changes to the baseline are required. IAPs will also be provided an opportunity to review the Scoping Report (see Section 5.1.4). All of the IAP issues and concerns raised during the scoping meetings are included in Appendix D. 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

"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 practice, belief or social interaction. They can be, but are not necessarily identified with defined locations. Cultural aspects of the project area are discussed below as part of the discussion of the heritage environment.

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 or resources collectively form the heritage. Heritage resources (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.

Limited archaeological resources were identified during the specialist heritage assessment. The site is characterised by a very low-density scatter of lithic artefacts. Two lithic artefacts (waste flakes from the Late Stone Age (LSA)) eroding from a sand dune overlooking the Kuruman River were observed.

Although a desktop palaeontological review concluded that the Precambrian rocks, which underlie the project area, are not known to contain any fossils, it is noted that a study conducted for a nearby manganese mine found that the Hotazel Formation manganese ore body could contain stromatolites. There is also a possibility of Quaternary fossils being present in the overlying Kalahari sand deposits.

Considering the above it is possible that Stone Age and Fossil resources may be found at the project site. These resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval.

2.4 EXISTING STATUS OF THE SOCIO-ECONOMIC ENVIRONMENT

This section describes the existing status of current land uses and the socio-economic environment that may be affected by the proposed project.

2.4.1 CURRENT LAND USES AND THE SOCIO-ECONOMIC ENVIRONMENT

This section describes the existing status of current land uses and the socio-economic environment that may be affected by the proposed project.

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.

Current land use on the project site

Regionally, the project area falls within a rural setting characterised by farms, mining and associated communities and supportive networks/activities. The land in and immediately surrounding the project area is mainly used for grazing. Overall, surface rights in the region are held by mining companies as well as private owners. It is also common in the region for mine-owned land to be leased to third parties for grazing use. The surface rights of Portion 1 of Lehating 741, where the surface infrastructure for the project will be located, are currently held by Terra Nominees (Pty) Ltd (BHP Billiton), whilst the grazing rights are held by Mr R. van Schalkwyk. Mr van Schalkwyk's house is situated south of the Portion 1 on Portion 0 of Lehating 741. The surface rights of Portion 2 of Wessels 227, of which a small portion will be crossed by the proposed access road, are held by Ntsimbintle Mining (Pty) Ltd (Ntsimbintle), who also hold the prospecting right on the portion. Grazing rights on Portion 2 of Wessels 227 are held by Mr W. Strauss and farm worker dwellings are located on this portion, to the north of the R380 road.

Mineral/prospecting rights

Lehating currently hold the manganese prospecting rights for Portion 1 of the farm Lehating 741 (NC 1160/PR). The application for a mining right was submitted to the DMR on 25 October 2012 and accepted by DMR on 4 March 2013 under DMR reference number NC 30/5/1/2/2/10028 MR.

Socio-economic profile of immediate area

The district municipality (John Taolo Gaetsewe District Municipality) comprises of three local municipalities: the Gamagara, Ga-Segonyana and Joe Morolong Local Municipality. The proposed project area falls within the John Taolo Gaetsewe District Municipality of the Northern Province. 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 schooling 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.

2.5 EXISTING STATUS OF INFRASTRUCTURE THAT MAY BE AFFECTED

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

2.5.1 COMMUNITIES AND COMMUNITY STRUCTURES

With reference to Figure 1 and Figure 2, the nearest residential centres are the Black Rock mining community (located approximately 10 km south of the project site) and Hotazel town (situated about 19 km to the south east). Due to the lack of available surface water resources in the area, no informal 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 or people that work on the mines in the region. Many of these dwellings are not occupied.

2.5.2 MINING STRUCTURES AND WARD COUNCILLOR CONSULTATION

There are several mining-related activities in the vicinity of the proposed Lehating Mine. BHP Billiton's Wessels Mine and Assmang's N'Chwaning Mine are both located to the south of the proposed project. There are other mines (in various phases of development) in the wider area and these include; Kudumane Mine, United Manganese of the Kalahari Mine, Mamatwan Mine, Tshipi Borwa Mine, Gloria and Black Rock Mines. There are several old/non-operational mines such as York Mine, Hotazel and Devon Mines and Middelplaats mine.

The land owners and users at the proposed project site are located within the Joe Morolong Local Municipality boundary, into the jurisdiction of ward NC451 (Moshaweng), and therefore the councillor of this ward is being consulted.

2.5.3 REGIONAL ROAD INFRASTRUCTURE

The un-surfaced R380 road runs along the southern side of the Kuruman River to the south of the project site, linking Hotazel in the south east with McCarthy's Rest border post in the north. Various un-surfaced farm roads are present throughout the project area and surrounding properties.

2.5.4 REGIONAL POWER LINE INFRASTRUCTURE

A 132KV power line is located to the south of the project site, which follows the R380 road route (on the northern and eastern side of the road. The local area is supplied power from the Hotazel distribution network and at present there is no spare capacity on this network. Due to the proliferation of mining operations in the area, Eskom is in the process of expanding the supply to this area and this expansion is due to be completed in 2014. Lehating has put in an application to obtain 7.5 MVA of the power after the upgrade has been completed. It has been decided that diesel powered generators will be used during the construction phase, and that this power will be supplied by the contractors.

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/EMP report. However, a basic description of the regional geology is described below:

Soil types are discussed in Section 2.6.4, groundwater in Section 2.6.7 and paleontological resources in Section 2.6.7.

Regional Geology

Surface geology at Lehating 741 comprises predominantly of Cenozoic deposits which are part of the Kalahari Formation. The Kalahari Formation (refer to

Figure 3 and Figure 4) is approximately 80m thick and overlies the Dwyka Formation. The Dwyka Formation is approximately 200m thick and overlies the Hotazel Formation. The Hotazel Formation contains important minerals and Lehating will target this formation for manganese. The Hotazel Formation is approximately 20m metres thick in the area of investigation and overlies the Ongeluk Formation. There are also two distinct topographic highs formed by the rocks of the Olifantshoek Supergroup outcrop approximately 30km southwest of the mine and the rocks of the Asbestos Hill Subgroup outcropping approximately 20km towards to the east of Lehating 741 (Metago Groundwater Report, April 2011).

Local Geology

The Kalahari Formation consists of various units and constitutes the most extensive body of terrestrial sediments from the Cenozoic age in Southern Africa. Throughout the area the thickest parts of the Kalahari Formation appear to coincide with the occurrence of rocks of the Dwyka Group. The presence of faulting and graben formation in pre-Kalahari rocks also has a strong influence on the distribution of the Kalahari sediments (Partridge et al, 2006).

The overall lithology and main stratigraphic units of the Kalahari Formation are represented in Figure 4 (Partridge et al, 2006).

FIGURE 3: REGIONAL GEOLOGY OF THE KALAHARI MANGANESE BELT

FIGURE 4: KALAHARI FORMATION STRATIGRAPHY

2.6.2 TOPOGRAPHY

Information in this section was sourced from the survey data collected for the BFS, 1:50000 topographical maps and site visits conducted by the environmental team.

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 and along valleys.

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

This section provides a brief description of the site topography to facilitate an understanding of the topographical features relevant to the project sites and surrounding area from which to measure potential change. More detailed information will be provided in the EIA/EMP report.

The project area is relatively flat and slopes gently towards the Kuruman River. The proposed main project infrastructure will be located to the north of the river at an altitude of between 1 009 and 1 013 meters above mean sea level (mamsl). The proposed access road junction with the R380 lies at 1 015 mamsl. The lowest point in the project area which is in the Kuruman River channel at the proposed river crossing is at 997 mamsl.

2.6.3 CLIMATE

Information in this section was sourced from the draft hydrology report compiled for the BFS (SLR, April 2012) and from other EIAs conducted by SLR in the area.

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.

Regional climate

The proposed project site falls within the Northern Steppe climatic zone as defined by the South African Weather Bureau. This is a semi-arid region characterised by erratic rainfall, high evaporation levels, hot temperatures in summer and cold temperatures in winter. 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.

Rainfall and Weather stations

WR2005 (2009) indicates that the mean annual rainfall (MAP) for the site is approximately 320 mm/year. There are a number of South African Weather Service (SAWS) weather stations within 50km of the site, while the closest Department of Water Affairs (DWA) station is approximately 55km away. Table 6 presents the monthly totals of rainfall for the two SAWS gauges near the site; namely Winton and Milner located at 40.5km and 17.5km away respectively, and the DWA station, Kuruman (55km away). The mean annual rainfall measured at the nearby Winton and Milner weather stations ranges between 330mm and 362mm respectively. Rainfall is typically in the form of thunderstorms during the summer months of October to March. The peak rainy period occurs between the months of January to March. Rainfall is erratic and may vary significantly from year to year.

TABLE 6: MONTHLY RAINFALL FOR WEATHER STATIONS NEAR THE SITE

	STATIONS		
Station name	**Winton**	**Milner**	**Kuruman**
Station No.	392148 W	393083 W	D4E004
Latitude	27°29’ S	27°22’ S	27°28’ S
Longitude	22°37’ E	23°02’ E	23°26’ E
Distance to site (km)	55	40	75
Altitude (m)	1180	1118	1320
Years of Record	72	67	54
	RAINFALL (mm)		
January	62.1	66.1	85.6
February	61.2	61.4	82.9
March	58.0	66.4	86.5
April	31.8	35.5	45.1
May	13.9	16.1	21.5
June	4.2	6.0	7.4
July	2.5	1.9	2.8
August	4.9	4.2	9.8
September	6.2	6.2	7.8

October	16.2	19.0	26.3
November	25.7	32.0	45
December	43.3	46.8	44.9
Annual	330.1	361.6	465.7

Evaporation

The WR2005 (2009) shows a range in annual evaporation for the site of greater than 2600mm (A-Pan estimate). A correction factor of approximately 0.65 (based upon the annual average for monthly correction factors) allows for the translation of the A-Pan estimate to the evaporation estimate for a very shallow body of water (Lake), equivalent to 1695mm. Table 7 presents evaporation data sourced from the DWA station (Kuruman) closest to the site.

TABLE 7: MONTHLY EVAPORATION FOR KURUMAN WEATHER STATION

Month	Mean Monthly A-Pan Evaporation (mm)	Mean Monthly Lake Evaporation (mm)
Jan	259.0	169.7
Feb	208.4	144.9
Mar	161.3	112.1
Apr	122.3	83.9
May	113.2	76.8
Jun	82.5	56.1
Jul	99.1	63.3
Aug	131.2	81.8
Sep	188.5	109.9
Oct	236.3	135.9
Nov	243.6	157.8
Dec	272.7	183.3
Total	**2118.1**	**1375.7**

Wind

In general, the wind tends to blow from the north and northeast. Further wind data will be available once the air quality impact modelling is completed during the EIA/EMP phase of the process.

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 determines the type of land use the area is suitable for, for example, soil with low nutrients may not be able to support crop farming.

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

A brief description of the soil types and land capability in the project areas is provided below.

Soil types and land capability within the project site

The information in this section draws upon the findings of the specialist soils and land capability baseline study conducted by ARC Institute for Soil, Climate and Water (March, 2012).

The land type survey of the region indicates that the project area falls within land type Ah5, which comprises structureless, deep (>1 200 mm), sandy, red and yellow soils of the Hutton and Clovelly forms. 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 the low annual rainfall and hot temperatures in the area, means that 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 farms or cattle ranches.

2.6.5 BIODIVERSITY

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 in the project area is provided below.

Flora (Natural plant life)

The information in this section draws upon the findings of the specialist biodiversity study conducted by Ecological Management Services (September, 2011).

The project area falls within the Kathu Bushveld and Southern Kalahari Mekgacha (Mucina & Rutherford 2006). The Kathu Bushveld is open savannah, whilst the Southern Kalahari Mekgacha is typically found on the bottom of dry river beds. It is also noted that the proposed project area lies outside of an area identified in the 2008 National Protected Area Expansion Strategy (NPAES) as a potential protected area for the eastern Kalahari bushveld.

On a local scale, the project area consists of the following four distinct vegetation types and associated habitat sensitivities:

- *Cynodon dactylon – Prosopis glandulosa* shrubland: This vegetation type is associated with dry river beds in the region and considered highly sensitive habitat.
- *Acacia erioloba* Woodland: This woodland is found in association with dry river beds in the region and can be found along and just beyond the river banks. This vegetation type is also highly sensitive habitat.
- *Acacia haematoxylon* Savannah: This is the main vegetation type found on the flat plains in the area and is considered moderately sensitive.
- *Acacia mellifera* Scrub: This vegetation type is found in patches within the Acacia haematoxylon Savannah, and is rated as low sensitivity habitat.

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 8 and Table 9 below. The conservation status of the identified species is included in the table along with the vegetation habitat in which they were considered likely to occur.

TABLE 8: BIRD SPECIES POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA

Common name	Scientific name	Conservation status	Suitable habitat Requirements	Potential for occurrence on-site
Martial Eagle	*Polemaetus bellicosus*	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	*Neotis ludwigii*	Vulnerable	Requires semi-arid dwarf shrublands, occasionally visiting the southern Kalahari.	Medium – Moderate to high shrub density throughout the site.
Secretary bird	*Sagittarius serpentarius*	Near threatened	Requires open grassland with scattered trees, shrubland, open Acacia Savannah.	High – Patches of open savannah will accommodate this species.

African Whitebacked Vulture	*Gyps africanus*	Vulnerable	Savannah and bushveld. Nest in tall trees (Acacia erioloba).	High - No nest sites were recorded within the planned development area. However the presence of large Acacia erioloba trees (in the Acacia erioloba woodland) presents ideal nesting habitat for these birds.
Kori Bustard	*Ardeotis kori*	Vulnerable	Dry Thornveld grassland, arid scrub requires the cover of some trees	Medium – Moderate to high shrub density throughout the site.
Black stork	*Ciconia bigra*	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	*Polemaetus bellicosus*	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	*Falco naumanni*	Vulnerable	Open semi-arid grasslands, usually avoids wooded areas.	Low - Area too densely wooded for ideal habitat.

Source: Ecological Management Service, September 2011: *Ecological survey for the proposed manganese mine on the property Lehating 741, near Black Rock, Northern Cape*

TABLE 9: MAMMAL SPECIES 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	*Rhinolophus denti*	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	*Mellivora*	Near threatened	High – As they are	High– Suitable habitat within

	capensis		catholic in habitat requirements, they are likely to occur on-site.	the study area.
Schreiber's long-fingered bat	*Miniopterus schreibersii*	Near threatened	Limited – Suitable cover such as caves and mine adits determines distribution.	Very little – No caves or mine adits occur on-site. In addition, as the landscape 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	*Atelerix frontalis*	Near threatened	High – Require ample groundcover and dry places for nesting.	High to Medium – Suitable habitat available.

Source: Ecological Management Service, September 2011: *Ecological survey for the proposed manganese mine on the property Lehating 741, near Black Rock, Northern Cape*

2.6.6 HYDROLOGY (SURFACE WATER)

The information in this section draws upon the findings of the specialist surface water investigations and management plan compiled by SLR (March, 2012) and the geochemical analysis of potential mineralised waste conducted by SLR (February, 2012).

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 and permanent infrastructure and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste (general and hazardous) and mineralised wastes. 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.

Drainage and water resources

The site is located in the Orange River Basin, in quaternary catchment D41M. No perennial rivers or permanent surface water features such as dams or lakes are located in the area. The ephemeral Kuruman River runs to the south of the site from east to west. A large catchment of approximately 13 780 km^2 feeds the Kuruman River, and consequently when the river is in flood, flows can become considerable. The Kuruman River is, however, considered ephemeral as the river only produces surface flows during periods of heavy precipitation.

The Kuruman catchment is large but sparsely vegetated and features freely draining soils which indicates that minor rainfall events would infiltrate to groundwater as opposed to generating significant volumes of runoff. This understanding is supported by the fact that numerous road crossings and houses are situated within or immediately adjacent to the river channel which suggests that the watercourse does not flow on a regular basis. Anecdotal evidence suggests that no flow has been observed within the watercourse in this locality for some years. The Kuruman River in this locality is meandering and features a low longitudinal gradient (approximately 1:1050) indicating that any flows are likely to be relatively deep but slow moving.

There is a preferential flow path running along the south eastern side of the project site before draining into tributary of the Kuruman River (during heavy rainfall events).

Surface water quality

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

Surface water users

Water could be abstracted from surface water resources both up and downstream of the proposed mine for domestic purposes and livestock watering. The precise quantities of abstraction are unknown.

Wetlands

No wetlands have been identified within the project area.

2.6.7 GROUNDWATER

Groundwater is a valuable resource and is defined as water which is located beneath the ground surface in rock pore spaces and in the fractures of lithologic formations. Understanding the geology of the area provides a basis from which to understand the occurrence of groundwater resources. 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.

Information in this section was sourced from the groundwater impact assessment study complied by SLR (April, 2012) and the acid rock drainage and geochemical report compiled by SLR (February, 2012).

Presence of groundwater

Three distinct aquifers are present in the area: An unconfined Kalahari aquifer (top layer) underlain by a relatively impermeable, confined Dwyka aquifer (middle layer), and the confined, fractured Hotazel and Ongeluk aquifer (bottom layer). These aquifers are described below:

Kalahari aquifer: The upper unconfined, intergranular Kalahari aquifer consists of heterogeneous sedimentary deposits indicating varying hydraulic characteristics (e.g. changes in effective porosity over short distances). Accordingly, groundwater flow velocity, borehole yields and seepage rates vary considerably throughout the area. Groundwater flow in the Kalahari sediments is controlled by unsaturated flow conditions, perched aquifers, the irregular bedrock (i.e. Dwyka) topography and/or a regional groundwater table. Exploration boreholes drilled indicate an average thickness of 80 metres for the Kalahari sediments, with water levels occurring varying between 20 and 70 m below surface. Typical borehole yields expected in the Kalahari aquifer vary between 0.1 and 0.5 L/s. Localized palaeochannels (old river systems) found on the contact between the base of the Kalahari sediments and Dwyka formation produce much higher yielding boreholes. In this regard, pump tests of exploration borehole LEX 3A indicate that the borehole can be pumped at a recommended rate of 8.0 L/s for 12 hours with a maximum groundwater level drawdown of 8 m, and allowing a 12 hour recovery time for the aquifer to recover to its original water level.

Dwyka aquifer: Below the upper aquifer, the confined, fractured Dwyka aquifer overlies older lithologies, i.e. rocks of the Hotazel/Ongeluk and Asbestos Hill units, and contacts the overlying Kalahari Formation at various depths between 40 m and 120 m below surface. The exploration boreholes drilled on Lehating 741 indicate an average thickness of 200 metres for the Dwyka aquifer. According to the Department of Water Affairs' Groundwater Resource Assessment Phase 2 (GRAII) data, expected borehole yield in this aquifer ranges between 0.5 and 2 L/s. Pumping test analysis conducted on exploration borehole LEX 4 supports the GRAII data.

Hotazel Ongeluk aquifers: The lower confined, fractured Hotazel and Ongeluk aquifers are the deepest aquifer units characterised by the conceptual model. Both formations form part of the Pretoria Group (Transvaal Supergroup). The Hotazel Formation overlying the Ongeluk Formation is economically the most important unit due to the presence of manganese deposits. The unit is structurally confined within the Dimoten Syncline, plunging 8° in a north-western direction comprising mostly of banded iron with manganese bearing units. The exploration boreholes drilled on Lehating 741 indicate an average thickness of no more than 20 metres for the Hotazel Formation. The Ongeluk Formation underlies the Hotazel Formation and consists predominantly of lavas. Towards the eastern and western catchment (model) boundaries rocks of the Ongeluk Formation is directly overlain by Kalahari sediments. The expected borehole yields for the Ongeluk aquifer unit range between 0.1 and 0.5 L/s.

Groundwater quality

Groundwater samples from boreholes LEX 3A and LEX 4A were analysed and compared to the Department of Water Affairs standards for drinking water.

The groundwater sample collected at borehole LEX3A presented an Mg-HCO3 water type with an elevated magnesium concentration. The enriched bicarbonate type water indicates shallow, younger

groundwater conditions possibly associated with the weathering of calcareous and limestone units within the Kalahari sediments. This is expected from the sample collected at borehole LEX3A as the borehole was drilled to a depth of 40 metres targeting higher yielding zones in the Kalahari Formation. The groundwater sample collected at borehole LEX4 presented a Na-Cl water type with elevated concentrations of chloride, sodium and magnesium. The elevated sodium and chloride concentrations may represent deeper and/or older groundwater within an evolved groundwater regime. This water type is probably characteristic of the groundwater within the deeper, confined Hotazel and Ongeluk aquifers. The groundwater samples for LEX3A and LEX4 are thus indicative of two distinctive groundwater regimes.

Groundwater users

The majority of boreholes in the wider region are used for domestic use or livestock watering, with a small number being used for monitoring and withdrawal of water for mining use.

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.

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.

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.

The proposed project site is located in a rural-type area characterised by farms and associated scattered residences with limited traffic on the R380 road. Accordingly, the ambient noise climate is expected to exhibit noise 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 receptors in the area are limited to those described 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.

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. In contrast, the region to the 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 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.
- Low – these include towns, communities, roads, railway line, industries and existing mines.

Although numerous mining related structures dominate the landscape to the south of the project area, the overall scene surrounding the project area is characterised by the Kuruman 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.

2.7 RELEVANT ADDITIONAL INFORMATION

None.

3 IDENTIFICATION OF THE ANTICIPATED IMPACTS

Potential environmental, social or cultural impacts, including the cumulative impacts, where applicable, that were identified during the scoping process are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in Section 2 of the scoping report.

The potential impacts associated with all the phases (construction, operations, decommissioning and closure) have been conceptually identified and described, and reference has been made to the studies/investigations that are required to provide the necessary additional information.

The project description is provided first in this chapter to provide a reference when discussing the potential impacts.

3.1 PROJECT DESCRIPTION

A description of the proposed project including a map (refer to Figure 5) showing the spatial locality of infrastructure, extraction area and any associated activities is given in the section below.

The aim of the current EIA/EMP amendment process is to apply for the authorisation of the proposed underground mining and associated infrastructure. More details are provided below.

Lehating is proposing to undertake underground mining activities on the farm Lehating 741, and will target the Hotazel Formation. The proposed Lehating project will consist of a new gravel access road, establishment of a main and ventilation shaft, on-surface crushing and screening of Manganese (Mn) ore, stockpiling of product, waste rock and tailings storage, water abstraction, and associated support infrastructure and services. The proposed Lehating project will be mined using conventional underground mining techniques.

3.1.1 LAYOUT OF SURFACE INFRASTRUCTURE

The conceptual locations of the proposed surface infrastructure component layout are presented in Figure 5. A detailed layout of these components including associated service related infrastructure (pipelines, roads, power lines, water management infrastructure etc.) will be provided in the EIA/EMP report.

FIGURE 5: PROPOSED SURFACE INFRASTRUCTURE LAYOUT

3.1.2 CONSTRUCTION PHASE ACTIVITIES

The following activities will take place during construction:

- selective clearing of vegetation in areas designated for surface infrastructure in line with a biodiversity management plan and soil conservation procedure to be developed during the EIA phase;
- stripping and stockpiling topsoil and sub-soil;
- digging of foundations and trenches;
- drilling and blasting associated with the development of the main shaft and the ventilation shaft;
- dewatering, if required;
- establishment of the new access road;
- construction of mine infrastructure including shafts, waste rock dump for shaft development etc;
- construction of plant infrastructure including processing plant, stockpile pads, tailings facility etc;
- construction of services including storm water management facilities, solid waste management facilities, sewage plant, water supply infrastructure, power supply infrastructure etc.

3.1.3 CONSTRUCTION PHASE SUPPORT SERVICES AND FACILITIES

The proposed support facilities that will be required include (Figure 5):

- construction contractors accommodation camp;
- portable air compressors for sinking operations;
- contractors laydown areas;
- temporary handling and storage area for construction materials (paints, solvents, oils, grease);
- temporary storage area for non-mineralised waste prior to removal by appropriate contractor;
- temporary water supply will be supplied by borehole and/or trucks;
- power supply will be by temporary diesel-powered electricity generator;
- workshops and wash bays;
- fuel handling and storage area;
- temporary offices and temporary chemical toilets; and
- settling ponds for sinking operations.

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

The total construction worker compliment over the construction phase is approximately 320 people. During peak construction periods there will be approximately 180 workers on site that will be accommodated as per the specifications in Table 10.

TABLE 10: CONSTRUCTION ACCOMMODATION CAMP

Item	Description
Duration	The camp will be a temporary facility that is required for approximately 3 years
Capacity	The camp will be designed to house up to 180 occupants during peak construction periods.
Occupants	Only construction workers and camp facility service personnel will be permitted to stay in the camp.
Ablution facilities	Prefab toilets and showers will be provided until the permanent sewerage plant is constructed.
Transport	The construction work cycle will be six days on duty and one day off duty.
Potable water	Water will be abstracted from a well-field comprising four number boreholes each delivering raw water to a raw water tank located in its permanent position on the construction camp terrace. A reverse osmosis plant will be installed to provide potable water.
Power supply	Power will be sourced from a temporary 500kVA diesel generator.
Sewage	Sewage will be treated in the sewage treatment plant.
General waste	General waste will be sorted and stored before being trucked off site and disposed of at the appropriately licenced waste facility. The construction camp company would be responsible for disposing of waste generated as a result of the construction camp operations.
Health, safety and environment	All camp occupants will receive induction on arrival and at appropriate intervals when returning from extended leave periods. There will be ongoing awareness campaigns.
Security	The camp will be fenced and will have one access gate with 24 hour security.

3.1.4 OPERATIONAL PHASE ACTIVITIES

The operational phase is expected to have a duration of 15 years. This project has a design capacity of approximately 600 000 tonnes of Manganese product per annum. The core activities that are expected to take place during the operational phase include:

- underground drilling and blasting;
- run of mine (ROM) is stored in underground silos before being hoisted to the surface headgear bin in skips;
- dumping of minimal waste rock in underground cavities;
- ROM is conveyed from the headgear bin to the primary jaw crusher;
- the crushed ore will be conveyed to a stockpile from where it is conveyed to the processing plant;
- the processing plant comprises of various screens, additional crushers, dewatering facilities and product handling and stockpiling facilities;
- waste fines will be deposited onto the tailings storage facility; and
- product will be transported off site by trucks.

3.1.5 OPERATIONAL PHASE SUPPORT SERVICES AND FACILITIES

Employment and housing

During steady state operations approximately 350 people will be employed at Lehating Mine. More than half of these people will be contractors. No housing will be provided on the mine site during the operational phase.

Transport Systems

Access to the proposed Lehating project site from the R380 will be via the new 10m wide gravel access road that will be constructed from in-situ sands and imported waste rock. This road will be used to transport workers, consumables and product. According to current estimates, the approximate vehicles per day are listed below:

- Transporting workers – 50 light vehicles; and
- Consumables and product – 55 No. 34 tonne pay-loaders and 94 No. 20 tonne skiptainers.

Water Supply and Management

Both process and potable water will be sourced from boreholes. Process water is required for dust suppression along the new access road, the process plant and underground mining. Potable water is required in the offices and ablution facilities. A reverse osmosis treatment unit will be used as required to product potable water from the borehole water.

Stormwater management

Water management facilities for the control of storm water and for pollution prevention will be designed to meet the requirements of Regulation 704, 4 June 1999 (Regulation 704) for water management on mines. In this regard the management of stormwater generated at the project site will include the diversion of clean water by means of berms and/or channels and the containment of dirty water.

Power Supply

Operational power will be sourced from Eskom via a dedicated powerline. Backup power will be provided by diesel generators.

Sewage

Sewage will be treated by the sewage treatment plant with the grey water being disinfected, blended with the brine water from the reverse osmosis plant and then used for surface road dust allaying.

Non-mineralised wastes

The types of non-mineralised wastes associated with the proposed project that could be generated include:

- General waste such as domestic waste and cleared vegetation and building material; and
- Hazardous wastes such as fuel, lubricants and explosive packaging.

Temporary storage facilities will be provided on site. All waste will be removed by an appropriate contractor for either recycling or disposal at an appropriately licensed facility, save for explosives packaging which will be handled in accordance with explosives legislation.

Stores and workshops

Workshops (including wash bays) and facilities for the storage for hazardous material and fuel and lubricants will be provided on site.

Other facilities

There will be a need for additional services and related facilities depending on final design parameters. These will include offices, laboratory facilities and medical clinic facilities.

3.1.6 DECOMMISSIONING PHASE ACTIVITIES

In broad terms, decommissioning activities associated with the proposed site includes the demolition and the removal of infrastructure, preparation of final land forms for closure and prompting vegetation growth in order to reduce the effects of soil erosion and to re-establish landscape functionality.

3.1.7 CLOSURE PHASE ACTIVITIES

After decommissioning, closure activities will include maintenance and aftercare that is required to ensure that rehabilitation is successful. In this regard, although closure objectives have not been finalised, one of the options that will be considered is rehabilitation back to grazing potential land.

3.1.8 TIMING

Life of the project

The construction phase is expected to have a duration of 28 months. The operational phase is expected to have a duration of 15 years. If the project is approved, construction will commence toward the middle of 2014.

3.2 RELEVANT NEMA LISTED ACTIVITIES

The relevant NEMA listed activities that may require authorisation in terms of Regulation 544, Regulation 545 and Regulation 546 are included in Table 11 below.

TABLE 11: RELEVANT NEMA ACTIVITIES CURRENTLY BEING APPLIED FOR

Regulation	Activity No	Listed activity:	Description of Listed Activity
R.544 of 2010	1	The construction of facilities or infrastructure for the generation of electricity where: (i) the electricity output is more than 10 megawatts but less than 20	Diesel powered electricity generators used at construction phase will be in the region of 7.5MW

		megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare	– 10MW. The final output will be confirmed once specific details are known.
	10	The construction of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	The Lehating power transformer (substation) will have the capacity to step power from the external powerline (expected to be 132kV) to 11kV required on site.
	11	The construction of: (i) canals (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; or (x) buildings exceeding 50 square metres in size; or (i) infrastructure or structures covering 50 square metres 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 river crossing is proposed over the Kuruman River so as to provide access to Portion 1 of Lehating 741 from Portion 2 of Wessels 227.
	12	The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010.	The proposed project will require the construction of return water and stormwater control dams.
	13	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.	The proposed project will require the storage and handling of fuel with a combined capacity exceeding 80 cubic metres.
	18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i) a watercourse (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater – but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a	The construction of the proposed river crossings may require the excavation, removing and/or removal of soil in excess of $5m^3$ from a watercourse.

		management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line.	
	22	The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 metres or, (ii) where no reserve exists where the road is wider than 8 metres, or (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.	Preliminary design information indicates that the access road on Lehating and Wessels will be wider than 8m.
	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):	Prior to removing or damaging any protected plant species, the necessary permits will be required from the Department of Agriculture, Forestry and Fisheries (DAFF) as well as from DENC in terms of the National Forests Act, 84 of 1998 and authorisation from the Department of Nature Conservation (DENC) in compliance with the Northern Cape Nature Conservation Ordinance (Schedule 4).
R.545 of 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. 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 the Act will apply.	The proposed Lehating project will require the submission of a Water Use Licence application for the control of pollution from the tailings dam and waste rock facilities.
	15	Physical alternation of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this schedule will apply.	The total site area that will be transformed will exceed 20 hectares.
	19	The construction of a dam, where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.	The proposed project will require the construction of return water and stormwater control dams.
R.546 of 2010	2	The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic meters;	The proposed project will require the construction of return water and stormwater control dams that are

		(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;	calculated as having a combined capacity of more the 250 cubic meters.
	3	The construction of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purpose; (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;	The proposed project will require the construction of a telecommunication mast or tower.
	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;	The project area is located near to a Sensitive Area and will require the construction of a road wider than 4 metres.
	9	The construction of above ground cableways and funiculars; (a) in the Northern cape Province; (ii) Outside urban areas.	The proposed project will require the construction of conveyors.
	10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in container with a combined capacity of 30 but not exceeding 80 cubic metres. (a) in the Northern Cape province: (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;	The proposed project will require the storage and handling of fuel with a combined capacity exceeding 30 cubic metres.
	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 project will require the removal of indigenous vegetation for the establishment of the proposed main and ventilation shafts and surface infrastructure.
	16	The construction of: (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. (dd) Sensitive areas as identified in	In order to facilitate access to the proposed project site, a river-crossing road will be constructed over the Kuruman river.

		an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.	

NEM:WA listed activities that could also be triggered include:

Category A

1: The temporary storage of general waste; and

2: The temporary storage of hazardous waste.

Category B

7: The treatment of effluent, waste water or sewage; and

11: The construction of facilities for activities listed in Category B.

3.3 CONFIRMATION OF IAP CONSULTATION AND AGREEMENT ON POTENTIAL IMPACTS

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

3.4 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.

3.5 POTENTIAL HERITAGE ENVIRONMENT IMPACTS

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

3.5.1 PALEONTOLOGICAL, ARCHAEOLOGICAL, HERITAGE AND CULTURAL RESOURCES

Loss of or damage to paleontological, archaeological, heritage and cultural resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Paleontological, archaeological, heritage and cultural resources of varying significance are expected to occur in and around the project area. It is possible that the project could impact some of these resources.

The additional work required to address these issues is described in Section 0 of the scoping report.

3.6 POTENTIAL SOCIO-ECONOMIC ENVIRONMENT IMPACTS

A list and description of potential impacts identified on the socio-economic conditions of any person on the property, and on any adjacent or non-adjacent property which may be affected by the proposed mining operation, is provided below.

3.6.1 LAND USE

Impact on existing surrounding agricultural and residential uses

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The land use of the project site will be changed during the construction, operational and decommissioning phases of the proposed project. The proposed site is used for grazing and the proposed development may prevent access to this grazing land for the operational, decommissioning and closure phases. At this stage it is anticipated that some of the proposed surface infrastructure areas will be returned to their current land use after mine closure, however some infrastructure such as the proposed tailings facility and WRD may remain in perpetuity.

In addition, adjacent land uses, such as wilderness/conservation, residential and grazing could potentially be affected by one or more impacts associated with the mining activities. Associated issues may include disruption to surrounding land uses, reduced quality of life for surrounding residential areas and potential for change in property values.

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

3.6.2 TRANSPORT SYSTEMS

Issue: Disturbance of roads by project-related traffic

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The proposed Lehating mine will be accessed via a gravel road on portion 2 of Wessels 227 which will be constructed off the gravel provincial R380 road. It is considered likely that additional traffic on this local road network will be generated during the construction phase by vehicles transporting construction workers and construction materials to and from the site. Similar levels of traffic are likely to be expected during the decommissioning phase.

During the operational phase, transportation will be required for workers, consumables and product. This will result in more traffic than any other project phase.

The increase in traffic on local roads during the construction, operation and decommissioning phase of the proposed project may result in service level and safety impacts on the public road network, as well as road users. The additional work required to address this issue is described in Section 6.1.5 of the scoping report.

3.6.3 BLASTING

Issue: damage from blasting

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

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 once surface blasting is complete (for the initial shaft development), the potential for fly rock and air blast related impacts is eliminated and vibration impacts are reduced the deeper underground blasting occurs.

The focus of the blasting assessment will be on cattle, cattle minders, residences and road users.

The additional work required to address this issue is described in Section 6.1.6 of the scoping report.

3.7 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.

3.7.1 ECONOMIC IMPACTS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The project will result in positive economic benefits through wages, taxes, procurement and foreign exchange income. In the case of wage related employment the impact of creating 320 temporary construction jobs and 350 operational jobs will be magnified through the multiplier effect of increased

spending power in local and regional economies. During the decommissioning phase it is anticipated that temporary jobs will also be created, however the number of jobs is not known at this stage. At closure of the relevant mine sections, 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 potential for negative economic impacts after the operational phase when employment is reduced.

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

3.7.2 SOCIAL IMPACTS

There is potential for the following impacts to occur during the construction, operational and decommissioning phases:

- influx of people into the area in search of work, leading to informal settlements and associated problems of crime, disease, and social disruption; and
- increased pressure on housing and related services (water, power, sanitation, rubbish removal, schooling);

The additional work required to address all of these issues is described in Section 6.1.15 of the scoping report.

3.8 POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS

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

3.8.1 GEOLOGY

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 target minerals therefore the impact that the proposed Lehating project will have on the geology will be high in all project phases. It is also important

that no future resources become sterilised either through the mine design or through the disposal of mineralised waste.

The additional work required to address this issue is described in Section 6.1.1 of this scoping report.

3.8.2 TOPOGRAPHY

Issue: Hazardous excavations and infrastructure

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. The proposed Lehating project may have the potential to alter the topography through the introduction of new infrastructure which may present safety risks.

Hazardous excavations and infrastructure occur in all mine phases from construction through operation to decommissioning and closure.

The additional work required to address this issue is described in Section 6.1.2 of this scoping report.

3.8.3 SOIL AND LAND CAPABILITY

Issue: Loss of soil and change in land capability through pollution, erosion or compaction

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

Topsoil is generally a resource of high value containing a gene bank of seeds of indigenous species.

The proposed project will result in disturbance of the land surface and associated topsoil in all project phases. A loss of topsoil (through pollution, erosion or compaction) would generally result in a decrease in the rehabilitation and future land use capability of any land that is disturbed by the project.

The additional work required to address this issue is described in Section 6.1.3 of this scoping report.

3.8.4 FAUNA AND FLORA (NATURAL PLANT AND ANIMAL LIFE)

Issue: Loss of natural vegetation and animal life

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The proposed projects will require the clearing of land and habitat for the establishment of infrastructure and this has the potential to impact negatively on plant and animal life in the project sites and adjacent areas.

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

3.8.5 HYDROLOGY (SURFACE WATER)

Issue: Alteration of surface drainage patterns

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The proposed project site is located within the vicinity of the ephemeral Kuruman River water course which the access road has to cross. The diversion of clean water and the retention of water in dirty areas has the potential to impact on drainage patterns.

The alteration of drainage patterns may also result in secondary impacts on fauna and flora, either through the direct disturbance of habitat and individuals or by the reduction of the availability of water to sustain plant and animal life.

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

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 throughout the duration of the projects. The potential pollution sources associated with the proposed projects include: sewage, fuel, lubricants, non-mineralised waste

(hazardous and general), run-off from the mineralised waste and erosion of particles from exposed soils in the form of suspended solids.

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

3.8.6 GROUNDWATER

Issue: Reducing groundwater levels and availability

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

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 on groundwater.

The additional work required to address this issue is included in Section 6.1.9 of this scoping report.

Issue: Contamination of groundwater

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 groundwater quality throughout the duration of the projects. The potential pollution sources associated with the proposed projects include: ad-hoc spills, sewage, fuel, lubricants, non-mineralised waste (hazardous and general) and run-off/seepage from the mineralised waste facilities.

The additional work required to address this issue is included in Section 6.1.9 of this scoping report

3.8.7 AIR QUALITY

Issue: Pollution from emissions to air

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The proposed project has the potential to present a number of pollution sources that can have a negative impact on air quality if unmanaged. Typically, the following pollution sources may exist: dust clouds from

initial surface blasting, wind erosion from exposed surfaces, vehicle tail-pipe emissions and fugitive dust from un-surfaced roads.

The additional work required to address this issue is described in Section 6.1.10 of this scoping report.

3.8.8 NOISE

Issue: Increase in disturbing noise levels

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

Site clearing activities, vehicle movements and blasting on site have the potential to increase the ambient noise levels in the immediate vicinity of the proposed project sites during the construction phase. During the operational phase general mining activities and processing activities will also increase ambient noise levels during the operational phase. Limited noise is expected post closure.

The additional work required to address this issue is described in Section 6.1.11 of this scoping report.

3.8.9 VISUAL ASPECTS

Issue: Negative visual impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion:

The mine will alter the visual character of the project area. The proposed project area is situated in a remote setting. There are however several private landowners' located within a 5km radius, and whose properties may overlook the proposed site and from whose properties the proposed project areas are/could be visible.

The additional work required to address this issue is described in Section 6.1.12 of this scoping report.

3.9 POTENTIAL CUMULATIVE IMPACTS

Potential cumulative impacts are those for which the incremental changes associated with the proposed projects will cumulatively add to existing environment which may already be experiencing impacts. In this regard, the following are considered cumulative impacts and these will be assessed in accordance with the terms of reference for each individual impact set out in Section 6:

- fauna and flora – loss of natural vegetation and animal life (only temporarily);
- surface water – alteration of surface drainage patterns or contamination of surface water;
- groundwater – reduction of groundwater levels and availability or contamination of groundwater;
- air quality - pollution from emissions to air;
- noise – increase in disturbing noise levels;
- visual – negative visual aspects;
- socio-economic impacts;
- traffic and road impacts; and
- land use impacts.

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; and
- the “no-go” alternative.

4.1 LAND USE ALTERNATIVES

A list and description of the current land uses that exist on the proposed project site or on adjacent or non-adjacent properties that may be affected by the proposed mining operation is provided in Section 2.4.1. Given current land uses, the most obvious alternative to mining is livestock grazing.

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.

Aside from the cattle grazing, conservation and recreational use, no land developments have been identified which may be affected by the proposed development.

4.3 PROJECT ALTERNATIVES AND IAPS PROPOSAL TO ADJUST PROJECT PLAN

4.3.1 INFRASTRUCTURE LAYOUT ALTERNATIVES

No on-site layout alternatives have been considered. The chosen layout is influenced by the location of the target ore body. Alternatives may be required for the access road, but this depends on the outcome of the discussions with Ntsimbintle and Lehating.

4.3.2 IAP PROPOSALS TO ADJUST PROJECT PLAN

This section provides a description of proposals made 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. Given the issues raised to date, there is no

requirement to change the on-site project plan but there may be a need to reconsider the access road, dependant on the outcome of the discussions with Ntsimbintle and Lehating.

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 6.1 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 overall project team, which consists of Lehating Mining, TWP lead engineers and other engineering companies, and SLR, aims to develop the project infrastructure layout and plan in a manner which will minimise impacts to the socio-economic, cultural and biophysical environment. Should impacts be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by IAPs and the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project. Further detail will be provided in the EIA and EMP report.

Given the issues raised to date, there is no requirement to change the on-site project plan but there may be a need to reconsider the access road, dependant on the outcome of the discussions with Ntsimbintle and Lehating.

4.5.2 PROJECT PLAN TO AVOID POTENTIAL IMPACTS

This section describes the most appropriate procedure to plan and develop the proposed mining operation with due consideration of the issues raised in the consultation process.

As indicated above, the overall project team aims to develop the project infrastructure layout and plan in a manner which will minimise impacts to the socio-economic, cultural and biophysical environment. Should impacts be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by IAPs and the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project. Further detail will be provided in the EIA and EMP report.

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 community representatives, landowners, land users, and others IAPs to inform them in sufficient detail of the proposed projects, in order for them to form an opinion on related impacts.

5.1.1 DATABASE

The database for the proposed Lehating project was developed using databases from previous and ongoing projects in the project area and supplemented with information on IAPs provided in the focused meetings and social scan.

5.1.2 NOTIFICATION

The landowners, land users, ward councilors, and regulatory authorities (provincial and local) 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 sites and block advertisements were placed in the Kalahari Bulletin and Kathu Gazette newspapers on 1 and 3 November 2012 respectively. Photographs of the site notices and copies of the newspaper advertisements are provided in Appendix B.

5.1.3 SCOPING MEETINGS

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

- one authorities meeting was held on 27 November 2012 at the Hotazel Recreation Club; and
- one public scoping meeting was held on 27 November 2012 at the Hotazel Recreation Club.

The meetings provided background information for the project and the environmental process being followed. The meetings were therefore focussed on:

- informing IAPs and regulatory authorities 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 at the project sites and obtaining input thereon;
- providing information about the potential impacts of the project and obtaining input thereon; and

- providing an opportunity for IAPs and regulatory authorities to raise issues and concerns. These issues and concerns have been documented in the Issues and Concerns Report (Appendix D) 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 and Appendix D.

5.1.4 REVIEW OF SCOPING REPORT

The scoping report will be made available for public review from 15 April 2013. 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 Public Library;
- SLR's offices in Johannesburg;
- electronically on a CD, will be made available to IAPs on request.

Summaries of the report will be sent by post or e-mail to all IAPs and authorities on the project's public involvement database. In addition, IAPs will be notified when the report is available for review via SMS.

5.2 IAPS CONSULTED DURING SCOPING PHASE

This section discusses which of the identified stakeholders were in fact consulted during the Scoping Phase.

IAPs that are registered on the project database have been consulted during the scoping phase (see Appendix C).

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 D.

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 D.

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 D. Issues pertained to:

- procedural related issues;
- technical/project related issues;
- access to minerals;
- groundwater issues;
- roads, transport and traffic issues;
- heritage;
- economic and infrastructure development, employment issues;
- communication; and
- emergency procedures.

5.6 MEETING MINUTES AND RECORDS OF CONSULTATIONS

Copies of the minutes and attendance registers are included in Appendix B and the issues and concerns report is also provided in Appendix D.

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 D. The only objection received to date is from Ntsimbintle, and relates to the potential impact of the access road on its prospecting right. This issue will be dealt with in discussions with Lehating and Ntsimbintle.

6 FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY

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/EMP report. Where relevant, the assessments will be cumulative in nature. A list of potential cumulative impacts is provided in Section 3.9.

6.1.1 GEOLOGY - DISTURBANCE AND STERILISATION OF MINERALS

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

6.1.2 TOPOGRAPHY - HAZARDOUS EXCAVATIONS AND INFRASTRUCTURE

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

6.1.3 SOIL AND LAND CAPABILITY - POLLUTION, EROSION OR COMPACTION

It is proposed that a specialist investigation be conducted by ARC-Institute for Soil, Climate and Water to:

- classify the different soil types and produce a soils distribution map;
- confirm and quantify the natural land capabilities;
- identify and assess the potential impacts on these soil types and land capabilities; and
- have input together with SLR and Lehating into management and mitigation measures.

6.1.4 LAND USE-IMPACT ON EXISTING SURROUNDING AGRICULTURAL AND RESIDENTIAL USES

SLR will assess the potential impacts on land use and surrounding land users with the following objectives:

- identifying land uses on and surrounding the project area;
- identifying and assessing the potential impacts on these land uses by considering the cumulative effects of biophysical, social and economic impacts;
- having input together with Lehating into management and mitigation measures for the EMP.

6.1.5 TRANSPORT SYSTEMS-DISTURBANCE OF ROADS BY PROJECT-RELATED TRAFFIC

It is proposed that Siyazi conduct a specialist investigation to:

- conduct traffic counts with a view to establishing baseline traffic levels;
- inspect the condition of the R380 and proposed access road;
- assess the impact of the project on the roads and traffic levels; and

- have input together with SLR and Lehating into management and mitigation measures.

6.1.6 BLASTING-DAMAGE FROM BLASTING

SLR will conduct a blasting specialist investigation to:

- review the proposed blast management programme;
- assess the impact of blasting on surrounding receptors; and
- have input together with SLR and Lehating into management and mitigation measures.

6.1.7 NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)-LOSS OF NATURAL VEGETATION AND ANIMAL LIFE

It is proposed that Ecological Management Services conducted a detailed ecological investigation to:

- identify and map different habitats in the proposed project area;
- review of distribution lists (including Red Data species) of fauna and flora species to provide reference data against which the findings of the field surveys can be compared;
- survey the areas that are required for surface infrastructure;
- assign species to each habitat through various trapping and sampling methods;
- verify whether any Red Data species or any other sensitive species identified are located within the proposed project area. The locality of any identified sensitive species must be recorded and mapped;
- rank each habitat type based on conservation importance (in terms of provincial biodiversity priorities) and ecological sensitivity;
- identify potential impacts on ecology;
- have input together with SLR and Lehating into management and mitigation measures.

6.1.8 HYDROLOGY (SURFACE WATER)-ALTERATION OF SURFACE DRAINAGE PATTERNS OR CONTAMINATION OF SURFACE WATER

SLR will conduct the surface water study. The investigation will include the following tasks:

- determine climatic data (including mean monthly and annual rainfall for the site and number of days per month with measurable precipitation, mean monthly, maximum and minimum temperatures, mean monthly evaporation);
- develop a baseline hydrological description of the site and immediate surrounds;
- determine flood peaks and volumes;
- have input into the identification and assessment of the potential surface water impacts; and
- provide input, together the technical project team, into surface water management measures going forward.

6.1.9 GROUNDWATER-REDUCING GROUNDWATER LEVELS AND AVAILABILITY OR CONTAMINATION OF GROUNDWATER

SLR will conduct a detailed investigation that will address potential impacts on groundwater resources. The investigation will include the following tasks:

- characterise the baseline geohydrological environment;
- model the dewatering impacts of the proposed underground mine;
- model the potential pollution dispersion associated with the mine and associated infrastructure;
- assess the significance of dewatering and contamination impacts; and
- provide input, together with technical project team into project alternatives and groundwater management measures going forward.

6.1.10 AIR QUALITY-POLLUTION FROM EMISSIONS TO AIR

It is proposed that Airshed Planning Professionals conduct a qualitative air quality assessment to:

- characterise the existing climatic environment;
- identify potential dust and other emission sources from the project;
- model the impact from these emission sources;
- undertake a first level screening of existing and potential emission sources in terms of potential health impacts through the comparison of predicted concentrations to ambient South African standards; and
- provide input, together with SLR and the technical team into air quality management and mitigation measures going forward.

6.1.11 NOISE-INCREASE IN DISTURBING NOISE LEVELS

SLR will make use of the findings from previous noise studies done for similar mining operations in the area to:

- qualify existing ambient noise conditions;
- assess the impact of the project on the existing environment;
- have input together with Lehating into management and mitigation measures.

6.1.12 VISUAL ASPECTS-NEGATIVE VISUAL IMPACTS

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

6.1.13 ARCHAEOLOGICAL, CULTURAL, PALEONTOLOGICAL AND HERITAGE RESOURCES

It is proposed that PGS conduct a specialist investigation to

- identify archaeological, cultural, heritage and paleontological resources within the project area;

- assess the impact of the project on identified resources; and
- have input together with SLR and Lehating into management and mitigation measures.

6.1.14 ECONOMIC AND SUSTAINABILITY ANALYSIS

Strategy for Good will conduct an economic and sustainability analysis in order to meet the requirements of the DMR EIA and EMP report template in terms of Regulation 50 of the MPRDA. The investigation will include the following tasks:

- quantification of the economic impacts of the project;
- comparative land economic value-add assessment; and
- sustainability analysis.

6.1.15 SOCIAL ISSUES

SLR will undertake the social impact assessment to:

- understand the baseline social environment, including a baseline review of people residing adjacent to the proposed project;
- identify and assess both positive and negative social impacts; and
- have input together with Lehating into management and mitigation measures for the EMP.

6.2 METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES

The proposed method for the assessment of environmental issues is set out in Table 12 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 12: 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	Long term	**H**	**Medium**	**Medium**	**Medium**
	Medium term	**M**	**Low**	**Low**	**Medium**
	Short term	**L**	**Low**	**Low**	**Medium**

SEVERITY = M

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

SEVERITY = H

DURATION	Long term	**H**	**High**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	**High**
	Short term	**L**	**Medium**	**Medium**	**High**
			L	**M**	**H**
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
			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 high level comparison between the existing situation without the project and the possible future situation with the project, as assessed in the EIA/EMP report. This comparison will take existing and future impacts into account, including both positive and negative impacts.

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 underground and surface infrastructure will be designed by appropriately qualified professional engineers at TWP 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, 36 of 1998.

6.5 CLOSURE COST ESTIMATE

The proposed Lehating Mine's closure cost estimate will be calculated by SLR Consulting using the current DMR method.

6.6 WAY FORWARD FOR SCOPING

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, DENC, the DMR and other regulatory authorities; and
- receive comments and address these in the EIA phase.

6.7 PLAN OF STUDY FOR THE EIA PHASE

This section describes the nature and extent of further investigations (Section 6.1) required, including any specialist studies that may be required, and sets out the proposed approach to the EIA and EMP phase.

6.7.1 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 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;
- undertake consultations with IAPs and provide them with an opportunity to review and comment on the outcomes of the environmental assessment process and acceptability of mitigation measures;
- develop an environmental management plan and a conceptual closure/decommissioning plan; and
- 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.

6.7.2 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 13: PROPOSED EIA TEAM

Team	Name	Designation	Tasks and roles	Company
Project management	Brandon Stobart	Project reviewer	Process management, stakeholder engagement, and report compilation.	SLR Consulting (Africa) (Pty) Ltd
	Victoria Tucker	Project manager		
	Suan Mulder	Stakeholder engagement assistant	Assistance with public participation process	
Proposed specialist team	Hanlie Liebenberg-Enslin	Air quality and noise specialist	Air quality and noise assessment	Airshed Planning Professionals (Pty) Ltd
	Garry Paterson	Soil and land capability specialist	Soil and land capability assessment	ARC-Institute for Soil, Climate & Water
	J. Reyneke and Theo Rossouw	Groundwater specialist	Groundwater assessment	SLR Consulting (South Africa) (Pty) Ltd
	Jenny Ellerton	Geochemical specialist	Acid Rock Drainage and Geochemical report	SLR Consulting (Africa) (Pty) Ltd
	Mark Bollaert	Surface water specialist	Surface water and floodline assessment	SLR Consulting (Africa) (Pty) Ltd
	Natalie Birch	Biodiversity specialist	Biodiversity assessment	Ecological Management Services
	Wouter Fourie	Heritage specialist	Heritage and culture assessment	Professional Grave Solutions (Pty) Ltd
	Paul van der Westhuizen	Traffic specialist	Traffic impact assessment	Siyazi Gauteng

	Gerrie Muller	Economic specialist	Economic impact assessment	Strategy4Good

6.7.3 EIA/EMP PHASE ACTIVITIES AND TIMING

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

TABLE 14: EIA/EMP ACTIVITIES AND TIMING

Objectives	Corresponding activities and estimated dates
Further investigations (April 2013 to July 2013)	
• Describe the affected environment • Define potential impacts • Give management and monitoring recommendations	• Investigations by technical project team and SLR of issues identified during the scoping stage including investigations into alternatives.
EIA/EMP phase (April 2013 to August 2013)	
• Assessment of potential environmental impacts • Design requirements and management and mitigation measures • Receive feedback on application	• Compilation of EIA and EMP report. • Distribute EIA and EMP report to IAPs and other regulatory authorities for review (August 2013). • Feedback meetings with authorities and IAPs as required (September 2013). • Record comments (September 2013). • Forward IAP comments to DMR (October 2013). • Circulate record of decision to all registered IAPs (December – February 2013).

6.7.4 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); and
- 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.

6.7.5 PUBLIC INVOLVEMENT PROCESS IN EIA PHASE

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

Focused involvement

As part of the various investigations that form part of the EIA tasks focused meetings with key stakeholders 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/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.

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

Once the DMR has issued its decision, the IAPs will be notified by e-mail, and post in accordance with the instructions from the DMR.

7 SUMMARY AND CONCLUSIONS

The scoping phase of the EIA catering for the proposed underground manganese mine near Hotazel has been completed and the scoping report will be made available for public review. Comments received from the review process will be incorporated into the comments and response report and where necessary the scoping report will be amended to cater for these comments. Stakeholder engagement will continue throughout the EIA/EMP amendment process.

The scoping phase of the EIA has identified potential environmental impacts associated with the surface infrastructure and underground mining activities in the project area. These potential impacts will be investigated in accordance with the proposed terms of reference in Section 6 of this report and with input from specialist consultants where necessary.

Victoria Tucker
Project Manager

Brandon Stobart (EAPSA)
Reviewer

8 REFERENCES

ARC Institute for Soil, Climate and Water, March 2012: *Soil Information for Proposed Mining Operation for Lehating Mine, Near Hotazel*

Ecological Management Service, September 2011: *Ecological survey for the proposed manganese mine on the property Lehating 741, near Black Rock, Northern Cape*

Metago Environmental Engineers, April 2011: *Groundwater Report for Lehating 741.*

Mucina & Rutherford, 2006: *The Vegetation Map of South Africa, Lesotho and Swaziland*. SANBI, Pretoria.

Partridge, T.C., Botha, G.A. and Haddon, I.G. (2006): *Cenozoic deposits of the interior*. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J. (Eds.), The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria, 585 – 604.

Professional Grave Solutions (Pty) Ltd (PGS), 2010: *Heritage Impact Assessment for Lehating Mining (Pty) Ltd for the proposed underground manganese mine on portions of the farm Lehating 714, approximately 20km northwest of Hotazel, Northern Cape Province*

SLR Consulting (Africa) (Pty) Ltd, February 2012: *Lehating Manganese Mine Acid Rock Drainage and Geochemical Report*

SLR Consulting (Africa) (Pty) Ltd, March 2012: *Lehating Mine Surface Water Management Plan*

SLR Consulting (Africa) (Pty) Ltd, April 2012: *Desktop Groundwater Assessment for Lehating Mining Pty Ltd*

: *Lehating Manganese Mine Bankable Feasibility Study*

B: 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:	**Nico Hager**
Company:	**Lehating Mining (Pty) Ltd**
Identity number:	**2006/032350/07**

APPENDIX A: PROOF OF DENC APPLICATION

- NEMA application submitted to DENC (21 August 2012)
- DENC acknowledged receipt of application (3 October 2012)

APPENDIX B: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS

- Proof of landowner notification
- Background Information Document
- Site notices
- Photographs of site notices
- Advertisements
- Correspondence to and from IAPs
- Correspondence to and from Regulatory Authorities
- Regulatory Authorities scoping meeting attendance register and minutes
- Public scoping meeting attendance register and minutes
- Regulatory Authority and Public Scoping Meeting Presentation

APPENDIX C: INTERESTED AND AFFECTED PARTY DATABASE

APPENDIX D: ISSUES AND CONCERNS REPORT

RECORD OF REPORT DISTRIBUTION

Project Number:	710.12015.00001
Title:	Scoping Report for the Proposed Lehating Manganese Mine near Hotazel
Report Number:	1
Proponent:	Lehating Mining (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Ephesia Semenya	Department of Minerals Resources	1 - 5	April 2013	V Tucker
Marvin Matthews	Department of Nature Conservation	6 - 11	April 2013	V Tucker
Noami Mashishi	Northern Cape Department Agricultural, Land Reform and Rural Development;	12	April 2013	V Tucker
Katie Smuts	South African Heritage Resource Association	Electronic copy	April 2013	V Tucker
Lerato Mokhoantle	Northern Cape Department of Water Affairs;	13	April 2013	V Tucker
Jacoline Mans	Northern Cape Department of Agriculture, Forestry and Fisheries;	14	April 2013	V Tucker
Kennith Lembowane	Northern Cape Department of Rural Development and Land Reform (Provincial Office)	15	April 2013	V Tucker
Itumeleng Bulane	Northern Cape Department of Roads and Public Works	16	April 2013	V Tucker
Seneo Seleka	Joe Morolong Local Municipality - Environmental Manager	17	April 2013	V Tucker
Klaas Teise	Acting Director - Economic Development Department John Taolo Gaetsewe District Office	18	April 2013	V Tucker
Vinene Wessels	Hotazel Public Library	19	April 2013	V Tucker
Librarian	SLR's offices in Johannesburg	20	April 2013	V Tucker
Nico Hager	Lehating Mining (Pty) Ltd	21	April 2013	V Tucker