Technical Report

AS-R-2012-12-13

Draft Scoping Report as part of the Environmental Impact Assessment process for the proposed construction and operation of Lesego Platinum Mine and associated infrastructure located on the farms Koppieskraal 475 KS, Spelonk 478 KS, Dal Josaphat 461 KS, Olifantspoort 479 KS, Eerste Regt 502 KS, Zaaikloof 480 KS and Stofpoort 481 KS, Limpopo Province

Prepared for: **Lesego Platinum Mining (Pty) Ltd**

December 2012

Document version 1 – Draft

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Technical report: AS-R-2012-12-13

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December 2012

Conducted on behalf of:

Lesego Platinum Mining (Pty) Ltd

Compiled by:

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C Smith (BHSC Hons. Archaeology)

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REPORT DISTRIBUTION LIST

Name	Institution
I&APs	Refer to Appendix A5
Director	Limpopo Department of Economic Development, Environment & Tourism
Richard Montjoie	Lesego Platinum Mining (Pty) Ltd

DOCUMENT HISTORY

Report no	Date	Version	Status
AS-R-2012-12-13	13 December 2012	1.0	Draft for Comments

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Executive Summary

1. Introduction

Africa Geo-Environmental Services (Pty) Ltd (AGES), was appointed by Lesego Platinum Mining (Pty) Ltd to facilitate the Scoping and Environmental Impact Assessment (EIA) Process contemplated in the National Environmental Management Act, 107 of 1998 read with the Environmental Impact Assessment Regulations 2010, for the proposed mining activities on the farms Koppieskraal 475 KS, Spelonk 478 KS, Dal Josaphat 461 KS, Olifantspoort 479 KS, Eerste Regt 502 KS, Zaaikloof 480 KS and Stofpoort 481 KS, Limpopo Province.

The Scoping and EIA Process is being undertaken in support of an environmental authorisation application submitted to the Limpopo Department of Economic Development, Environment and Tourism in terms of the National Environmental Management Act (Act No 107 of 1998) (NEMA) read with the Environmental Impact Assessment Regulations, 2010 (GNR 543 of 2010) (EIA Regulations).

The proposed project will involve platinum mining activities and related infrastructure. The resource battery limit of the identified platinum resources is 350 m below ground surface. The ore body underlying the site consists of Merensky as well as UG2 reefs, which will be exploited via access from two vertical shafts. The shaft system will go to a depth of 1700 m with one shaft to be used for man and material and the other for ventilation. Mining will consist of two phases, with phase 1 having an eight years life of mine and phase 2 a fifteen years life of mine.

The proposed site is located on the farms Koppieskraal 475 KS, Spelonk 478 KS, Dal Josaphat 461 KS, Olifantspoort 479 KS, Eerste Regt 502 KS, Zaaikloof 480 KS and Stofpoort 481 KS. The proposed site is located next to the Phosiri dome, also known as the Zaaikloof or Fortdraai dome, in the Limpopo Province of South Africa and is approximately 240 km north east of Johannesburg and 65 km northwest of Burgersfort.

2. Approach to the Study

Lesego Platinum Mining (Pty) Ltd submitted the environmental authorisation application in terms of section 24 of the NEMA read with regulation 26 of the EIA Regulations on the 26th of April 2012 to the Limpopo Department of Economic Development, Environment and Tourism (LEDET). Acknowledgement of receipt of the application was received from LEDET on the 26th of April 2012 and a reference number was subsequently issued,

namely: 12/1/9/2-C17.

In addition, a Mining Right Application will submitted to the Department of Mineral Resources (DMR).

AGES has been appointed to undertake the Scoping and EIA process on behalf of Lesego Platinum Mining (Pty) Ltd.

3. Project Description

The proposed project will involve platinum mining activities and related infrastructure. The resource battery limit of the identified platinum resources is below 350 m below ground surface. The ore body underlying the site consists of Merensky as well as UG2 reefs within the Bushveld Igneous Complex, which will be exploited via access from two vertical shafts. The mining method will be mechanised long hole open stoping from depths of 350 m to 1,200 m and then conventional breast stoping using scraper cleaning on the stope faces, strike and dip gullies from depths of 1,200 m to 2,350 m. Ore will be processed at an onsite processing plant, and tailings will be disposed of at an on-site tailings disposal facility (TDF).

The overall life of mine for the combined deposits will be approximately 60 years.

<u>Infrastructure Requirements</u>

Envisaged infrastructure will comprise of the following:

- Underground mining infrastructure;
- A tailings disposal facility (TDF);
- A processing plant and associated infrastructure;
- Offices and workshops;
- Water management and distribution infrastructure;
- A 132 kV electricity line;
- Diesel storage facilities;
- Sewage treatment plant;
- Water treatment plant;
- Haul and access roads and bridges
- Perimeter and internal fencing;
- Waste rock dumps; and
- Topsoil stockpiles.

4. Public Participation

The details of the public participation process as well as a summary of the issues raised by interested and affected parties (I&APs) and the Environmental Assessment Practitioner's (EAP) response to the issues raised as contemplated in regulation 28(a) and 29(1)(h) of the EIA Regulations 2010 are captured in a Comments and Response Report which will be submitted along with this Scoping Report.

Preliminary key issues raised by the I&APs include *inter alia* the following:

- Ecological Impact
    - Guarantee of rehabilitation of the area after mining
- Groundwater Impact
- Surface water Impact
    - Impact of contaminated water on the Olifants River
    - Control of contaminated water
- Air Pollution
- Heritage Impact
    - Impact on graves and old buildings
    - Respect for cultural sites
    - Preservation of graves
- Socio-economic impacts
    - Communication and interaction with local community
    - Job creation, social investment, health, safety and security
    - Outsourcing of non-core business to local community
    - Skill training for local community

- Sustainable development projects
- Request for assistance with community projects
- Access to the Social Labour Plan (SLP)

- Change of land use

5. The Site

- The proposed site is located next to the Phosiri dome, also known as the Zaaikloof or Fortdraai dome. The dome rises approximately 950 meters above mean sea level (mamsl) reaching a maximum height of 1,112 mamsl along the southern flank and a maximum of 992 mamsl on the eastern flank (Henning, 2011). The regional topography of the study area can generally be classified as low mountainous terrain throughout most parts of the central, eastern and western sections of the study area often forming deep valleys and a gorge where the Olifants River cuts through the mountainous area.
- The site is situated within a rural area utilised for subsistence farming and rural settlements. The agricultural potential associated with the site is classified as low due to soil and climate constraints and is utilised mainly for extensive grazing purposes. The site is classified as Ohrigstad Mountain Bushveld as well as Sekhukhune Plains Bushveld. (Mucina and Rutherford, 2006).
- The study area is located within the Olifants Water Management Area and falls mainly within the Quaternary surface water catchment B52E, with parts of the site situated within B52D and B52B quaternary surface water catchments. The Olifants River is the main surface water feature on site transecting the site mainly in a north easterly direction.
- The study area is drained mainly by sheet wash with surface run-off draining into non-perennial streams that cut through the proposed development area. These non-perennial streams eventually drain into the Olifants River or one of its two main tributaries, namely the Mohlaletsi River in the south and the Pelangwe River in the north.
- The main noise source in the area is generated by traffic on the R37 situated approximately 25 km north of the site, as well as the district road running south

towards Malogeng and Apel. Less prominent noise arises from sounds generated by activities associated with the local communities.

- Early, Middle and Later Stone Age artefacts were identified across the major drainage lines in all survey areas, however not all the sites identified were of high significance. The various ruined homesteads identified across the site were classified as of low significance. Family cemeteries as well as possible unmarked graves were identified. Should any of the cemeteries or graves be impacted in any way, full grave relocations are recommended.

- There are a number of different groups in the social environment that will be affected by the proposed development:
    - Adjacent landowners;
    - People in surrounding towns and settlements; and
    - Municipalities and technical groups.

6. Alternatives

In the case of the proposed development, possible alternatives were identified through discussions with authorities, discussions with I&APs (public and focus group meetings), reviewing of existing environmental data, specialist inputs/studies and the design team. Alternatives relevant to this development can be categorized into the following:

- Location alternatives
    - Location of tailings disposal facility; and
    - Location of shaft/vent.
- Layout alternatives
    - Layout of Waste Rock Dumps
    - Layout of the Plant
- Service alternatives

- Water provision;
- Energy alternatives;
- Access alternatives; and
- Waste disposal.

- Technology Alternatives
  - TDF Construction Alternatives
- The “no-go” alternative

7. Impact Assessment

Key Impacts identified by the EAP (AGES), specialists and the public include *inter alia*:

- Groundwater impact
- Surface water impact
- Stormwater impact
- Flooding
- Air quality impact (dust)
- Land availability
- Noise pollution
- Biodiversity impact (Fauna and Flora)
- Wetland impact
- Impact on land use and land capability
- Visual impact
- Heritage impact

- Communication and interaction with local community
- Socio-economic impacts (job creation, social investment, health, safety and security, skill training, change of land use)
- The potential impact on property values and arrangements with landowners
- Potential mine rewatering and flooding after mine closure

9. Conclusion

AGES submits that the Scoping Phase was undertaken in accordance with the correct and appropriate standards and procedure for the environmental authorization application as provided for in the NEMA read with the EIA Regulations of 2010. The Scoping Study includes a description of various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment during the EIA phase. Impact significance will be assessed during the specialist studies and impact assessment phase.

The proposed specialist studies are:

- Ecological Assessment (AGES)
- Heritage Impact Assessment (AGES)
- Geohydrological and Surface Water Impact Assessment (AGES)
- Wetland Delineation and Aquatic Assessment (SAS)
- Soils and land use capability (Terrasoil)
- Noise Impact Assessment (Menco)
- Air Quality Impact Assessment (Airshed)
- Social Impact Assessment (Ptersa)
- Health Impact Assessment (Envirosim)
- Visual Impact Assessment (Newtown Landscape Architects)
- Traffic Impact Assessment (Havenga Transportation Engineers)

- Stormwater Management Plan & Floodline Delineation (AES)
- Mine Closure and Rehabilitation plan (AGES)

AGES (Pty) Ltd recommends that the project proceed into the EIA phase of the authorisation process. The EIR will address the key issues identified in the Scoping Report, at a level required to provide the public and the decision-making authorities with sufficient information to deliver a final decision.

8. Way Forward

- **Completion of the Public Participation Process (PPP).** The comments received from I&APs will be included in the Comments and Response Report which will be included in the final EIR.
- **Appointment of Specialists.** The identified specialists will be appointed to undertake the specialist studies as identified in this Scoping Report.
- **Draft Environmental Impact Report.** The results of the specialist studies will be synthesized by the project team to provide a draft EIR.
- **Draft EIR and EMPR published**. The draft EIR and EMPR will be circulated to key I&APs for comment for a period of 4 weeks (30 days).
- **Comments Report**. Comments on the Draft EIR and EMPR will be synthesised by the project team into a Comment and Response Report, which will be appended to the final Report.
- **Revise draft EIR and EMPR**. The draft report will be updated by addressing and responding to the issues raised in the Comment and Response Report as contemplated in regulation 31(2)(e) of the EIA Regulations.
- **Final EIR and EMPR.** The revised final report will be published with the various specialist reports appended. This will be submitted to the Limpopo Department of Economic Development, Environment & Tourism (LEDET).

LIST OF ABBREVIATIONS

Abbreviation	Description
AES	AGES Engineering Services
AGES	Africa Geo-Environmental Services (Pty) Ltd
ARC	Agricultural Research Council
BPEO	Best Practicable Environmental Option
CS	Community Survey
DFS	Definitive Feasibility Study
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DEAT	Department of Environmental Affairs and Tourism
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMPR	Environmental Management Programme
FAII	Fish Assemblage Integrity Index
GNR	Government Notice Regulation
LEDET	Limpopo Department of Economic Development, Environment & Tourism
I&APs	Interested and Affected Parties
IDP	Integrated Development Programme
IEM	Integrated Environmental Management
IHAS	Invertebrate Habitat Assessment System
IHIA	Intermediate Habitat Integrity Assessment
ISCW	Institute for Soil, Climate and Water
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
LOM	Life of Mine
MAMSL	Meter Above Mean Sea Level
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MRA	Mining Right Application
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)

NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NEMAQA	National Environmental Management: Air Quality Act, 39 of 2004
NHRA	National Heritage Resources Act (Act 25 of 1999)
NFA	National Forest Act (Act 84 of 1998)
NWA	National Water Act (Act 36 of 1998)
PAIA	Promotion of Access to Information Act (Act 2 of 2000)
PAJA	Promotion of Administrative Justice Act (Act 3 of 2000)
PES	Present Ecological State
PGMs	Platinum-Group Metals
PFS	Pre-Feasibility Study
PPP	Public Participation Process
RAL	Roads Agency Limpopo
ROM	Run of Mine
RVI	Riparian Vegetation Index
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SASS	South African Scoring System
TDF	Tailings Dam Facility

LIST OF DEFINITIONS

Environmental Assessment Practitioner (EAP)	Means the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the Regulations.
Environmental Impact Assessment (EIA)	Means the independent investigation conducted and EIA report compiled by AGES in compliance with environmental and mining legal requirements.
Ephemeral drainage	Means an area of land where water drains away for brief, transient periods following an influx of moisture such as from localized snowmelt or heavy precipitation.
Footprint	It is the area that will be covered by infrastructure. Anything outside the footprint will be left as is.
Interested and Affected Parties	Means an Interested and Affected Party contemplated in section 24(4)(d) of the National Environmental Management Act and which in terms of that section includes:- a) any person, group of persons or organisation interested in or affected by an activity, b) any organ of state that may have jurisdiction over any aspect of the activity.
Land Tenure right	Means any leasehold, deed of grant, quitrent or any other right to the occupation of land created by or under any law and, in relation to tribal land, includes any right to the occupation of such land under the indigenous law or customs of the tribe in question.
Mining area	Means the area for which the right to mine is granted (also see *Site*).
Site	Means the remaining extent of the farms Koppieskraal 475 KS, Spelonk 478 KS, Sal Josaphat 461 KS, Olifantspoort 479 KS, Eerste Regt 502 KS, Zaaikloof 480 KS and Stofpoort 481 KS, Limpopo Province. The proposed footprint area

	is approximately 73 km² in extent.
Public Participation Process	Means a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to the application.

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1.1 Introduction

Africa Geo-Environmental Services (Pty) Ltd (AGES), was appointed by Lesego Platinum Mining (Pty) Ltd to facilitate the Scoping and Environmental Impact Assessment (EIA) Process contemplated in the National Environmental Management Act, 107 of 1998 read with the Environmental Impact Assessment Regulations, 2010 for the proposed mining activities on the farms Koppieskraal 475 KS, Spelonk 478 KS, Dal Josaphat 461 KS, Olifantspoort 479 KS, Eerste Regt 502 KS, Zaaikloof 480 KS and Stofpoort 481 KS, Limpopo Province.

The Scoping and EIA Process is being undertaken in support of an environmental authorisation application in accordance with Regulation 543 of the EIA Regulations (2010) submitted to the Limpopo Department of Economic Development, Environment and Tourism (LEDET); as well as a Mining Right Application (MRA) to be submitted to the Department of Mineral Resources (DMR) in terms of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) read with the Mineral and Petroleum Resources Development Regulations (GNR 527 of 23 April 2004).

The resource battery limit of the identified platinum resources is 700m below ground surface. The ore body underlying the site consists of Merensky as well as UG2 reefs, Lesego Platinum Mining intend developing these into a platinum mine.

The proposed site is located next to the Phosiri dome, also known as the Zaaikloof or Fortdraai dome, in the Limpopo Province of South Africa and is approximately 240 km north east of Johannesburg and 65 km North west of Burgersfort. The proposed site is located between the local settlements of Mphahlele and Ga-Mankopane, near Lebowakgomo in the Limpopo Province. The proposed site covers an area of roughly 73 km², measuring approximately 11 km from south to north as well as east to west. General coordinates for the underground mine are:

Latitude: S -24°23'14.61"

Longitude: E 29°44'14.44"

1.2 Terms of reference

To ensure that all requirements and processes in terms of the Acts mentioned under

Section 2 are complied with the following tasks need to be conducted:

Scoping: Initial investigation, communication, assessment and consideration of the application, identification of the potential environmental impacts of the proposed development and reasonable and feasible alternatives and the preparation and submission of a Scoping Report.

Environmental Impact Assessment: Further investigation of environmental impacts identified during the Scoping Phase and submission of an EIA Report (EIR) and Environmental Management Programme (EMPr).

IWULA Application: Application for an integrated Water Use License Application with supporting studies.

1.3 Details of the applicant

Details of the Applicant	
Full name of the applicant:	Lesego Platinum Mining (Pty) Ltd
Contact person:	Mr. Richard Montjoie
Physical address:	Isle of Houghton Old Trafford No.4 Cnr Boundary and Carse O'Gowrie Road Houghton
Postal address:	Suite 201 Private Bag X30500 Houghton South Africa
Telephone number:	+27 (0)11 484 5005
Fax number:	+27 (0)11 484 5004
Email address	rmontjoie@umbono.co.za

1.4 Details of the environmental assessment practitioner

As contemplated in regulation 28(1)(a) of the Environmental Impact Assessment Regulations of 2010, the following information is pertinent with regards to the Environmental Assessment Practitioner (EAP) that has subjected the environmental authorisation application to scoping and prepared the Scoping Report in respect of the proposed development.

The expertise and qualification of the EAP referred to above are set out in the table below:

Table 1 Details of the Project Team

EAP	Qualifications	Years experience
Mr. Michael Grobler	BSc. Hons. Conservation Ecology (Pr.Sci.Nat) (US)	7.5 years
Ms. C Smith	BHSC Hons. Archaeology	4 years

Table 2 Details of the EAP

Environmental Assessment Practitioner	
Full name:	AGES (Pty) Ltd
Contact person:	Michael Grobler
Postal Address	Postnet 74, P/Bag X07, Arcadia, 0007 Pretoria
Telephone number:	012 751 2160
Fax number:	086 607 2406
Email:	mgrobler@ages-group.com

1.5 Regional Setting – Location of the Activity

The proposed site is located next to the Phosiri dome, also known as the Zaaikloof or Fortdraai dome, in the Limpopo Province of South Africa and is approximately 240 km north east of Johannesburg and 65 km north west of Burgersfort. The site is intersected by the Olifants River, leaving the farms scattered to the east and west of the river. The following coordinates serve as the centre point of the site:

Latitude: S - 24°23'14.61"

Longitude: E 29°44'14.44"

1.6 Magisterial District and Local municipality

The proposed development falls under the jurisdiction of the Lepelle-Nkumpi Local Municipality which is located in the Capricorn District Municipality and the Fetakgomo Local Municipality which is located in the Greater Sekhukhune District Municipality.

1.7 Surface Rights

The surface rights are held by the following parties:

- Remaining extent of the farm Dal Josaphat 461 KS – Frank Maisela;

- Remaining extent of the farm Spelonk 478 KS – Mphahlele Traditional Authority (previously the Bakgaga Ba-Mphahlele Tribe);
- Remaining extent of the farm Koppieskraal 475 KS – Mphahlele Traditional Authority (previously the Bakgaga Ba-Mphahlele Tribe);
- Remaining extent of the farm Olifantspoort 479 KS – Government of Lebowa / Government of South Africa (Mphahlele Traditional Authority);
- Remaining extent of the farm Eerste Regt 502 KS – Government of Lebowa / Government of South Africa (Baroka Ba-Nkwana and Tau-Mankotsana Communities)
- Remaining extent of the farm Zaaikloof 480 KS – Government of Lebowa / Government of South Africa; and
- Remaining extent of the farm Stofpoort 481 KS - Suid-Afrikaans Ontwikkelingstrust.

Lesego Platinum Mining (Pty) Ltd will enter into negotiations with the surface owners to obtain the required surface rights and/or access or rental agreements. Lesego Platinum Mining (Pty) Ltd was awarded a Prospecting Right on 16 May 2006 in respect of all minerals on the farms Dal Josaphat 461 KS, Koppieskraal 475 KS, Spelonk 478 KS, and Olifantspoort 479 KS. Prospecting rights were granted to Sweet Sensation 79 (Pty) Ltd for the farm Eerste Regt 502 KS on 21 November 2006. Both Lesego and Sweet Sensation are owned by Village Main Reef, and collectively these prospecting rights constitute the Phosiri Project Prospecting Rights.

Table 3 Legal Title Information for Phosiri Project Prospecting Rights

LICENCE OWNERSHIP	FARM NAME	MINERAL RIGHT	TYPE OF LICENCE	DATE OF ISSUE	EXPIRY DATE	LICENCE NUMBERS	AREA (HA)
Lesego Platinum Mining Limited (Lesego Farms)	Dal Josaphat 461 KS Koppieskraal 475 KS Spelonk 478 KS Olifantspoort 479 KS	Unspecified (All minerals)	New Order Prospecting Right	16th May 2006	15th May 2011	228/2006	3312.6

Sweet Sensation 79 (Pty) Limited (Eerste Regt Farm)	Eerste Regt 502 KS	PGE's and associated minerals	New Order Prospecting Right	21st November 2006	20th November 2011	83/2008	2545.0

In terms of section 19(1)(c) of the MPRDA, Lesego Platinum Mine, as the holder of the above mentioned prospecting rights, has the exclusive right to apply for and be granted a mining right in respect of the minerals and the prospecting area as provided for in the said prospecting rights. The proposed mining activities will require a mining right application to be submitted along with an Environmental Management Program (EMPR), in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002). The existing Lesego mineral right holdings do not include the farms Stofpoort 481 KS and Zaaikloof 480 KS, which are the location for the proposed Tailings Dam Facility, and will thus is in the process of being amended to include these farms by Section 102 of the MPRDA.

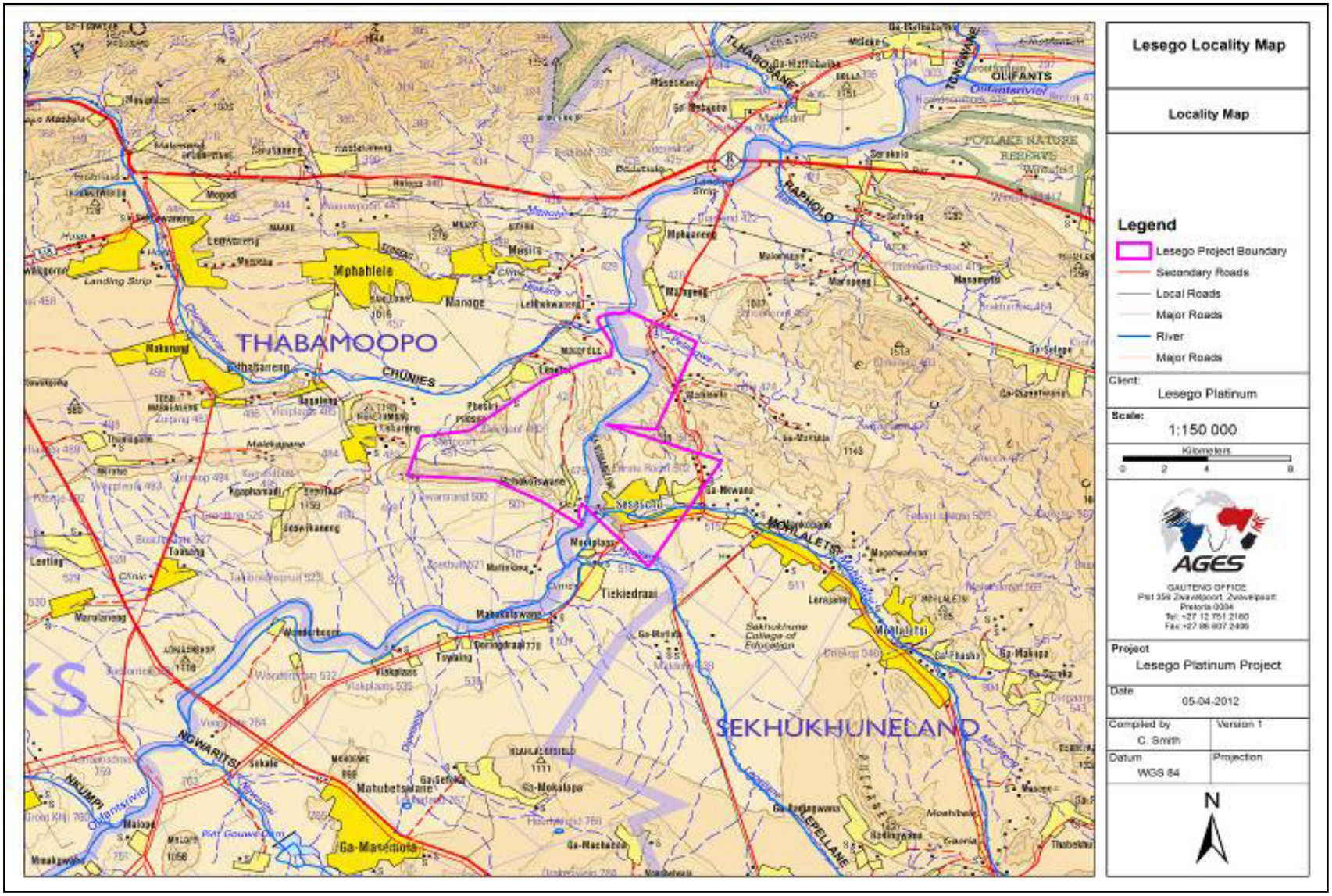

Figure 1 Locality Map

2 LEGAL FRAMEWORK

This document constitutes the Scoping Report prepared in support of an environmental authorisation application in terms of section 24 of the National Environmental Management Act (Act 107 of 1998), and as contemplated in regulation 27(f) and 28 of the EIA Regulations 2010, in addition to regulation 48(1) and 49(1) of the Mineral and Petroleum Resources Development Regulations (GNR 527 of 23 April 2004) to be submitted to the DMR in support of a mining right in terms of section 22 of the MPRDA . In addition to the statutory provisions in the NEMA and the MPRDA, more fully referred to herein below, other legislation and guidelines that have been considered in the preparation of the Scoping Report includes relevant legislation on all levels including the constitutional, national, provincial and local level. A brief summary of the legislation which are relevant to the proposed mining development are outlined below. Note that other legislative requirements may be relevant to the proposed mining development, but identification and interpretation of these will be considered in further detail as part of the EIA process. As such, the list provided below is not intended to be definitive or exhaustive and serves to highlight key mining and environmental legislation and obligations only.

2.1 Legal Content Requirements

Requirements for the contents of a Scoping Report according to Regulation 28 of the EIA Regulations 2010 and Regulation 49(1) of the MPRDA Regulations include:

NEMA Requirement	Section in Report	MPRDA Requirement	Section in Report
(a) Details and expertise of EAP	Section 1.4	(a) Describe the methodology applied to conduct scoping	Section 2.16
(b) Description of proposed activity	Section 3	(b) Describe the existing status of the environment prior to the mining operation	Section 4
(c) Description of alternatives identified	Section 7	(c) Identify and describe the anticipated environmental, social and cultural impacts, including the cumulative effects, where applicable	Section 6.4
(d) Description of property on which activity is to be undertaken and the location of the activity on the property	Section 4.1	(d) Identify and describe reasonable land use or development alternatives to the proposed operation, alternative means of carrying out the proposed operation and the consequences of not proceeding with the proposed operation	Section 7
(e) Description of environment that may be affected by the activity	Section 4	(e) Describe the most appropriate procedure to plan and develop the proposed mining operation	Section 3
(f) Indication of all legislation and guidelines that have been considered	Section 2	(f) Describe the process of engagement of identified interested and affected persons, including their view and concerns	Section 5 and Appendix A2.1
(g) Description of environmental issues and potential impacts, including cumulative impacts	Section 6.4	(g) Describe the nature and extent of further investigations required in the environmental impact assessment report.	Section 6.5

(h) Details of public participation process conducted	Section 5		
(i) Steps taken to notify potentially interested and affected parties	Section 5.2 – 5.4		
(j) Proof that notice boards, advertisements and notices notifying potentially interested and affected parties have been displayed, placed or given	Appendices A2.2, A3.2, A4.2		
(k) Copies of any representations and comments received in connection with application or scoping report form I&APs	Appendix A2.1		
(l) Copies of minutes of meetings held by the EAP with I&APs and other role players which record the views of the participants	Appendix A7		
(m) Responses by EAP to those representations, comments and views	Appendix A2.1		
(n) Plan of study for environmental impact assessment	Appendix C		
(o) Specific information required by the competent authority	Appendix D		
(p) Any other matters required in terms of sections 24(4)(a) and (b) of the Act			

2.2 The Constitution of the Republic of South Africa (Act 108 of 1996)

Section 2 of the Constitution of the Republic of South Africa (Act 108 of 1996) (CA) states that: "This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled." Section 24 of the CA, states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- prevent pollution and ecological degradation;
- promote conservation; and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.

The mining right application and this Scoping Report was accordingly prepared, submitted and considered within the constitutional framework set by inter alia section 24 and 33 of the Constitution.

2.3 The Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)

The purpose of the Promotion of Administrative Justice Act (PAJA) is principally to give effect to the constitutional right to administrative action that is lawful, reasonable and procedurally fair; and to the right to written reasons for administrative action as contemplated in section 33 of the Constitution; and to provide for matters incidental thereto.

Administrative law governs the relationships between public bodies, and between public and private bodies and/or individuals. Because so many activities which affect the environment require authorisation from a public body, and environmental conflicts usually arise from the exercise of administrative decision-making powers, administrative law principles are of particular relevance to environmental law generally, and specifically in the context of the mining right application process requirements provided for in the

MPRDA and the environmental authorisation requirements stipulated by the provisions of section 24 of the NEMA read with its subordinate legislation regulating environmental impact assessment (or EIA).

2.4 The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

Closely linked to the notion of administrative justice is the right of access to information. Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or well-being or, for that matter, any other Constitutional right) has been infringed. The purpose of the Promotion of Access to Information Act ("PAIA") is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith.

In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature. This is captured under Chapter 4 of part 2 and 3 of PAIA.

2.5 The National Environmental Management Act (107 of 1998) and the Environmental Impact Assessment Regulations, 2010

The overarching principle of the National Environmental Management Act 1998 (Act 107 of 1998) (NEMA) is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations.

Section 2 of NEMA (Act no 107 of 1998) provides for National Environmental Management Principles. These principles include:

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.

- Environmental justice must be pursued.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted.
- Decisions must take into account the interests, needs and values of all I&APs.
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

The Environmental Impact Assessment (EIA) process to be undertaken in respect of the authorisation process of the proposed mining operations is in compliance with the NEMA read with the Environmental Impact Assessment Regulations of 2010 (Government Notice No's R543, 544, 545 and 546 of 2010). The proposed mining development involves 'listed activities', as identified in terms of the NEMA and in terms of section 24(1), the potential consequences for or impacts on the environment of *inter alia* listed activities must be considered, investigated, assessed and reported on to the competent authority except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of the NEMA.

As stated above, an environmental authorisation application in terms of section 24 of the NEMA has been submitted to the LEDET for consideration. The activities as listed in GNR 544, 545 and 546 of 2010 were identified as applicable to the proposed mining operations.

The following activities (Table 4) as listed in GNR 544, 545 and 546 of 2010 were identified as applicable to the proposed mining operations:

Table 4 Listed activities

Relevant Legislation	Description
GNR 544, Item 9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.
GNR 544, Item 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.
GNR 544, Item 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; (x) buildings exceeding 50 square metres in size; or (xi) 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 watercourse, excluding where such construction will occur behind the development setback line.
GNR 544, Item 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.
GNR 544, Item 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 of more than 5 cubic metres 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; (a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (b) occurs behind the development setback line.
GNR 544, Item 22	The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 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.
GNR 544, Item 37	The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more – excluding where such expansion: (i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.
GNR 544, Item 41	The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50000 cubic metres or more.
GNR 544, Item 47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres - excluding widening or lengthening occurring inside urban areas.
GNR 545, Item 15	Physical alteration 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.
GNR 545, Item 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.
List 3 due to: (a) In Limpopo - i. All areas outside urban areas. 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.	
GNR 546, Item 2	The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.
GNR 546, Item 4	The construction of a road wider than 4 metres with a reserve less than 13,5 metres.
GNR 546, Item 10	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.
GNR 546, Item 14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.
GNR 546, Item 16	The construction of: (iv) infrastructure covering 10 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.
GNR 546; Item 19	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.

2.6 Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)

Previously South African mineral rights were owned either by the State or the private sector. This dual ownership system represented an entry barrier to potential new investors. The current Government's objective is for all mineral rights to be vested in the State, with due regard to constitutional ownership rights and security of tenure. The MPRDA was passed in order to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, and to provide for matters connected therewith. The Preamble to the MPRDA inter alia affirms the State's obligation

to:

- protect the environment for the benefit of present and future generations;
- ensure ecologically sustainable development of mineral and petroleum resources; and
- promote economic and social development.

The aforesaid preamble affirms the general right to an environment provided for in section 24 of the Constitution (as set out herein above).

The objects of the MPRDA, as set out in section 2 thereof serve as a guide to the interpretation of the Act. The objects of the MPRDA are as follows:

- recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic;
- give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources;
- promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa;
- substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources;
- promote economic growth and mineral and petroleum resources development in the Republic;
- promote employment and advance the social and economic welfare of all South Africans;
- provide for security of tenure in respect of prospecting, exploration, mining and production operations;
- give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and

- ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.

The national environmental management principles provided for in section 2 of the NEMA apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including inter alia the Department of Mineral Resources that may significantly affect the environment.

Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations.

Section 38 of the MPRDA states that the holder of inter alia, a prospecting right, mining right or mining permit:

- Must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of NEMA;
- Must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment as contemplated in section 24(7) of NEMA;
- Must manage all environmental impacts –
    - In accordance with an environmental management plan or approved environmental management programme, where appropriate, and
    - As an integral part of the prospecting or mining operations, unless the Minister directs otherwise.
    - Must as far as reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and
    - Is responsible for any environmental damage, pollution or ecological degradation as a result of prospecting or mining operations and which may occur inside and outside the boundaries of the area to which such

right, permit or permission relates.

2.7 National Water Act (Act No 36 of 1998) [NWA]

In terms of the NWA, the national government, acting through the Minister of Water and Environmental Affairs (previously the Minister of Water Affairs and Forestry), is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)).

In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualify as a use listed in section 21 of the Act, require a water use license. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.

Section 21 of the NWA indicates that "water use" includes:

- taking water from a water resource (section 21(a));
- storing water (section 21(b));
- impeding or diverting the flow of water in a water course (section 21(c));
- engaging in a stream flow reduction activity contemplated in section 36 (section 21(d));
- engaging in a controlled activity which has either been declared as such or is identified in section 37(1) (section 21(e));
- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (section 21(f));

- disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g);
- disposing in any manner of water which contains waste from, or which has heated in, any industrial or power generation process (section 21 (h));
- altering the bed, banks, course or characteristics of a water course (section 21(i));
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people (section 21(j)); and
- using water for recreational purposes (section 21(k)).

In addition to the above and in terms of section 26 of the NWA, Regulations on the Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources were published in GN R. 704 of 4 June 1999 (GN R. 704). The aforesaid GN R. 704 provides for inter alia the capacity requirements of clean and dirty water systems (regulation 6), the protection of water resources by a person in control of a mine (regulation 7), security and addition measures (regulation 8) and temporary or permanent cessation of a mine or activity (regulation 9).

The statutory requirements of the NWA an in GN R. 704 have been considered as far as they may be applicable to the proposed mining operations.

Please note that the IWULA will be submitted to the DWA (Department of Water Affairs) during the month of March 2013 and a site visit with DWA officials was conducted on the 25th of May 2012 (Refer to Appendix E).

2.8 The National Heritage Resources Act (Act 25 of 1999) (NHRA)

The NHRA established the South African Heritage Resources Agency (SAHRA) as well as provincial heritage resources agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

No person may damage, disfigure, alter, subdivide or in any other way develop any part of a protected area unless, at least 60 days prior to the initiation of such changes, he/she/it has consulted with the relevant heritage resources authority. Section 34 of the

NHRA provides for the protection of immovable property by providing for a prohibition on altering or demolishing any structure or part of any structure, which is older than 60 years, without a permit issued by the relevant provincial heritage resources authority. Accordingly, should the proposed activities, prospecting or mining activities or the closure and rehabilitation of mined land involve the altering or demolishing of any structure or part of any structure, which is older than 60 years, a permit issued by the relevant provincial heritage resources authority is required.

No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves; destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or bring onto or use at the burial ground or grave referred to above any excavation equipment or any equipment which assists in the detection or recovery of metals.

Section 38 of the NHRA states that any person who intends to undertake developments categorised in Section 38 of the NHRA must at the very earliest stages of initiating such development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. By way of example, the developments referred to in Section 38 of the NHRA include:

- the construction of a road, wall, power-line, pipeline, canal or other similar form of linear development or barrier exceeding 300 metres in length;
- the construction of a bridge or similar structure exceeding 50 metres in length;
- any development or other activity which will change the character of a site as specified in the regulations; and

- any other category of development provided for in regulations by SAHRA or the provincial heritage resources authority.

However, the abovementioned provisions are subject to the exclusion that section 38 does not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act 73 of 1989 (now presumably the NEMA in view of the repeal of the listed activities under the ECA): Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

Based on the archaeological findings on site the NHRA and the associated permitting process will be applicable to this project.

2.9 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit. In terms of Section 57 of the NEMBA, no person may carry out any restricted activity involving any species which has been identified by the Minister as "critically endangered species", "endangered species", "vulnerable species" or "protected species" without a permit. The NEMBA defines "restricted activity" in relation to such identified species so as to include, but not limited to, "hunting, catching, capturing, killing, gathering, collecting, plucking, picking parts of, cutting, chopping off, uprooting, damaging, destroying, having in possession, exercising physical control over, moving or translocating".

The Minister has made regulations in terms of section 97 of the NEMBA with regards to Threatened and Protected Species which came into effect on 1 June 2007. Furthermore, the Minister published lists of critically endangered, endangered, vulnerable and protected species in terms of section 56(1) of the NEMBA.

2.10 National Forests Act (Act 84 of 1998)

The project may involve the cutting, disturbing, damaging or destroying of any protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998), if it this is proven during the EIA a licence in terms of section 15 of the NFA will be required.

2.11 National Veld and Forest Fire Act (Act 101 of 1998)

The applicant should provide fire breaks in accordance with Chapter 4 of the National Veld and Forest Fire Act (Act 101 of 1998) and should consider amongst other the following:

- Fire rating
- Consultation of adjoining owners and the fire protection association (if any)
- be present at such burning or have an agent attend.

The fire break should be:

- wide and long enough to prevent to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land;
- it does not cause soil erosion; and is reasonably free of inflammable material capable of carrying a veldfire across it.

2.12 National Environmental Management: Air Quality Act, 2003 (Act No. 39 of 2004) (NEMAQA)

In the comparison of simulated ambient pollutant concentrations (due to the proposed activity) with air quality criteria, reference will be made to guidelines proposed by the South African National Standard (SANS) in SANS 1929:2004 and published for comment by the Department of Water and Environmental Affairs (previously the DEAT).

In September 2005 certain provisions of the NEMAQA became operative and thereby

aligned another piece of national environmental legislation with the environmental right set out in section 24 of the Constitution, and the environmental principles articulated in section 2 of NEMA.

NEMAQA creates a framework progressively to "reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development".

However, the effectiveness and success of these "reasonable measures" remains limited in that not all of the sections of NEMAQA have yet been brought into force.

Listed Activities and Minimum Emissions Standard Setting Project – the minister must in accordance to the act publish a list of activities which result in atmospheric emissions and which is believed to have significant detrimental effects on the environment and human health and social welfare. The project aims to establish minimum emission limits for all the listed activities identified through a consultative process at several forums..

The listed activities include Waste rock Dumps and Slimes Dams under Category 5: Mineral Processing Industry. Non-metallic mineral processing plants (crushing, screening and handling) are also included as listed activities. This implies that minimum national emission limits will be stipulated for these sources and an Atmospheric Emissions License will be a legal requirement. It is likely that fugitive dust sources dust fallout monitoring and mitigation measures will be a requirement.

Currently there are no listed activities that require NEMAQA registration/permitting for the proposed mine, to be assessed further during the EIA phase.

2.13 National Environmental Management: Waste Act (Act 59 of 2008) ("NEMWA")

The NEMWA commenced on 1 July 2009 and as a result of its commencement the relevant provisions in the Environment Conservation Act 73 of 1989 (ECA) in respect of waste management, were repealed.

The NEMWA sets out to reform the law regulating waste management and deals with waste management and control more comprehensively than was dealt with in the ECA. It also introduces new and distinct concepts never before canvassed within the realm of waste management in South Africa, such as the concept of contaminated land and extended producer responsibility. It also provides for more elaborate definitions to assist in the interpretation of the Act.

Section 19 of the NEMWA provides for listed waste management activities and states in terms of section 19(1), the Minister may publish a list of waste management activities that have, or are likely to have a detrimental effect on the environment. Such a list was published in GN 718 of 3 July 2009 (GN 718).

In accordance with section 19(3), the Schedule to GN 718 provides that a waste management licence is required for those activities listed therein prior to the commencement, undertaking or conducting of same. In addition, GN 718 differentiates between Category A and Category B waste management activities. Category A waste management activities are those which require the conducting of a basic assessment process as stipulated in the EIA Regulations 2010, promulgated in terms of the NEMA as part of the waste management licence application and Category B waste management activities are those that require the conducting of a scoping and environmental impact assessment process stipulated in the EIA Regulations 2010, as part of the waste management licence application.

Section 20 of the NEMWA pertains to the consequences of listing waste management activities and states that no person my commence, undertake or conduct a waste management activity, except in accordance with the requirements or standards for that activity as determined by the Minister or in accordance with a waste management licence issued in respect of that activity, if a licence is required.

In terms of the current statutory framework with regards to waste management, a waste management licence is required for those waste management activities identified in the Schedule to GN 718. Certain of the waste management activities listed in the Schedule are governed by specific thresholds. Where any process or activity falls below or outside the thresholds stipulated, a waste management licence is not required.

The activities in respect of which waste management license might be required under NEMWA will be included as part of the EIR.

2.14 Mine Health and Safety Act, 1996 (Act No 29 of 1996)

Chapter 4 of the Regulations of the Mine Health and Safety Act, 1996 will be applicable if explosives are stored on site. The regulations include:

- Security in respect of explosives;
- Receipt, storage, issuing, transportation and destruction of explosives; and

- General precautionary measures when blasting.

Explosives will be stored on-site. This activity will be further elaborated upon in the EIR.

2.15 Permitting and License Requirements

The following permitting and or license requirements are applicable to the proposed project:

2.16 Water Use Licenses

As is set out herein above, various water uses associated with the project will require water use licensing in terms of section 22 of the NWA. Section 21 of the NWA contains those water uses that are to be registered and licensed in accordance with the legal obligations contained in the NWA. These uses will be applied for through an application for an Integrated Water Use Licence (IWUL) by AGES to the DWA. This process is currently underway (Appendix E IWULA documentation: DWA correspondence).

2.17 Atmospheric Emissions Licence

Currently there are no listed activities that require registration/permitting according to National Environmental Management: Air Quality Act, 2003 (Act No. 39 of 2004) for the proposed mine.

2.18 Noise Legislation

Noise measurements will be carried out in accordance with South African National Standards - Code of practice, SANS 10103:2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication, SANS 10210:2004: Calculating and predicting road traffic noise, SANS 10328:2008: Methods for environmental noise impact assessments, SANS 10328:2008: Methods for environmental noise impact assessmentsand as required by the the national noise-control regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) and the revised noise-control regulations (Government Notice Number R. 55 of 14 January 1994). No further permitting relating to noise will be conducted, but the noise impacts will be assessed and mitigated for during the EIA.

2.19 Waste Permit - NEMWA

The waste management activities as listed in Government Notice 718 of 3 July 2009 under the National Environmental Management: Waste Act (Act 59 of 2008, which may be applicable to the proposed mining operations and for which a waste management license is required will be assessed and included as part of the EIA.

2.20 Heritage Permit – Section 36 of NHRA

A permit in terms of the NHRA will be required for the alteration or demolishment of a structure which is older than 60 years. The ruined homestead of recent age are scattered across the Lesego properties, therefore should development take place on these sites, the appropriate permitting process by a qualified archaeologist must be conducted as highlighted above. Graves were also found within the Lesego Mine Site, and should any of the cemeteries or graves (or the proposed 50m buffer zone around them) be impacted in any way, a permit for the removal of these graves will need to be obtained.

2.21 Protected Tree Removal – Section 15 of NFA

It is expected that the project will involve the cutting, disturbing, damaging or destroying of protected trees declared in terms of section 12 of the NFA therefore a licence in terms of section 15 of the NFA might be required as part of the EIA. However the presence of these trees must be verified through a detailed floral survey in order to confirm their presence.

2.22 Study Approach and methodology

2.23 Environmental Methodology

The general approach to this study has been guided by the principles of Integrated Environmental Management (IEM). In accordance with the Integrated Environmental Management Guidelines (DEAT, 2004); an open, transparent approach, which encourages accountable decision-making, has been adopted. The study has also been guided by the requirements of the NEMA (Act 107 of 1998) as stipulated in Section 0. (Also refer to Figure 2).

The application for environmental authorization is subject to scoping and environmental impact assessment contemplated in Part 3 of the EIA Regulations 2010. As part of the

scoping and EIA process a Scoping Report must be prepared in terms of regulation 28(f) and in accordance with regulation 29 of the EIA Regulations.

Scoping is the process of identifying the significant issues, alternatives and decision points that should be addressed in the EIA process. The aim of the Scoping Process is to support informed decision-making by providing information on the potential environmental effects of development prior to decision-making. The overall aim of the Scoping Phase is to identify the environmental issues and impacts associated with the proposed development that require further investigation. More specifically, the objectives were to:

- Identify and inform all authorities, stakeholders and other I&APs of the proposed activity, alternatives and the EIA process;
- Provide stakeholders with the opportunity to participate effectively in the process and identify any issues and concerns associated with the proposed activity;
- Provide a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- Identify statutory requirements and guidelines
- Identify any additional alternatives and screen out unsuitable alternatives;
- Identify any additional potential impacts and environmental issues that may require further investigation;
- Ensure that the issues and concerns of stakeholders are accurately recorded and reflected in the Comments and Response Report (Appendix A5 Comments and Response Report).

The Scoping process comprises two parallel and integrated processes:

- A technical process to identify environmental and social impacts and evaluation of the impacts; and
- A public participation process to provide I&APs with the opportunity to raise their issues and concerns regarding the proposed project.

The EIA technical process followed during the scoping process included:

- Specialist Scoping which involved:
    - Assessing previous environmental and technical studies and existing information;
    - Focus group meetings with community representatives, land owners, management groups;
    - Primary screening of the mining area;
    - Scoping by specialists and baseline reporting;
    - Interaction with the project team to identify critical issues.
- Compilation of a Scoping Report. The Scoping Report is based on available information and issues identified during the Scoping Phase. The report describes the existing status of the environment prior to the mining operation, identifies potential issues/impacts including cumulative impacts, development and land use alternatives, the procedure to plan and develop the proposed mining operation and terms of reference for specialist studies to be conducted during the Environmental Impact Assessment Phase of the application process.
- Submission of the Scoping Report to LEDET. The draft Scoping Report will be made available to the LEDET and I&APs in order to provide everyone with an opportunity to comment on the Scoping Report as contemplated in regulation 28(g) and in accordance with regulation 56 of the EIA Regulations. The final Scoping Report incorporating comments received and issued raised by I&APs and the EAP's response thereto will be submitted to the LEDET and I&APs for consideration.

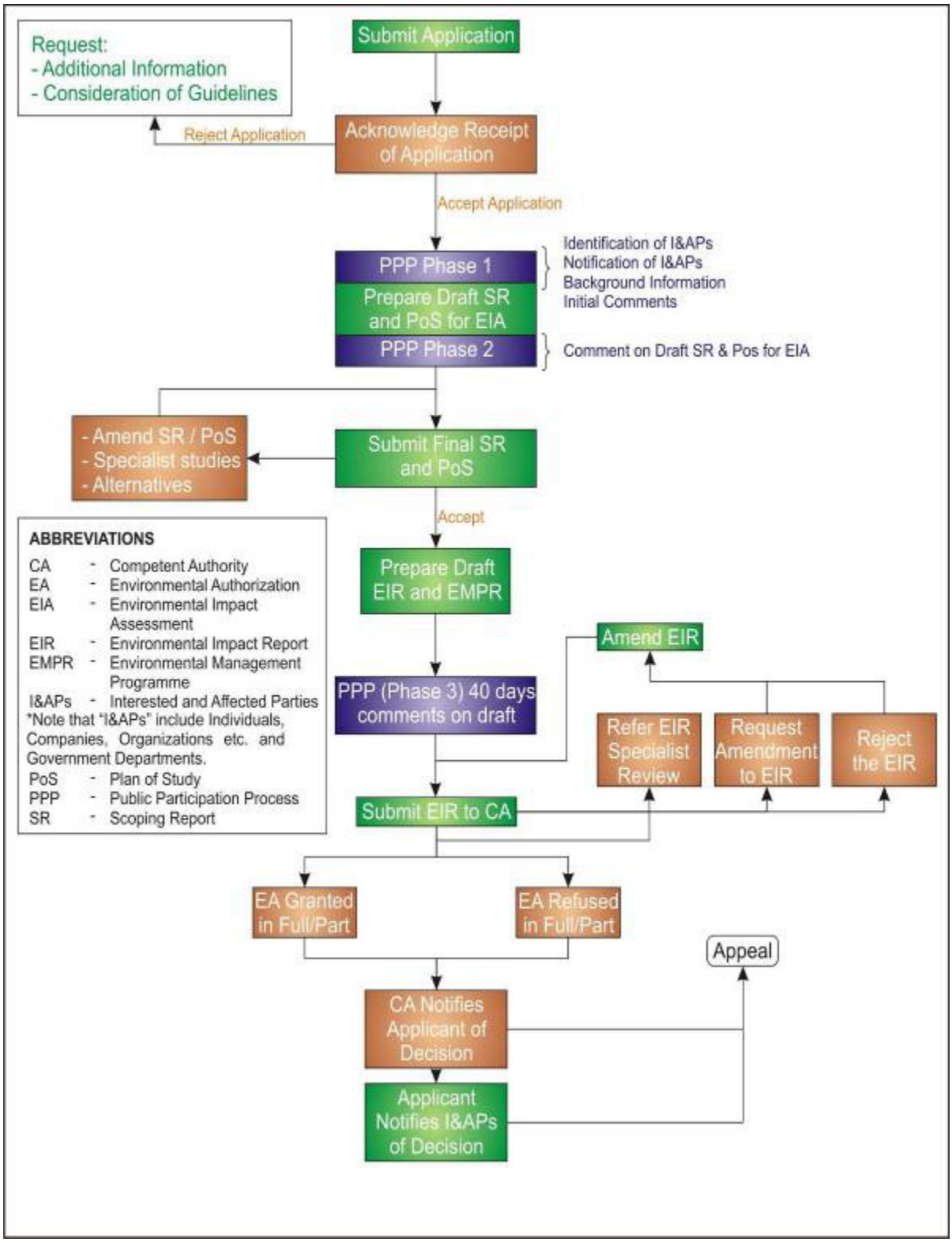

Figure 2 EIA Process according to NEMA (EIA Regulations 2010)

2.24 Specialist Studies

In order to inform this Scoping Report in terms of the baseline environment as well as the detail assessment of the anticipate impacts associated with the proposed development, the following specialist studies are in the process of being conducted:

- Ecological Assessment (AGES)
- Heritage Impact Assessment (AGES)
- Geohydrological and Surface Water Impact Assessment (AGES)
- Wetland Delineation and Aquatic Assessment (SAS)
- Soils and land use capability (Terrasoil)
- Noise Impact Assessment (Menco)
- Air Quality Impact Assessment (Airshed)
- Social Impact Assessment (Ptersa)
- Health Impact Assessment (Envirosim)
- Visual Impact Assessment (Newtown Landscape Architects)
- Traffic Impact Assessment (Havenga Transportation Engineers)
- Stormwater Management Plan & Floodline Delineation (AES)
- Mine Closure and Rehabilitation plan (AGES)

3 PROJECT DESCRIPTION

3.1 General

The Lesego Platinum site is located approximately 300 km northeast of Johannesburg in the Limpopo Province of the Republic of South Africa. Access from Johannesburg to the central portion of the site is via the national N1 highway to the town of Mokopane and then via a tarred road (R518) past Lebowakgomo and then onto the tarred R37 Polokwane – Burgersfort road to an intersection with a gravel road, north of the site.
The proposed project will involve platinum mining activities and related infrastructure. The resource battery limit of the identified platinum resources is below 350 m below ground surface. The ore body underlying the site consists of Merensky as well as UG2 reefs within the Bushveld Igneous Complex, which will be exploited via access from two vertical shafts. Ultimately the shaft system will go to a depth of 1700 m with one shaft to be used for man and material and the other for ventilation, with a decline being used to extract the full extent of the orebody to a depth of 2350 m

The main infrastructure which will be positioned and constructed along with the twin shaft system includes a tailings disposal facility, a process plant, offices and workshops, water management and distribution infrastructure, a 132 kV bulk electricity line, sewage treatment plant, water treatment plant, haul and access roads, waste rock dumps and topsoil stock piles.

3.2 Mining Method

Roughly 200 ktpm Merensky reef and 100 ktpm UG2 reef will be mined with 50 ktpm development waste. The ore body's orientation and depth dictates that the initial primary access would be via a twin vertical shaft system from surface that would service sub decline systems developed for each reef horizon. Continued future access for the later stages of the life of mine would be facilitated by an additional vertical and sub decline network. The two vertical shafts from surface consists of a main shaft of 11 m diameter (Number 1 Shaft) sunk to depth of 1700 m and a ventilation shaft of 9 m diameter (Number 2 shaft), sunk to a depth of 1650 m.
The ventilation and main shafts are sunk from surface using conventional shaft sinking methods. The sinking process shall consist of a pre-sink to 140 m followed by construction and equipping of the sinking winders and stage. Simultaneous concrete lining of the shaft walls shall be done in conjunction with the drill, blast, support and cleaning operations. Main shaft will be sunk to a depth of 1700 m; this includes the

loading level and the spillage winze configurations. The ventilation shaft however will only be sunk conventionally to a depth of 900 m once again taking into account the loading level and the spillage winze for the ventilation shaft loading arrangement. From a depth of 1600 m a raised bore shaft will be drilled to hole into the current ventilation shaft. Equipping of the shaft shall be performed in a “bottom-up” fashion following the completion of the shaft bottom excavations.

The Phase 3 resource is accessed by a four barrel cluster decline system on apparent dip developed from the main production level 1,600 m to access the shallow dip (22 – 7 degree) conventional mining section of the orebody from 1,600 m to 2,350 m.

The four barrel decline cluster, with laterals spaced at regular intervals of 75 m are developed using trackless mechanised machinery. It is developed on apparent dip at 1:6 or 9.46 degrees with approximately 500 m conveyor legs. It intersects each of the production levels via a level ramp and material transfer point. The decline cluster system consists of one material declines developed 5.0m wide and 5.0 m high (for ingress and egress of material), a conveyor decline developed 5.5 m wide and 5.0 m high, a chairlift for ingress and egress of the men and a dedicated return airway. All services are carried in the material decline. The decline is also used for the transport of major mobile mining equipment and the transport of materials.

The sub decline clusters for each reef horizon will be placed 50m in the footwall of each reef and developed using trackless mining machinery to attain faster development rates. The mining method will be conventional breast stoping using scraper cleaning on the stope faces, strike and dip gullies. Ore will be processed at an onsite processing plant, and tailings will be disposed of at an on-site tailings disposal facility (TDF).

3.3 Life of Mine

The mineral resources included in this study are extensive, giving an overall life of mine in excess of 60 years. As a result the mine is phased into three areas. The seam dip above 1,200 m depth is greater than 35 degrees and steepens to 89 degrees at the shallowest portion of the orebody (350 m depth).

Below 350 m the seams dip from approximately 89 degrees to 35 degrees. The mining area steeper than 35 degrees forms the Phase 1 production pipeline. It is located between 350 m and 1,200 m in the Merensky orebody and between 350 and 1,300 m in the UG2 orebody. The ore is exploited using a mechanised mining method. Below 1,200 m and 1,300 m the seam dip flattens to between 35 and 7 degrees. This portion of the orebody is exploited using a conventional breast mining method (Phase 2 and 3). A depth cut-off 1,600 m has been selected as the area forming the boundary for Phase 2 and 3.

The selection of 1,600 m is based on the point at which the sub-decline system is developed on true dip and the main vertical shafts bottom is located. The decline system provides a sufficient capital footprint for the required 8 Merensky levels to be developed to ensure steady state production is achieved. The portion of the orebody below 1,600 mbc forms the “Phase 3” mining area. The “Phase 3” mining area is accessed with decline system. This is done to ensure the efficiency of personnel, rock and material transportation and the supply of sufficient ventilation.

3.4 Surface Infrastructure

Since the proposed Lesego Platinum Mine is in the development phase, no mining infrastructure currently exists, and the design of these will be conducted as part of the mine’s Definitive Feasibility Study (DFS). The Lesego Platinum Mine is located within an area with existing mining activities, approximately 11 km north east and 22 km west of the proposed site. The infrastructure in the area is fairly poor (based on relevant specialist assessments), with major service backlogs, dispersed human settlements and high poverty levels.

The area is served by a number of provincial roads as well as the N1 national road linking it to Zimbabwe and the rest of South Africa. There is one commercial airport in the region (Polokwane International) as well as a number of private airstrips that are mainly used for tourism and private use.

The town of Lebowakgomo, which is located 20 km east-southeast of the site, as well as the villages of Phosiri, Malogeng, Pelangwe, India, Ga-Mankopane, Ga-Nkoana, Apel and Tiekiedraai will provide skilled and unskilled labour for future operations. All access roads are mainly existing gravel district roads and will need to be upgraded.

Envisaged infrastructure will comprise of the following:

- A tailings disposal facility (TDF);
- A processing plant and associated infrastructure;
- Offices and workshops;
- Water management and distribution infrastructure;
- A 132 kV electricity lines;
- Diesel storage facilities;
- Sewage treatment plant;
- Water treatment plant;
- Haul and access roads and bridges

- Perimeter and internal fencing;
- Waste rock dumps; and
- Topsoil stockpiles.

The proposed mine layout is indicated in Figure 3.

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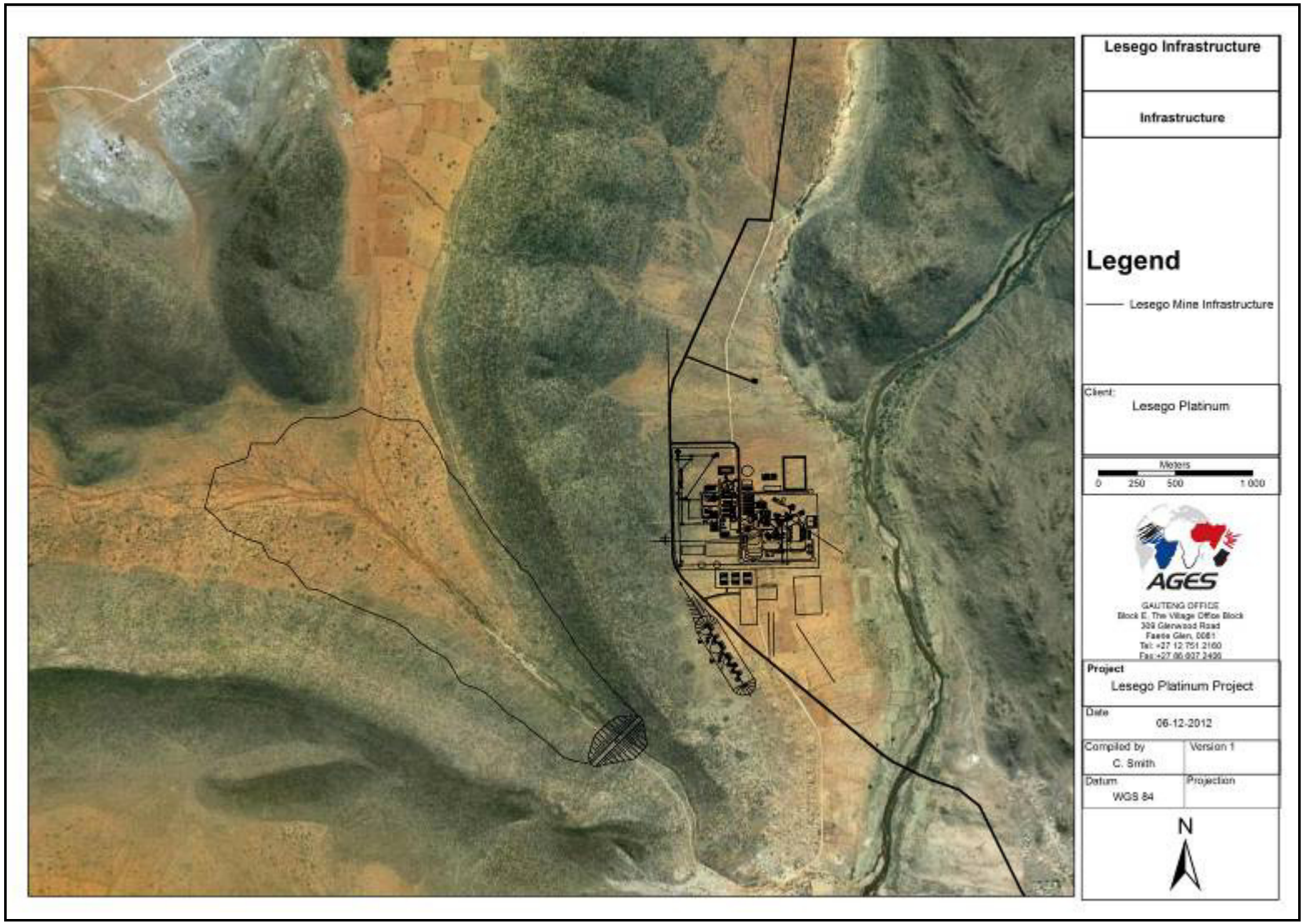


Figure 3 Mine infrastructure layout

3.5 Metallurgical Process

During the concentration process, ore is ground to liberate mineral particles. These are then recovered in the form of a concentrate by froth flotation. The ore mineralogy dictates both the fineness of grind required for liberation and the ideal flotation conditions. Very fine particles are difficult to recover, so two or even three milling and flotation stages may be used to minimise losses caused by over-grinding.

In Merensky processing a metallic concentrate rich in PGMs is sometimes produced in addition to the flotation concentrate. This concentrate can be sufficiently rich to by-pass the smelter and be sent straight to base metal removal.

In UG2 processing there are a number of options regarding by product chromite recovery and blending with the Merensky ore before milling. Chromite is recovered after primary milling, with the chromite crystals being liberated at their natural grain size. UG2 ores require finer grinding than Merensky ore for optimum PGM recovery, and blending of the two before milling therefore gives lower recoveries (Chamber of Mines, 2008).

The proposed process plant will consist of a standard MF2 circuit (i.e. mill/float followed mill/float of primary tailings) treating run of mine (ROM) ore crushed, by the primary crusher, to 80% passing 100mm, processing approximately 150 – 200 ktpm Merensky reef and 100 ktpm UG2 reef. The circuit will entail primary and secondary stage mills as well as flotation sections, which will generate primary and secondary concentrate. The generated concentrate will be filtered to 11 – 15% moisture from where it will be transported to a toll smelter.

3.6 Platinum Market & Uses

Platinum mining in South Africa is supported by the country possessing over 80% of the world's platinum group metal reserves. Along with Russia, platinum mining in South Africa produces a total of 90% of the world's platinum demand – which is about 130 tonnes per year (6% of gold production per annum). The Merensky Reef, stretching from southern Zimbabwe through to the Rustenburg and Pretoria regions, is the centre of platinum mining in South Africa.

Platinum-group metals (PGMs) have played an important role in the automotive industry, which requires the powerful catalytic properties of platinum for use in exhaust systems as catalytic converters – which transform nitrogen oxide, unburnt hydrocarbons and carbon monoxide into harmless nitrogen, water and carbon dioxide. Autocatalysts account for

more than 40% of total demand for platinum and this market is unlikely to see any economically viable substitutes for these metals for the next few years.

In addition, around 38% of the world's platinum finds its way into jewellery, with Japan by far being the world's largest consumer of platinum for jewellery fabrication. Platinum has also established a recognition for itself as a legitimate, complementary holding to gold and silver. Platinum is used in the following industry sectors:

- Electrical and electronics;
- Chemical - production of nitric acid essential for fertilizer and explosives manufacture;
- Petro-chemical - production of higher-octane fuels;
- Glass - glass fibre and high-performance glass (cameras, video equipment and televisions); and
- Motor manufacturing - platinum-tipped spark plugs.

PGM metals are also used in medicine with palladium rapidly supplanting gold in dentistry, and platinum being used in the treatment of certain types of cancer (Chamber of Mines, 2008).

And now platinum is being used in the development of alternative energy sources, such as hydrogen fuel cells, which are zero-emission devices that are capable of shrinking the world's carbon footprint. These fuel cells are used to power buses, boats, trains, planes, etc as well as cellphones and laptops. They convert gas into electricity at wastewater treatment plants and landfill sites as well as assisting in providing power to hospitals, police stations and far-flung off-grid rural areas.

In addition, hydrogen fuel cells produce water as a by-product, whereas other energy sources consume water readily. The various and increasingly important uses for platinum have made the modern demand for platinum mining in South Africa to outstrip the supply.

3.7 Services and Infrastructure

3.8 Water Supply

Ages Engineering Services (AES) was requested by AGES to do a conceptual water supply options analysis for the Lesego Platinum Mine Project (See Appendix G). This study precedes a detail Definitive Feasibility Study (DFS). The water supply options

addressed in this study were developed during a workshop between representatives from Lesego, AGES and AES. The following water supply options were identified:

1) Water sourced from **groundwater** (<30km radius);

2) Water sourced from existing agricultural allocations;

3) Net water saving through the **clearing of alien vegetation;**

4) Existing mines' discharged water (**Atok Mine**);

5) Water sourced from **regional groundwater** (>30km radius); and

6) Water allocated from the proposed **De Hoop Dam.**

It is recommended that any uncertainties regarding the water supply options be addressed as part of a detailed water supply options analysis study. The various stakeholders (i.e.: landowners, DWA, etc.) must also be engaged to develop some form of understanding regarding possible take-offs from existing rivers, dams or other sources. Table 5 serves as a summary of the water supply options.

Table 5 Water Supply Options

WATER SUPPLY SUMMARY		
OPTION/SCENARIO		**Flow (ML/d)**
1	Groundwater (< 30 km)	2–4 ML/d
2	Agricultural	10 ML/d
3	Alien Vegetation	2 ML/d
4	Mine discharged water (Atok)	2 ML/d
5	Regional Groundwater (40 to 140 km)	5 ML/d
6	De Hoop Dam	5 ML/d

3.9 Electricity

The proposed mining activities will require an estimated 6 MVA temporary supply and 118 MVA once in full operation. According to ESKOM the best option for the temporary 6 MVA electricity supply will be to construct a 3 km 33Kv line from the Strydkraal substation as

this substation has the capacity to supply 6 MVA.

The 118 MVA required once in full operation will be obtained from the construction of a single 132 kV overhead Kingbird power line from Leseding 32 km away. The total cost involved for construction of the electricity supply infrastructure is approximately R236m. Energy alternatives were also considered and are discussed in more detail in section 7.

3.10 Roads

The proposed site is located approximately 5.5 km south of the R37 which serves as the main road between Burgersfort and Polokwane. The main road running in the area is the R37 which is situated approximately 5.5 km north of the proposed site. The R37 is a National Road managed by SANRAL and connects Polokwane and Burgersfort.

The proposed access road will consist of a single lane road for traffic in both directions. Each lane is to be 3.6 m wide with a 1.4 m yellow lane shoulder. The district roads proposed for the access are managed by the Limpopo Roads Agency (RAL) and any upgrade and access to it needs to be negotiated in conjunction with this authority. Other roads will include haul roads, which will form part of the internal road network.

Five alternative access roads were assessed and entail the following:

1) Access route 1 - this proposed access route that will entail access from an existing gravel district road serving the surrounding communities with access to the R37;

2) Access route 2 – the proposed route alignment follows that of an existing gravel road and transverse through several villages until it reaches the R579, close to Lebowakgomo;

3) Access route 3 – this proposed route leads in a northerly direction and transverse through several villages until it intersects with the R37;

4) Access route 4 – this route will exit the site into a northerly direction from where it will follow the alignment of route alternative 1 diverting north through Mashite and the mountain neck and intersecting with the R37; and

5) Access route 5 – this route will exit the site in a southern direction crossing the Olifants river with a bridge from where it will connect to the main Apel road.

It is proposed that both access route 4 and 5 be combined for access to the mine as this

will provide the mine with access from the North and the South.

3.11 Sewage

An onsite sewage treatment facility will be constructed to treat sewage generated. This will be discussed during the EIA phase once more technical information is available.

3.12 Solid waste management facilities

All waste will be collected at the mine salvage yard where it will be sorted. Dedicated bays will be provided for different wastes. Recycling initiatives from the local communities will be investigated. Solid waste will be collected by a contractor and transferred to the closest registered waste facility. Oil will be stored in containers within a bunded area from where it will be collected and removed by an accredited contractor.

3.13 Waste gas management

Waste gas management is not expected to provide significant challenges, and will be further assessed during EIA phase.

3.14 Water management

3.15 Stormwater management

The proposed water management methodology at the mine should be based on the BPEO principle with responsible use and best practices. The impact of development on water quantity, quality and cost should be minimised. According to the GN 704 of 4 June 1999 clean and dirty water should be separated and process water recycled and re-used. The dirty water will be kept in a closed circuit and spillages minimised.

Note that the term “clean water” refers to water that has not been interfered with and “dirty water” is water that is handled in or precipitated on the mine operations. Dirty water is therefore not necessarily contaminated. The following water management aspects are included in the design of the mine infrastructure and waste facilities:

- Clean storm water will be diverted around the mine areas so that dirty and clean water are separated.
- No infrastructure will be located below the 1:50 year river flood line.

- Dirty water will be kept in closed circuit and be re-used in the mining processes.

Make-up process water will also be used in the following order:

- Return water from the tailings facility
- On-site storm water
- On site Sewerage Works

The requirement of regulation GN704 have been adhered to, especially the requirement for the storm water retention dams which should be designed to spill not more than once in fifty years.

Evaporation losses should be minimised, unless there is surplus water in the system (e.g. during storm events, the storm water dams could be used to evaporate surplus water).

3.16 Draft Mine water balance

The environmental water balance was compiled to evaluate the total flows required for the plant, mining and change house. The purpose of the environmental water balance is for reporting to the environmental process, regulatory authorities and for the water use licensing components where water management principles and make-up water use requirements are highlighted.

As indicated by the preliminary environmental water balance results are as follows:

- The average make-up water use would be 10 150 m^3/d (117.5 ℓ/s) for mining, plant and potable water requirements, which represents 1.02 m^3/ton milled. The potable component would be 98 m^3/d, and the drinking water component would be 2.4 m^3/d for Phase 1. For Phase 2, this will increase to 369 m^3/d potable component and the drinking water component would be 9 m^3/d,
- Storm water would be contained in storm water containment dams that can manage 1:50 year flood events as required by GN 704.

3.17 Need and Desirability

3.18 Need

The Bushveld Igneous Complex, which extends for 400 kilometres in the Northern Province, contains the world's largest known deposits of platinum group metals (PGMs) - platinum, palladium, rhodium, ruthenium, iridium and osmium. The Bushveld Igneous Complex consists of the Merensky and UG2 Reefs as well as the Platreef in the northern extension. The Merensky Reef accounts for over 80% of the platinum mined in South Africa, with the highest PGM values being associated with the UG2 Reef which lies about 200 m to 300 m below the Merensky Reef.

The extraordinary physical properties of the platinum group make its metals almost indispensable in a wide range of industrial applications. Autocatalysts, which account for more than 40% of the total demand for platinum, are the major demand sector for PGMs. Around 38% of the world's platinum finds its way into jewellery, and the electrical and electronics industry accounts for 50% of the annual palladium and ruthenium demands. Growth is associated with PGMs playing a role in fighting viral, bacterial and parasitic infections in the future and even being used as diagnostic tools. The use of clean and efficient fuel cells in the future, in which platinum catalysts are used to convert the chemical energy of a fuel into electrical energy, has for some time been sees as the next new major demand sector for platinum (Chamber of Mines, 2008).

An expected increase in the demand for platinum and palladium is expected for the future due to stricter emissions legislation globally and a rise in the growth of vehicle production and sales. In addition, with global energy demand expected to grow by more than 60% by 2030, the security of energy supply has become a concern and has led to the diversification of energy sources. This has created new opportunities for PGMs in the development of fuel cell technology, which could lead to significant socio-economic development as it will result in job creation in terms of manufacturing, installation and maintenance, as well as skills development (Mining Weekly, 2012).

The benefits of the development of the Lesego Platinum Mine is apparent from the above, with the expected increase in demand for platinum-group metals (PGMs) on a global basis, especially for fuel cell technology, which not only provides an alternative clean and sustainable energy source but comes with a variety of socio-economic benefits. In addition to the global socio-economic benefits, the Lesego Platinum Mine will also provide the local communities with various benefits relating mainly to job creation and skills development. Unemployment in the site is high and mining is seen to hold major possibilities for the area.

Without the implementation of this project, the mentioned benefits would not be realised. The realization of the outcome the Mining Charter (2004), within the context of the MPRDA (2002), would therefore also not be reached and this has potentially significant negative impacts on national economic growth and social well-being. The Mining Charters main objectives, which the Lesego Platinum Project will assist to reach, are:

- to promote equitable access to South Africa's Mineral Resources for all South Africans;
- to substantially and meaningfully expand opportunities for historically disadvantaged South Africans (HDSAs);
- to utilize the existing skills base for the empowerment of HDSAs (Refer to the Social and Labour Plan (SLP) as part of the Mining Right);
- to expand the skills base of HDSAs to serve the community; (Refer to the SLP conducted according to the MPRDA).
- to promote employment and advance the social and economic welfare of mining communities and areas supplying mining labour; (Refer to the SLP as part of the Mining Right) and
- to promote beneficiation of South Africa's mineral commodities beyond mining and processing, including the production of consumer products.

3.19 Desirability

Limpopo has rich mineral resources, making mining a critical sector of the economy of the province, contributing 22% to its GDP. Unemployment in the region is high with an estimated 46% of the economically active population in the Capricorn District being unemployed. Mining is the smallest contributor to the economy of the district and accounts for only 0.6% and is the only sector that experienced a negative growth (-6.7%) in the last decade. Mining is seen to hold major possibilities for the district and presents a number of backward and forward linkage opportunities for the entire district.

The economy of the Sekhukhune District is a mixture of very negative features (such as the highest unemployment rate in Limpopo) and very positive opportunities (like the enormous mining potential within the area).The region is also characterised by a high level of male absenteeism, a weak economic base, poor infrastructure, major service

backlogs, dispersed human settlements and high poverty levels. It is estimated that approximately 86% of the people in the Fetakgomo municipality live below the poverty line (Fetakgomo LM IDP).

The proposed Lesego Platinum Mine will create job opportunities in the region and provide the local workforce with skills development training. Lesego Platinum Mining is dedicated to employ people from the local communities and have developed a Social and Labour Plan (SLP) to this effect. The SLP focuses largely on human resource development activities, which will focus on equipping people from the local communities with skills that will make them desired employees during both the construction and operational phases of the project (Aucamp, 2011).

In addition to the socio-economic benefits of the proposed platinum mine, the mine will also contribute to the ecology. The current ecosystem of the site is already impacted upon, and is degraded in some instances due to over-grazing and crop cultivation. The soils are also highly erodible due to these anthropogenic disturbances. The mining development will support rehabilitation of the broader project site and will thus assist the system to recover to an enhanced state compared to the current status quo.

4 BASELINE DESCRIPTION OF THE AFFECTED ENVIRONMENT

Regulation 28 of the NEMA EIA Regulations (2010) requires a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity; in order to determine remedial measures, and associated environmental management objectives.

4.1 Lesego Project Site

The proposed site includes the farms Koppieskraal 475 KS, Spelonk 478 KS, Olifantspoort 479 KS, Dal Josaphat 461 KS, Eerste Regt 502 KS, Government Ground 503 KS, a portion of Stofpoort 481 KS and Zaaikloof 480 KS.

The proposed site is located next to the Phosiri dome, also known as the Zaaikloof or Fortdraai dome, in the Limpopo Province of South Africa and is approximately 240 km north east of Johannesburg and 65km North west of Burgersfort. The site is intersected by the Olifants River, leaving the farms grouped on both the east and west of the river. The following coordinates serves as the centre point of the site:

Latitude: S - 24°23'14.61"

Longitude: E 29°44'14.44"

4.2 Topography

The site is situated along the eastern slopes of the Phosiri dome, which rises approximately 950 m above mean sea level (mamsl) reaching a maximum height of 1,112 mamsl along the southern flank of the dome and a maximum of 992 mamsl on the eastern flank (Henning, 2011). The southern flank of the dome drops off sharply onto a wide flat grassy plain previously utilised for agricultural activities. The eastern flank of the dome drops at a similar gradient to an average elevation approximately 759 mamsl terminating in a low lying non perennial drainage plain, where after it abruptly rise again in the east to heights in excess of 900 mamsl.

The regional topography of the study area can generally be classified as low mountainous terrain throughout most parts of the central, eastern and western sections of the study area often forming deep valleys and a gorge where the Olifants River cuts through the mountainous area.

4.3 Climate

4.4 Temperature

Summers are characterised by high temperatures in summer months and temperatures dropping below zero in the winter. Mean monthly temperatures for the area ranges from 24.8°C for January and 12.4°C in July. The temperatures are generally very mild and stable with a minimum variance between maximum and minimum temperatures. Maximum daytime temperatures reach 36.6°C in October, while the coldest temperature recorded was 2.4°C in June.

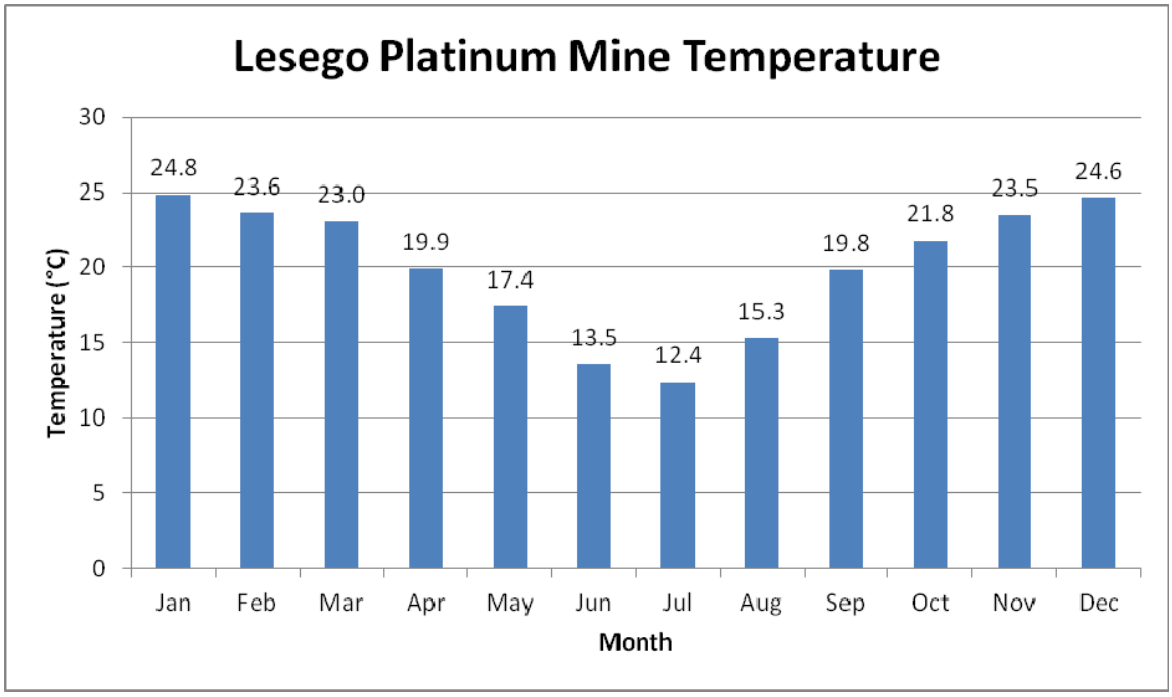


Figure 4 Mean monthly temperatures (South African Weather Bureau; 2012)

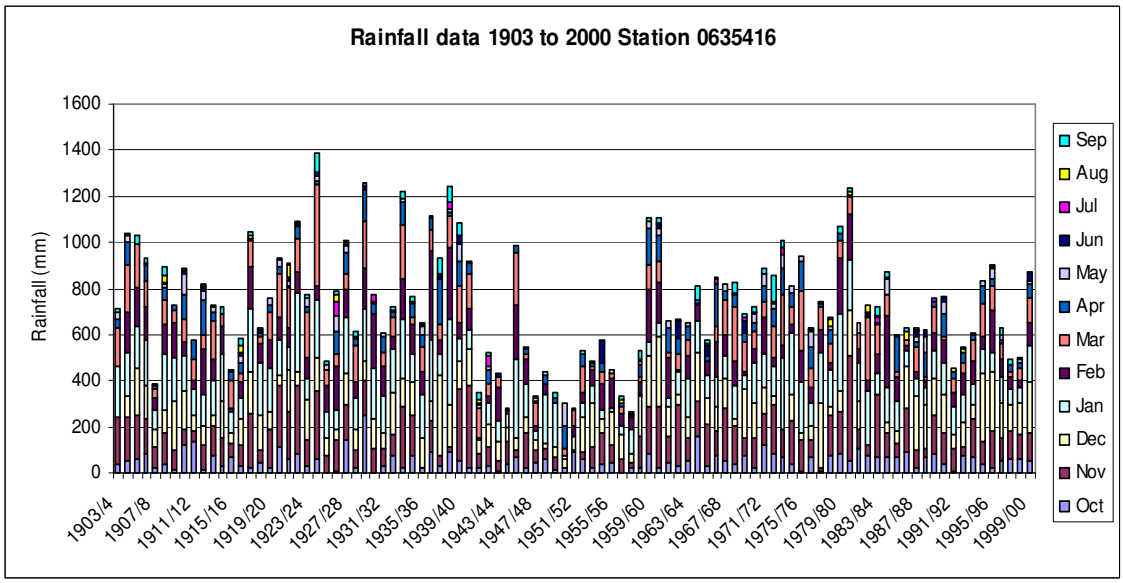
4.5 Rainfall

The site is located within the Limpopo Climatic Zone where the average annual rainfall varies from 478 mm to just over 738 mm. A mean annual rainfall figure of 537 mm was calculated for the five closest rainfall stations over approximately 97 years (see Figure 5). Precipitation in the region is almost exclusively due to showers and thunderstorms. Precipitation occurs mainly in the summer months (November to March) with the peak of the rainy season in January. The highest rainfall occurs in January with an average monthly rainfall of 85 mm per month while the months with the lowest rainfall are June and July. Most of the rainfall results from thunderstorms occurring in the afternoon and early evenings and as a result rainfall events of short duration can be expected. The

minimum rainfall for this period was recorded in 1935 at 228 mm with the maximum recorded during 1923 at 931.6 mm.

Rainfall data were obtained from weather station 0635416, which is situated just South of the proposed site. The data only represents the period from January 1903 to 2000 covering 97 years, as most of the weather stations in the area has insufficient data.

Figure 5 Average Rainfall data



4.6 Wind

Figure 6 indicates the average wind speed and direction for the last 4.5 years taken from the Sekhukhune Nchabeleng weather station situated south of the site. The average wind speed measured in the area varies from 1m/s to 3m/s and 48.6% of the winds can be classified as calm. The main wind direction are winds blowing from a north eastern direction, with a very small percentage blowing from a western, south western and eastern direction. The figure below depicts the average wind rose for the period January 2009 to December 2011 for the proposed site. The dominant winds during the day are from a north-easterly and easterly direction. Night-times are characterised by an increase in calm conditions, typical of most river valleys, with winds from the north-easterly sector increasing whereas the frequency of winds from the easterly sector decrease.

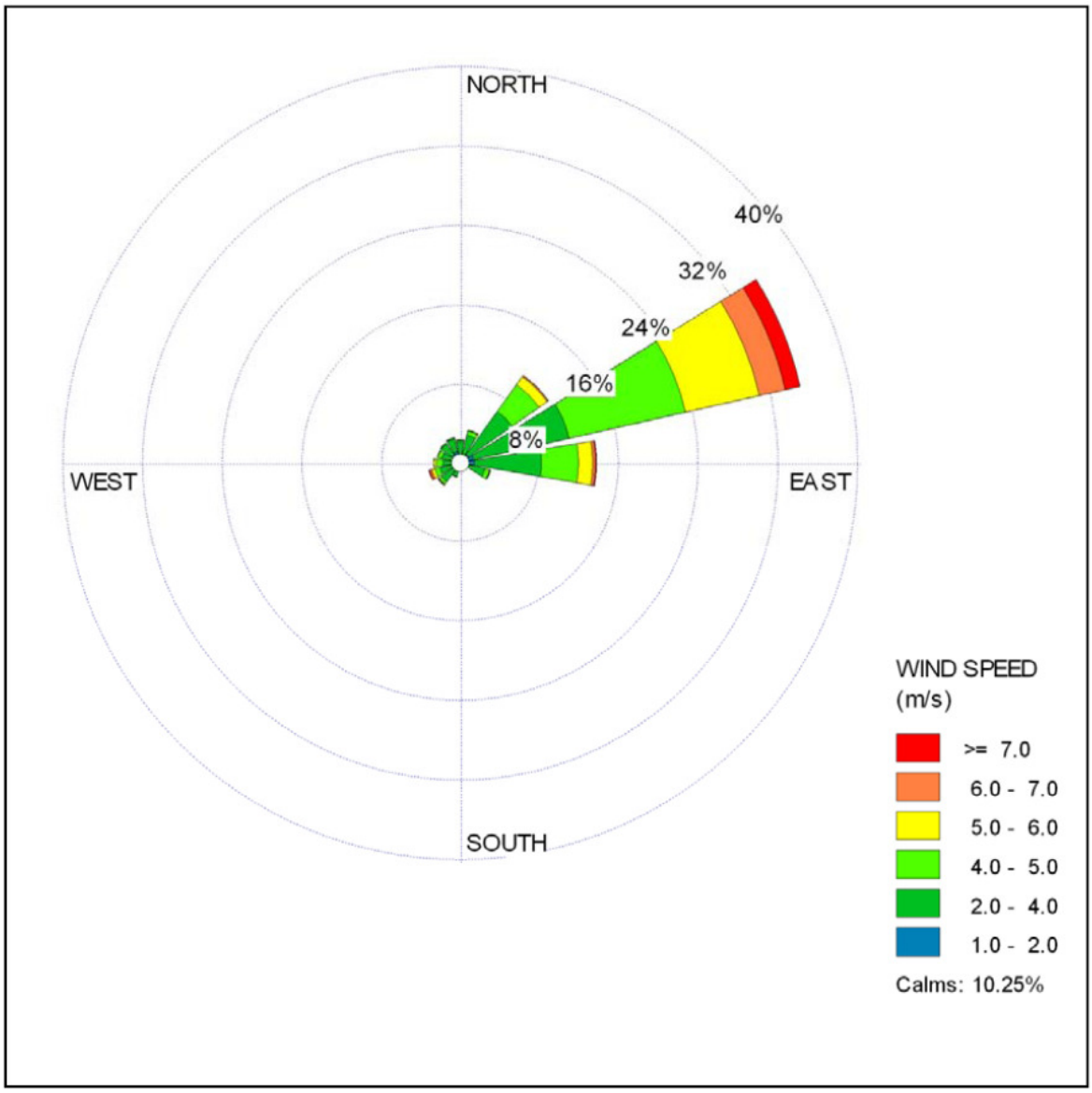


Figure 6 Project site wind rose (Liebenberg-Enslin and Gresse; 2012)

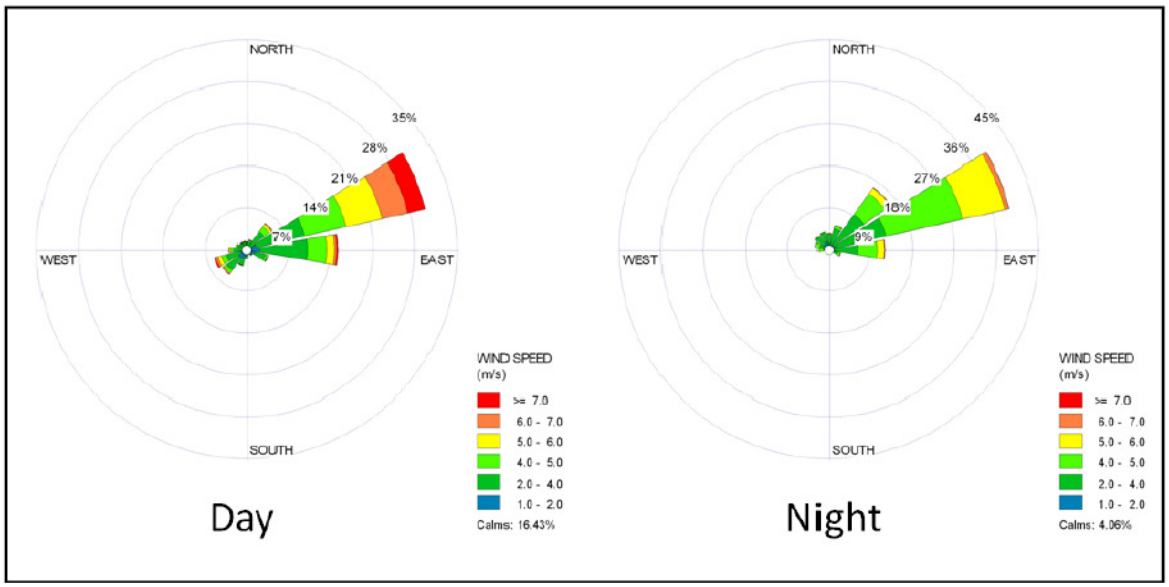


Figure 7 Day and night time wind roses for the site (Liebenberg-Enslin and Gresse; 2012)

4.7 Geology

The proposed site is located in the north-western sector of the eastern limb of the Bushveld Igneous Complex, as illustrated in Figure 8. The area overlays the Main Zone and Critical Zone mafic sequence of the Rustenburg Layered Suite. Merensky and UG2 reefs were identified and have been brought closer to surface by the Phosiri Dome structure, which consists of Transvaal Supergroup rocks. The geology identified on site is variable, consisting of gabbro, norite, hornfels, granite, quartzite and shale. (Uken, 1998)

The main rock types that prevail in the substrata underneath the proposed TDF comprise of hornfels, carbonaceous and calcareous shale, limestone and quartzite. The quartzite forms part of the Silverton formation in the Pretoria group of Vaalian age. The ridges and mountainous areas around the proposed TDF position consist of quartzite and sandstone with greywacke, arkose, orthoquartzite, micaceous siltstone and feldspathic sandstone. The formations mentioned form part of the Mackekaan and Magaliesberg formations, Pretoria Group. The remainder of the mine site area is mainly gabbro, norite, and anorthosite, which is from the Main Zone in the Rustenburg Layered Suite of the Bushveld Igneous Complex. The groundwater bearing strata types for this area would be the calcareous shale and sandstone and contact zones between the geology types (Meyer & Van Dyk; 2011).

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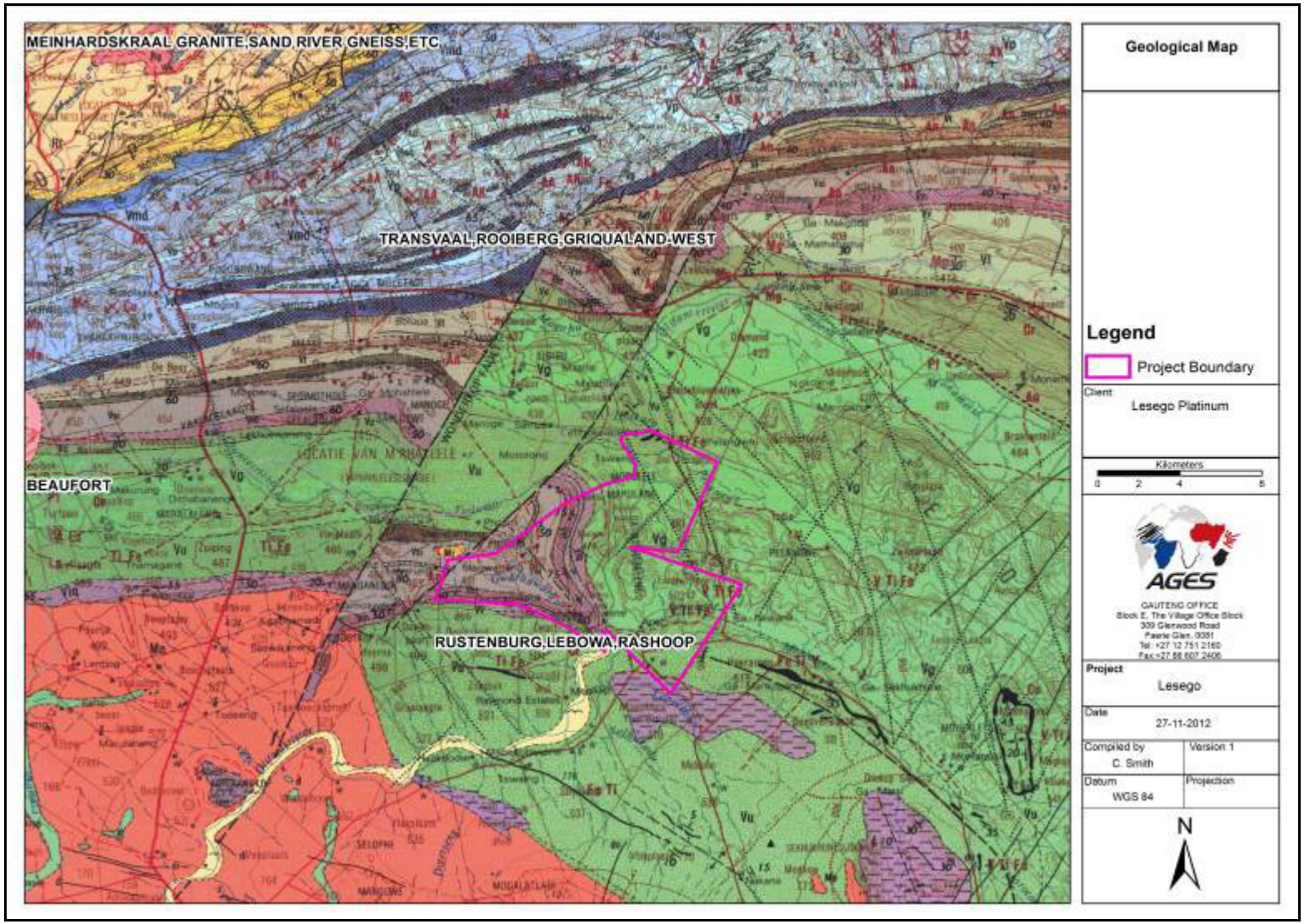

Figure 8 Geological Map

4.8 Soils and Land Capability

The soil, land use capability and agricultural potential survey were conducted by Dr. Van der Waals from Terra Soil and included three phases. Phase 1 included the collection of site specific land type data, which was obtained from the Institute for Soil Climate and Water (ISCW) as well as the Agricultural Research Council (ARC). Subsequently the soil data obtained was interpreted and classified. Phase 2 included aerial photo interpretation and land use mapping using the most recent aerial photographs taken from the site. Phase 3 included a site visit during which representative soils were augured and classified.

Five land types namely **Ae339, Db244, Ia175, Ib453** and **Ib454** were identified on site as indicated in Figure 8, due to the variable geology identified on site, consisting of gabbro, norite, hornfels, granite, quartzite, shale and limestone, the soils identified are also variable in terms of texture, colour and thickness. The agricultural potential associated with all five land types are classified as low due to soil and climate constraints and is utilised mainly for extensive grazing purposes(Van der Waals; 2011). . Table 6 serve as a summary of the soil, land use and agricultural potential associated with each land type. Figure 10 illustrates which areas are susceptible to erosion.

Table 6 Soil, land use and agricultural potential of the land types identified

Land type	Soil	Land use capability	Agricultural potential
Ae339	Variable depth, mesotrophic red apedal (structure-less) with regular occurrences of rock outcrops and lime in the soil profiles. In drainage depressions structured soils occur.	Mainly extensive grazing due to climatic and soil constraints. The sandy soils are suitable to irrigation if subsoil restricting layers can be broken and if water is available.	Low in the natural state.
Db244	Variable depth, lime containing structured soils with regular occurrences of rock outcrops. In drainage depressions structured as well as pedologically young (characterised by signs of recent transport and deposition) soils occur.	Mainly extensive grazing due to climatic and soil constraints. The soils are susceptible to erosion and over grazing is a distinct and widespread risk.	Low due to soil and climate constraints.

Ia175	Shallow and variable depth, lime containing structured and apedal soils with regular occurrences of rock outcrops. In drainage depressions structured as well as pedologically young (characterised by signs of recent transport and deposition) soils occur. Soil erosion occurs in most drainage depressions.	Mainly extensive grazing due to climatic and soil constraints. The soils are susceptible to erosion and over grazing is a distinct and widespread risk.	Low due to soil and climate constraints.
Ib453	Shallow, lime containing structured and apedal soils with very regular occurrences of rock outcrops. In drainage depressions structured as well as pedologically young (characterised by signs of recent transport and deposition) soils occur. Soil erosion occurs in most drainage depressions.	Mainly extensive grazing due to climatic and soil constraints. The soils are susceptible to erosion and over grazing is a distinct and widespread risk.	Low due to soil and climate constraints.
Ib454	Shallow, eutrophic apedal soils with very regular occurrences of rock outcrops. In drainage depressions structured as well as pedologically young (characterised by signs of recent transport and deposition) soils occur. Soil erosion occurs in most drainage depressions.	Mainly extensive grazing due to climatic and soil constraints. The soils are susceptible to erosion and over grazing is a distinct and widespread risk.	Low due to soil and climate constraints.

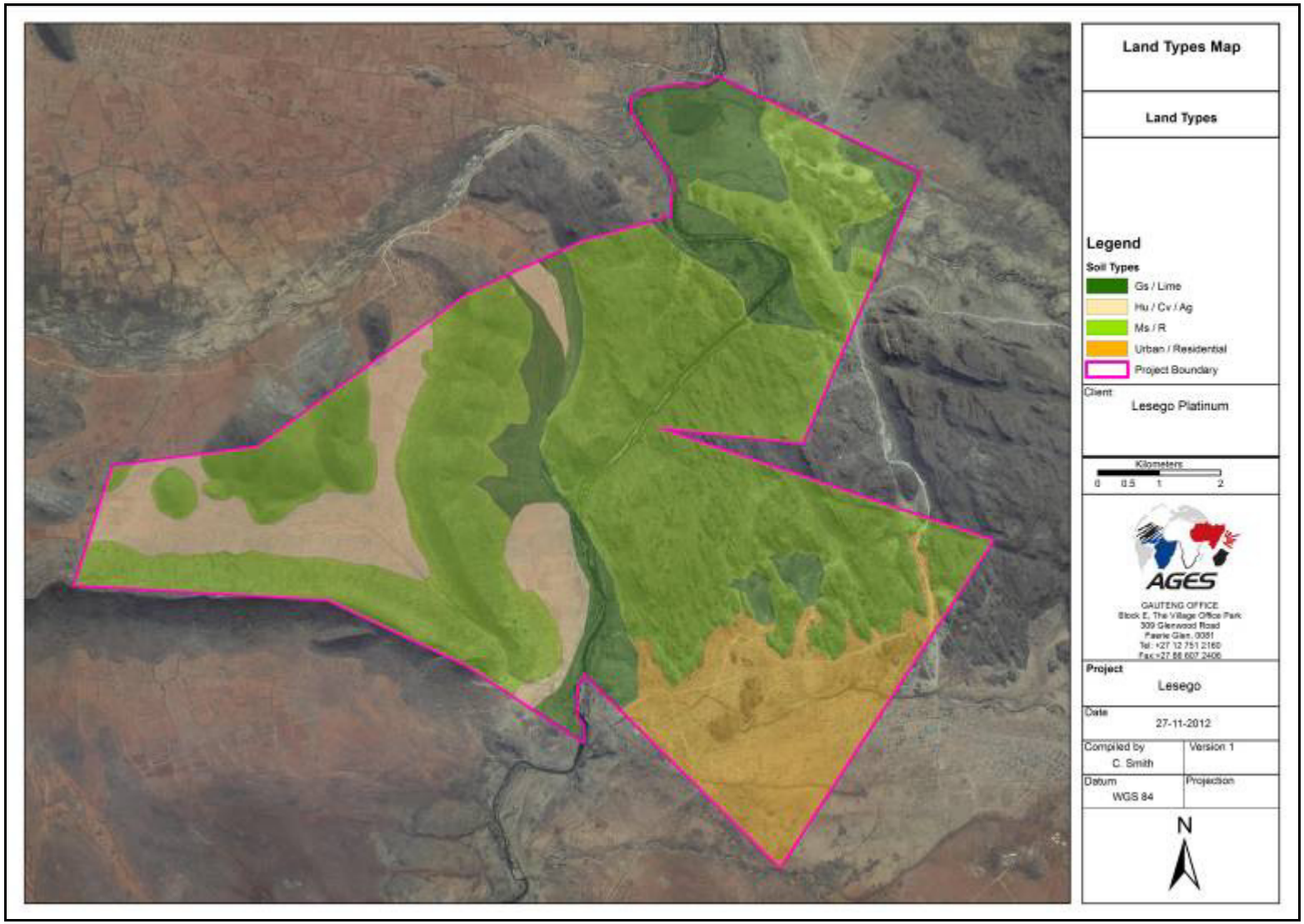

Figure 9 Land types

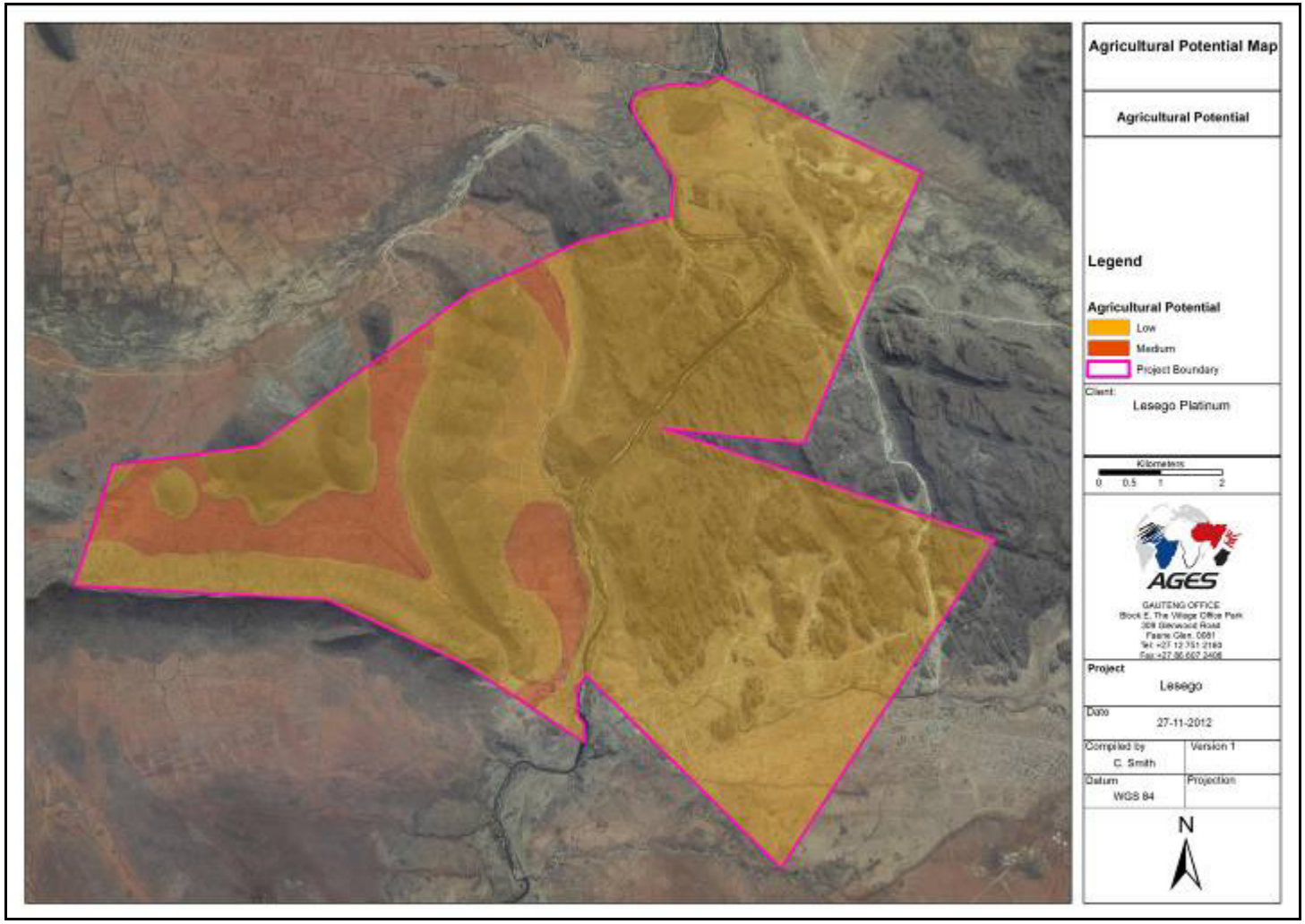

Figure 10 Agricultural potential

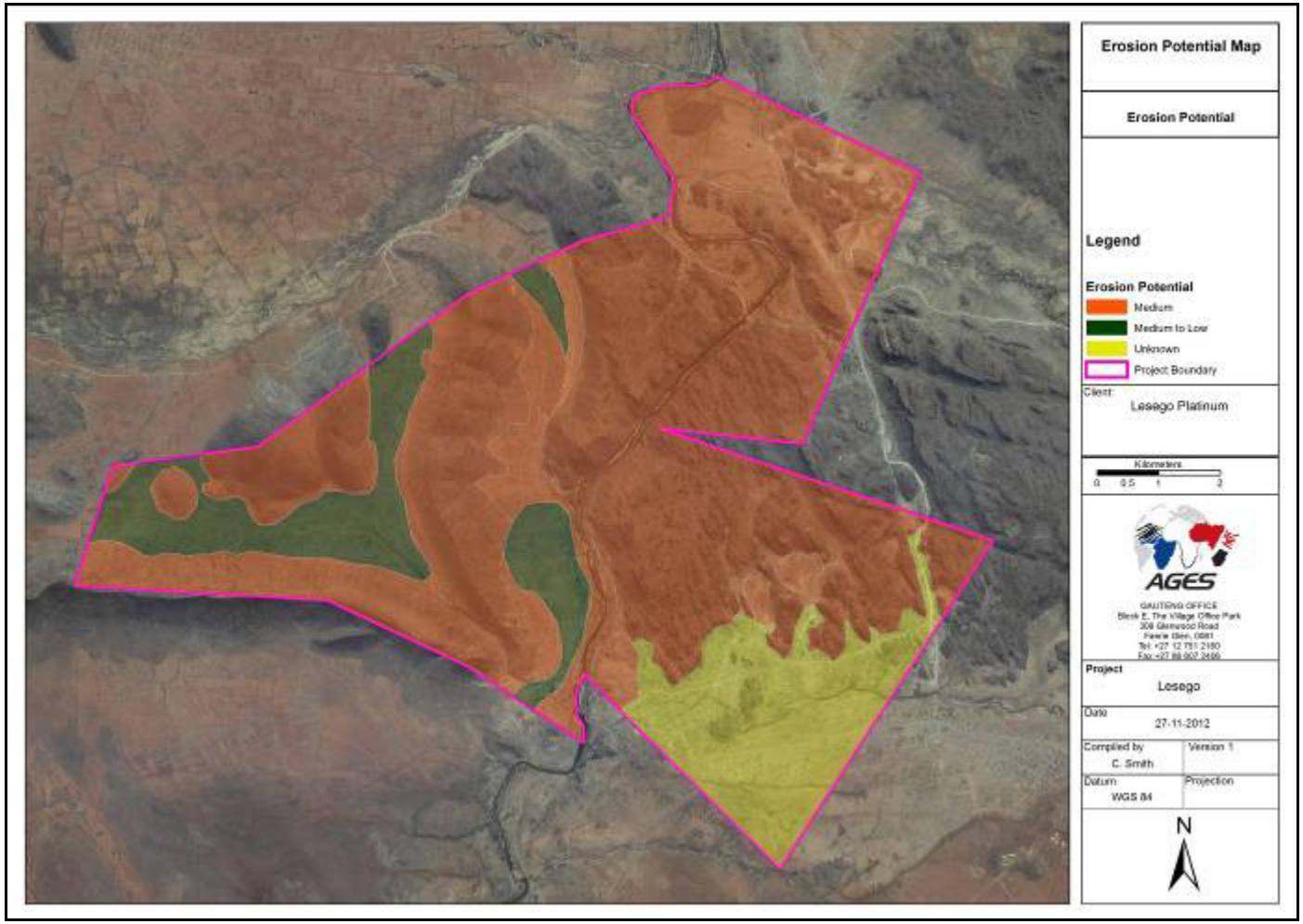

Figure 11 Erosion Potential

4.9 Flora and fauna

4.10 Flora

The proposed site falls within the Savanna biome which is also the largest biome in Southern Africa. The Savanna Biome is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The site is characterised by moderate to steep rocky slopes and mountainous terrain as well low lying valleys and plains. According to Mucina & Rutherford (2005) the site is further classified as Ohrigstad Mountain Bushveld as well as Sekhukhune Plains Bushveld.

Five main vegetation units were identified during the site visit and the findings associated with these vegetation units can be summarised as follows (Henning; 2011):

- *Kirkia wilmsii* - *Commiphora marlothii* - *Acacia senegalensis* arid mountain bushveld – this vegetation unit is in a pristine state with slight disturbances observed in certain areas with a moderate to high sensitivity. The red data species *Adenia fruticosa* were identified in this vegetation unit which also provides suitable habitat for other red data species which has the potential to occur on site. Infrastructure should be excluded from this vegetation unit as far as possible, due to the presence of a unique diversity of plant species within this unit.
- Degraded woodland and grasslands associated with low-lying valleys – this vegetation unit comprises of old fields or cultivated land, degraded *Acacia tortilis* woodland or secondary old fields, and degraded woodland or grassland in and around villages. The vegetation unit is degraded severely as a result of over grazing and crop cultivation and has a low sensitivity. No red data species were found within this vegetation unit, due to the ecological degradation. Mining activities and infrastructure will be supported within these areas.
- Vegetation associated with the Olifants River and its main tributaries – this vegetation unit has a high sensitivity and consists of dense, tall riparian woodland/floodplains, which are restricted to the Olifants River as well as associated smaller drainage channels. Mining activities and infrastructure should be excluded from the drainage channels as far as possible, with the implementation of surrounded no-go buffer zones.

- *Acacia mellifera – Aloe cryptopoda – Euphorbia schinzii* shrubveld – this vegetation unit consists of slightly degraded open to denser shrubveld with a moderate sensitivity and is characterised by woody low, open shrubveld with scattered tree species. Mining activities and infrastructure proposed in these areas should include specific mitigation and management measures, due to the high erodibility of these soils.

- *Salvadora australis – Acacia tortilis* woodland – this vegetation unit consists of open, overgrazed woodland with slight encroachment in some areas with a moderate sensitivity. As this vegetation unit hosts a unique species composition, mining activities and infrastructure within these areas will be supported, however this will be dependent on the implementation of specific mitigation measures.

Five red data species potentially occur in the study area as indicated in the table below. However, only one red data species was found to occur in the study area during the survey, namely *Adenia* fruticosa (Henning; 2011). *R*ocky habitats represent the most suitable habitat for most of the red data species described in the table below.

Table 7 List of red data plant species potentially found in the area

Species Name	IUCN Conservation status	Potential habitat	Potential occurrence in the area
Lydenburgia cassinoides	Near threatened	Rocky slopes, ravines	Medium, although none observed
Aneilema longirrhizum	Near threatened	Karroid low-lying areas	Low, due to degraded state of habitats
Euphorbia barnardii	Endangered	Rocky slopes / outcrops	Low, only isolated populations described in Sekhukuneland
Plectranthus porcatus	Vulnerable	Mountain slope. Welldrained, loam, stony soil.	Medium, although none observed
Adenia fruticosa subsp. fruticosa	Near threatened	Rocky slopes / outcrops	Confirmed

The National Forest Act (no.84 of 1998: National Forest Act, 1998) provides a list of protected tree species which may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by DWAF (or a delegated authority). The following protected tree species potentially occur in the area (Table 8 below) although these species only occur as individuals in their habitats. Should any of these protected trees be impacted by the mining layout plans a permit application should also be preliminary submitted to Department of Forestry to eradicate these species:

Table 8 List of protected tree species found in the area

Tree Species	Habitat
Combretum imberbe	Floodplains along drainage channels
Boscia albitrunca	Deep sandy soils
Sclerocarya birrea	Sandy soils on plateaus and undulating plains

Table 9 Vegetation types of the study area

Vegetation type	Characteristics	Protection level	Ecological status	% Transformed	% Conserved	Biographically / endemic important taxa
Sekhukune Plains bushveld	• Mainly semi-arid plains and open valleys between chains of small hills and mountains. Short, open to closed thornveld with abundance of aloe species and other succulents. Heavily degraded and verexploited in some places. • Complex geology with mainly mafic and ultramafic intrusive rocks giving rise mainly to red apedal soils.	Poorly Protected	Vulnurable	25% transformed	2% conserved	• *Lydenburgia cassinoides* • *Nuxia gracilis* • *Amphiglossa triflora* • *Asparagus fourei* • *Hibiscus barnardi* • *Petaidium oblongifolium* • *Ortosiphon fruticosus* • *Rhus batophylla* • *Aspargus sekukuniensis* • *Aneilema longirrhizum* • *Chlorophytum cyperaceum* • *Piaranthus atrosanguineus*
Ohrigstad Mountain Bushveld	• Open to dense woody layer, with associated woody and herbaceous shrubs and closed to open grass layer. Moderate to steep slopes on mountain sides and sometimes deep incised	Hardly protected	Least threatened	9% transformed	8% conserved	• *Petaidium oblongifolium* • *Encephalartos cupidus* • *Asparagus lynnetteae*

	valleys. Flat terrain in few places. • Geology primarily on quartsite and shale, with chemical sediments of Chuniespoort Group, weathering to shallow rocky soils.					• *Rhoicissus laetans* • *Ceropegia distincta var.verruculosa*

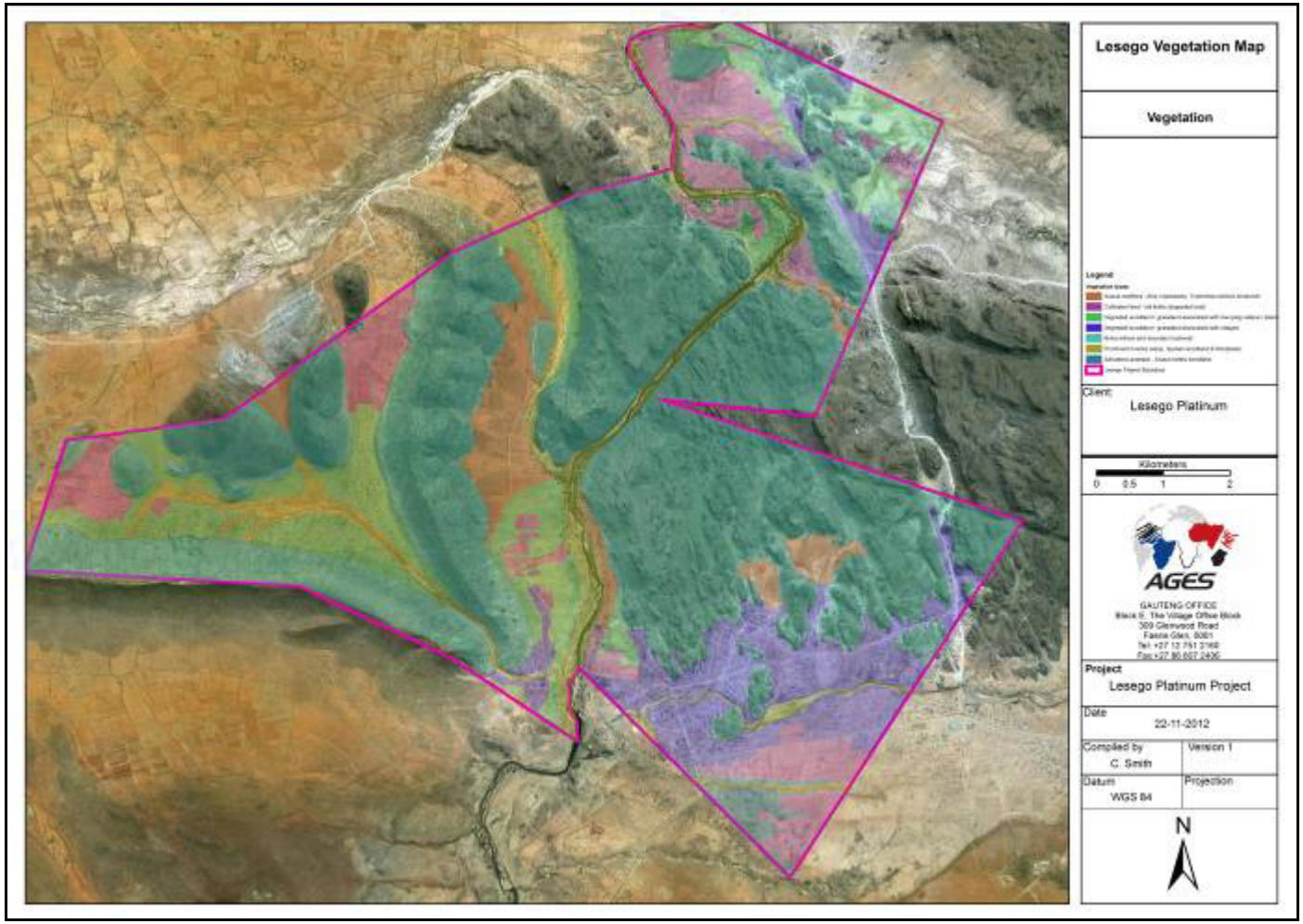

Figure 12 Vegetation Map

4.11 Fauna

Red data faunal species which might potentially occur on site, has a low probability of occurrence, due to degraded natural areas caused by crop cultivation and associated human activities (Henning; 2011). The degraded areas and eroded thicket found on site is not suitable for red data fauna species and only supports general fauna such as birds, small antelope and rodent species(Henning; 2011). It is deemed that most fauna species will migrate to the mountainous areas where the disturbance is less. As mentioned in the previous section, mining activities and infrastructure should be excluded from the sensitive vegetation units identified, as these areas host a diverse range of species.

The cumulative impact on faunal species resulting from the proposed mining activities and infrastructure can be rated as moderate, however with implementation of mitigation measures and management actions, this impact can be rendered low.

4.12 Aquatic Ecology

The site falls within the Eastern Bankenveld and the Bushveld Basin Aquatic Ecoregion, which can be considered to contain high aquatic biodiversity and a sensitive aquatic community (Van Staden; 2011). The wetland ecosystem type is Central Bushveld. Data obtained from the aquatic ecological survey indicated that the aquatic ecology of the area is considered to be in a fair ecological state; however the Olifants River system has limited diversity, due to a lack of habitat caused by severe erosion. The survey included the investigation of four sites, two sites situated up and downstream of the Olifants River respectively and two sites representing non perennial drainage channels only in flood after good rains (Van Staden; 2011). These sites provided a good representation of the aquatic ecological state on site.

The four identified sites were assessed using the following assessment methods (Van Staden; 2011):

- South African Scoring System version 5 (SASS5) – this index is an indication of the diversity of the macro-invertebrate communities present on site.
- Fish Assemblage Integrity Index (FAII) – this index is an indication of the diversity of fish species present on site.

- Riparian Vegetation Index (RVI) - the RVI is designed to give an indication of the Present Ecological State (PES) of the riparian zones, as well as their present functionality,

- Invertebrate Habitat Assessment System (IHAS) - this index determines the specific habitat suitability for aquatic macro-invertebrates,

- Intermediate Habitat Integrity Assessment (IHIA) - This method describes the Present Ecological State (PES) of both the instream and riparian habitats of the site,

- Biota specific water quality – this is an indication of the water quality and includes parameters such pH, electrical conductivity, dissolved oxygen concentration and temperature.

These various assessment methods were carried out in order to determine the present aquatic ecological state of the associated sites. Table 10 serves as a summary of the main findings reflected by the aquatic ecological assessment further assessment and detail will be included in the EIR.

Based on the findings of the aquatic ecological assessment, prelimanry indications are that no fatal flaws preventing the proposed mining development from taking place were identified.

Table 10 Summary of the aquatic ecological findings

Sites	Habitat suitability	Riparian vegetation	Invertebrate habitat integrity	Macro-invertebrate community integrity	Fish Assemblage Integrity Index	Water Quality
LP 1 (Olifants River upstream)	Overall habitat integrity can be regarded as being largely to extensively impaired, with severe riparian zone impacts.	Overall a very low diversity of indigenous species was encountered with significant habitat disruption.	Habitat conditions can be considered largely natural with few modifications, however habitat diversity and structure was inadequate for supporting a diverse aquatic macro-invertebrate community under higher flow conditions. During low flow conditions, the habitat can be considered adequate for supporting a diverse and sensitive aquatic macro-invertebrate community.	• The Macro-invertebrate community integrity can be considered as moderately impaired. • The system has a very broad variability in aquatic community integrity as a number of relatively sensitive aquatic macro-invertebrate species are present in the system.However, habitat limitations are likely to limit the diversity, abundance and sensitivity of the aquatic community to some degree.	• The fish assemblage integrity index can be considered as seriously impaired. • None of the species captured on site are listed as being endangered, vulnerable or rare according to the 1996 IUCN Red List (Skelton, 2001). • Most of the species observed have a relatively widespread distribution.	• The EC (Conductivity) values were well within the requirements of the Olifants River Ecological Water Requirements Assessment (OREWRA), and water quality in this segment of the Olifants River is generally considered adequate for supporting the aquatic ecology of the area. • pH levels are considered to be slightly alkaline in the Olifants River system, however no significant risk to the aquatic community is likely at this stage. • The Dissolved Oxygen (DO)

						levels are similar throughout the system and the changes are within the DWAF 1996 water quality guidelines for aquatic ecosystems. • A significant impact on the salt loads in the system is deemed likely to come from the areas upstream of the proposed mining area.
LP 2 (Olifants River downstream)	Overall habitat integrity can be regarded as being largely to extensively impaired, with severe riparian zone impacts.	Overall a very low diversity of indigenous species was encountered with significant habitat disruption.	Habitat conditions can be considered largely natural with few modifications, however habitat diversity and structure was inadequate for supporting a diverse aquatic macro-invertebrate community under higher flow conditions. During low flow conditions, the habitat can be considered adequate for	• The Macro-invertebrate community integrity can be considered as seriously modified. • The system has a very broad variability in aquatic community integrity as a number of relatively sensitive aquatic macro-invertebrate species are	• The fish assemblage integrity index can be considered as largely impaired. • None of the species captured on site are listed as being endangered, vulnerable or rare according to the 1996 IUCN Red List (Skelton, 2001). • Most of the	• The EC (Conductivity) values were well within the requirements of the Olifants River Ecological Water Requirements Assessment (OREWRA), and water quality in this segment of the Olifants River is generally considered adequate for supporting the aquatic ecology

			supporting a diverse and sensitive aquatic macro-invertebrate community.	present in the system.However, habitat limitations are likely to limit the diversity, abundance and sensitivity of the aquatic community to some degree.	species observed have a relatively widespread distribution.	of the area. • pH levels are considered to be slightly alkaline in the Olifants River system, however no significant risk to the aquatic community is likely at this stage. • The Dissolved Oxygen (DO) levels are similar throughout the system and the changes are within the DWAF 1996 water quality guidelines for aquatic ecosystems. • A significant impact on the salt loads in the system is deemed likely to come from the areas upstream of the proposed mining area.
LP 3 (Non perennial drainage)	Overall habitat integrity can be regarded as being moderately impaired.	Overall a very low diversity of indigenous species was encountered	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.

	A loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. Habitat structure and diversity are inadequate for supporting a diverse and sensitive aquatic macro-invertebrate community.	with significant habitat disruption.				
LP 4 (Non perennial drainage)	Overall habitat integrity can be regarded as being moderately impaired. A loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. Habitat structure and diversity are inadequate for supporting a diverse and sensitive aquatic	Overall a very low diversity of indigenous species was encountered with significant habitat disruption.	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.	Due to no water present at this site no data could be captured.

	macro-invertebrate community.					

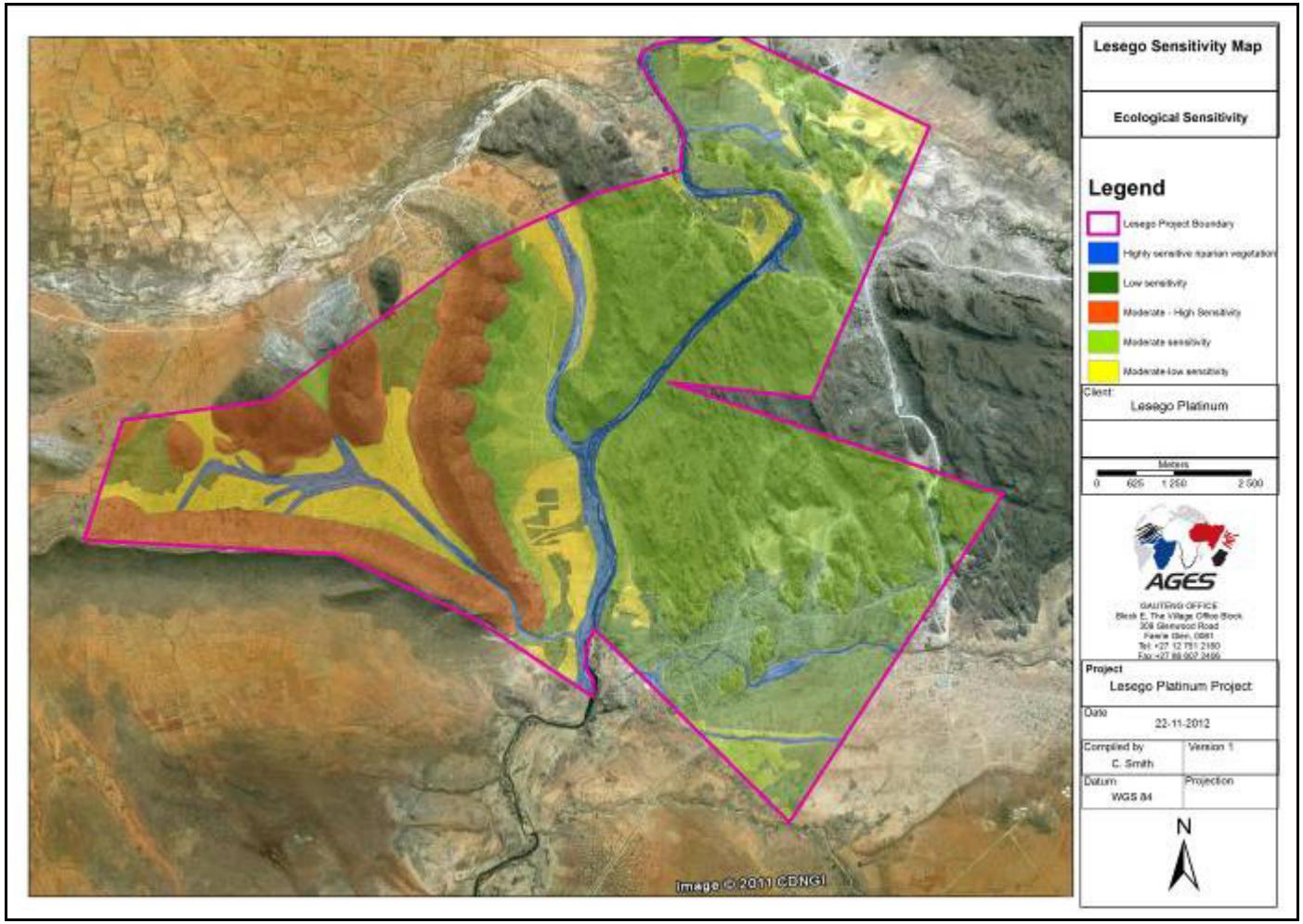

Figure 13 Ecological Sensitivity Map

4.13 Surface Water

The study area is located within the Olifants Water Management Area and falls witin the Middle Olifants sub-water management unit. The site falls mainly within the Quaternary surface water catchment B52E, with parts of the site situated within B52D and B52B quaternary surface water catchments as illustrated by Figure 14.

The major perennial system occurring on site is the Olifants River, which transects the site mainly in a north easterly direction. The Olifants River joins with the Letaba River on the South African border to form the Rio Das Elephantes River, which flows through Mozambique, where it eventually discharges into the Indian Ocean.

Other surface water features on site includes the Mohlaletsi and Pelangwe Rivers, which are perennial tributaries of the Olifants River. Due to the mountainous terrain on certain areas of the site, there are also numerous non-perennial drainage lines flowing after good rains.

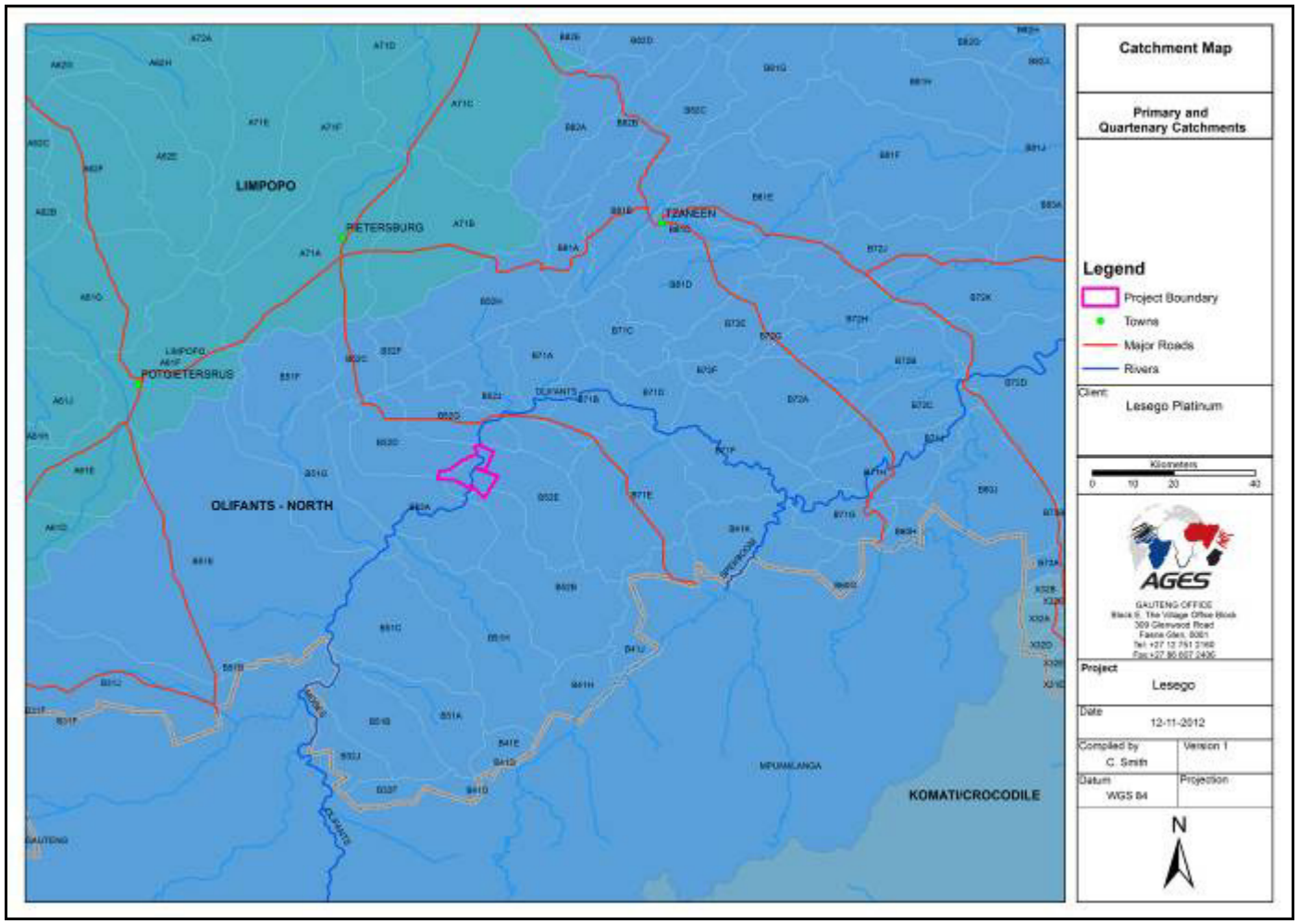

Figure 14 Catchment Map

4.14 Wetlands

Wetland areas in the region are mainly found at the edges of dams, in catchments, and along rivers and streams. These wetland areas and associated riparian vegetation are severely disturbed due to anthropogenic impacts, most notably over-grazing. Wetlands are ecologically important as they serve as water sponges which assist in purifying water, and act as buffers to control flooding during high rainfall events. Therefore, these areas have a high conservation status and should be conserved, with no development being allowed in these areas.

Three types of wetland systems were identified for the site; namely the larger perennial system (Olifants River), smaller perennial systems (e.g. Pelangwe and Mohlaletsi Rivers) and non-perennial systems. The Olifants River is the major perennial system located within the project boundary. All of the above systems have been fragmented by current and historic community development and agricultural activities. Soil erosion along the Olifants River has caused severe transformation (alien vegetation) and caused incisions within certain areas. However, because it is classified as a NFEPA River and because of the instream ecological aspects, it still provides high ecological value and function to the environment and the surrounding communities.

The perennial (larger and smaller systems) and non-perennial systems are characterised by mostly unstable sandy substrates and very little vegetation growth within the perennial systems. These systems were classified as lower intermittent. The non-perennial systems contain almost no vegetation, with mostly sandy soils and mud as the substrates. The non-perennial drainage features were considered of little ecological value and function, while the smaller perennial drainage systems could still provide an ecological function (Van Staden; 2011).

The present ecological state (PES) as well as the Ecological Management Class (EMC) for the Olifants River was identified as Class C – moderately modified. The PES and EMC for the smaller perennial systems are both Class D – largely modified. The PES for the non-perennial systems was calculated as Class E – seriously modified, due to agriculture, grazing and sedimentation. The EMC for these systems is considered Class D – largely modified.

4.15 Rivers

The study area is drained mainly by sheet wash with surface run-off draining into non-perennial streams that cut through the proposed development area. These non-perennial streams eventually drain into the Olifants River or one of its two main tributaries, namely the Mohlaletsi River in the south and the Pelangwe River in the north. The Mohlaletsi River crosses the southern portion of the site in an south-easterly direction and the Pelangwe River occurs in the north in an north-easterly direction. Both the Olifants River and the Pelangwe and Mohlaletsi Rivers are considered National Freshwater Ecosystem Priority Areas (NFEPA) Rivers; however the condition of the rivers are considered class D as they are largely modified. The non-perennial streams flowing along drainage channels occur only during and directly after heavy precipitation events, and may continue for a short period directly after a particularly good rainy season.

A floodline assessment and delineation of the 1:100 year floodline of the Olifants River, along the site is currently underway. This study will estimate the expected flood extent subjected to typical flood scenarios, and will evaluate the sensitivity of the site to a rising water level.

4.16 Geohydrology

A baseline groundwater assessment was conducted by AGES in order to identify the potential mine seepage and dewatering, environmental requirements and water supply options for the proposed new mine operations included as Appendix H

Geohydrological and Surface Water Assessment.

As part of the baseline geohydrological assessment, a hydrocensus was conducted in order to determine the baseline conditions and applications prior to mining and to identify potentially receptors i.e. groundwater users in the vicinity of the proposed mine. The hydrocensus covered a radius of 5 km around the proposed site and during the survey 28 sites were recorded, of which 26 boreholes were located within the surrounding communities. 58% of the boreholes identified were in use, indicating the dependency of the local communities on groundwater resources.

The geophysical data indicated sixteen potential drilling positions to be explored by drilling, of which four targets were drilled to a depth of 80 m as site characterisation boreholes, with the additional purpose of being used as monitoring boreholes once mining activities

commence. The borehole positions were positioned such to optimize the borehole applications for the monitoring program and to serve as seepage capturing positions once the mine is operational (See Figure 16). Samples taken from drilled boreholes were sent for analysis, which indicated that the overall quality of these water sources is poor. The chemical constituents which are non-compliant in all or some of the boreholes are fluoride, nitrate, chloride, sulphate, sodium, potassium, calcium, magnesium, manganese and lead (Meyer & Van Dyk; 2011). The geophysical study indicated the study area has groundwater potential, which should be investigated in more detail during the EIA phase.

The magnetic study indicated that intrusive structures cover a large area of the valley floor and TDF, also confirming the existence of magnetic intrusive structures with some of these structures being highly conductive to such an extent that it is expected that they will most probably be water bearing.

The site characterisation drilling executed on the footprint of the TDF indicated high yielding boreholes i.e. 5 – 20 ℓ/s of poor water quality. According to Parsons (1995) and DWA (1998), this constitutes a minor aquifer. Core boreholes were also drilled during the exploration program at Lesego and the core borehole extending to depth of mining could supply valuable information regarding possible dewatering and associated volumes.

A detailed water monitoring programme should be implemented to measure and mitigate any potential negative influences on the environment due to the proposed mining activities and associated infrastructure. Groundwater monitoring boreholes need to be placed on un-weathered host rock as well as below the toe line of the TDF, in order to complete the information on the range of aquifer parameters.

The mine should be designed with mine dewatering as a mitigation measure, with the mine design based on an effective dewatering design that allows for pre-depressurization (below 1 bar or 10 m head) of aquifer zones, regardless of the flow rate. The mine water inflow should also be mitigated with cover drilling in order to allow the pressure head in permeable or fracture zones to drop before development through these zones take place or an approach of sealing (grouting etc) of fractures could be adopted. A trade-off should be done between dewatering and sealing in the EIA phase.

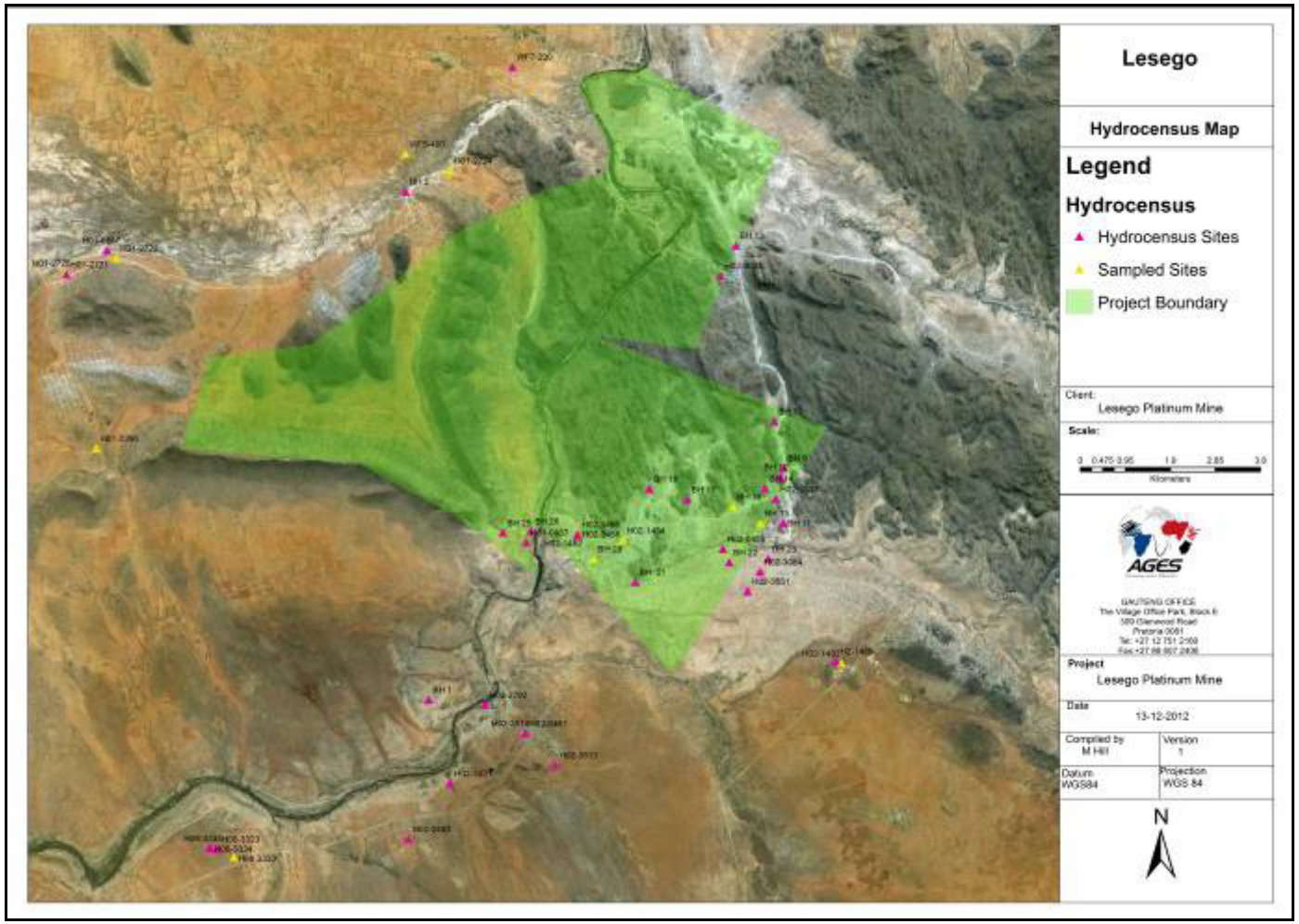

Figure 15 Hydrocensus map

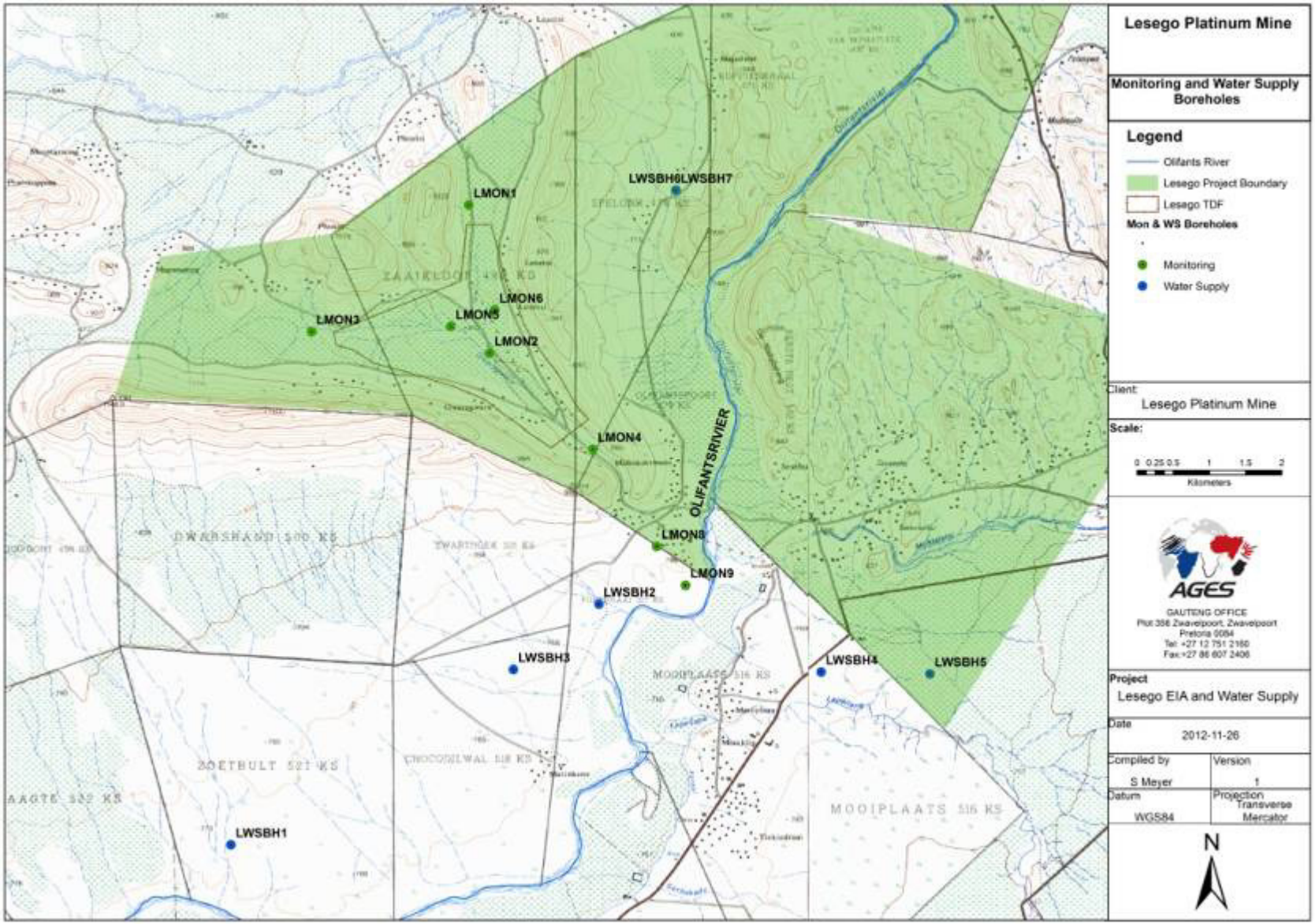

Figure 16 Position of drilled boreholes

4.17 Noise

The study area has a rural character in terms of the background ambient sound levels. Presently, the main noise source in the area is generated by traffic on the R37 situated approximately 12 km north of the site, as well as the district road running south towards Malogeng and Apel. Less prominent noise arises from sounds generated by activities associated with the local communities.

Increased noise levels are directly linked with the various activities associated with the construction of the proposed mine and related infrastructure, as well as the operational phase of the activity. The noise impact generated by the proposed mining activities will be investigated in more detail during the EIA phase through a noise impact assessment.

4.18 Visual

The site is situated within a rural area utilised for subsistence farming and rural settlements. The area surrounding the mine is characterised by the Phosiri dome. The regional topography of the study area can generally be classified as low mountainous terrain throughout most parts of the central, eastern and western sections of the study area often forming deep valleys and a gorge where the Olifants River cuts through the mountainous area. Localised mining activities occur approximately 20 km to the west and 18 km north east of the site.

Hence it can be expected that the proposed mining operations and associated activities will contribute to the visual impact and as a result should be investigated in further detail during the EIA phase.

4.19 Roads and Transport

The proposed site is located approximately 12 km south of the R37 which serves as the main road between Burgersfort and Polokwane. The R37 is a National Road managed by SANRAL, with communities residing next to the road virtually all the way between Polokwane and Burgersfort. As a result there are a lot of interaction between pedestrians, animals and vehicles along this road.

Traffic counts recently conducted for other mines in the area further east towards Burgersfort along the R37, indicates traffic volumes varying between 280 and 500 vehicles per hour between 6 am and 6 pm, with a directional split of more or less 50:50. Heavy vehicles make up approximately 8% of this hourly traffic volume (Grobler et al; 2011).

Based on traffic studies conducted for similar platinum mines towards Burgersfort, a trip generation in the order of 100 to 250 trips can be expected during shift change times at least twice a day, excluding any other trips generated by the mine during the remainder of the day. It is anticipated that the proposed access road will require upgrading to accommodate the expected traffic demand from the mine. A full traffic impact assessment should be conducted as part of the EIA phase in order to quantify the traffic impact on the surrounding road network.

4.20 Air quality

Mining operations are sources of fugitive dust emissions, with particulate matter being the main pollutant of concern. Fugitive dust sources associated with mining activities include materials handling activities, dust-entrainment, crushing and screening activities and wind-blown dust from the tailings disposal facility and mine dumps. These pollution sources place pressure on the ambient air quality of the region. Existing mining activities are located approximately 11 km north east and 22 km west of the proposed site.

According to the Capricorn District Municipality (DM) Air Quality Management Plan of 2006, limited air quality monitoring data are available and mainly around major industrial and urban centres with few (if any) background sites (CDM, 2006). The air quality status for the Capricorn District Municipality is regarded as potentially poor due to mining and industrial activities. No measured or simulated PM10 or dust fallout data for the area around Lesego Platinum Mine are available.The main sources likely to contribute to fugitive dust emissions are the following:

- Surrounding mining activities (land clearing, materials handling, vehicle entrainment from haul roads, drilling and blasting);
- Emissions from paved and unpaved roads;
- Wind erosion of open areas;
- Domestic fuel combustion;
- Biomass burning;
- Vehicle tailpipe emissions; and
- Informal Refuse burning.

The nearest sensitive receptors (in terms of human settlements) to the proposed Lesego Platinum Mine site are Malogeng, Dal Josaphat, Phosiri, Ga-Nkoana and Apel. The impact on air quality as a result of the proposed mining activities will be investigated in more detail during the EIA phase.

4.21 Archaeological and cultural interest

A Phase 1 Heritage Impact Assessment was done by Mr Neels Kruger from AGES during April 2011 and is attached as Appendix G. The study was conducted in order to determine the presence of heritage sites and artefacts and to compile adequate mitigation measures with regards to the cultural resources that may be required for the affected sites/features. A follow-up Heritge Impact Assessment was done in May of 2011 specifically on the footprint for the proposed Tailings Dam Facility. Heritage Assessments are a requirement of the National Heritage and Resources Act (Act 25 of 1999). The NHRA protects all structures and features older than 60 years, archaeological sites and graves in order to limit potential negative impacts as a result of development.

The methods by which archaeological sites were identified included a desktop study as well as historical archaeological studies conducted in the Steelpoort area, an aerial survey using the latest aerial photographs of the proposed site and field surveys. The field surveys focused mainly on three study areas which included the areas where mining infrastructure, like the tailings disposal facility, the plant and the shafts are planned. Figure 17 illustrates the sensitive archaeological sites and artefacts identified during the site surveys.

Early, Middle and Later Stone Age artefacts were identified across the major drainage lines in all survey areas, however not all the sites identified were of high significance. The Stone Age artefacts identified at the plant area located within study area 3 might provide significant research material and as a result has a medium to high significance rating. It is recommended that a limited phase 2 archaeological investigation be done on the Iron Age sites identified in study area 3 and a full phase 2 archaeological investigation on the Middle Stone Age structures identified, should these sites be impacted on by the proposed infrastructure.

Family cemeteries as well as possible unmarked graves were identified within study area 1, where the tailings disposal facility is proposed, as well as study area 3, where the plant is proposed (Also refer to Appendix G). During the follow-up assessment, which covered the larger footprint of the tailings disposal facility and incorporated both study area 1 and study area 3, an additional 26 graves were identified on the property. These graves include:

- 1 Grave belonging to the Mphahlele Family (Site BP1).
- 6 Graves belonging to the Ntsoane family (Site BP2).
- 3 Graves belonging to the Phaladi family (Site BP3).

- 1 Grave belonging to the Chaba family (Site BP5)
- 8 Graves belonging to the Mazwi family (Site BP6).
- 5 Graves belonging to the Maleka family (Site BP7).
- 2 Graves of unknown origin.

A conservation buffer zone of at least 50 m around all graves and cemeteries should be maintained at all times or be relocated. It is recommended that the locations and provenance of any additional graves be established in close consultation with local communities and possible relatives of individuals interred in the area. All cemeteries and burial places should be fenced off with access control. However, should any of the cemeteries or graves (or the proposed 50 m buffer zone around them) be impacted in any way by the planned Lesego Mining infrastructure, full grave relocations are recommended for graves to be impacted. Such measures should be undertaken by a qualified archaeologist, and in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to the cemetery. A full social consultation process should occur in conjunction with the mitigation of any burial place or cemetery. The exhumation, investigation and reburial of the burial place may only commence after SAHRA has issued relevant permits and permissions.

Although the various ruined homesteads identified across the site are of low significance, a demolishment permit will still have to be obtained from the relevant heritage resources authority before such homesteads can be demolished.

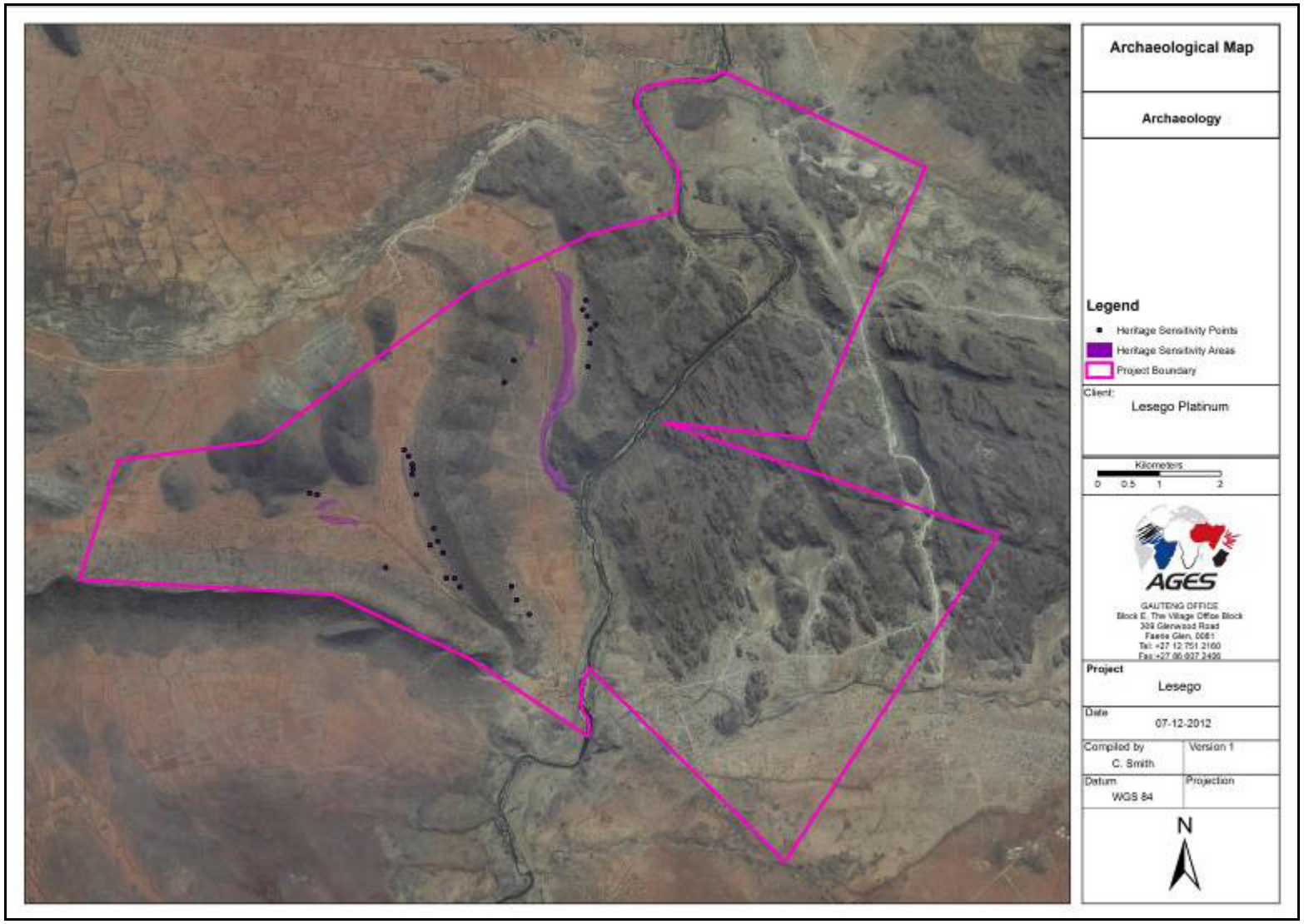

Figure 17 Sites of archaeological and historical interest

4.22 SOCIO ECONOMIC ENVIRONMENT

A Social Impact Assessment is being conducted by PTERSA social scientists and will be included in the EIR.

4.23 Description of the communities

Ptersa are in the process of compiling the SLP in preparation for the Mining Right Application (MRA) and have compiled a preliminary social statement on the progress to date (Appendix J).

There are a number of different groups in the social environment that may be affected by the proposed mining activities:

- Adjacent landowners

The proposed development site borders various landowners ranging from land owned by local municipalities, communities, trusts, and private companies.

- People in surrounding towns and settlements

Surrounding towns include Lebowakgomo as well as the villages of Phosiri, Malogeng, Pelangwe, India, Mphahlele, Ga-Mankopane, Ga-Nkoana, Apel and Tiekiedraai. The proposed new mining development may positively affect these residents by creating employment opportunities.

- Municipalities and technical groups

The proposed development site is located in Limpopo Province, with a portion of the site falling within the jurisdiction of Sekhukhune District Municipality and Fetakgomo Local Municipality and another portion within the jurisdiction of the Capricorn District Municipality and Lepelle-Nkumpi Local Municipality. The Municipalities can be affected in terms of infrastructure expectations as well as their Integrated Development Plans and Local Economic Development Initiatives.

4.24 Socio-Economic Description

The figures used for the socio-economic description were sourced from the Community Survey 2007 that was released by STATS SA.

4.25 Population

Limpopo Province has an estimated population of 5 238 286 (Community Survey, 2007). The annual growth rate of approximately 1.1% is based on STATS SA population estimates between 2001 and 2007 calculated on community level. Increasing housing and service backlogs are some of the challenges which must be addressed within the Province.

Fetakgomo Local Municipality is one of the local municipality's which has jurisdiction over the proposed site and has a population of approximately 92083 people with an average household size of approximately 5 people per household (Community Survey 2007). Lepelle-Nkumpi Local Municipality is the other municipality with jurisdiction of the site and has an estimated population of 227 970 and an average household size of approximately 4 people per household. (Community Survey 2007).

Figure 18 provides an illustration of the population distribution within the applicable district as well as local municipalities.

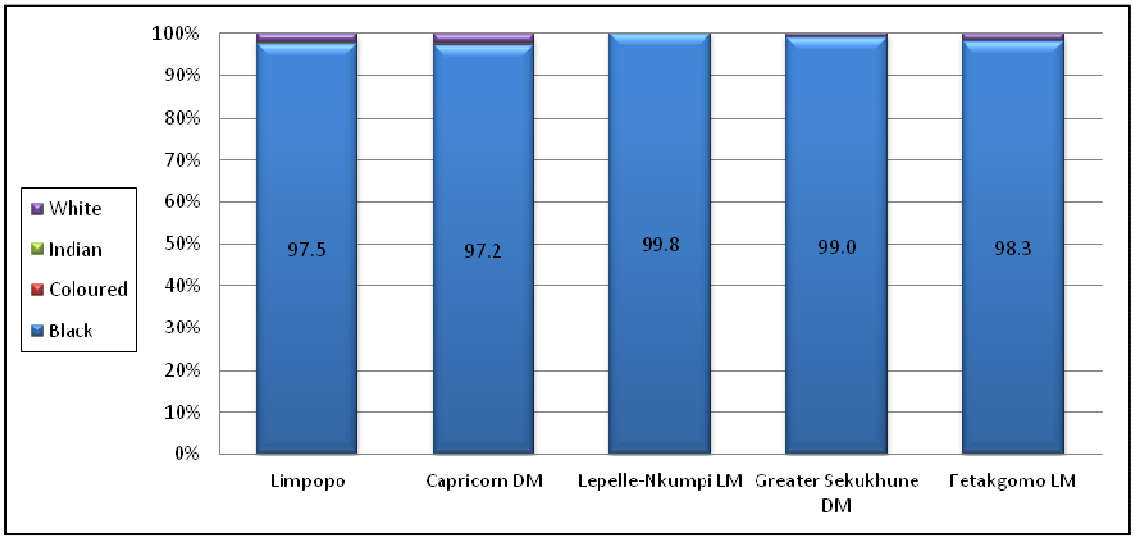

Figure 18 Population distribution (shown in percentage, source: CS 2007)

4.26 Age

Of the estimated 5 238 286 people residing in Limpopo Province, more than 50% are of a working age (between 19 and 65 years of age). However there are still large percentages of the total population falling below the working age of 19 to 65. The average age of the population on provincial, district and municipal level is very similar, approximately 25 years, placing them in the life stage of young adulthood (Census 2001: Stages in the life cycle of South Africans; 2005).

The Fetakgomo Local Municipality has the greatest proportion of people aged 14 years or younger as well as the second highest proportion of people aged 65 years or older, who combined, make up almost half of the population. This places a very heavy burden on the part of the population who are of economically active age, especially since opportunities within Fetakgomo itself are extremely limited. Such a large proportion of children and infants is also indicative of future demands for employment and infrastructure. The profile for the Lepelle-Nkumpi LM looks very similar to the provincial profile, just with a higher proportion of people aged 65 years or older (SIA, 2012).

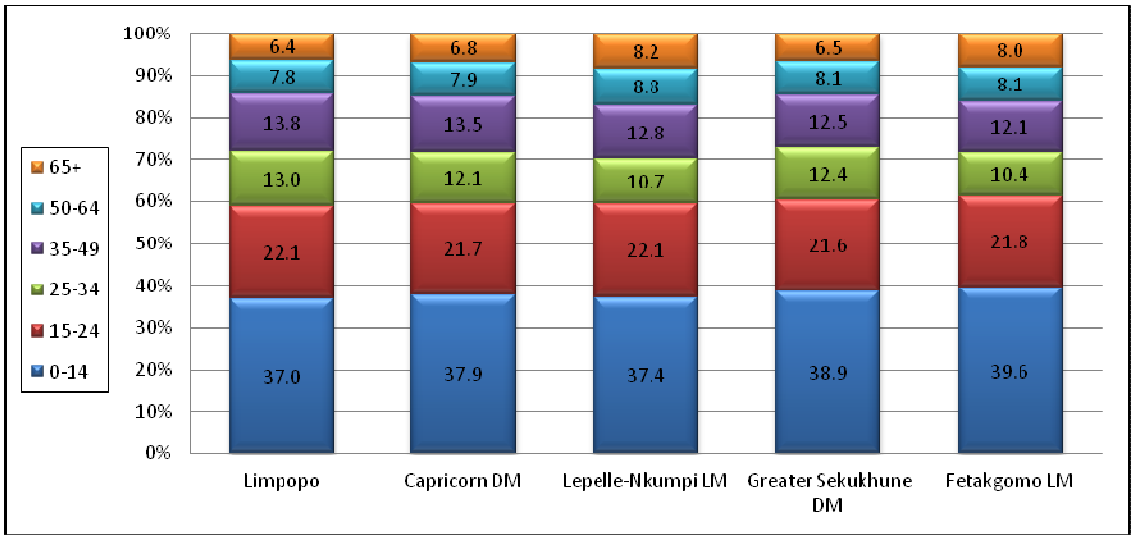

Figure 19 Age distribution (shown in percentage, source: CS 2007)

4.27 Gender

Fetakgomo Local Municipality has a gender distribution of 54.6% female and 45.4% male and Lepelle-Nkumpi Local Municipality has a similar 54.8% female and 45.4% male distribution. The gender distribution bias towards females can most likely be ascribed to the migration of economically active males to other areas and provinces in search of employment opportunities.

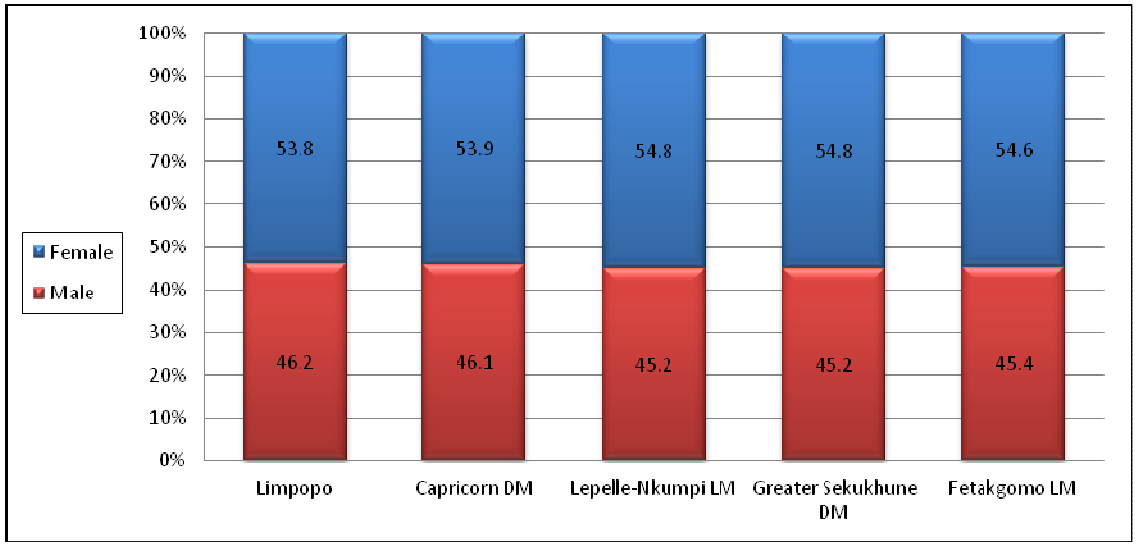

Figure 20 Gender distribution (shown in percentage, source: CS 2007)

4.28 Language

The Community Survey of 2007 did not release any information on language, thus the Census of 2001 was reviewed for indicative purposes. The local and district language profiles proved to differ substantially from the provincial language profile. On local and district level, Sepedi is the dominant home language. In the Lepelle-Nkumpi Local Municipality, isiNdebele is the second most frequent home language and Xitsonga the third most frequent. Home languages other than Sepedi do not really feature in the Fetakgomo Local Municipality, this suggests that the Fetakgomo Local Municipality is culturally more homogeneous.

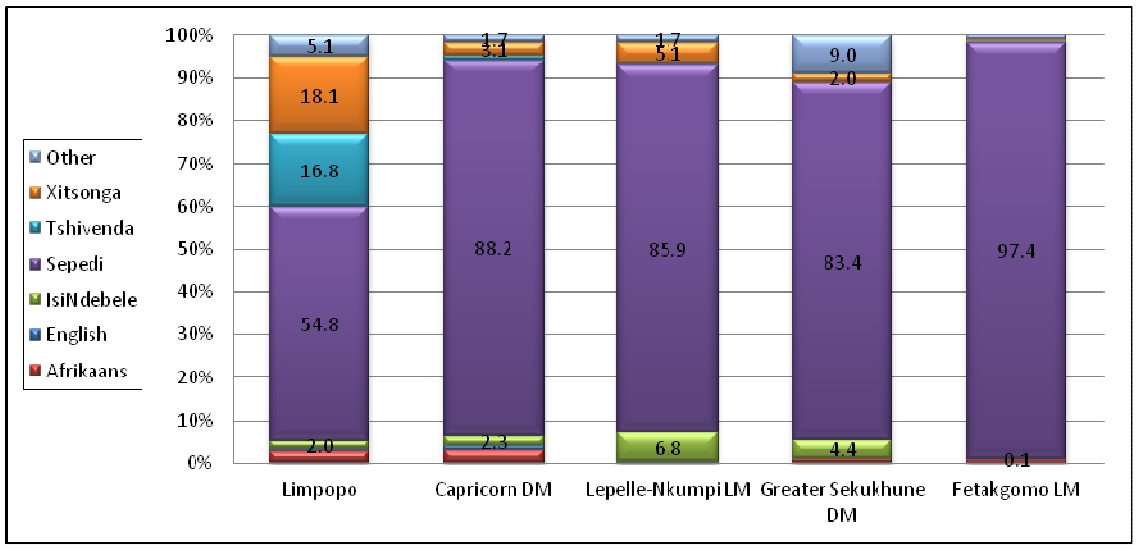

Figure 21 Language distribution (shown in percentage, source: Census 2001)

4.29 Education

The level of education of the people comprising the workforce in the area (as in the rest of the province) is considered poor. Approximately 41.5% of Lepelle-Nkumpi Local Municipality's population only received some kind of education or no schooling at all. Fetakgomo Local Municipality's education figures are also poor with 49.1% of the municipality's population having received some kind of education or no schooling at all.

Only an average of 11.5% of the two applicable municipality's population received higher education.

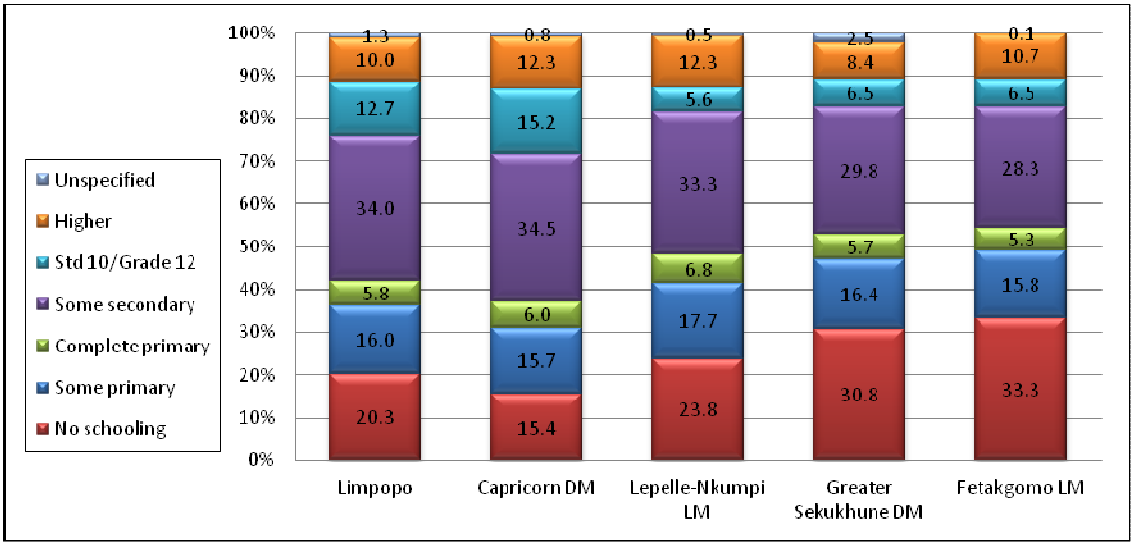

Figure 22 Level of education (shown in percentage, source: CS 2007)

4.30 Income

The high percentage of economical inactive individuals within Limpopo Province is reflected in the monthly income statistics. The majority of the economically active individuals in the Lepelle-Nkumpi Local Municipality receive no monthly income with only 4.1% earning more than R6400/month. Approximately 80.5% of Fetakgomo Local Municipality's population has no income with only 1% earning more than R6400/month. Very high levels of poverty and deprivation can be expected in both municipalities, however the Lepelle-Nkumpi Local Municipality appears to be less deprived than Fetakgomo.

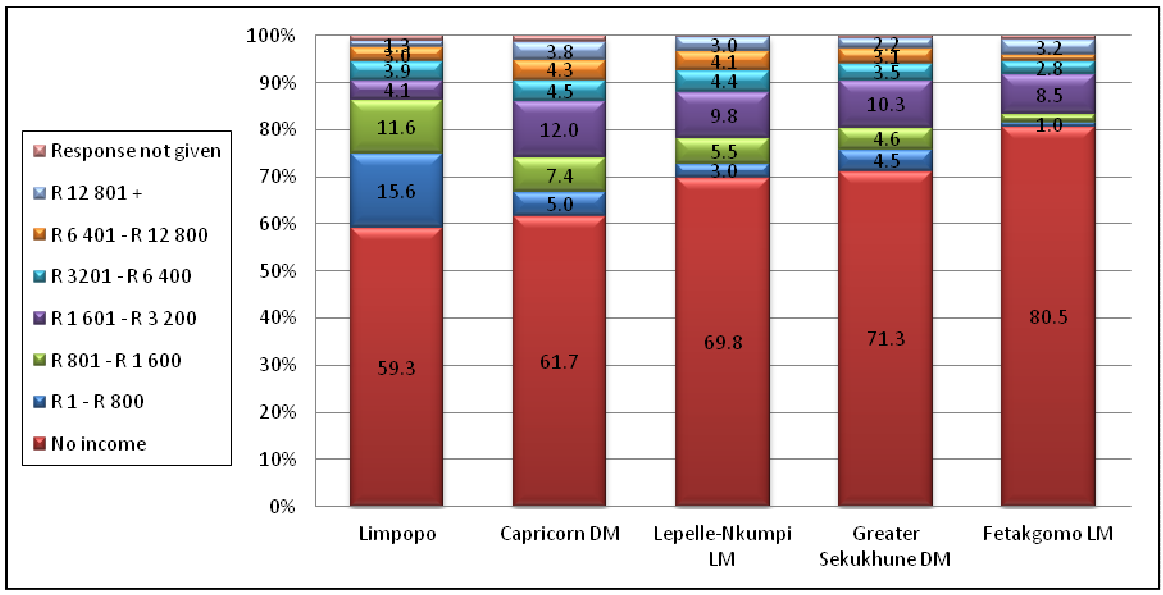

Figure 23 Monthly income (shown in percentage, source: CS 2007)

4.31 Industries and Employment

Only 21.4% of Lepelle-Nkumpi Local Municipality's population is employed with 15.6% without any work. Fetakgomo Local Municipality's population has an unemployment figure of 19.8% with 12.4% being employed.

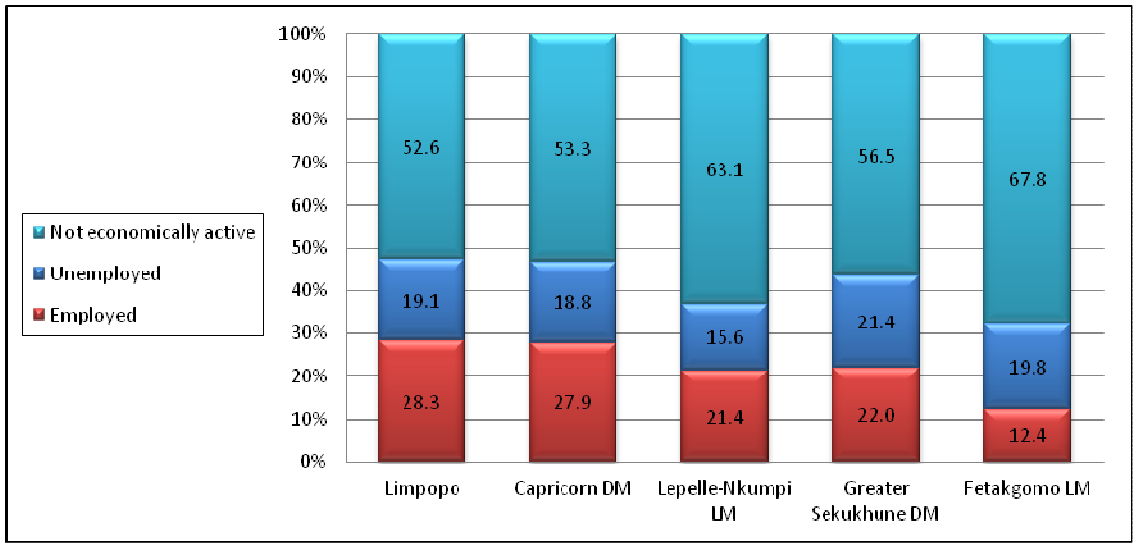

Figure 24 Labour status (shown in percentage, source: CS 2007)

The mining industry is a large contributor to employment within the area, with approximately a third of employed individuals within Fetakgomo Local Municipality being employed within the mining and quarrying sector. However the mining industry within Lepelle-Nkumpi Local Municipality contributes only 3.6% to employment. This suggests that there are mining skills present in the communities and it would be possible to source

local labour with mining experience. Other big contributors to employment within the municipalities are community, social and personal services.

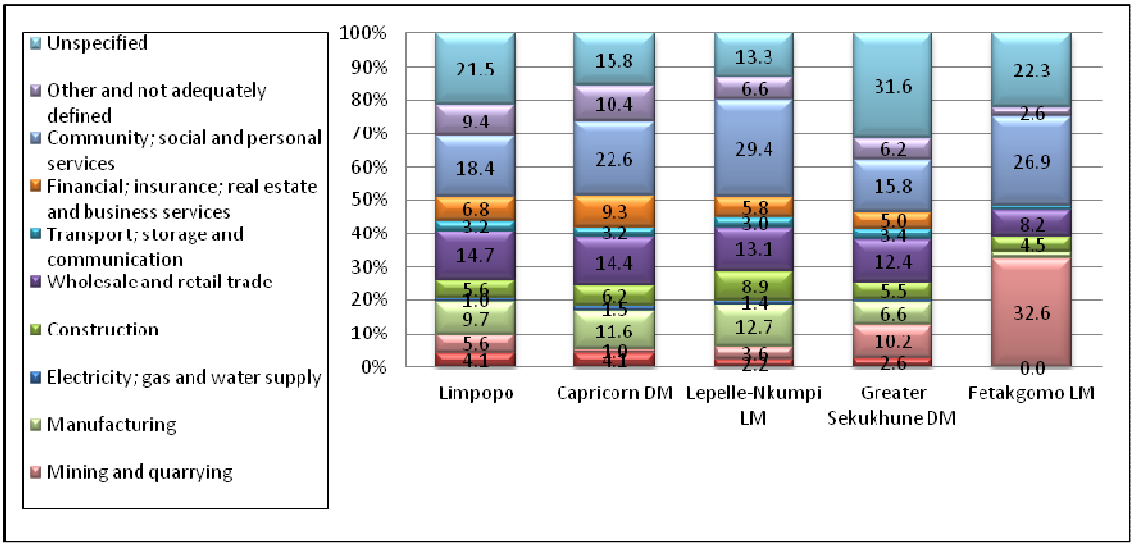

Figure 25 Industry distribution of employment (shown in percentage, source: CS 2007)

4.32 Services

Access to piped water, electricity and sanitation services relate to the domain of Living Environment Deprivation as identified by Noble et al (2006). Very few households in the study area have access to piped water inside the dwelling. In the Lepelle-Nkumpi Local Municipality approximately 46.3% of households have access to piped water inside the yard and approximately 27% have access to piped water from an access point outside the yard. About 19.3% of households in Lepelle-Nkumpi source their water from boreholes. In the Fetakgomo Local Municipality approximately 53.6% have access to piped water from an access point outside the yard. About 15.9% source their water from a river or a stream while approximately 8.1% receive water from a water vendor.

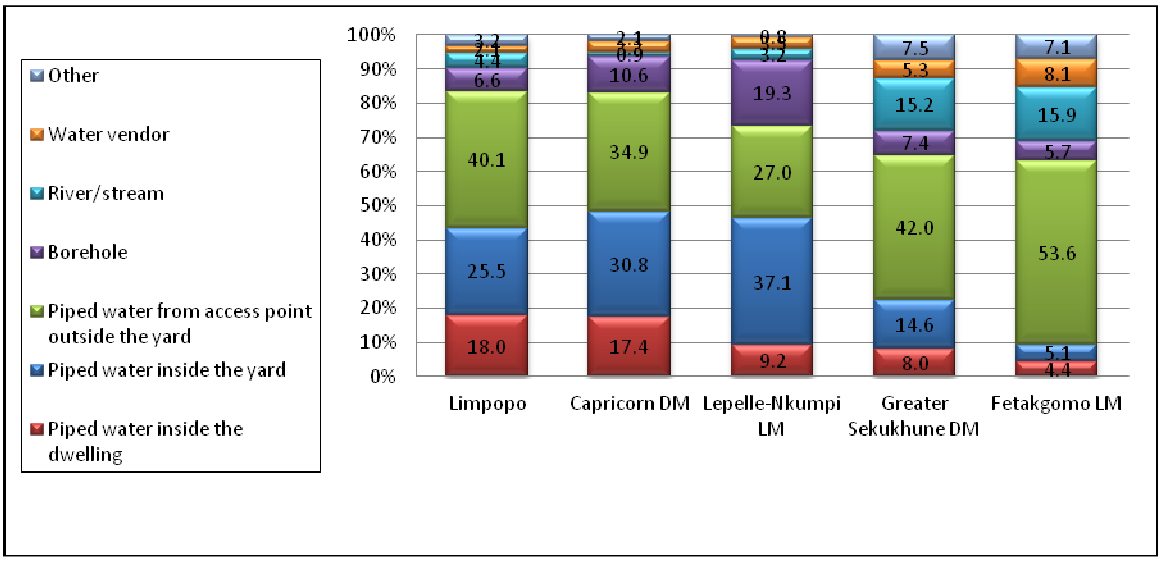

Figure 26: Distribution of water supply (households, shown in percentage, source: CS 2007)

According to RDP standards adequate sanitation means having a minimum of access to a ventilated pit latrine (VIP). The Lepelle-Nkumpi Local Municipality has just over 13% flush toilets to a severage system and 23.6% pit toilets with ventilation. The Fetakgomo Local Municipality has approximately 16.7% pit toilets with ventilation with the majority of household in both municipalities having pit roilets without ventilation. This implies that very few households in these municipal areas have adequate sanitation facilities.

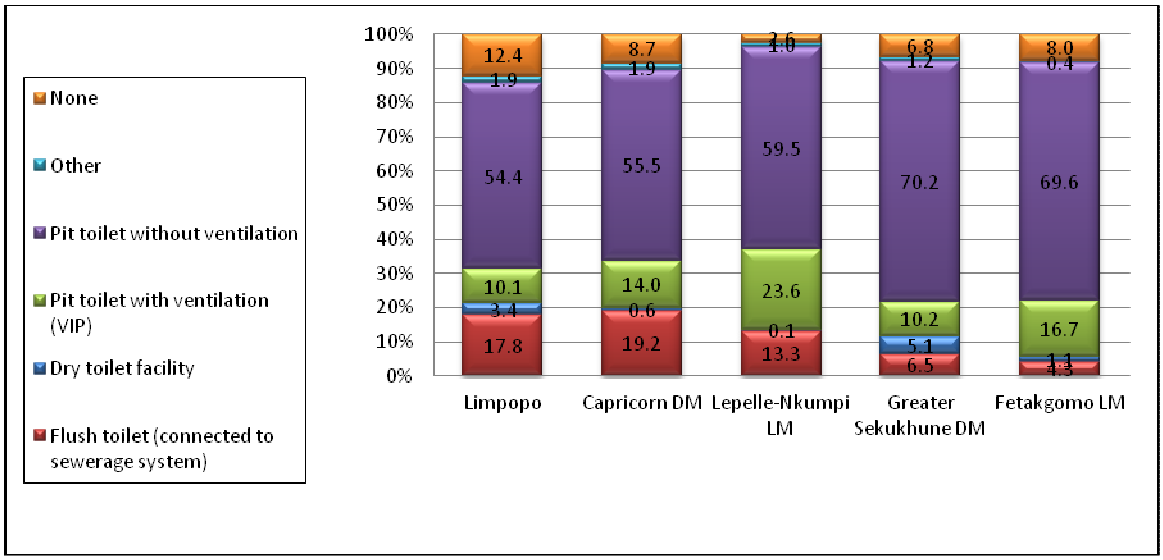

Figure 27: Sanitation distribution (households, shown in percentage, source: CS 2007)

Electricity is seen as the preferred energy source for lighting (Noble et al, 2006). The Lepele-Nkumpi LM has the highest incidence of households using electricity as source of energy for lighting, with almost 90% indicating that they use electricity for lighting purposes. This is higher than on provincial or district level, and also higher than for the Fetakgomo Local Municipality, with approximately 70% of household using electricity for lighting.

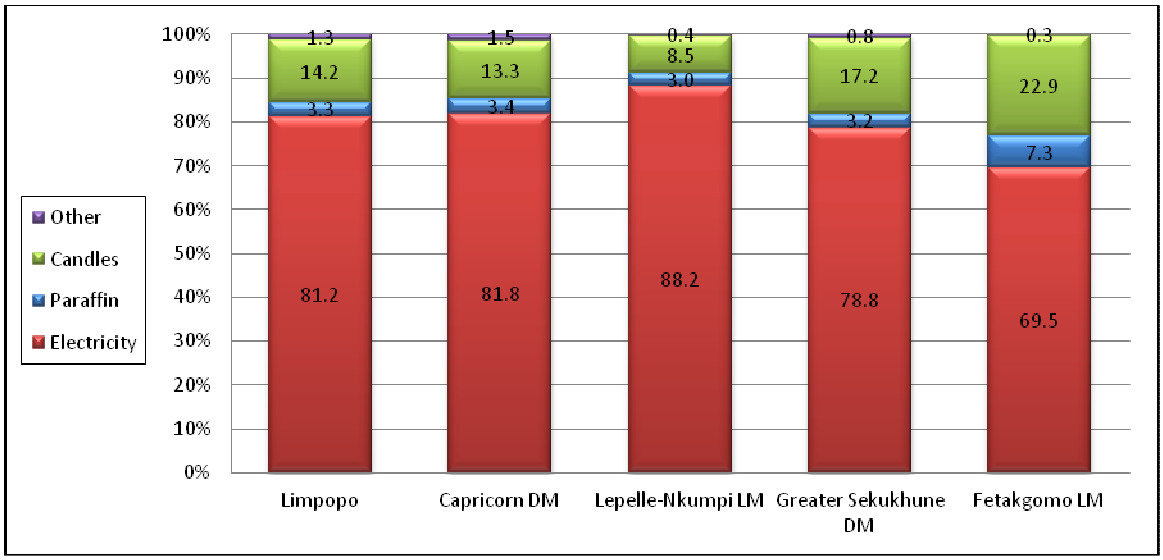

Figure 28: Distribution of energy source for lighting (households, shown in percentage, source: CS 2007)

The majority of households in the Lepelle-Nkumpi Local Municipality and the Fetakgomo Local Municipality indicated that they have their own refuse dumps. This can be attributed to the rural character of these municipalities with most areas being far away from infrastructure and municipal facilities. Households with their own refuse dumps rely mostly on backyard dumping, burial and burning. These practices adversely impact on human health and the environment, specifically:

- air pollution from smoke;
- ground and surface water pollution;
- Disease from smoke inhalation; and
- fires destroying property.

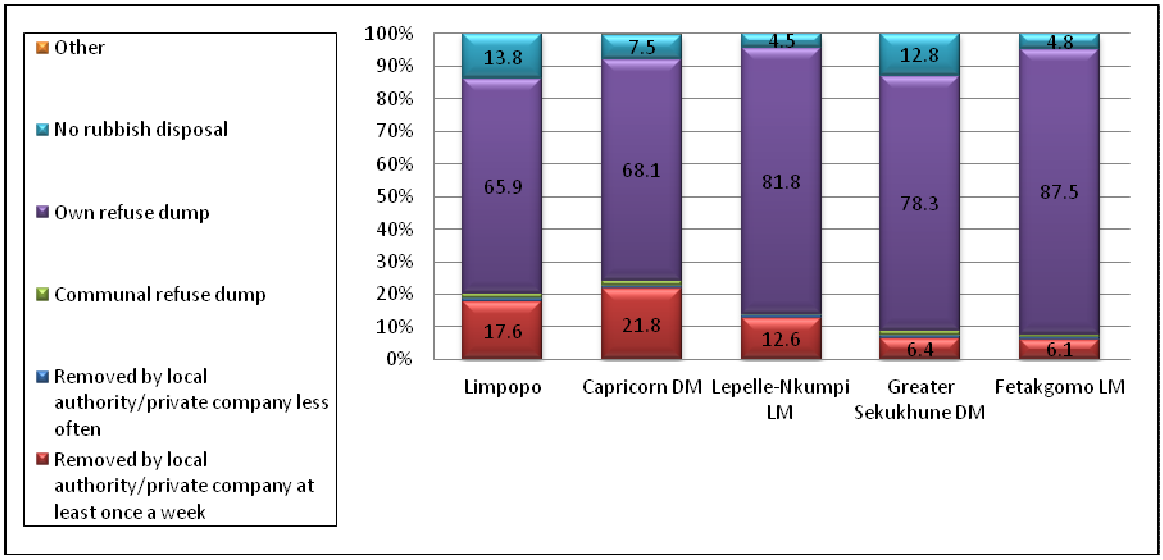

Figure 29: Refuse removal distribution (households, shown in percentage, source: CS 2007)

4.33 Transport

The Community Survey for 2007 did not release data on a transport and therefore data from Census 2001 is used for indicative purposes. The majority of people in the Fetakgomo Local Municipality travel by foot. The profile for the Lepelle-Nkumpi Local Municipality is similar, however travel by taxi and car as passengers also features.

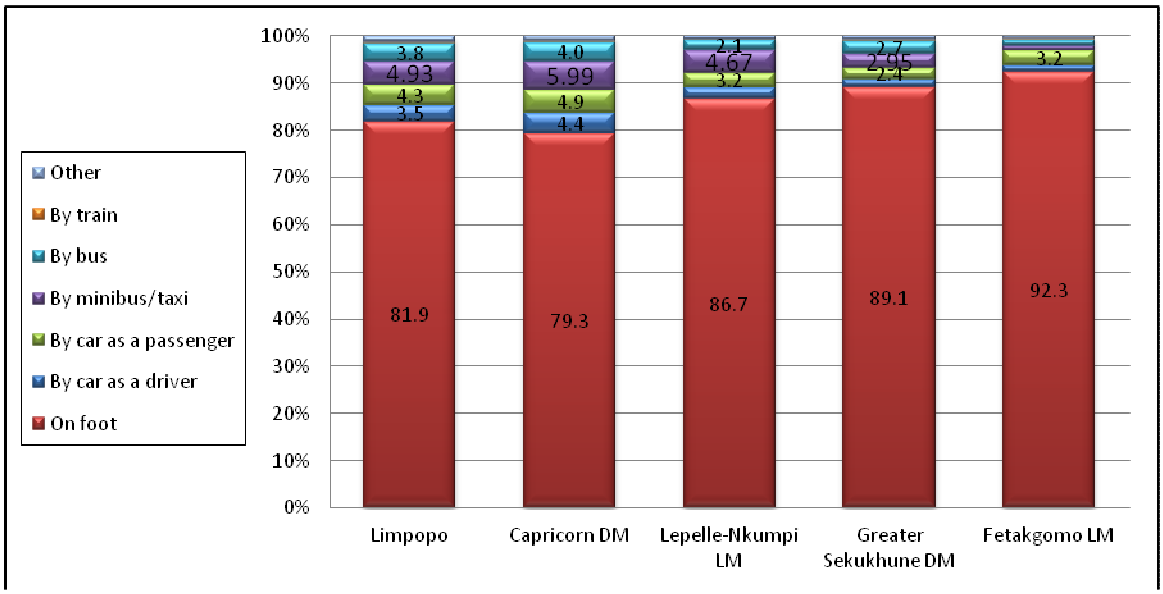

Figure 30: Mode of travel (shown in percentage, source: Census 2001)

4.34 Human Health

Various wastes and other effluents, typically generated and managed by mining operations, have the potential to either directly or indirectly impact on the health of communities living in the vicinity of the operations. Atmospheric and groundwater pathways were identified as issues of potential concern with regard to public health impacts in the areas surrounding the proposed Project. In recent years, evidence has shown that airborne particulate matter is the cause of a range of adverse health effects in humans ranging from decreases in pulmonary function reported in children to increased mortality reported in the elderly and in individuals with cardiopulmonary disease. This has led to particulate matter being identified by the USEPA as one of a set of six criteria air pollutants that require the setting of standards on a national level, in order to protect public health.

The reliance of the communities living in the vicinity of the proposed Project on groundwater resources, and the close proximity of some of the communities to the proposed operations, may result in communities being exposed to contaminants present in the raw materials, ore or residues from the mining and mineral processing operations through the water pathway. The potential risks to public health, posed by particulate and gaseous emissions as well as the potential contamination of water resources, will be assessed in depth during the EIA phase by means of an Human Health Impact Assessment.

4.35 Sensitive landscapes

In terms of the Department of Environmental Affairs and Tourism (DEAT) guidelines for Integrated Environmental Management (IEM), sensitive landscapes are a broad term applying to:

- Nature conservation or ecologically sensitive areas – indigenous plant communities (particularly rare communities or forests), wetlands, rivers, river banks, lakes, islands, lagoon, estuaries, reefs, inter-tidal zones, beaches and habitats of rare animal species;
- Unstable physical environments, such as unstable soil and geo-technically unstable areas;
- Important nature reserves – river systems, groundwater systems, high potential agricultural land;

- Sites of special scientific interest;
- Sites of social significance or interest – including sites of archaeological, historic, cultural spiritual or religious importance and burial sites; and
- Green belts or public open space in municipal areas.

Sensitive landscapes in terms of the above definition are illustrated in Figure 31 below and include:

- Archaeological features
- Local Communities
- Soil and Landuse Potential zones
- Ecological Sensitive areas and
- Surface Water features

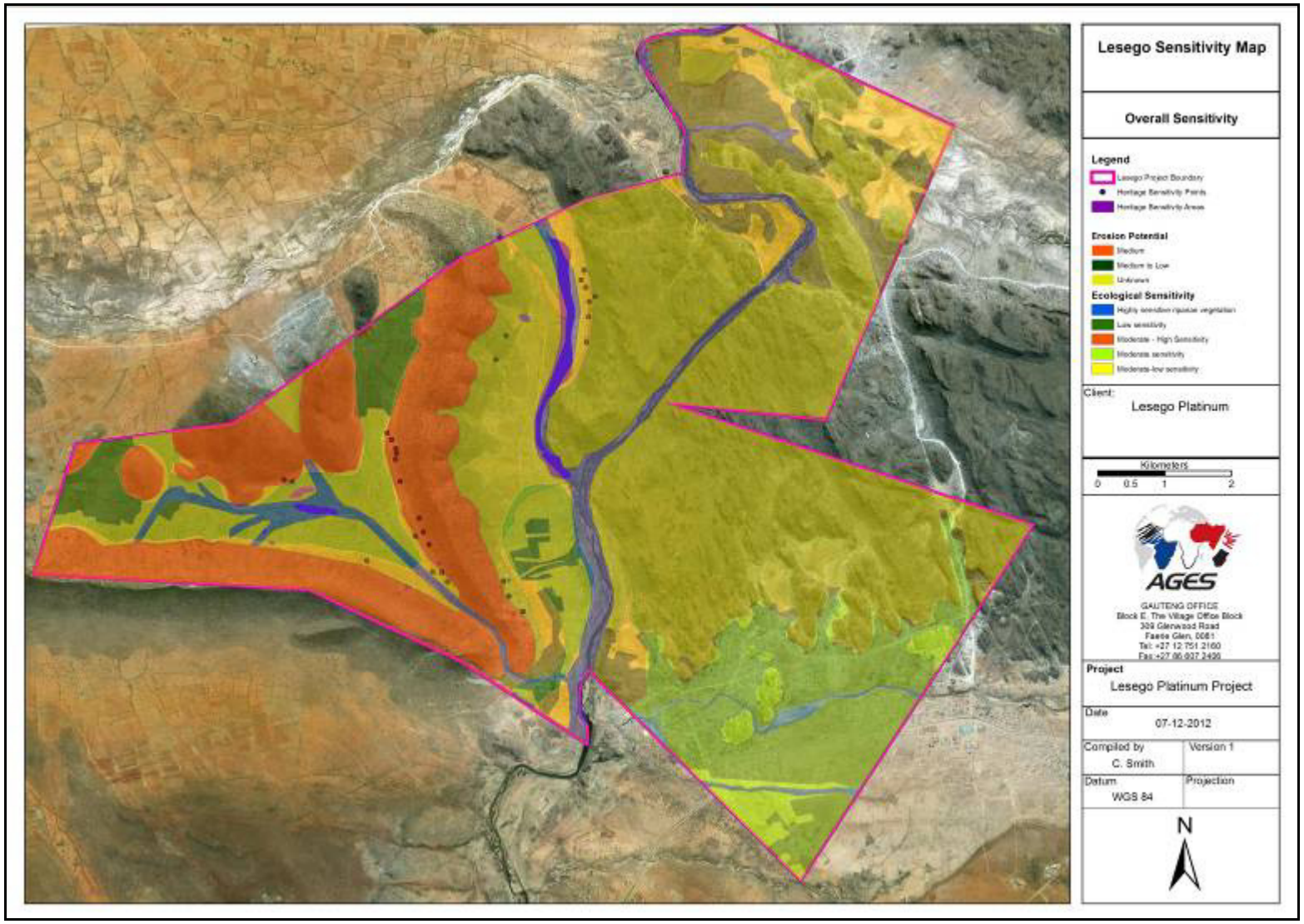

Figure 31 Overall Sensitivity Map

5 PUBLIC PARTICIPATION

The principles of NEMA read with the EIA Regulations govern public participation with interested and affected parties (I&APs). These principles include the provision of sufficient and transparent information to I&APs on an ongoing basis, to allow them to submit comments on the proposed development. The public participation process forms an integral part of the environmental authorization processes and feasibility process and should be conducted during the planning and design stages of any project prior to implementation. The comments received and issues raised during the Scoping Phase of the Lesego Platinum Project have been incorporated into the Comments and Response Report (Appendix A5 Comments and Response Report) and will be utilized in order to identify, assess and mitigate the proposed identified impacts as part of the EIA phase.

The aim of public participation is to achieve the following:

- Provides for public input and facilitate negotiated outcomes; and
- Provide up-front indication of issues that may prevent project continuation or can cause costly delays at a later stage.

Public Participation is a process leading to informed decision-making through joint effort by:

- The proponent;
- Technical experts;
- Governmental authorities; and
- Interested and Affected Parties (I&APs).

5.1 Identification of Interested and Affected Parties

Key stakeholders, who included the following sectors, were directly informed of the proposed development by means of registered post, fax and/or email (proof of notification included in Appendix A):

- The owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;

- The owners and occupiers of land within 100 m of the boundary of the site or alternative site who are or may be directly affected by the activity;
- Mphahlele Tribal Authority;
- Baroka Ba Nkwana Traditional Authority;
- Tau-Mankotsana Traditional Authority (Nchabaleng);
- Limpopo Department of Economic Development, Environment and Tourism (LEDET)
- Department of Mineral Resources (Limpopo)
- Department of Water Affairs
- Department of Forestry and Fisheries (DAFF)
- Limpopo Department of Roads and Transport
- Department of Land Affairs
- Department of Rural Development and Land Reform: Limpopo
- Department of Cooperative Governance Human Settlements and Traditional Affairs (CoGHSTA)
- SANRAL (northern region)
- Limpopo Roads Agency (RAL)
- South African Heritage Resources Agency (SAHRA) (Limpopo)
- Regional Manager of Land Development for ESKOM
- Municipality Manager from the Sekhukhune District Municipality
- Municipality Manager from the Fetakgomo Local Municipality
- Municipality Manager from the Capricorn District Municipality
- Municipality Manager from the Lepelle-Nkumpi Local Municipality

- ESKOM
- AGRI Limpopo
- Other mines in the area

The consultation process with I&APs is an ongoing process and included a notice to all I&APs and Background Information Document notifying I&APs of *inter alia* the environmental authorization application and providing an overview of the proposed mining operations and the associated infrastructure. The aforesaid notice referred to the applicable provisions of the NEMA read with the EIA Regulations (2010).

Details of the engagement process with I&APs followed during the course of the scoping phase, a summary of the issues raised and the date thereof as well as the EAP's response have been included in the Comments and Response Report attached to this Scoping Report in accordance with regulation 28(1)(h) of the EIA Regulations. In addition, copies of written comments received from I&APs are included in the Comments and Response Report attached hereto as contemplated in regulation 55 of the EIA Regulations. In addition to the above, the following notification methods as contemplated in the EIA Regulations, 2010 were used:

5.2 Site Notices

In order to inform surrounding communities and adjacent landowners of the proposed development, three notice boards (in accordance with regulation 54(2)(a) and 54(3) of the EIA Regulations were erected at the Mphahlele, Tau-Mankotsana and Barok-Ba-Nkwana Tribal Authorities, as well as Gwara-Gwara School in Nkotokwane and the Bopedi Shopping Centre in Apel on the 17th of October 2012 (See Appendix A3.2 Proof of Site Notices).

5.3 Advertisement

An advertisement, notifying the public of the proposed mining operations and the Environmental Impact Assessment process and inviting I&APs to register with and submit their comments to AGES was placed in the in both English and Sepedi in the Daily Sun on the 17th of October 2012 in accordance with regulation 54(2)(c) of the EIA Regulations of 2010 (See Appendix A4.2 Proof of Newspaper Advert).

5.4 Interested and Affected Parties Consultation

Background Information Documents informing the I&APs of the project were distributed by means of registered mail, emails and faxes to I&APs during October 2012. (See Appendix A1 Background Information Document and Registration Form).

5.5 Raising of Issues for investigation by EIA Specialists

I&APs have had the first opportunity to raise issues either in writing, by telephone or email. All the issues raised by I&APs during the scoping process have been captured in a Comments and Response Report (Appendix A5 Comments and Response Report) and I&APs subsequently received correspondence acknowledging their contributions.

5.6 Scoping Report

The EIA Regulations specify that I&APs must have an opportunity to verify that their issues have been captured. A period of 30 days has been made available for public comment on the draft Scoping Report (4 January 2013 to 4 February 2013) as part of the environmental impact assessment process. The availability of the draft Scoping Report has been announced via personal notification letters to all the registered I&AP's on the distribution list.

In addition, the Scoping Report has been distributed for comment as follows:

- Published on the AGES website at www.ages-docs.co.za;
- Electronic copies on request; and
- Hard copies at the Mphahlele Tribal Authority Offices, Tau-Mankotsana Traditional Authority, Baroka Ba Nkwana Traditional Authority, as well as the Public Library in Apel.

5.7 Final Scoping Report

The Comments and Response Report and Scoping Report will be updated after the draft review to incorporate the comments received and issues raised by I&APs. (Appendix 5 hereto).The Final report will then be submitted to I&APs (for 30 days) and the LEDET.

5.8 Public Participation during the Environmental Impact Assessment Phase

Public participation during the Environmental Impact Assessment Phase of the EIA process will revolve around a review of the findings of the Scoping Phase. The findings will be presented and addressed in a draft EIR and Environmental Management Plan and the volume of specialist studies.

Details of the engagement process of I&APs followed during the course of the assessment and an indication of how issues raised have been addressed will be included in the EIR as contemplated in regulation 31(2)(e) of the EIA Regulations.

6 ASSESSMENT OF IMPACTS

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

The questions, issues and responses shown in Appendix A5 Comments and Response Report have been analysed using knowledge of the affected environment, available information and professional judgment, in order to identify key issues that require further assessment in the next phase of the environmental impact assessment – specialist studies and environmental impact assessment phase.

The reader should note that the classification of an issue as a key issue during the scoping phase does not necessarily imply that a significant impact will result. The significance of an impact can only be ascertained once a specialist study has been conducted.

Impact significance will be assessed by means of the specialist studies and impact assessment phase using the criteria listed below.

6.1 Assessment Methodology

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. Assessment of impacts will be based on the Department of Environmental Affairs (previously the DEAT) (1998) Guideline Document: EIA Regulations. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability. This describes the likelihood of the impact actually occurring.

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable:	There is a probability that the impact will occur to the extent that provision must be made therefore.
Highly Probable:	It is most likely that the impact will occur at some stage of the development.
Definite:	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.
Duration.	The lifetime of the impact
Short term:	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
Medium term:	The impact will last up to the end of the phases, where after it will be negated.
Long term:	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent:	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.
Scale.	The physical and spatial size of the impact
Local:	The impacted area extends only as far as the activity, e.g. footprint
Site:	The impact could affect the whole, or a measurable portion of the above mentioned properties.
Regional:	The impact could affect the area including the neighbouring residential areas.
Magnitude/ Severity.	Does the impact destroy the environment, or alter its function.

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance. This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Medium: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights will be assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1

	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	**Sum (Duration, Scale, Magnitude) x Probability**	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity will be rated without mitigation measures and with mitigation measures for both construction, operational and closure phases of the Lesego Platinum Mine development.

6.2 Impact Assessment

Impacts on the identified key issues will be assessed according to the following structure:

- *Source of the impact*: will be identified (e.g. initial vegetation clearance on site, establishment of construction camp, passage of vehicles on dirt roads, etc).

- A *Description of the impact* will describe the interaction between the activity and the environment, i.e. how and why the impact occurs and how the activity changes the environment.

- *Significance*: an explanation of the significance rating of the impact with and without mitigation, with reference to the impact assessment criteria will be provided. Impacts will be rated as highly significant, or of low significance. Fatal flaws will additionally be identified. There are no mitigation measures which can be implemented to manage a fatal flaw.

- *Mitigation:* The mitigation measures that can be implemented to eliminate or

minimise negative impacts or result in the optimization of positive benefits must, wherever possible, be expressed as practical actions.

6.3 Cumulative Impact Assessment

The proposed development would create cumulative impacts that need to be assessed and mitigated, especially in relation to the surrounding environment. The mining activities in the area have altered the environment and cumulative impacts can therefore be expected.

The anticipated impacts resulting from the construction and implementation of the proposed development could potentially result in cumulative effects and are expected in terms of (also refer to the Plan of Study for EIA – Appendix C):

- Cumulative social impacts;
- Cumulative water impacts;
- Cumulative traffic impacts; and
- Cumulative air quality impacts.

6.4 Determining the extent of cumulative impacts

When identifying potentially significant cumulative impacts, it is necessary to determine what the extent of potential cumulative impacts will be. This will be done by adopting the following approach:

- Identify potentially significant cumulative impacts associated with the proposed activity;
- Establish the geographic scope of the assessment;
- Identify other activities affecting the environmental resources of the area; and
- Define the goals of the assessment.

6.5 Assessment of cumulative impacts

The general methodology which is used for the assessment of cumulative impacts should be coherent and will comprise of the following:

- An identification of the important cause-and-impact relationships between proposed activity and the environmental resources;
- A determination of the magnitude and significance of the cumulative impacts; and
- The modification, or addition, of alternatives to avoid, minimize or mitigate significant cumulative impacts.

6.6 Identification of Key Issues

The key issues listed in the following section have been determined through the following avenues:

- Views of and issues raised by interested and affected parties;
- Legislation; and
- Professional understanding of the project team, environmental assessment practitioners and specialist consultants.

Preliminary significant issues for the proposed mining development and associated infrastructure are summarized below:

Key Impact	Specialist input during the EIA phase
Groundwater Impact • Anticipated pollution of groundwater resources due to TDF • Depletion of the underground aquifer • Excessive ingress of underground water Surface water Impact • Surface water pollution and subsequent decrease in water quality due to mining activities • Improved water quality due to proposed water treatment plant • Improved water quality monitoring	Geohydrological and Surface Impact Assessment Water Supply Assessment
Stormwater impacts on surface water resources	Stormwater Management Plan Geohydrological and Surface Impact Assessment
Flooding • Flooding of mine	Floodline Delineation

infrastructure	
Air quality impact • Dust from roads, TDF and crushing activities • PM10	Air Quality Impact Assessment
Land availability	Agreements have been finalized and / or are in process with the respective landowners
Noise pollution • Impact on surrounding community	Noise Impact Assessment
Biodiversity Impact • Impact on red data species • Impact on aquatic diversity • Habitat degradation and fragmentation	Ecological Assessment
Wetland Impact	Wetland Delineation and Assessment
Land use and Land Capability • Loss of agricultural land • Increased soil erosion and sedimentation	Land use and Land Capability Impact Assessment
Visual Impact • Impact on surrounding community •	Visual Impact Assessment
Heritage Impact • Anticipated grave relocation	Heritage Impact Assessment
Socio-economic • Jobs to be created • Social investment within surrounding communities • Safety and security • Health	Social Impact Assessment Health Impact Assessment
Traffic Impact on roads	Traffic Impact Assessment
Mine Closure • Mine rewatering and flooding	Mine Closure and Rehabilitation Plan and Geohydrological Assessment

Further details associated with the construction and operation of the various activities as listed in the Project Description will be discussed in detail in the EIA Report. The EIA Report will assess the impacts of each of the activities as well as ascertain the cumulative impacts of the development. The EIA report will outline the necessary mitigation measures and delineate sensitive areas containing species of conservation importance

and habitats integral to the maintenance of ecosystem function.

6.7 Specialist Studies

As a result of the above-mentioned anticipated impacts, the specialist studies as listed below will be undertaken during the EIA phase of the process. The specialist studies assist with the development of an understanding of the system processes and the potential positive and negative impacts of the proposed development on both the social and biophysical environments. The following specialist studies are proposed for the EIA phase of the process:

- Ecological Assessment (AGES)
- Heritage Impact Assessment (AGES)
- Geohydrological and Surface Water Impact Assessment (AGES)
- Wetland Delineation and Aquatic Assessment (SAS)
- Soils and land use capability (Terrasoil)
- Noise Impact Assessment (Menco)
- Air Quality Impact Assessment (Airshed)
- Social Impact Assessment (Ptersa)
- Health Impact Assessment (Envirosim)
- Visual Impact Assessment (Newtown Landscape Architects)
- Traffic Impact Assessment (Havenga Transportation Engineers)
- Stormwater Management Plan & Floodline Delineation (AES)
- Mine Closure and Rehabilitation plan (AGES)

7 ALTERNATIVES

7.1 Process to assess alternatives

The IEM procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the EIA Regulations require that a number of possible proposals or alternatives for accomplishing the same objectives should be considered.

In the case of the proposed development, a Pre-Feasibility Study (PFS) was conducted and concluded during November 2011. The following alternatives were identified through discussions with authorities, discussions with I&APs, reviewing of existing environmental data, specialist inputs/studies and the client.

- Location alternatives
  - Location of tailings disposal facility; and
  - Location of shaft/vent.
- Layout alternatives
  - Layout of Waste Rock Dumps
  - Layout of the Plant
- Service alternatives
  - Water provision;
  - Energy alternatives;
  - Access alternatives; and
  - Waste disposal.
- Technology Alternatives
  - TDF Construction Alternatives
- The “no-go” alternative

7.2 Tailings Disposal Facility location alternatives

a) Location alternative 1 evaluated for the Tailings Disposal Facility is situated within the Phosiri dome to the west of the site.

The advantages of location alternative 1 are:

- There are no major drainage lines crossing the proposed area and as a result the Department of Water Affairs will prefer location alternative 1 over location alternative 2. It is also deemed that costs associated with storm water management will be lower for location alternative 1.
- Preliminary investigations indicate that most of the area is not deemed sensitive from an environmental perspective,
- The heritage impact assessment indicated that the archaeological artefacts identified in the area are of medium to low significance and as a result demolishment of such artefacts will not require the completion of a phase 2 heritage impact assessment,
- The largest part of the site is classified as containing non-erosive soils.
- From a visual impact point of view, location alternative 1 will have the lowest impact.

The disadvantages of location alternative 1 are:

- Parts of the Tailings Disposal Facility infringes into the ecological sensitive areas along the ridge,
- Grave relocation permits will still have to be obtained,
- The proposed Tailings Disposal Facility will be situated further away from the plant and shaft, with associated cost implications,
- The existing Lesego mineral right holdings do not include the proposed area and are in the process of being amended to include the farms Stofpoort 481 KS and Zaaikloof 480 KS.

b) Location alternative 2 evaluated for the Tailings Disposal Facility is situated in the north western portion of the site and is planned to be established along the eastern slopes of

the Phosiri dome, stretching across the valley towards the rocky outcrops in the east.

The advantages of location alternative 2 are:

- The proposed Tailings Disposal Facility will be situated closer to the plant and shaft, as location alternative 1. Thus this will have a lower cost implication than location alternative 1.

The disadvantages of location alternative 2 are:

- There is a major drainage line crossing the proposed site and as a result there are risks associated with the authorisation of the water use licence application. Location alternative 2 will also be associated with a higher cost implication regarding storm water management.

- Large parts of the tailings disposal facility infringes into the ecological sensitive rocky outcrops,

- The heritage specialist identified various archaeological artefacts within the area with a high significance. As a result a phase 2 heritage impact assessment will have to be conducted and submitted to the South African Heritage Resources Agency prior to the commencement of construction activities. Graveyards were also identified within the proposed area, for which relocation permits will have to be obtained,

- The biggest part of the proposed site is classified as highly erosive,

- From a visual impact point of view location alternative 2 will have a much higher visual impact than location alternative 1.

7.3 Shaft/vent location alternatives

Three location alternatives were investigated for the proposed shaft/vent.

a) The proposed location alternative for the shaft/vent is situated more or less in the centre of the valley located east of the Phosiri dome.

The advantages of the proposed location alternative are:

- The proposed location alternative is not situated within any drainage lines,

- The proposed location alternative is not situated within any ecological or archaeological sensitive areas,
- From a visual impact point of view, the proposed location alternative will have a moderate impact,

The disadvantages of proposed location alternative are:

- The area associated with the proposed alternative is characterised by highly erosive soils.

b) Location alternative 1 investigated for the shaft/vent is situated north of the proposed location alternative, within the valley located east of the Phosiri dome.

The advantages of location alternative 1 are:

- Location alternative 1 is not situated within any drainage lines,
- Location alternative 1 is not situated within any ecological or archaeological sensitive areas,
- From a visual impact point of view, location alternative 1 will have the lowest visual impact.

The disadvantages of location alternative 1 are:

- The area associated with location alternative 1 is characterised by highly erosive soils,
- As location alternative 1 is the furthest away from the TDF, the costs involved with regards to tailings will be high.

c) Location alternative 2 investigated for the shaft/vent is situated south of the proposed location alternative, within the valley located east of the Phosiri dome.

The advantages of location alternative 2 are:

- Location alternative 2 is not situated within any ecological or archaeological sensitive areas,
- The area associated with the location alternative 2 is characterised by non-erosive soils,

The disadvantages of location alternative 2 are:

- Although location alternative 2 is not situated within any drainage lines, the proximity of the Olifants river flood line might cause impacts during an extreme flood event,
- From a visual impact point of view, location alternative 2 will have the highest visual impact.

7.4 Plant layout alternatives

Two layout alternatives were investigated for the proposed plant.

a) Layout 1 is associated with the proposed shaft/vent location and is situated more or less in the centre of the valley located east of the Phosiri dome.

The advantages of the proposed layout alternative are:

- The plant is not situated within any drainage lines,
- The location is economically optimized in relation to the position to the TDF and the shaft

The disadvantages of layout alternative 1 are:

- Layout alternative 1 is partially situated within the ecological sensitive area associated with the ridge,
- The area associated with alternative 1 is characterised by highly erosive soils.

b) The preferred layout is similar to the location of Alternative 1 however it has been optimized in order not to infringe on the ecological sensitive areas.

The advantages of layout alternative 2 are:

- The advanteages are similar to Alternative 1 but with the significant improvement of less of an ecological impact.

The disadvantages of layout alternative 2 are:

- The area associated with layout alternative 2 is characterised by highly erosive erosive soils.

7.5 Waste Rock Dump alternatives

Two location alternatives were investigated for the proposed waste rock dump.

c) Alternative 1 is situated south of the plant.

The advantages of the proposed location alternative are:

- The dump is not situated within any drainage lines at this location
- The dump is not situated within any ecological or archaeological sensitive areas,
- The location makes the most economical sense as the dump is located closest to the shaft thus ensuring the shortest transportation distances.

The disadvantages of this layout are:

- From a visual impact point of view, the proposed location will have a larger visual impact.
- The dump is in close proximity to the host community and will result in larger air quality, noise, and human health impacts.
- The area associated with the proposed alternative is characterised by highly erosive soils.

d) Location alternative 2 is situated north of the preferred plant location:

The advantages of layout alternative 2 are:

- The waste rock dump is visually screened by the Plant.
- The dump is further away from the community and less air quality, noise and human health impacts are anticipated.

The disadvantages of layout alternative 2 are:

- As the dump for alternative 2 is the furthest away from the shaft, the costs involved with regards to transportation and capital expenditure will be higher than for Alternative 1.

Table 11 serves as a summary of the risks identified for the two location alternatives proposed for the tailings disposal facility as well as the three location alternatives

proposed for the vent/shaft

Table 11 Comparative summary of the impacts associated with the proposed infrastructure location and layout alternatives

Drainage lines	Alt 1	Preferred/ Alt 1	N.A.	N.A.
Ecological impacts	Alt 1	Preferred/ Alt 1/Alt 2	Alt 1	N.A.
Heritage impacts	Alt 1	Preferred/ Alt 1/Alt 2	N.A.	N.A.
Erosion	Alt 1	Alt 2	Alt 1	Alt 1
Visual Impacts	Alt 1	Alt 1	Alt 1/ Alt 2	Alt 1
Cost implication	Alt 2	Preferred/ Alt 1/Alt 2	Alt 2	Alt 2

7.6 Service Alternatives

7.7 Water Provision

The following water supply options were identified:

1) Water sourced from groundwater (<30 km radius);
2) Water sourced from existing agricultural allocations;
3) Net water saving through the clearing of alien vegetation;
4) Existing mines' discharged water (Atok Mine);
5) Water sourced from regional groundwater (>30 km radius); and
6) Water allocated from the proposed De Hoop Dam.

It is recommended that any uncertainties regarding the water supply options be addressed as part of a detailed water supply options analysis study as part of the EIA. The various stakeholders (i.e.: landowners, DWA, etc.) are currently being engaged to develop some form of understanding regarding possible take-offs from existing rivers, dams or other sources.

7.8 Energy alternatives

Wind energy was considered as an energy alternative for the proposed project. The construction of a wind farm generating renewable energy could be considered using various funding models including 100% ownership or co-ownership. The option of embedded energy generation entails the generation of wind energy without ESKOM transmission facilities on site and should be considered as an alternative to ESKOM power.

The potential of bio energy as well as solar energy as alternative energy sources should also be investigated in further detail during the EIA phase. The combination of renewable energy sources such as wind, solar and bio energy in combination could offer cost effective energy generation.

It would be beneficial for the project to further assess these options as part of the EIA as it would assist in further securing the supply of electricity and indicate goodwill on the side of Lesego to align themselves with future carbon footprint reduction initiatives.

7.9 Access alternatives

Five access alternatives were assessed. Two options were identified as being preferred going into the EIA based on distance and capital cost implications. These two alternatives entail the following:

1) Route option 4 which exit the site in a northerly direction from where it will follow the alignment of route alternative 1 diverting north through Mashite and the mountain neck and intersecting with the R37.

   The advantages of route option 4 are:

   - Route 4 appears to be the most economical solution should the existing road pavements prove to be adequate to accommodate the revised traffic load associated with the change in function.

   The disadvantages of route option 4 are:

   - Approximately 13 km will have to be constructed before route option 4 can be used as an access road.

2) Access route 5 which exit the site in a southern direction crossing the Olifants River with a bridge from where it will connect to the main Apel road.

The advantages of route option 5 are:

- 54 km of route of option 5 are already constructed and as a result only an additional road of 5 km needs to be constructed.

The disadvantages of route option 5 are:

- Route 5 is the longest route from the base point; and
- A bridge will have to be constructed over the Olifants River.

Table 12 Summary of the impacts associated with the route alternatives

Associated impacts	Option 4	Option 5
Drainage lines	Preferred option: no new construction of bridges (excl Olifants River bridge)	Alternative option: this option will traverse drainages and require bridge upgrades/construction.
Ecological impacts	New roads and upgrades will add to impacts on ecology.	Preferred option as the impact on undeveloped land is limited.
Heritage impacts	Alternative: route to the north will pass identified archaeological remains that might be impacted upon.	Route option 5 will be situated well away from any archaeological sites.
Visual Impacts	Alternative: new construction and upgrades – creating additional visual impacts.	Preferred: 5 km of road construction, the rest will be existing roads.
Social & Safety	Similar impacts in terms of the additional traffic generated to travel through the surrounding communities.	Similar impacts in terms of the additional traffic generated to travel through the surrounding communities.
Cost implication	The cost involved for construction of Route option 4 is approximately R86.2m	The cost involved for construction of Route option 4 is approximately R81.2m

7.10 Waste Disposal

Various sewage disposal facilities will be evaluated as part of the EIA phase. Recycling

initiatives should also be investigated with regards to waste disposal.

7.11 Tailings Dam Facility alternatives

Two technology or construction method alternatives are being investigated for the proposed TDF's construction.

1) Valley-fill tailings deposition:

The advantages of the proposed deopistion or construction alternative are:

- The whole footprint of the TDF site will be utilized thus resulting in a lower dump.
- A lower dump will imply less wind exposure resulting in less of an air quality impact and therefore less of an human health impact.
- The lower dump will also result in less visual intrusion.
- The dump is not situated within any ecological or archaeological sensitive areas,
- The valley fill makes the most economical sense as the the deposition will take place by means of simple benches.
- Due to decreased exposed slopes, the reabilliataion costs are also expected to be less than conventional construction methods.
- The TDF will also suffice as a stormwater management facility during times of excess fissure water recovery from the underground mine. This water will be recoverable to the plant by means of the various drains and water recovery structures at the foot of the TDF.

The disadvantages of this deposition method are:

- The are sections of the TDF that would infringe on the moderate to high ecological zone but the cumulative benefits outweigh the limited ecological impact.

2) Conventional deposition has been assessed as alternative 2:

The advantages of the conventional alternative are:

- No advantages of conventional deposition have yet been determined.

The disadvantages of alternative 2 are:

- The construction method will result in higher visual, air quality and human health impacts.
- The closure costs will be extensively higher due to a greater amount of exposed slopes requiring rehabilitation.
- The construction and operation of a conventional TDF is more expensive.
- Water containment facilities need to be constructed additionally thus increasing the environmental footprint impact.

Table 11 serves as a summary of the risks identified for the two location alternatives proposed for the tailings disposal facility as well as the three location alternatives proposed for the vent/shaft

7.12 "No-go" Alternative

The assessment of the "no-go" alternative is a legal requirement according to NEMA and the EIA Regulations. In this scenario no development would take place. The environment would be left as is and the impact on the area and potential benefits would remain unchanged.

The no-go alternative will be assessed against the following categories, *inter alia*:

- Groundwater Impacts
- Surface water Impacts
- Fauna and Flora Impacts
- Heritage Impacts
- Visual Impacts
- Air Quality Impacts
- Noise Impacts
- Traffic Impacts

- Socio Economic Impacts

It is expected that the majority of the specialists would agree that in the event that the Lesego Platinum Mine is not developed that the status quo of the site will be maintained. The “no-go” alternative implies that none of the identified impacts of the project will occur, however existing impacts will continue. The specialists’ studies to be undertaken during the EIA phase will provide reference to the “no-go” alternative and needs to be reported on in the relevant sections of the EIR.

Alternatives will also be evaluated against the “no-go” option.

8 MINE CLOSURE AND REHABILITATION

Regulation 33 of the EIA Regulations requires that information given on the methods to rehabilitate and manage negative impacts on the environment be described. Due to the fact that the project is a mining activity the closure and rehabilitation with the associated financial provision will be determined as per Section 39 (4) (a) (ii) read together with section 37 (2) of the MPRDA.

The Closure Plan for the Lesego Platinum Mine will be based on the various specialist studies conducted for the Project.

The closure objectives and goals are highlighted as follows:

- To rehabilitate all disturbed land to a state that is suitable for its post closure use.
- To ensure that all affected areas are made safe for both humans and animals in the post closure land use.
- To rehabilitate all disturbed land to a state where limited or preferable no post closure management is required.
- To rehabilitate all disturbed land to a state that facilitates compliance with current environmental quality objectives (air and water quality).
- To limit the impact on personnel whose positions may become redundant on decommissioning of the mine.

8.1 Legal Framework for Closure

The holder of mining rights must make the prescribed financial provision for the

rehabilitation and management of the negative environmental impacts due to mining activities. The MPRDA is specific in its requirements for the rehabilitation, closure and aftercare of mines and also in specifying the requirements for the identification of environmental risks.

The Mine Closure and Rehabilitation Report acts as the assessment of the financial liability should the proposed Lesego Platinum Mine come into operation on the proposed site. The closure plan and financial provision will be done in line with the above-mentioned legislation as well as known best-practise principles.

8.2 Accounting Policy

This colusre and rehab report aims to establish a financial estimate for activities in 5 categories:

1. Activities carried out during the development and construction phase of mining activities.
2. Activities carried out during the operational phase of mining activities.
3. Activities carried out during the rehabilitation and closure phase.
4. Activities carried out during the aftercare phase.
5. Current closure liability, should operations cease immediately.

The closure liability will be based on the mine production plan and the infrastructure associated with each of the elements in the mine plan. This figure should be reviewed annually once the mine is in operation to accurately estimate the immediate closure provision required. This figure will be the base to determine the shortfall between the provision in the fund, as well as the amount of shortfall to be insured against. Volumes, rates and quantities will be presented in such a way that future annual updates, as required by the MPRDA, can be done quickly and cost-effectively.

8.3 Financial Estimate of Rehabilitation and Closure Financial Liability

Section 39 (4) (a) (ii) of the MPRDA, read together with Section 41 (1) requires that you must make the prescribed financial provision for the rehabilitation or management of negative environmental impacts.

The Mine Closure Quantum Guideline document with regards to additional weighting factors will be added to take the nature of the terrain and the proximity to urban areas into account.

8.4 Post Closure Land Capability

According to preliminary soil survey the soils found on the site of the proposed Lesego Platinum mine are generally shallow and those that are somewhat suitable for agriculture are exclusively used for subsistence agriculture. However there are a number of limitations which include low and erratic rainfall as well as inadequate fertiliser use.

The post closure land use proposed for the site is to return the area to wilderness/natural area or area suitable for grazing land. The soil and land use capability study (Terrasoil Science, 2011) conducted for the site concluded that the region consists of either residential areas, natural land or areas already disturbed by subsistence agriculture.

The Closure Plan will be designed to facilitate the social, environmental and financial aspects of the rehabilitation and closure process. This equates to a Closure Plan that takes into consideration the needs of all stakeholders, and finds a way of integrating these needs into a plan that will be satisfactory to everyone's expectations.

The closure plan will facillitate the dismantling or demolition of all infrastructure, the disposal thereof in a suitable on-site disposal location and the landscaping and re-vegetation of the disturbed area. This will allow for this area to be returned to a state as close as possible to its intended post closure land use.

9 CONCLUSION AND RECOMMENDATIONS

AGES submits that the Scoping Phase was undertaken in accordance with the correct and appropriate standards and procedure for the environmental authorization application as provided for in the NEMA read with the EIA Regulations of 2010.

The Scoping Study includes a description of various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment during the EIA phase. Impact significance will be assessed during the specialist studies and impact assessment phase using the criteria listed in section 6.1.

The specialist studies in process are:

- Ecological Assessment (AGES)
- Heritage Impact Assessment (AGES)
- Geohydrological and Surface Water Impact Assessment (AGES)
- Wetland Delineation and Aquatic Assessment (SAS)
- Soils and land use capability (Terrasoil)
- Noise Impact Assessment (Menco)
- Air Quality Impact Assessment (Airshed)
- Social Impact Assessment (Ptersa)
- Health Impact Assessment (Envirosim)
- Visual Impact Assessment (Newtown Landscape Architects)
- Traffic Impact Assessment (Havenga Transportation Engineers)
- Stormwater Management Plan & Floodline Delineation (AES)
- Mine Closure and Rehabilitation plan (AGES)

Public participation during the Environmental Impact Assessment Phase of the EIA process will revolve around a review of the findings of the Scoping Phase. The findings will be presented and addressed in a draft EIR and Environmental Management Plan and

the volume of specialist studies. Details of the engagement process of I&APs followed during the course of the assessment and an indication of how issues raised have been addressed will be included in the EIR

AGES (Pty) Ltd recommends that the project proceed into the EIA phase of the authorisation process. The EIR will address the key issues identified in the Scoping Report, at a level required to provide the public and the decision-making authorities with sufficient information to deliver a final decision. The anticipated way forward on the next phase of the EIA process is explained below in Section 9.1.

9.1 Way Forward

1. Completion of the Public Participation Process (PPP). The comments received from I&APs will be included in the Comments and Response Report which will be included in the final EIA Report.

2. Appointment of Specialists. The identified specialists will be appointed to undertake the specialist studies as identified in this Scoping Report.

3. Draft Environmental Impact Report. The results of the specialist studies will be synthesized by the project team to provide a draft EIR.

4. Draft EIR and EMPR published. The draft EIR and EMPR will be circulated to key I&APs for comment for a period of 4 weeks (30 days).

6. Comments Report. Comments on the Draft EIR and EMPR will be synthesised by the project team into a Comments and Response Report, which will be appended to the final Report

7. Revise draft EIR and EMPR. The draft report will be updated by addressing and responding to the issues raised in the Comment and Response Report as contemplated in regulation 31(2)(e) of the EIA Regulations.

8. Final EIR and EMPR. The revised final report will be published with the various specialist reports appended. This will be submitted to the Limpopo Department of Economic Development, Environment & Tourism (LEDET).

10 REFERENCES

Aucamp, S. 2011. Lesego Platinum Mine: Social Statement, November 2011.

De Jager, M. 2012. Lesego Platinum Mine Limited Baseline Report: Ambient Sound Levels. M2 Environmental Connections cc. April 2012.

Grobler, Mostert and Stolp. 2011. Pre-Feasibility Study for the proposed Lesego platinum mining activities, Limpopo Province. November 2011.

Havenga, C. Traffic Impact Assessment Lesego Platinum Mine. Corli Havenga Transportation Engineers. November 2012.

Henning, B. 2011. A strategic ecological assessment and fatal flaw analysis for the proposed Lesego platinum underground mine and associated infrastructure, Limpopo Province. L11 – 027 EC. AGES, June 2011.

Kruger, N. 2011. Lesego platinum mine, Sekhukhune area, Steelpoort, Limpopo Province: Phase 1 Archaeological Impact Assessment Report. AGES, July 2011.

Liebenberg-Enslin and Gresse. 2012. Air Quality Baseline Assessment for the Lesego Platinum Mine in Limpopo Province, South Africa. May 2012.

LNR. 2011. Wind data for weather stations 30744, 30757 and 30883.

Louw, M. 2011. Memorandum: Lesego Platinum Mine conceptual water supply options analysis, November 2011.

Louw, M. 2011. Conceptual mine closure plan and estimate of financial provision, November 2011.

Meyer, W.J., Van Dyk, G. 2011. Lesego Platinum Mine: Geohydrological Pre-Feasibility Study, November 2011.

Mucina and Rutherford. 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Ncube, D *et al.* 2010. Lesego Platinum Project: Scoping Study Report.

Plomp, H. 2004. A process for assessing and evaluating environmental management risk and significance in a gold mining company. Conference Papers-Annual National Conference of the International Association for Impact Assessment: South African Affiliate.

Potgieter, N. 2012. Prospective Human Health Risk and Impact Assessment for the proposed Lesego Platinum Mining Project, Limpopo Province. Envirosim Consulting. May 2012.

Uken, R. 1998. The geology and structure of the Bushveld Complex metamorphic aureole in the Olifants River area. Ph.D. Thesis (unpubl.) University of Natal, Durban, South Africa.

Van der Waals, J. 2011. Baseline Assessment Report, Soil, Land use, Land capability and Agricultural Potential Survey: Proposed Lesego platinum mine, Limpopo Province. Terra Soil, August 2011.

Van Schalkwyk, M. 2011. Lesego Platinum: Floodline estimation. LP MO1_R01. AGES, June 2011.

Van Staden, S. 2011. Aquatic biomonitoring report for the Olifants River and associated drainage features in the vicinity of the proposed Lesego platinum mine. SAS 211042. Scientific Aquatic Services, May 2011.

Van Staden, S. 2012. Wetland Delineation, Function and PES Assessment of the aquatic resources in the vicinity of the proposed Lesego platinum mine. SAS 212018. Scientific Aquatic Services, June 2012.

http://www.miningweekly.com/print-version/government-impelling-local-pgm-beneficiation-2012-02-03

http://www.bullion.org.za/content/?pid=86&pagename=Platinum

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