



global environmental solutions

Applicant: Tharisa Minerals (Pty) Ltd

EIA/EMP AMENDMENT I:

**FOR A CHROME SAND DRYING PLANT, CHANGES TO
THE TAILINGS DAM DESIGN AND OTHER OPERATIONAL
AND SURFACE INFRASTRUCTURE CHANGES**

SCOPING REPORT

Submitted with due regard to consultation with communities and interested and affected parties as required in terms of:

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

Regulation 28 of the National Environmental Management Act (Act 107 of 1998).

SLR PROJECT NUMBER: T014-12/ 710.20002.00012

DMR REFERENCE NUMBER: NW30/5/1/2/3/2/1/358

DEDECT REFERENCE NUMBER: NWP/EIA/50/2011

REPORT NO. 1

June 2012

DOCUMENT INFORMATION

Title	EIA/EMP Amendment I: For a chrome sand drying plant, changes to the tailings dam design and other operational and surface infrastructure changes
Project Manager	Stella Moeketse
Project Manager e-mail	smoeketse@slrconsulting.com
Author	Stella Moeketse
Reviewer	Brandon Stobart
Client	Tharisa Minerals (Pty) Ltd
Date last printed	2012/06/12 05:30:00 PM
Date last saved	2012/06/12 05:30:00 PM
Comments	
Keywords	Tharisa Mine, Marikana, Rustenburg Local Municipality, Madibeng Local Municipality, Bojanala Platinum District Municipality, surface infrastructure layout
Project Number	T014-12/ 710.20002.00012
Report Number	1
Status	
Issue Date	June 2012

SLR OFFICES

<p>Johannesburg, South Africa</p> <p><u>Physical Address:</u> SLR House Fourways Manor Office Park Corner Roos and Macbeth Streets Fourways Johannesburg South Africa</p> <p><u>Postal Address:</u> P O Box 1596 Cramerview 2060</p> <p>Tel: +27 (011) 467-0945</p> <p>Fax: +27 (011) 467-0978</p>	<p>Pretoria, South Africa</p> <p><u>Physical Address:</u> Pentagon House 669 Plettenberg Road Faerie Glen Pretoria South Africa</p> <p><u>Postal Address:</u> P O Box 40161 Faerie Glen 0043</p> <p>Tel: +27 (012) 991-8881</p> <p>Fax: +27 (012) 991-1907</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**EIA/EMP AMENDMENT I: FOR A CHROME SAND DRYING PLANT, CHANGES TO
THE TAILINGS DAM DESIGN AND OTHER OPERATIONAL AND SURFACE
INFRASTRUCTURE CHANGES**

CONTENTS

1	INTRODUCTION	1-1
2	THE METHODOLOGY APPLIED TO SCOPING.....	2-1
2.1	LEGAL FRAMEWORK.....	2-1
2.2	STRUCTURE OF THIS SCOPING REPORT	2-1
2.3	SCOPING PHASE OBJECTIVES.....	2-2
2.4	SCOPING TEAM	2-2
2.5	SCOPING PROCESS.....	2-3
2.6	STAKEHOLDER ENGAGEMENT	2-3
2.7	COMMUNITY LAND OWNERSHIP	2-3
2.8	DEPARTMENT OF LAND AFFAIRS INTEREST	2-4
2.9	LAND CLAIMS	2-4
2.10	RELEVANT TRADITIONAL AUTHORITY	2-4
2.11	LIST OF LANDOWNERS.....	2-4
2.12	LAWFUL OCCUPIERS	2-8
2.13	OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED.....	2-8
2.14	POTENTIAL SOCIO-ECONOMIC IMPACTS	2-10
2.15	RELEVANT LOCAL MUNICIPALITIES.....	2-10
2.16	OTHER STAKEHOLDERS	2-11
2.17	NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPS	2-11
3	DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT.....	3-1
3.1	IAP COMMENTS ON EXISTING STATUS OF ENVIRONMENT	3-1
3.2	EXISTING STATUS OF THE CULTURAL ENVIRONMENT.....	3-1
3.3	EXISTING STATUS OF THE HERITAGE ENVIRONMENT	3-1
3.4	EXISTING STATUS OF THE CURRENT LAND USES AND SOCIO-ECONOMIC ENVIRONMENT	3-2
3.4.1	CURRENT LAND USES	3-2
3.4.2	SOCIO-ECONOMIC ENVIRONMENT PROFILE	3-3
3.5	EXISTING STATUS OF RELEVANT INFRASTRUCTURE	3-8
3.6	EXISTING STATUS OF THE BIOPHYSICAL ENVIRONMENT.....	3-8
3.6.1	GEOLOGY	3-8
3.6.2	TOPOGRAPHY.....	3-9
3.6.3	CLIMATE	3-9
3.6.4	SOIL AND LAND CAPABILITY.....	3-10
3.6.5	FAUNA (NATURAL ANIMAL LIFE)	3-10
3.6.6	FLORA (NATURAL PLANT LIFE)	3-11
3.6.7	HYDROLOGY (SURFACE WATER).....	3-12
3.6.8	GROUNDWATER.....	3-13
3.6.9	AIR QUALITY	3-14
3.6.10	NOISE	3-14
3.6.11	VISUAL ASPECTS	3-15
3.7	RELEVANT ADDITIONAL INFORMATION	3-15
4	IDENTIFICATION OF THE ANTICIPATED IMPACTS	4-1

4.1	PROJECT DESCRIPTION	4-1
4.1.1	THE PROPOSED CHROME SAND DRYING PLANT	4-1
4.1.2	PROPOSED INCREASED OF THE HIGH WALL FROM 120M TO 180M.....	4-1
4.1.3	PROPOSED REALIGNMENT AND RESHAPING OF WASTE ROCK DUMPS.....	4-2
4.1.4	PROPOSED CHANGE TO THE DESIGN OF THE TAILINGS STORAGE FACILITY	4-2
4.1.5	PROPOSED CHANGE TO THE GENERAL INFRASTRUCTURE LAYOUT AT THARISA MINE	4-3
4.1	CONSTRUCTION PHASE.....	4-3
4.1.1	CONSTRUCTION PHASE FACILITIES	4-3
4.1.2	CONSTRUCTION PHASE ACTIVITIES.....	4-4
4.2.3	CONSTRUCTION PHASE SERVICES.....	4-4
4.1.3	CONSTRUCTION PHASE TIMING	4-5
4.3	OPERATIONAL PHASE	4-5
4.3.3	PROPOSED PROJECT COMPONENTS.....	4-5
4.3.4	APPROVED/ EXISTING SURFACE INFRASTRUCTURE	4-5
4.3.5	OPERATIONAL PHASE SERVICES	4-6
4.3.6	OPERATIONAL PHASE WORKFORCE AND HOUSING	4-8
4.3.7	LIFE OF MINE.....	4-8
4.4	DECOMMISSIONING AND CLOSURE	4-8
4.5	BRIEF PROJECT MOTIVATION (NEED AND DESIRABILITY)	4-8
4.6	RELEVANT NEMA LISTED ACTIVITIES.....	4-8
4.7	CONFIRMATION OF IAP CONSULTATION ON POTENTIAL IMPACTS	4-9
4.8	POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS	4-9
4.8.1	POTENTIAL CULTURAL AND HERITAGE IMPACTS.....	4-9
4.8.2	POTENTIAL SOCIO-ECONOMIC IMPACTS	4-10
4.8.3	POTENTIAL IMPACTS ON EMPLOYMENT OPPORTUNITIES, COMMUNITY HEALTH, COMMUNITY PROXIMITY AND LINKS TO THE SOCIAL AND LABOUR PLAN.....	4-13
4.8.4	POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS.....	4-13
4.9	POTENTIAL CUMULATIVE IMPACTS.....	4-16
5	PROJECT ALTERNATIVES	5-1
5.1	ALTERNATIVE LAND USES ON THE PROPOSED PROPERTIES AND SURROUNDING AREAS THAT MIGHT BE AFFECTED	5-1
5.2	ALTERNATIVE LAND USES ON THE PROPOSED PROPERTIES	5-1
5.3	ALTERNATIVE LAND USES ON THE SURROUNDING AREAS	5-1
5.4	OTHER ALTERNATIVES UNDER CONSIDERATION.....	5-1
5.5	LAND DEVELOPMENT CONCERNS RAISED BY THE IAPS.....	5-1
5.6	PROPOSALS MADE TO ADJUST THE OPERATIONS AT THE MINE.....	5-2
5.7	THE “NO-GO” OPTION.....	5-2
5.8	PROJECT PLAN.....	5-2
5.9	PROJECT PLAN TO AVOID POTENTIAL IMPACTS	5-3
6	DESCRIPTION OF THE PROCESS OF ENGAGEMENT OF IAPS, INCLUDING THEIR VIEWS AND CONCERNS.....	6-1
6.1	INFORMATION SHARING PROCESS.....	6-1
6.1.1	LETTERS, SITE NOTICES AND NEWSPAPER ADVERTISEMENTS.....	6-1
6.1.2	BACKGROUND INFORMATION DOCUMENT	6-1
6.1.3	SCOPING MEETINGS	6-1
6.2	IAPS CONSULTED DURING SCOPING PHASE	6-2
6.3	IAP VIEWS ON EXISTING ENVIRONMENT	6-2
6.4	IAP VIEWS ON POTENTIAL IMPACTS.....	6-2
6.5	OTHER IAP CONCERNS	6-2
6.6	MEETING MINUTES AND RECORDS OF CONSULTATIONS.....	6-3

6.7	IAP OBJECTIONS	6-3
6.8	REVIEW OF SCOPING REPORT	6-3
7	FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY	7-1
7.1	EIA PHASE OBJECTIVES.....	7-1
7.2	EIA PROJECT TEAM.....	7-1
7.3	EIA/EMP PHASE ACTIVITIES AND TIMING.....	7-2
7.4	SPECIALIST/FURTHER INVESTIGATIONS	7-2
7.4.1	CULTURAL AND HERITAGE RESOURCES	7-2
7.4.2	PALEONTOLOGICAL RESOURCES	7-2
7.4.3	GEOLOGY: STERILISATION OF THE MINERAL RESOURCES	7-3
7.4.4	LAND USE	7-3
7.4.5	BLASTING	7-3
7.4.6	TRANSPORT SYSTEMS	7-3
7.4.7	ECONOMIC ISSUES.....	7-3
7.4.8	SOCIAL ISSUES.....	7-3
7.4.9	TOPOGRAPHY.....	7-3
7.4.10	SOILS	7-4
7.4.11	NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)	7-4
7.4.12	HYDROLOGY (SURFACE WATER).....	7-4
7.4.13	GROUNDWATER.....	7-4
7.4.14	AIR QUALITY	7-4
7.4.15	NOISE	7-5
7.4.16	VISUAL ASPECTS.....	7-5
7.4.17	CLOSURE COST ESTIMATE	7-5
7.5	METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES	7-5
7.6	METHODOLOGY FOR THE ASSESSMENT OF PROJECT ALTERNATIVES.....	7-7
7.6.1	ASSESSMENT OF THE “NO-GO OPTION”	7-7
7.6.2	ASSESSMENT OF PROJECT ALTERNATIVES	7-7
7.7	STAKEHOLDER ENGAGEMENT DURING THE EIA PHASE	7-7
7.7.1	AUTHORITY ENGAGEMENT	7-7
7.7.2	PUBLIC ENGAGEMENT	7-7
8	SUMMARY AND CONCLUSIONS.....	8-1
9	REFERENCES	9-1

LIST OF FIGURES

FIGURE 1-1: REGIONAL SETTING OF THARISA MINE	1-2
FIGURE 1-2: LOCAL SETTING	1-3
FIGURE 3-1: MAP SHOWING PROXIMITY OF PROJECT AREA TO COMMUNITIES	3-7

LIST OF TABLES

TABLE 2-1: LEGAL REQUIREMENTS FOR THE SCOPING REPORT CONTENT	2-2
TABLE 2-2: THARISA MINE AND RELEVANT SURFACE OWNERS.....	2-4
TABLE 2-3: SURROUNDING LANDOWNERS AND USERS	2-9
TABLE 4-1: THE PROPOSED WASTE ROCK DUMPS DIMENSIONS.....	4-2
TABLE 4-2: THE PROPOSED TAILINGS STORAGE FACILITIES DIMENSIONS.....	4-2
TABLE 4-3: NEMA LISTED ACTIVITIES RELEVANT TO THE PROJECT.....	4-8
TABLE 6-1: SCOPING PHASE PUBLIC MEETINGS	6-1
TABLE 6-1: PROPOSED EIA TEAM.....	7-1
TABLE 7-2: EIA/EMP ACTIVITIES AND TIMING.....	7-2
TABLE 7-3 CRITERIA FOR ASSESSING IMPACTS.....	7-5

LIST OF APPENDICES

APPENDIX A: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS	I
APPENDIX B: INTERESTED AND AFFECTED PARTY DATABASE.....	II
APPENDIX C: ISSUES AND CONCERNS REPORT	III

1 INTRODUCTION

Tharisa Minerals (Pty) Ltd (Tharisa) produces chrome and platinum group metals (PGM) concentrate at Tharisa Mine near Marikana town is located within the Rustenburg Local Municipality (RLM) and Madibeng Local Municipality (MLM) and Bojanala Platinum District Municipality (BPDM) in the North West Province. The regional setting of Tharisa Mine is illustrated in Figure 1-1.

Tharisa has an approved environmental impact assessment (EIA) and environmental management programme (EMP) report (Metago, June 2008). This environmental assessment process is the first amendment (Amendment I) to the original EIA/EMP report.

Tharisa proposes the following developments at Tharisa Mine:

- Construct and operate a chrome sand drying plant;
- Changes to the tailings dam design; and
- Changes to the general surface infrastructure layout and operations at Tharisa Mine.

It must be noted that the proposed project has changed since the scoping meetings that were held in February 2012. In this regard, Tharisa has removed the on-site smelter from the proposed project. Should this smelter be reconsidered in future, a separate EMP amendment process will be undertaken. The approved run of mine (ROM) pads as per the EIA/EMP report (Metago, 2008) will be sufficient for the operations at the mine as a result; the proposed ROM pads have been removed from this EIA process. Tharisa has also increased the size of the proposed chrome sand drying plant.

The proposed project components will be located on the farms Kafferskraal 342 JQ and Elandsdrift 467 JQ. The local setting of the proposed activities is illustrated in Figure 1-2.

The proposed project components require authorisation on the basis of an environmental assessment process, which comprises two phases: the scoping phase and environmental impact assessment (EIA)/environmental management programme (EMP) phase.

This report describes the scoping phase for the proposed project components. The main purpose of this scoping report is to set out the project-related environmental, cultural, social and economic issues; to identify and outline what investigations need to be conducted to assess these issues and to detail how these investigations will be performed.

FIGURE 1-1: REGIONAL SETTING OF THARISA MINE

FIGURE 1-2: LOCAL SETTING

2 THE METHODOLOGY APPLIED TO SCOPING

The methodology comprised of compliance with the relevant legislation, following a specific scoping process and interaction with the relevant stakeholders. Each of these components is discussed below.

2.1 LEGAL FRAMEWORK

Prior to the commencement of the proposed project components, environmental authorisations are required from the following regulatory authorities:

- Department of Mineral Resources (DMR): an environmental decision in terms of Section 102 of the Mineral and Petroleum Resources Development Act (MPRDA), 28 of 2002 in the form of an approved amended Environmental Impact Assessment and Environmental Management Programme (EIA/EMP) report;
- North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT): environmental authorisation in terms of the National Environmental Management Act, 107 of 1998 (NEMA). The proposed projects incorporate several listed environmental activities (refer to section 4.6); and
- A possible amendment to the Tharisa water use license or a General Authorisation from the Department of Water and Environment Affairs (DWEA) in terms of the National Water Act (NWA) 36 of 1998.

It is expected that any additional approvals/permits needed for the proposed project components will be identified during the course of the environmental assessment process. A detailed list will be provided in the EIA/EMP report.

2.2 STRUCTURE OF THIS SCOPING REPORT

Given that the proposed changes to the mine require authorisations from a number of regulatory authorities, this scoping report has been compiled in terms of the following regulations:

- Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA) and the regulations there under (Regulation 527 of 23/04/2004); and
- National Environmental Management Act, 107 of 1998 (NEMA) and the regulations thereunder (Regulation 544 and 545 of 18/ 07/2010).

The combined requirements for the scoping report content are outlined in Table 2-1 below.

TABLE 2-1: LEGAL REQUIREMENTS FOR THE SCOPING REPORT CONTENT

Reference in scoping report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 28 of Regulation 543 of 18 June 2010
Section 2.4	-	Details of the environmental practitioner who prepared the report, including relevant expertise to carry out scoping procedures.
Section 2	Describe the methodology applied to conduct scoping.	Identify all legislation and guidelines that have been considered in preparing the scoping report.
Section 2.17 and 6.2, 6.3 and 6.4	Describe the process of engagement of identified interested and affected parties (IAPs), including their views and concerns.	Details of the public participation process conducted in terms of Regulation 27 including: notification of IAPs, proof of notification, IAP register/database, summary of issues raised by IAPs.
Section 3	Describe the existing status of the environment prior to the mining operation.	Description of the environment that may be affected by the activities.
Section 4	Describe the most appropriate procedure to plan and develop the proposed operation.	A description of the proposed activities, a description of the property on which the activity is to be undertaken, and the location of the activity on the property.
Section 4.8 and 4.9	Identify and describe the anticipated environmental, social and cultural impacts, including cumulative effects where applicable.	A description of the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activities. A description of environmental issues and potential impacts, including cumulative impacts.
Section 5	Identify and describe reasonable land use or development alternatives to the proposed operation. Describe the consequences of not proceeding.	A description of any feasible and reasonable alternatives that have been identified.
Section 7.4	Describe the nature and extent of further investigations required in the environmental impact assessment report.	Information on the methodology that will be adopted in assessing the potential impacts that have been identified. A plan of study for EIA, including: tasks to be undertaken, specialist reports and processes, consultation of authorities, method of assessing environmental issues and alternatives, the option of not proceeding, proposed public participation process, other information required by the authorities.

2.3 SCOPING PHASE OBJECTIVES

The objectives of scoping phase are to understand the proposed project components, identify and describe potential environmental and social impacts, and to set out any related terms of reference for further investigations that will enable the meaningful assessment of all relevant environmental and social issues. The terms of reference for further investigations are included in section 7.4.

2.4 SCOPING TEAM

SLR Consulting (Africa) (Pty) Ltd (SLR) is an independent of consultants that has been appointed by the applicant to undertake the environmental assessment and related processes. Stella Moeketse (Project

Manager) has five years of relevant experience. Brandon Stobart (Reviewer) has approximately 14 years of relevant experience.

2.5 SCOPING PROCESS

The scoping process was conducted in accordance with the requirements of the legal framework outlined in Section 2.1 and Section 2.2 above and involved the following steps:

- Site visit conducted by project team members ;
- Review of available studies and reports covering the current operations and the proposed projects;
- Review of maps regional geology map, topographical maps (1:50 000 scale);
- Drafting of the project description in consultation with the applicant;
- Identification of potential positive and negative impacts by considering the project description and site conditions;
- Identified interested and affected parties (iaps) and notified/ consulted them about the proposed projects (the consultation process is outlined in section 6 of this report). This included landowners;
- Identified the relevant authorities, and consulted them about the proposed projects (the consultation process is outlined in section 2.17 of this report);
- The SLR environmental team identified further studies investigations required to investigate the positive and negative impacts identified with input from iaps and the relevant authorities, and drafted terms of reference for these studies; and
- A scoping report was compiled.

2.6 STAKEHOLDER ENGAGEMENT

To date the following stakeholders have been consulted:

- Non-governmental organisations (ngos);
- Landowners;
- Land users;
- Communities;
- Surrounding land owners and mines; and
- National, provincial and local authorities.

2.7 COMMUNITY LAND OWNERSHIP

The various properties that are located within Tharisa Mine are owned by a number of individuals/entities and not communal ownership.

2.8 DEPARTMENT OF LAND AFFAIRS INTEREST

The Department of Rural Development and Land Reform (DRDLR) has been identified as an interested and affected party (IAP).

2.9 LAND CLAIMS

The DRDLR is yet to confirm if there are any land claims that have been lodged on the affected properties. However, should there be any claims on any of these properties; they will be dealt with accordingly with the DRDLR.

2.10 RELEVANT TRADITIONAL AUTHORITY

There are no traditional authorities in and around Tharisa Mine.

2.11 LIST OF LANDOWNERS

The various properties in the mine right area are held by a number of individuals/entities. The proposed project components will be located on a few of the properties within the mining right area Tharisa is in the process of negotiating land purchase agreements with some of the land owners.

The land owners within Tharisa mining right area as identified on the title deeds by the applicant are listed in Table 2-2 below.

TABLE 2-2: THARISA MINE AND RELEVANT SURFACE OWNERS

Portion	Title Deed	Property Owner	Location/site for the proposed project components
Farm Name: Kafferskraal 342 JQ			
2	T67069/1995	Tharisa Minerals (Pty) Ltd	Yes
3	T38079/1994		Yes
5	T64583/1996		Yes
6	T14551/2006		Yes
7	T76897/2005		Yes
9	T43875/1982		Yes
10	T41909/1990		M.M. Potgieter
11	T1717/2001	A.M. Cronje	-
12	T113316/2003	Real Time Inv 505 CC	-
13	T161962/2006	Tharisa Minerals (Pty) Ltd	-
15	T9685/1981		-
16	T147657/2000		-
19	T161962/2006		-
20	T14551/2006		-
22	T12642/2006		Yes
23	T138104/2006		Yes
25	T42329/1989		-

Portion	Title Deed	Property Owner	Location/site for the proposed project components	
26	T134912/1999		-	
27	T42329/1989		-	
28	T25210/1961		-	
29	T38157/2007		-	
30	T161962/2006		-	
32	T94260/2002	Western Platinum Ltd	-	
33	T30047/1982	Tharisa Minerals (Pty) Ltd	-	
38	T1842/1971	H.N. Janse van Rensburg	-	
39	T4623/1994	Tharisa Minerals (Pty) Ltd	-	
40	T92592/2007		-	
41	T161962/2006		-	
47	T161962/2006		-	
48	T161962/2006		-	
53	T61677/2006		Yes	
74	T147657/2000		-	
76	T38779/2006		Yes	
83	T11736/1993		Gekoop R.J. Smit	Yes
84	T11736/1993		Tharisa Minerals (Pty) Ltd	-
90	T142320/1999	Yes		
91	T42560/1981	Yes		
94	T29690/2001	-		
96	T14551/2006	Yes		
100	T23910/1985	Republiek van Suid Afrika		-
101	T36849/2006	B D van Rensburg	-	
104	T85416/1995	Tharisa Minerals (Pty) Ltd	Yes	
105	T42329/1989		-	
108	T42830/2005		Yes	
109	T114379/2003	Real Time Inv 505 CC	Yes	
110	T79572/1997	P.H.C. Wolvaart	-	
111	T064124/2011	Tharisa Minerals (Pty) Ltd	-	
114	T25649/1982		Yes	
116	T92592/2007		Yes	
117	T161962/2006		-	
118	T42329/1989		-	
119	T22243/1973		M.J. Barnard	Yes
120	T1112/1985		Tharisa Minerals (Pty) Ltd	Yes
122	T61179/1989	-		
123	T3444/1948	-		
127	T57298/2001	Aquarius Platinum SA (Pty) Ltd.	-	
132	T22243/1973	M.J. Barnard	-	
133	T6182/1987	Tharisa Minerals (Pty) Ltd	Yes	
135	T6613/1979	Anna C. Retief	-	
137	T161795/2002	Tharisa Minerals (Pty) Ltd	Yes	
138	T76897/2005		-	
139	T7863/1995	G.J.C. Pretorius	-	
140	T156819/2002	G.M.J. Breedt	-	
144	T59171/2001	T.J. Janse van Rensburg	-	
145	T71659/2007	J.S. Vorster	-	

Portion	Title Deed	Property Owner	Location/site for the proposed project components
146	T41909/1990	M.M. Potgieter	-
147	T1842/1971	H.N. Janse van Rensburg	-
148	T6075/2006	Tharisa Minerals (Pty) Ltd	-
149	T56494/1992	R.J. Labuschagne	Yes
150	T101570/1992	E.A.S. Strydom	Yes
151	T173614/2004	Western Platinum Ltd	-
152	T94702/2002	Tharisa Minerals (Pty) Ltd	-
153	T12496/1930	Laerskool President van Rensburg	-
154	T128885/2005	Harber Hermanus	-
155	T46830/1983	Republiek van Suid Afrika	-
156	T14717/1972	G.J. Smit	-
157	T37769/1978	G.J. Fouche	-
158	T17799/2007	B.D. Janse van Rensburg	-
159	T161626/2003	J.C.B. van Heerden	-
166	T22741/2006	Mohomed Faizal	Yes
175	T8350/1987	H.G. Pieterse	-
176	T7551/1949	R.J. Janse van Rensburg	-
182	T9761/1992	C.C. Henning	Yes
183	T14551/2006	Tharisa Minerals (Pty) Ltd	-
184	T6648/2001		-
185	T102310/2005		Yes
186	T11737/1993		-
187	T96329/1993		Yes
188	T134912/1999		-
189	T134912/1999		-
190	T102045/2000		-
191	T147657/2000		-
192	T123083/2002		Yes
193	T105214/2001		Yes
196	T121794/2006	Lukas Olivier	-
205	T42329/1989	Tharisa Minerals (Pty) Ltd	-
206	T9685/1981		-
207	T42329/1989		-
208	T56342/1997	Cornelius van den Berg	Yes
209	T86042/2002	Western Platinum Ltd	-
211	T84739/1991		-
212	T161962/2006	Tharisa Minerals (Pty) Ltd	-
213	T161962/2006		-
215	T38780/2006	Leonora Els	Yes
216	T9136/1974	Leonara Els	Yes
217	T38079/1994	Tharisa Minerals (Pty) Ltd	Yes
218	T33433/1974		-
219	T85416/1995		-
220	T3570/1983		Yes
221	T11736/1993		-
222	T30047/1982		-
224	T592/2003		Yes
225	T19566/2000		Yes

Portion	Title Deed	Property Owner	Location/site for the proposed project components
226	T7857/1984		Yes
227	T32266/1998	Rens Trust	-
229	T59680/2005	Tharisa Minerals (Pty) Ltd	-
230	T34253/1991		-
233	T58999/1997	Gideon de Beer	-
234	T20862/2007	W. Vorster	-
235	T20863/2007	J.S. Vorster	-
236	T36849/2006	B.D. Janse van Rensburg	-
237	T6215/1987	P.C. van der Westhuizen	-
238	T110135/2001	M & M Hattingh Familie Trust	-
239	T89395/1997	H.N. Janse van Rensburg	-
240	T27622/1985	Tharisa Minerals (Pty) Ltd	-
241	T91335/2003		-
242	T111592/2005		Yes
243	T43875/1982		Yes
250	T73731/1989		-
251	T23627/2001		Yes
253	T61895/2005	Western Platinum Ltd	-
254	T61895/2005	Western Platinum Ltd	-
255	T61895/2005	Western Platinum Ltd	-
256	T57231/1989	Tharisa Minerals (Pty) Ltd	Yes
257	T47390/1982		Yes
259	T150882/2006	M.A. de Beer	-
260	T84739/1991	Western Platinum Ltd	-
261	T84741/1991	Western Platinum Ltd	-
262	T16452/1962	Tharisa Minerals (Pty) Ltd	-
265	T40635/1947	Republiek van Suid Afrika	-
266	T161962/2006	Tharisa Minerals (Pty) Ltd	-
276	T40767/1980	C.H. Grobler	-
283	T40815/2002	Tharisa Minerals (Pty) Ltd	Yes
285	T115263/2005		Yes
286	T175765/2004		Yes
289	T45714/2003		-
297	T102910/2002		Yes
298	T89395/1997	H.N. Janse van Rensburg	-
301	T514/1956	Dutch Reformed Church	-
303	T49542/2004	Tharisa Minerals (Pty) Ltd	Yes
304	T90087/2000	P.C. van Wyk	-
305	T18565/2001	G.J. Du Preez	-
306	T11709/1970	Tharisa Minerals (Pty) Ltd	Yes
307	T84739/1991	Western Platinum Ltd	-
314	T8044/1986	R.J. Smit	-
310	T45844/2007	Aquarius Platinum South Africa (Pty) Ltd	-
313/ 151	Consolidated into 151	Western Platinum (Pty) Ltd	-
314	T100242/2008	Tharisa Minerals (Pty) Ltd	Yes
317	T6076/2006	Tharisa Minerals (Pty) Ltd	
318	T161962/2006		
319	T117751/2005		

Portion	Title Deed	Property Owner	Location/site for the proposed project components
324	T58859/1981		Yes
329	T8298/1988		Yes
330	T57789/2007	Pierre Kleynhans	Yes
331	T45715/2003	Tharisa Minerals (Pty) Ltd	Yes
335	T57460/1993	Dabepie Beleggings CC	Yes
336	T5221/1991	Patatadraai Beleggings CC	Yes
342	T8176/2005	Tharisa Minerals (Pty) Ltd	-
344	T6704/1979	G.S. Du Toit	-
350	T40794/1996	W.C. Coetzer	-
352	T34366/1999	P.J. Schoeman	-
353	T89395/1997	H.N. Janse van Rensburg	-
354	T27562/2006	Wellem Vistor David	-
356	T19032/1984	Tharisa Minerals (Pty) Ltd	Yes
357	T49551/1984		-
358	T117783/1996	A.W. Janse van Rensburg	-
361	T16345/1986	Tharisa Minerals (Pty) Ltd	Yes
362	T52112/1989		Yes
368	T45843/2007		Yes
370	T32396/2008	SANRAL	-
381	T25744/2010	SANRAL	-
Farm Name: Elandsdrift 467 JQ			
29	T130232/2006	M.M. Potgieter	-
64	T3799/2007	Tharisa Minerals (Pty) Ltd	Yes
69	T14756/2001	Montys Trust	-
89	T43379/1976	P M Coetzee	
90	T100022/1993	Tinus de Beer	Yes
91	T31326/1982	Tharisa Minerals (Pty) Ltd	Yes
92	T27649/1981		-
93	T115743/2001	Jannie Jacobz	-
94	T985/2006	Tharisa Minerals (Pty) Ltd	Yes
111	T3799/2007	Tharisa Minerals (Pty) Ltd	Yes
176	T91044/2006	Tharisa Minerals (Pty) Ltd	Yes
177	T91044/2006		-

2.12 LAWFUL OCCUPIERS

Most of the properties that have been identified as the sites for the proposed project components are owned by Tharisa Mine and are occupied by Tharisa's employees who work for the contractors at the mine. The remaining properties are occupied by the private landowners and their resident employees.

2.13 OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED

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

Other than the above-mentioned properties and landowners that are located within the mining right area, other affected parties that may be directly affected include the landowners on the adjacent and non-adjacent properties (as listed in Table 2-3 below) and the associated farm workers.

TABLE 2-3: SURROUNDING LANDOWNERS AND USERS

Property Description	Surface Owner and User
Kafferskraal 324 JQ	Hennie van der Walt
	Spyker Redelinghuys
	Eugene Kleyhans
	Johnny Coetzee
	Dirk Coetzee
	Jan Vorster
	Willem Vorster
	Spyker Redelinghuys
	Johan van Heerden
	D Potgieter
	B Potgieter
	R J Smit
	Alet & Karel Swanepoel
	P F Batma
	J E van Vuuren
Trumpie Hendrik	
Spruitfontein 342 JQ	Hester M Wilignson Malan
	Ben Malan
	Marie Marais
	Ina Malan
	Bettie van Rensburg
Rooikoppies 279 JQ	Western Platinum Mine
	Lonmin Platinum Mine
	Aquarius Platinum Mine
Buffelspoort 343 JQ	A Maritz
	J Flemming
	Natasha Pretorius
	Linki Stagemann
	Eric De Beer
	Mooketsi Mofolo
	At Van Rensburg
	Mohammed Karani
	T Alblas
	Eben Jubileus
	Rizette Greeff
	Hettie Le Roux
	Johan Van der Merwe

Property Description	Surface Owner and User
	Willem Van Schalkwyk
	Schalla Van Schalkyk
	Johnny and Sanet Coetzee
	D P Coetzee
	Hilton Bedwell
	Barand Clark
	Bellinda Blom
	Pieter Kohler
	P Potgieter
	Tina Du Toit
	Giel Du Toit
	J Jacobs
	L van der Merwe
	A A C Coetzee
	R Du Plessis
	D Du Plessis
	Chris Bosch
Ilze Bosch	
Elandsdrift 467 JQ	Ahmed Ebrahim
	Annatjie Kuhne
	Ahmed Ebrahim
	Theunis van Staden
	B D Bouwer
	M Pretorius
	W J C Jacobs
	E M Jacobs

2.14 POTENTIAL SOCIO-ECONOMIC IMPACTS

The existing land use and related socio-economic environment in and around Tharisa Mine that have a potential to be affected by the proposed project components has been outlined in section 4.1 of this report.

The associated potential positive and negative socio-economic impacts are described in sections 4.8.2.5 and 4.8.2.6 of the scoping report.

2.15 RELEVANT LOCAL MUNICIPALITIES

Bojanala Platinum District Municipality (BPDM), Rustenburg Local Municipality (RLM) and Madibeng Local Municipality (MLM).

2.16 OTHER STAKEHOLDERS

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

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

- Regulatory authorities:
 - North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT)
 - North West Department of Mineral Resources (DMR)
 - National Department of Environmental Affairs (DEA)
 - North West Department of Water and Environment Affairs (DWEA)
 - North West Department of Agriculture (DoA)
 - Department of Rural Development and Land Reform (DRDLR)
 - South Africa Heritage Resource Agency (SAHRA)
 - North-West Heritage Resource Agency (NWHRA)
 - North West Parks and Tourism (NWDPT)
 - North West Department of Transport Roads and Community Safety (NWDTRCS)
 - Bojanala Platinum District Municipality (BPDM)
 - Rustenburg Local Municipality (RLM)
 - Madibeng Local Municipality
 - Ward councillor
- Non-governmental Organisation (NGO):
 - North West Ecoforum;
 - WESSA;
 - Buffelspoort Irrigation Scheme (BIS)
 - Surrounding mining companies
- Parastatals:
 - Eskom
 - Telekom
 - Transnet
 - Magalies Water

2.17 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPS

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

3 DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT

This section has been compiled using studies completed by various specialists as well as information from the relevant site visits conducted by SLR personnel. This baseline information is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment. More detailed information will be provided in the EIA/EMP report.

3.1 IAP COMMENTS ON EXISTING STATUS OF ENVIRONMENT

IAPs were provided with information on the existing status of the environment in the background information document (BID) and during both the focussed scoping meeting and the general public meeting. All of the IAP issues and concerns raised about this information during the scoping meetings have been provided in Appendix C. There are no outstanding issues in this regard.

3.2 EXISTING STATUS OF THE CULTURAL ENVIRONMENT

The existing status of the cultural environment that may be affected by the proposed project components is described in this section.

Cultural resource is a broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.

There are a number of churches within Tharisa mining right area. These churches include the following: The African Faith Mission (AFM), Uniting Reform Church (URC), New Earth Apostolic Church (NEAC) and Ts'enolo Apostolic Church (TAC) and many other apostolic churches whose members assemble at the various random venues including private homes, schools and/or hired venues where possible.

At the general public meeting, a community member indicated that there is a church on the eastern side on the mine that can potentially be affected by the proposed activities. This will be taken into account in the EIA phase and will be addressed accordingly.

3.3 EXISTING STATUS OF THE HERITAGE ENVIRONMENT

This section describes the existing status of the heritage and cultural environment that may be affected by the proposed project components. The various natural and cultural assets or resources collectively form the heritage. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features

may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

The 2007 heritage survey identified the most important heritage and cultural resources at the mine as follows (Pistorius, 2007):

- Stone walled settlements;
- Graveyards;
- A historical village and homestead;
- Mining heritage remains;
- Isolated and randomly scattered stone tools;
- Historical houses and outdated; and
- Discarded agricultural implements.

At each scoping phase community meeting, the attendees were asked whether there were any additional cultural resources. No additional resources were identified by the IAPs.

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

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

3.4.1 CURRENT LAND USES

Land in and around Tharisa mine is mostly used for residential, business, crop farming, livestock grazing and general community activities.

There are a number of land users that are actively involved in subsistence and/or commercial farming activities such as livestock, piggery, growing citrus fruits and vegetables in the vicinity of the mine. There are also land users who own small businesses such as transport operations, accommodation places such as bed and breakfast places and lodges, shops and restaurants. Residential land use i.e. formal, informal and farmsteads is also one of the main land uses near the mine.

Mining activities within the Tharisa mining right area (see Figure 1-2) are authorised in terms of mining right (NW 30/5/1/2/3/2/1/358EM and 358 MR). This mining right covers the following platinum group metals (PGMs) copper ore, nickel ore and chrome ore. Areas that have been earmarked for the proposed project components have already mostly been disturbed by the previous and current mining related activities.

There are also various mining and industrial operations that are located around Tharisa Mine. These include the following (see Figure 3-1):

- Aquarius marikana platinum mine;
- Lonmin platinum's karee mine;
- Lonmin Platinum's open pit;
- Lonmin platinum's western platinum mine;
- First Platinum (previously Salene B&S and Salplats mines);
- Anglo platinum;
- Xstrata wonderkop;
- Mamba Chrome Mine and;
- Samancor.

There are also areas of interest around the mine. These include;

- A Protected Natural Environment of the Magaliesberg (3km south of the mine). This constitutes: an area with a high aesthetic value due to its mostly intact natural features and its tourism potential.
- Rustenburg Town lies approximately 28km to the west;
- Hartebespoort lies approximately 43km to the south east; and
- Sun City which lies approximately 60 km to the north of the mine.

The following issue was raised by community members at the general public scoping meeting:

- Some of the people felt that the rural aspect of the project area had been understated and that the disturbed nature had been overstated, thereby indicating that mines can do as they please because the area is already disturbed.

It was explained that the description was meant to indicate that there has been a change of land use from rural to a combination of industrial, mines, residential and farming over the years and that all the land uses will be taken into consideration during the EIA process.

3.4.2 SOCIO-ECONOMIC ENVIRONMENT PROFILE

The majority of the mining activities and related surface infrastructure at Tharisa Mine is located on the farm Kafferskraal 342 JQ which is within the Rustenburg Magisterial District, the Rustenburg Local Municipality (RLM), and the Bojanala Platinum District Municipality (BPDM). See the regional and local setting of Tharisa Mine is illustrated in Figure 1-1 and Figure 1-2.

In the context of social interventions in general, the integrated development planning of both the RLM and the BPDM should be taken into account. Given that there is mine infrastructure located on the farm Elandsdrift 467 JQ which is within the Madibeng Local Municipality (MLM). The integrated development planning of the MLM may also have to be taken into account, as required.

3.4.2.1 Provincial Level – North West Province

The socio-economic environment in the province can be summarised as follows:

- Population: the North West Province (NWP) has a population of approximately 3.2 million residents (Community Survey, 2007; Quantec, 2010), with an average household size of 3.6.
- Economic activity: provincially it was estimated that, in 2009, the most dominant sector contributing to the North West Province's economy was the mining industry. This was demonstrated by 25% of the economically active population being employed in this industry. The sectors with the smallest contributions to the province's Gross Geographic Product (GGP) were electricity and water, as well as the transportation industry.
- Unemployment: it was estimated that the unemployment rate of the NWP in 2009 was 26% (presenting a similar profile to South Africa as a whole – with an unemployment rate of 25% in the same year).
- Education: ten percent (10%) of the working age population has had no formal education. Furthermore, only 18% of the total population in the province obtained a grade 12/matric education.
- Basic services: the majority of the population's households have access to piped water, with only eight percent (8%) using alternate water sources (for example, boreholes, water vendors, wells, tankers, dams, rivers, streams). Approximately 46% of households with toilet facilities utilise pit or bucket latrines. Eight percent (8%) have no toilet facilities. In terms of households' dominant energy source, 86 % use electricity as the primary means for lighting. Refuse removal services are provided to most households, with a small percentage of the population (an estimated nine percent (9%)) not having any refuse disposal facilities.
- Housing: within the NWP, it is estimated that 22% of the population reside in informal dwellings (with 15% of the population living in informal settlements and seven percent (7%) in backyards).
- HIV status: those with a tested HIV positive status account for approximately 13% of the North West Province population. In 2010, one percent (1%) of the entire province's residents died of AIDS related illness.

3.4.2.2 District and Local Municipal Level – Bojanala Platinum District Municipality and Rustenburg Local Municipality

The socio-economic environment at municipal level can be summarised as follows:

- Population: the population residing within the Bojanala Platinum District Municipality (BPDM) constitutes approximately 39% of the total population of the NWP. Rustenburg Local Municipality (RLM) is the largest municipality within the district, with a population concentration of approximately 32% of the total population of BPDM. The average household size in BPDM is estimated to be 3.4, with RLM's average household size at 2.9.
- Economic activity: mining plays an important role in the region's economy and is the district's major source of employment. It was estimated that in 2009 that 33% of the district's economically active population was employed in the mining sector. Fifty percent (50%) of rlm's economically active population was employed by this industry. As reflected at a provincial level, the sectors with the

smallest contributions to the province's gross geographic product (ggp) were electricity and water, along with transportation, agriculture and construction— all within the range of a 2 to 4% contribution.

- Unemployment: an unemployment rate of 25% and 20% has been estimated for 2009 at the district and local municipal levels respectively.
- Education: in 2010, approximately 66% of the BPDM residents constituted the working age population. Of these individuals, 19% had completed matric and 7% had received no formal education in line with the South African schooling system. This is a similar depiction of the RLM, with 18% obtaining a matric certificate and 6% of the population with no schooling. Within the Rustenburg Local Municipality, 71% of the population is of working age.
- Basic services: as far as access to piped water is concerned, Bojanala Platinum District Municipality (BPDM) and its Rustenburg Local Municipality (RLM) display a similar profile to that of the province at large. Nine percent (9%) and 11% of the district and local municipality households, respectively, use alternate water sources. The remainder of each population has access to piped water. Higher than the provincial average, 56% of households with toilet facilities utilise pit or bucket latrines in BPDM.

In RLM, pit or bucket latrines are used by 38% of households. As depicted at a provincial level, between 8 and 9 % have no toilet facilities. Electricity is used as a primary source of energy for lighting in 87% of the homes within BPDM and 81% in RLM. Refuse removal services are provided to the majority of all households at the district and local municipal levels, with 11% not having any refuse disposal facilities.

- Housing: it is estimated that 33% of the BPDM homes are informal dwellings. Approximately 38% of the RLM homes are informal dwellings, of which 20% are in informal settlements and 18% can be found in backyards.
- HIV status: between 14 and 15% of the BPDM and RLM, respectively, have tested positive for HIV. Similar to the provincial level, 1% (one percent) of both the district and local municipalities' residents died of AIDS related illness.

3.4.2.3 Local Level

The local community comprises the land owners, their tenants, the villages of Lapologang, Madithlokwa and Tsilong and Marikana town (see Figure 3-1).

The socio-economic environment at the local level can be summarised as follows:

- Population: approximately 2727 people reside in the local area. Approximately 67% of the population is of working age (between 19 and 65 years).
- Education: only 31% of all children (aged between 1 and 18) recorded within the household survey received some form of education.
- Economy/employment: excluding the informal sector, the unemployment and/or not economically active rate is high at an estimated 50% of the economically active age. Mining is considered to be the major formal employment provider (approximately 52%). Income statistics indicate that 84% of households received less than or equal to R1 500 per month, and only 1% received more than R9 500 per month.

- Housing and services: apart from the formal residences, the housing infrastructure is generally informal in their construction (mainly corrugated iron) and is largely ill equipped with basic services (water, electricity and sanitation). The farmhouses are an exception as they comprise mainly of cement brick homes.

Figure 3-1: Map showing Proximity of Project Area to Communities

3.5 EXISTING STATUS OF RELEVANT INFRASTRUCTURE

This section describes the existing status of infrastructure within the mining right area:

- There is a network of roads that exists in and immediately near the mine. These include:
 - the N4;
 - the P2-4 (Old N4);
 - the D2565- a gravel road in the far western section of the mine;
 - the D1526/1566- the main gravel road servicing the western side of the mine;
 - the D1325- Marikana Road;
 - the D108- road between Marikana and Rustenburg;
 - a bridge crossing the N4 in the eastern side of the mine;
 - the internal Lonmin tarred road to the north of the mine area, that runs east – west;
 - the D2170- a gravel road linking the eastern side of the mine with Mooinooi; and
 - various unnamed, private gravel/dirt roads.
- There is a railway siding at Marikana town to the north of the mine area and an associated railway line running in an east-west direction.
- A 275KV power line, and associated Eskom servitude, which crosses through the eastern part of the mine in a north-south direction.
- Smaller rural power lines and telephone lines currently service the residential areas within the western and eastern sections of the project area.
- Infrastructure (pipes and canals) associated with the Buffelspoort Irrigation Board transverses various sections of the mine area in a south-north direction.

3.6 EXISTING STATUS OF THE BIOPHYSICAL ENVIRONMENT

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

3.6.1 GEOLOGY

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

Tharisa is situated in the Bushveld Igneous Complex. The Bushveld complex is an intrusive igneous body, extending about 400 km from east to west and about 350 km from north to south. It comprises a series of ultramafic-mafic layers and a suite of associated granitoid rocks.

The ultramafic-mafic rocks of the Bushveld Igneous Complex are known as the Rustenburg Layered Suite. The stratigraphy of the Rustenburg suite is summarised as follows:

- Upper zone consisting of norites, gabbros and diorites, magnetite seams
- Main zone consisting of norites and gabbros

- Critical zone consisting of pyroxenites, norities and anorthosites. It is within this layer that the platinum group metals are found
- Lower Zone consisting of pyroxenities and harzburgites, chromitite seams
- Marginal zone consisting of pyroxenites and norites.

There are four main limbs to the complex, namely the Northern Limb, the Eastern Limb, the Southern Limb and the Western Limb. Tharisa Mine is located on the Western limb of the Bushveld Complex in the Marikana section. The Marikana section is separated from the Brits section to the east by Wolhulterkop and the Rustenburg section to the west by the Spruitfontein upfold.

3.6.2 TOPOGRAPHY

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

The topography in and around the Tharisa Mine is gently undulating. The elevation ranges from 1,140m in the south-west to approximately 1,320m in the north. Immediately north of the mine are a number of gabbro-norite hills. South of the mine area is the Magaliesberg Mountain range. Peaks in this part of the Magaliesberg rise to approximately 1400 metres above mean sea level (mamsl). The perennial Sterkstroom and various non-perennial tributaries run through the mine area. Refer to Figure 1-2.

3.6.3 CLIMATE

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

3.6.3.1 Regional climate

Tharisa falls within the Highveld Climatic Zone and generally has an average annual precipitation range from 650 mm (west) to 900 mm (east) (WRC, 1994). Rainfall is generally in the form of thunderstorms. These can be of high intensity with lightening and strong gusty south-westerly winds. Hail frequency is high, tending to occur 4-7 times per season.

3.6.3.2 Rainfall and evaporation

Buffelspoort station is the closest station to the mine and has the longest rainfall record (83 years). From this station, it was recorded that the highest rainfall was 630mm in 1989 while the lowest of 429mm was recorded in 1985. From this station, it was also concluded that the majority of the rainfall occurs in the summer months of October to March at which time approximately 90% of the annual rainfall occurs.

Evaporation data was calculated from the Surface Water Resources 1990 (Vol.I) (WR 90). The results showed that evaporation in the area exceeds the mean annual precipitation.

3.6.3.3 Temperature

The area experiences average high temperatures of 26.2°C and average low temperatures of 11.1°C. The area has experienced a maximum of 40.2°C in summer and a minimum of 8.0°C in winter over the last 32 years the station was operational (1961 – 1990).

3.6.3.4 Wind

The dominant day time winds are from the north-east and north-west. The dominant night time wind is from the south and south east. On average, the south and south easterly winds occur approximately 25% of the time and are associated with low wind speeds between 1 and 2m/s. On average, the winds from the north-east, north-west and south-west occur less frequently but are associated with higher speeds that are greater than 5m/s. On average, calm conditions are experienced approximately 14% of the time.

3.6.4 SOIL AND LAND CAPABILITY

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

Soils within Tharisa Mine include those of the orthic phase (Mispah, Glerosa and Hutton), structured forms (Milkwood, Mayo, Shortlands, Sterkspruit, Swartland and Valsrivier), and hydromorphic forms (Sepane, Rensburg and Bonheim). The heavy structured black and dark brown clay soils (Sterkspruit, Mayo and Swartland soil forms) are commonly referred to as “black-turf”.

In general, the dominant soils mapped within the mine are neutral to slightly alkaline (pH of 5.2 to 7.3), which is within accepted range for good nutrient mobility. These soils tend to be saline in character. Due to the generally high clay content of the soils, the cation exchange capacity (CEC) of the soils is moderate to high. The majority of the soils within the mine area have a moderate erodibility.

Due to the general low levels of potassium, zinc and phosphorous in the soils, the dryland production potential, especially of the shallower Valsrivier, Swartland, Sterkspruit, and Mayo soil forms is low. In order to increase the productivity to a viable and sustainable cropping potential, additional fertilizers will be required.

In terms of soil structure and drainage capability, the irrigation potential of the soils can be described as “moderate”. With adequate drainage and good water management, the soils can be economically cultivated.

3.6.5 FAUNA (NATURAL ANIMAL LIFE)

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

Tharisa Mine is located on a generally disturbed area due to previous mining, farming and residential activities as well the current mining and mining related activities. This disturbance has resulted in

fragmentation of the natural veld and only patches of undisturbed veldt occur. However, the potential natural animal life in the area and those that were found during the field investigation that conducted by include:

- Mammalian species that were identified on site include; scrub hare, common duiker, steenbok, Dwarf mongoose, porcupine, slender mongoose, yellow mongoose, large-spotted or small-spotted genet and striped polecat. The following were identified Red Data mammals in the area: short-eared trident bat, Juliana's golden mole, white-tailed rat, peak-saddle horseshoe bat, Maquassie musk shrew, pangolin and leopard;
- The birds that were identified on site include; black-headed heron, spur-winged goose, laughing dove, Cape turtle dove and Southern masked weaver. No Red Data listed birds were observed during the field investigation that was conducted in 2007. However, the likelihood of occurrence of Red Data listed bird species utilising the mining right area for breeding or foraging cannot be excluded;
- The amphibian and reptiles that were identified on site include; bubbling kassina, banded rubber frog, common river frog, puff adder, Transvaal gecko and Eastern striped skink. Red Data listed reptile and amphibian species that could potentially occur within and/ or adjacent to the mine include: Giant Bullfrog, thin-tailed legless, skink, percival's legless skink, South African python and striped harlequin snake; and
- The invertebrates that were identified on site, through actual observation or capture, and through evidence of presence include: ground beetle, yellow-belted fruit chafer, house fly, pugnacious ant, African monarch, common garden cricket, grass funnel-web spiders, centipedes and millipedes.

3.6.6 FLORA (NATURAL PLANT LIFE)

Tharisa Mine falls within the Savanna Biome which is the largest biome in Southern Africa. The majority of the mine area falls within the Marikana Thornveld. The Marikana Thornveld is characterised by open Acacia karoo woodlands, which occur in valleys and slightly undulating plains, and some lowland hills. This vegetation unit is of significance because it is listed as endangered mainly due to severe impacts from transformation through cultivation and urbanisation.

The following vegetation/habitat zones commonly occur within the mine area. With recent mine development, parts of these zones have been transformed. These include:

- Scattered open woodland: this is the by far the most dominant within the mine area. It is generally associated with the deep vertic clays or gabbros. It is a short microphyllous woodland with a well-developed graminoid (grass) layer that is interspersed by distinctive bush clumps comprising of many wood species;
- Transformed cultivated land and built up areas: typical of old agricultural lands and disturbed areas, this assemblage is in close proximity to human settlement areas. It is a pioneer grassland, with the forb layer represented by many agrestal weed species;

- Rocky outcrops: this vegetation unit is concentrated on norite outcrops and consisted of an open mesophylluous woodland with a dense graminoid layer composed of late-successional species. It is rich in woody species and is structurally and floristically more diverse in comparison to other vegetation units;
- Wetland, river system and associated riparian vegetation: this assemblage is located along the perennial Sterkstroom River and is represented by a closed woodland consisting of tall tree species and a well-developed basal grassy layer. A number of invader species were also noted;
- Azonal vegetation units: this unit comprises of a species composition relating to areas where frequent runoff or retention of surface water occurs such as along road reserves, leaking pipelines and quarries; and
- Endangered or rare species: 13 protected species were identified on the mine area as per the South African Threatened Species Programme (TSP) list of January 2007, the Transvaal Nature Conservation Ordinance (Ordinance 12, 1983) and Government gazette No. 29062, Notice 897, 8 September 2006. (Metago, 2008). These species include:
 - Aloe greatheadii
 - Large turret flower
 - Liver Lily
 - Highveld Cabbage Tree
 - Wild Pear
 - Twisted-petal eulophia
 - Gladiolus antholyzoides;
 - Thick-leaved Gladiolus
 - Porcupine Huernia
 - Star-Flower
 - Small-leaved Bride's Bush
 - Pellaea calomelanos; and
 - Marula

3.6.7 HYDROLOGY (SURFACE WATER)

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008) as well as site observations by SLR in 2012.

3.6.7.1 Water Resources

Tharisa Mine is located within the upper reaches of the A21K quaternary catchment, which falls within the Lower Crocodile Secondary catchment and the Crocodile West and Marico Water Management Area (WMA3).

The Sterkstroom and two unnamed non-perennial tributaries of the Brakspruit flow through the western side of Tharisa Mine.

To the east of the mine is the non-perennial Elandsdriftspruit which flows in a northerly and then north westerly direction into the Middelkraal Dam. The Middelkraal Dam then feeds the perennial Maretlwane which also then feeds into the Sterkstroom downstream of the mine. Two non-perennial drainage lines, forming a tributary of the Maretlwane, flow through the north eastern parts of the mine. A non-perennial tributary of the Elandsdriftspruit originates just south of the mine and flows through the eastern edge of the mine. See Figure 1-2 and Figure 3-1. Tharisa is currently busy with the diversion of this tributary.

3.6.7.2 Surface water quality

Water quality monitoring is currently being conducted in the Sterkstroom river upstream and downstream of the mine as well the non-perennial rivers when water is available. This forms as part of the monitoring network for Tharisa Mine operations. Observations for the Sterkstroom indicate that the water quality is good and suitable for domestic use.

3.6.7.3 Surface water users

Water from the Sterkstroom is used for domestic purposes such as washing and bathing, livestock watering and for agricultural purposes.

3.6.8 GROUNDWATER

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

3.6.8.1 Presence of groundwater

Tharisa Mine is underlain by shallow upper weathered aquifer and a deeper fractured aquifer. The interface between these features is relatively impermeable. In the vicinity of the water courses, alluvium replaces the weathered overburden and the water courses do lose and gain water to the alluvium aquifer. Groundwater studies indicate that water levels vary from 10m to 30m below ground level. Ground water flow is generally influenced by the topography in the area. In general, the flow is from the higher ground in the south to lower lying areas in the north and towards water courses which occur in lower lying areas.

3.6.8.2 Groundwater quality

A significant number of boreholes located within and surrounding the mine are monitored as part of Tharisa's groundwater monitoring programme. Groundwater quality in this area ranges from good to poor with most samples being classed as either good or marginal. Nitrates are predominantly elevated in the region, especially on the eastern side of the operation.

3.6.8.3 Groundwater use

Boreholes are used for domestic and agricultural (livestock and irrigation) purposes by the surrounding landowners and users.

3.6.9 AIR QUALITY

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008).

Due to the nature of the land use locally and regionally (Rustenburg, Marikana and Brits region); ambient air quality in the area is already impacted by the various sources of air pollution such as:

- Platinum smelter operations;
- Ferrochrome smelter operations;
- Furnace and converter operations;
- Boiler operations;
- Informal settlements;
- Mining operations;
- Farming activities; and
- Vehicle entrainment of dust.

Potential sensitive receptors include the communities discussed in section 2.6.

3.6.10 NOISE

Information provided in this section was sourced from the original EIA/EMP report (Metago, June 2008) and was augmented by the noise monitoring report (Ben van Zyl, An Acoustic Consulting Engineer, May 2009).

Since no baseline ambient noise levels had been established prior to the mine start up, efforts were made to ascertain baseline data during the initial noise survey that was conducted in the period between March and April 2009 (Ben van Zyl, May 2009).

Although the area around Tharisa Mine has some rural elements, it is already subjected to elevated noise levels, mainly caused by road traffic, other surrounding mining activities and general community activities (including small business and farming). Ambient noise levels vary between day and night. The pre-mining ambient noise levels were assumed to vary from 45dBA during the day to 35dBA at night.

The baseline information indicated that with the absence of Tharisa's mining activities, the ambient night-time noise level was 50dB, which is 5dB above a typical night-time for urban districts and 15dB above a typical rural district. Tharisa's mining activities were audible especially from the Buffelspoort residential area that is located south of the N4 but there was no discernible increase in the dBA reading registered on a sound level meter.

The monitoring report (Tharisa Mine, February 2012), showed that the ambient night-time noise level ranged between 50.4dB and 61.4dB.

3.6.11 VISUAL ASPECTS

Tharisa Mine lies on a flat and relatively open area characterised by semi-industrial mining related activities, open pits and agriculture. The natural environment in and around the area is extensively disturbed by residential, mining, agricultural and related activities. The vegetation in the area bares little resemblance to the indigenous vegetation once found in the area before these activities began. When viewed from within the mining belt, the mine is located within an area that has a relatively weak sense of place. However, the broader area has a stronger sense of place due to the presence of distant hills, which soften the harsh nature of the disturbing activities. Taken together it can be said that the area in which the mine is located has a moderate to weak sense of place.

3.7 RELEVANT ADDITIONAL INFORMATION

None.

4 IDENTIFICATION OF THE ANTICIPATED IMPACTS

This section describes the proposed project components with respect to the construction, operations, decommissioning and closure phases and identifies the potential impacts associated with these phases.

4.1 PROJECT DESCRIPTION

Information that provides perspective on the scale of the proposed project components has been outlined below. The related proposed positions of these components are indicated in Figure 1-2.

4.1.1 THE PROPOSED CHROME SAND DRYING PLANT

The capacity of the proposed chrome sand drying plant is approximately 25,000 tons per month of chrome concentrate.

It is proposed that the wet chrome concentrate will be fed by front-end loader to a conveyor feeding the drier feed bin. This wet chrome will then be fed into the static fluid bed drier where it will be dried by a stream of hot gas blowing through a perforated plate. The hot burner gas will be mixed with air to achieve the correct drier gas temperature. The moisture-laden exhaust gas will be drawn off from the top of the drier chamber and ducted to gas cleaning cyclones and a bag filter to remove particulates before discharge to atmosphere. The dried chrome will be discharged from the drier and be fed to a similar static fluid bed cooling unit. The dried and cooled product will be discharged via a conveyor to a storage bin, from where it will be packaged in 1 ton bags, stored in a covered store and loaded by forklift onto trucks for dispatch.

The proposed plant will make use of approximately 640 kg/h of diesel or fuel oil. The exhaust gas volume will be approximately 64,000 Am³/hr at 110°C. There will be trace amounts of SO₂ in the off gas due to the combustion process which uses diesel and other products of combustion such as CO₂ will be present as well. There will be no solid or liquid effluent or wastes generated by the drier plant.

The proposed plant will be located within the existing concentrator plant area and will be operated continuously (24 hours per day). Approximately 460 tons of diesel or HFO will be stored in the concentrator plant area.

4.1.2 PROPOSED INCREASED OF THE HIGH WALL FROM 120M TO 180M

The open pit mining operations at Tharisa Mine are divided into two sections: being the western and eastern pits on each side of the mine. The two sections are separated by the D1325 (Marikana) road. Tharisa proposes to increase the approved depth of the pits from 120m to 180m. This change will result in an increase of the life of the mine from 12 years as approved (EIA/EMP report 2008) to 18 years. The

TSF and rock waste dumps have also incorporated the related increase in the tailings and waste rock tonnages.

4.1.3 PROPOSED REALIGNMENT AND RESHAPING OF WASTE ROCK DUMPS

It is proposed that there will be three rock waste dumps: two on the western side of the mine and one on the eastern side of the mine. The related volumes have been outlined below and demonstrated in Figure 1-2:

Table 4-1: THE PROPOSED WASTE ROCK DUMPS DIMENSIONS

Approved Waste Rock Dumps				
Dimensions	Eastern Waste Rock Dump (1)	Eastern Waste Rock Dump (2)	Western Waste Rock Dump (4)	Western Waste Rock Dump (5)
Footprint	22ha	22ha	22ha	49ha
Volume	5 890 000m ³	5 890 000m ³	5 890 000m ³	13 330 000m ³
Proposed Waste Rock Dumps				
Dimensions	Eastern Waste Rock Dump (1)		Western Waste Rock Dump (6)	Western Waste Rock Dump (8)
Footprint	116ha		34ha	65ha
Volume	41 342 832m ³		18 663 400m ³	35 852 500m ³

It is proposed that there will also be a side slopes alteration from 14 degrees to approximately 28 degrees associated with the waste rock dumps.

4.1.4 PROPOSED CHANGE TO THE DESIGN OF THE TAILINGS STORAGE FACILITY

Due to the proposed increase of the open pit high wall and space related constraints at the mine, the designs and sizes of the tailings storage facility (TSFs) have changed as follows:

TABLE 4-2: THE PROPOSED TAILINGS STORAGE FACILITIES DIMENSIONS

Dimensions	Approved TSF 1	Proposed new TSF1	Approved TSF 2	Proposed new TSF 2
Footprint	52Ha	70Ha	100Ha	135Ha
Maximum Height	33m	40m	31m	40m
Volume	5.4 million m ³	8.1million m ³	12.8 million m ³	24million m ³

Furthermore, the black turf clays underneath the containment walls that were included in the approved designs have not been incorporated in the new designs as well as low permeability liner along the inside of the face of the TSF. The clay cut-off keys have also not been incorporated in the new designs instead, toe drains have been incorporated on the inside toe of the TSF containment walls to draw down the phreatic surface of the tailings dam thus making it more stable. A seepage collector trench to intercept seepage in the weathered norite will also be constructed. The side outer slopes of the TSF have been

constructed at 1V:2.5H instead of 1V:3H as per the approved EIA/EMP report. It is understood that the outer slopes will ultimately be constructed at 1V:3H.

4.1.5 PROPOSED CHANGE TO THE GENERAL INFRASTRUCTURE LAYOUT AT THARISA MINE

Tharisa proposes various other changes to the mine's general surface layout.

4.1.5.1 Proposed construction of a truck parking area

Tharisa proposes to construct a truck parking area near to the mine entrance. The parking area will comprise a one-way gravel road, 700m long x 8m wide for queuing/parking trucks that wait to enter the plant as well as the main gravel parking area of approximately 200 x 50m. The total parking area will be 15,600m² and will operate for 24hrs per day.

Trucks that be will be parked will be double-trailer 'interlink' type, 22m long. There will be space for 28 trucks to be parked in the queuing road and 50 trucks in the main parking area. The trucks will access the plant from the truck park by crossing the Marikana road (D1325) public road at a 4-way stop to be constructed at the plant truck entrance. Ten trucks will travel from the truck parking area to the plant per hour.

4.1.5.2 Change to the location and height of the topsoil berms

The approved eastern topsoil berm walls have been shifted towards the concentrator plant which is currently under construction. Tharisa also propose to increase the height of the berm walls from 10m high to 30m. The related purpose is to minimise negative visual and noise impacts.

4.1.5.3 Proposed construction of one topsoil facility on the western side of the mine

It is proposed that an additional topsoil storage facility will be developed on the western side of the mine. This facility will be 30m high, volume of 5, 047,770m³ and cover an area of approximately 123, 417m².

4.1 CONSTRUCTION PHASE

4.1.1 CONSTRUCTION PHASE FACILITIES

The following facilities already exist and will be utilised during the construction and operational phases:

- Handling and storage area for construction materials (paints, solvents, oils, grease);
- Existing waste management facilities;
- Existing workshops, stores, wash bays, lay-down areas, fuel handling and storage area, offices, ablution facilities;
- Existing power supply;
- Existing water management infrastructure; and
- Existing access roads.

4.1.2 CONSTRUCTION PHASE ACTIVITIES

The following activities are expected to take place during construction:

- Selective clearing of vegetation in areas designated for surface infrastructure;
- Stripping and stockpiling topsoil and sub-soil;
- Digging of foundations, trenches and pits;
- Preparing residue disposal areas;
- Delivery of materials; and
- General building/construction activities.

4.2.3 CONSTRUCTION PHASE SERVICES

4.2.3.1 Transport Systems

The existing road network will be utilised in the construction phase. This network has been described in section 3-8 of this report and is illustrated in Figure 1-2. The following are the types of materials that could be transported to and from site:

- To site:
 - Staff;
 - Building materials;
 - Mining and plant equipment; and
 - Consumables.
- From site:
 - Staff; and
 - Waste (domestic and industrial).

Traffic volumes for the construction period will vary depending on the activities at the mine. The total construction traffic that is associated with the proposed project components on public roads will include:

- Proposed chrome sand drying plant: 20 abnormal loads, 200 truckloads and 2000 light vehicle trips plus 250 loads of ready-mix concrete from Rustenburg (N4 from Gauteng);and
- Other activities: these activities will result in an increase in the mine's internal traffic.

4.2.3.2 Water Supply

Water for construction will be sourced from the same sources that are being utilised for the current mine.

These include:

- Boreholes;
- Water from the open pit; and
- Storm water dam.

4.2.3.3 Power Supply

Power for the construction phase will be sourced from the existing Eskom supply. It is estimated that during the year of construction, an average of 25kW of power will be used.

4.2.3.4 Waste Management

Sewage

The existing sewage treatment plant will be utilised for the construction phase.

Non-mineralised wastes

There are no on-site waste disposal facilities at the mine and none are planned for the proposed project components. Domestic waste from the proposed construction activities will be collected, compressed and then transported to a municipal dump at Rustenburg or Mooiwooi.

Hazardous waste from the construction activities will be collected and either be sent for recycling or be transported to a licensed hazardous waste landfill. Domestic and industrial wastes will be removed and as far as reasonably practical, reused and/or sent for recycling and/or transported to a permitted waste disposal site.

4.2.3.5 Construction workforce and housing

A maximum number of 100 jobs will be created during construction. The appointed contractors will make use of their own personnel and where necessary, the current workforce at Tharisa will be used. The construction contractors will be responsible for housing their workers off site and providing the required facilities and services.

4.1.3 CONSTRUCTION PHASE TIMING

The bulk of construction activities should be starting in the latter half of 2013, pending the EIA authorisation process.

4.3 OPERATIONAL PHASE

4.3.3 PROPOSED PROJECT COMPONENTS

The proposed project components will be treated as an extension of the current mining operations.

4.3.4 APPROVED/ EXISTING SURFACE INFRASTRUCTURE

The proposed additional surface infrastructure will be considered as an extension of the approved/ existing surface infrastructure and related operation. The main components of the approved/ existing surface infrastructure include:

- Contractor's work areas during construction;

- Open pit mining operation;
- Mining contractor's yard;
- Soil, overburden and waste rock stockpiles;
- Run of mine (ROM) crushing and stockpiling;
- Internal conveyor and haul roads;
- Access road and helipad;
- Concentrator complex for the PGM and chrome plant;
- A tailings dam complex;
- A sewage treatment plant and associated pipelines;
- Water management infrastructure including boreholes, supply pipelines, dirty storm water control measures, clean storm water control measures, a river diversion, a storm water dam/s and process water dams;
- Waste management infrastructure: temporary handling and storage of general and hazardous waste and a salvage yard;
- Storage and handling of hazardous substances: fuel, lubricants, various process input chemicals, raw material stockpiles/bunkers, gas, burning oils, explosives;
- Services: power lines and substation, pipelines, telephone lines, communication and lighting masts;
- Security and access control;
- Workshops and wash bays;
- Laboratory, offices, control rooms; and
- First aid clinic.

Figure 1-2 shows the conceptual additional surface infrastructure areas. This will be refined and more detail on surface infrastructure will be provided in the EIA report.

4.3.5 OPERATIONAL PHASE SERVICES

4.3.5.1 Transport Systems

The existing road network will be utilised in the operational phases. This network has been described in section 3.5 of this report and is illustrated in Figure 1-2.

The following are the types of materials that will generally be transported to and from site:

- To site:
 - staff;
 - consumables.
- From site:
 - staff; and
 - waste (domestic and industrial); and
 - final product.

Traffic volumes for the operational period will vary depending on the activities at the mine. It is estimated that there will be insignificant increase in the traffic volume associated with the proposed project components. This will be an addition to the approved traffic volumes outlined below:

- Three hundred and two (320) trucks per day for chrome and eight trucks per day for the PGM;
- Sixteen (16) trucks per day for consumables;
- Two (02) trucks per week for waste; and
- One hundred and forty (140) vehicles per day for staff.

4.3.5.2 Water Supply and Management

Water for the operational phase will be sourced from the same sources that are being utilised for the current mine as outlined in section 4.2.3 above.

It must be noted that Tharisa has also applied for the transfer of its existing water allocation from the Buffelspoort dam from agricultural to industry/ mining water.

The existing water management facilities (dirty process water dam and dirty storm water) will be utilised for both construction and operational phases.

4.3.5.3 Power supply

Power for the operational phases will be sourced from the existing Eskom supply. The proposed chrome sand drying plant will use about 300kW of power during full operation.

4.3.5.4 Waste management

Sewage

The existing sewage treatment plant will be utilised for the operational phase. It has a capacity to service the existing and proposed staff.

Non-mineralised wastes

There are no on-site waste disposal facilities at the mine and none are planned for the proposed project components. Domestic waste from the proposed construction activities will be collected, compressed and then transported to a municipal dump at Rustenburg or Mooiooi.

Hazardous waste from the construction activities will be collected and either be sent for recycling or be transported to a licensed hazardous waste landfill. Domestic and industrial wastes will be removed and as far as reasonably practical, reused and/or sent for recycling and/or transported to a permitted waste disposal site.

4.3.6 OPERATIONAL PHASE WORKFORCE AND HOUSING

A maximum number of 34 permanent jobs will be created in the operation phase. These workers will be provided with a housing allowance. No on-site facilities will be provided for the employees.

4.3.7 LIFE OF MINE

The life of Tharisa Mine is currently planned for 12 years. The proposed increase of the high wall will increase the life of the mine to 18 years.

4.4 DECOMMISSIONING AND CLOSURE

The conceptual plan at this stage is to remove surface infrastructure and rehabilitate the disturbed areas where possible. The closure objective will be to return the land to pre-mining potential. In this regard, the permanent tailings and waste rock facilities areas cannot be rehabilitated back to pre-mining potential. Funding for mine closure will be in accordance with the DMR requirements.

4.5 BRIEF PROJECT MOTIVATION (NEED AND DESIRABILITY)

The motivation for the proposed activities as follows:

- The purpose of the chrome sand drying plant is to produce higher-value chrome sand suitable for use as foundry sand;
- The purpose of the trucks parking area is to provide sufficient parking and/or waiting area for the trucks enroute to Marikana Railway Siding (MRS);
- The changes in the tailings character and design will optimise tailings disposal via the installation of toe drains on the “inside toe of the TSF containment walls”. These drains will draw down the phreatic surface of the tailings dam thus: making it more stable, helping the tailings consolidate and improve the placed density and reducing the hydrostatic pressures acting on the containment walls; and
- The other changes to the general surface infrastructure will optimise the available space at the mine.

4.6 RELEVANT NEMA LISTED ACTIVITIES

The relevant listed activities (in terms of the NEMA Regulations) which are relevant to the proposed EIA/EMP Amendment are listed in the table below.

TABLE 4-3: NEMA LISTED ACTIVITIES RELEVANT TO THE PROJECT

Activity Number	NEMA Listed Activity	Description of activity
Notice 544, 18 June 2010		
13	The construction of facilities or infrastructure for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not 500 cubic metres.	The construction of facilities or infrastructure for the storage and handling of 460 tons of a dangerous good (diesel or heavy fuel oil).
Notice 545, 18 June 2010		

Activity Number	NEMA Listed Activity	Description of activity
5	The construction of facilities or infrastructure for any purpose or activity which requires a permit in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	Construction of a chrome sand drying plant.
Notice 545, 18 July 2010		
26	Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where Activity 28 in Notice No. R. 544 of 2010 applies.	Operation of a chrome sand drying plant.

4.7 CONFIRMATION OF IAP CONSULTATION ON POTENTIAL IMPACTS

IAPs were provided with information on the potential impacts during the scoping focussed and public meetings. Additional input from the IAPs has been taken into consideration and has been incorporated in section 4.8.

4.8 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

Potential environmental, social, economic or cultural impacts, including the cumulative impacts where applicable, that were identified during the scoping process are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in section 3 of the scoping report.

For projects with sufficient information at the scoping stage, preliminary impact assessments are provided. In this scoping report a preliminary assessment is not possible. Before the assessment can be meaningfully conducted there is a need for additional information from a number of investigations.

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

4.8.1 POTENTIAL CULTURAL AND HERITAGE IMPACTS

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

4.8.1.1 Archaeological, Heritage and Cultural Resources

Issue: Loss of or damage to cultural, heritage and/or archaeological resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Heritage and cultural resources of varying significance such as graves, churches and areas of historical significance have been identified within the mining right area. The proposed new infrastructure particularly the waste rock dumps have the potential to impact some of these resources.

The additional work required to address this issue is described in section 7.4.1 of the scoping report.

4.8.1.2 Paleontological Resources

Issue: Loss of or damage to paleontological resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

No resources of paleontological significance were previously identified within the mining right area because the entire area is underlain by igneous rocks of the Rustenburg Layered Suite of the Bushveld Igneous Complex as discussed in section 3.6.1. This complex is an intrusive igneous body comprising a series of ultramafic-mafic layers and a suite of associated granitoid rocks. As these rocks are Precambrian in age and are of igneous origin it is highly unlikely that fossils will be affected by the proposed projects.

The additional work required to address this issue is described in section 7.4.2 of the scoping report.

4.8.2 POTENTIAL SOCIO-ECONOMIC IMPACTS

The socio-economic impacts are discussed below.

4.8.2.1 Geology

Issue: Loss and sterilisation of mineral resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

By the nature of mining projects the geology is exploited for the target minerals therefore the impact on the geology at the pits and associated mining areas will be high in all project phases. It is important, however, that no potential future resources be sterilised as it may become feasible to mine them in the

future. It is unlikely that third party's minerals will be sterilised by either mining activities or by the placement of surface infrastructure at Tharisa Mine.

The additional work required to address this issue is described in section 7.4.3 of the scoping report.

4.8.2.2 Land use

Issue: Impact on the existing land uses

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The existing land uses within the mining right area and around the mine are described in section 2.11 and 2.13. Residents and land use activities have a potential to experience impacts from the proposed project components. The significance of the impacts is dependent on the assessment and mitigation of the full set of impacts potentially associated with the proposed project components and the existing mines.

The additional work required to address this issue is described in section 7.4.4 of the scoping report.

4.8.2.3 Blasting

Issue: Damage to surrounding people and property

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed increase of the high wall and the continuation of the current mining activities has the potential blast related impacts on the people and property from fly rock, air blast and vibrations.

The additional work required to address this issue is described in section 7.4.5 of the scoping report.

4.8.2.4 Transport Systems

Issue: Disturbance of roads and road safety

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed project components as well as the current operations are likely to cumulatively impact the existing roads. This may result in increased safety risks, reduction in road service levels and road condition.

The additional work required to address this issue is described in section 7.4.6 of the scoping report.

4.8.2.5 Economic Impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

During the construction of the additional surface infrastructure, the most significant positive impacts will be that of short term job creation and stimulation of the economy. In the longer term, the following positive economic impacts are expected during the operational phase:

- New jobs will be created and the existing Tharisa staff will also be moved across from the existing mining activities to the proposed project components instead of being laid off, a significant job creation is expected for this phase as indicated in section 4.3.6;
- The extension of the operations at the Tharisa Mine will assist in the continued stimulation of the local, regional and national economy through continued jobs, capital investment, increase in service-sector jobs and the sale of pgms;
- Direct investment in the local communities as per the Tharisa Social and Labour Plan; and
- At closure of the relevant mine sections, there may still be some positive impacts through maintenance and aftercare activities and the fact that the mine would have contributed to a greater economic critical mass, skills, and wealth that can be used in other economic opportunities.

The following **negative economic impacts** may occur during the construction and operation phases:

- Deterioration of property value in the immediately surrounding areas; and
- Decline in business such as commercial farming activities in the immediately surrounding areas.

The additional work required to address all of these issues is described in section 7.4.7 of the scoping report.

4.8.2.6 Inward Migration

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The following negative impacts may occur during the construction and operational phases:

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

The additional work required to address all of these issues is described in section 7.4.8 of the scoping report.

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

A list of potential impacts (positive and negative) on: employment opportunities, community health, community proximity and links to the Social and Labour Plan, is provided in section 4.8.2.4 and 4.8.2.6 above.

4.8.4 POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS

A list and description of potential impacts identified with the biophysical environment is provided below.

4.8.4.1 Topography

Issue: hazardous excavations and infrastructure

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The construction of the proposed additional surface infrastructure and the increase of the high wall will significantly alter the site topography. Related issues include hazardous excavations and infrastructure which pose a danger to humans and animals and potential alteration of drainage patterns.

The additional work required to address this issue is described in section 7.4.9 of the scoping report.

4.8.4.2 Soil and land capability

Issue: Loss of soil and land capability

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Topsoil is generally a resource of high value containing a gene bank of seeds of indigenous vegetation species. A loss of topsoil (through sterilisation, erosion or contamination) would generally result in a decrease in the rehabilitation and future land use potential of any land that is disturbed by the construction of the proposed project components.

The additional work required to address this issue is described in section 7.4.10 of the scoping report.

4.8.4.3 Fauna and flora (natural plant and animal life)

Issue: Loss of natural vegetation and animal life

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed construction and operation and subsequent decommissioning of the proposed additional infrastructure has the potential to impact negatively on terrestrial and aquatic ecosystems.

The additional work required to address this issue is described in section 7.4.11 of the scoping report.

4.8.4.4 Hydrology (Surface water)

Issue: Alteration of surface drainage patterns

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Some of the proposed surface infrastructure: TSF, open pit and the waste rock dump on the eastern side of the mine are situated in areas where the headwaters of non-perennial tributaries are situated. This may result in changes to surface drainage patterns at these sites.

The additional work required to address this issue is described in section 7.4.12 of the scoping report.

Issue: Contamination of surface water

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

There are various activities and infrastructure that may have a negative impact on surface water quality. This could impact the surrounding surface water users including people, animals and the aquatic system. The relevant activities and infrastructure include: hazardous construction chemicals, sewage, tailings, waste rock, fuel, lubricants and non-mineralised waste.

The additional work required to address this issue is described in section 7.4.12 of the scoping report.

4.8.4.5 Groundwater

Issue: Reduction of groundwater levels and availability

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Groundwater levels could be reduced by dewatering open pits. This dewatering could negatively impact the surrounding groundwater users including people and animals.

The additional work required to address this issue is included in section 7.4.13 of the scoping report.

Issue: Contamination of groundwater

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

There are various activities and infrastructure that may have a negative impact on groundwater quality. This could negatively impact the surrounding groundwater users including people and animals. The relevant activities and infrastructure include: hazardous construction chemicals, sewage, tailings, waste rock, fuel, lubricants and non-mineralised waste.

The additional work required to address this issue is included in sections 7.4.13 of the scoping report.

4.8.4.6 Air quality

Issue: Air pollution

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

There are various activities and infrastructure that may have a negative impact on air quality. This could impact surrounding people and animal. The relevant activities and infrastructure include: dust entrainment on roads, blasting, material handling and wind erosion of stockpiles and waste facilities.

The additional work required to address this issue is included in section 7.4.14 of the scoping report.

4.8.4.7 Noise

Issue: Increase in disturbing noise levels

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

There are various activities that may have a negative impact on noise levels. This could impact surrounding people and animals. The relevant activities include: construction, additional mining, vehicle movement, materials handling, waste rock dumping and chrome dryer plant operation.

The additional work required to address this issue is described in section 7.4.15 of the scoping report.

4.8.4.8 Visual aspects

Issue: Negative visual impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The additional activities and infrastructure will alter the visual environment causing potential additional visual impacts. Key activities and infrastructure include: the modified tailings dam, waste rock dumps and dust generating activities.

The additional work required to address this issue is described in section 7.4.16 of the scoping report.

4.9 POTENTIAL CUMULATIVE IMPACTS

All identified impacts in the preceding sections will be considered in a cumulative manner such that the impacts of the current Tharisa mining activities and those potentially associated with the proposed project components will be assessed together.

In some instances, the assessment will also take account of impact contributions from activities outside of the Tharisa mining right area.

5 PROJECT ALTERNATIVES

This section describes alternative land uses, development alternatives and other alternative means of carrying out the proposed project components and the consequences of not proceeding with them.

5.1 ALTERNATIVE LAND USES ON THE PROPOSED PROPERTIES AND SURROUNDING AREAS THAT MIGHT BE AFFECTED

This section provides a list of the alternative land uses that exist on the proposed properties and on adjacent or non-adjacent properties that may be affected by the proposed project components.

5.2 ALTERNATIVE LAND USES ON THE PROPOSED PROPERTIES

This section outlines the existing/current land uses on the proposed project components areas which also serve as alternative land uses to the proposed activities. This section also serves to identify land uses that will be undertaken should the listed activities below not go ahead. The identified land uses include: farming,

- Open pit mining activities,
- Soil berm related activities; and
- Other pieces of land are vacant/ unused.

5.3 ALTERNATIVE LAND USES ON THE SURROUNDING AREAS

The surrounding identified land uses include:

- Residential land use;
- Mining and mining related activities;
- Agricultural activities; and
- Business (shops, restaurants and bed and breakfast facilities and transport services).

5.4 OTHER ALTERNATIVES UNDER CONSIDERATION

No project alternatives are under consideration.

The option of an on-site smelter was originally part of the planning but has been removed as part of this amendment. At this stage, an off-site smelter capacity at another mining company will be used.

5.5 LAND DEVELOPMENT CONCERNS RAISED BY THE IAPS

This section provides an indication of land developments identified by the community or IAPs that are in progress and which may be affected by the operation of the proposed project components.

Some land owners indicated that they could not plan and/or develop their properties due to uncertainties pertaining to unknown future mine plans at Tharisa that may extent to their properties and as well as the lack of knowledge relating to whether or not the mine intends to buy their properties.

Tharisa has identified all properties/land that it requires in order to operate effectively and will engage with the relevant land owners in due time.

5.6 PROPOSALS MADE TO ADJUST THE OPERATIONS AT THE MINE

This section provides an indication of proposals made in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and IAPs.

Many local community members indicated that more local people should be employed by Tharisa and that the communities must benefit from future projects. Some IAPs further indicated that they would like Tharisa to operate between 06H00 to 22H30 per day and not operate for 24hours due to high noise levels from the same activities which disturb them at night.

Tharisa endeavours to employ local people where possible and requires contractors to employ local people as well. It should however be noted that the project components are only additional surface infrastructure to an existing mine and that new permanent job opportunities are expected.

Tharisa is also considering an option of operating at the requested hours and/ or mitigating the noise impacts on the immediately surrounding communities so that they can operate 24 hours per day. The following are the mitigation measures that have been put in place to address noise related concerns:

- Changed the reverse hooters and uses the less noisy hooters;
- Increase of berm wall height; and
- Revised the working schedule for the tailings dam construction crew which does not permit them to work near the highway (N4) after 22H00.

5.7 THE “NO-GO” OPTION

This section provides information in relation to the consequence of not proceeding with the proposed project components (additional surface infrastructure).

Not proceeding with the proposed project components may reduce the environmental impact and may also reduce the opportunity for economic development and job creation in the region.

5.8 PROJECT PLAN

A description of the most appropriate procedure to plan and develop the proposed project components' operation is provided in section 4.1.

5.9 PROJECT PLAN TO AVOID POTENTIAL IMPACTS

The overall project team, which consists of Tharisa, its engineering companies, and SLR aims to develop the project infrastructure layout and plan in a manner that will prevent impacts to the socio-economic, cultural and biophysical environment. Should impacts be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project.

Further detail will be provided in the EIA/EMP report.

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

6.1 INFORMATION SHARING PROCESS

6.1.1 LETTERS, SITE NOTICES AND NEWSPAPER ADVERTISEMENTS

The IAPs (including landowners) were informed of the proposed project via email, fax and hand delivered letters. Proof of these notifications is provided in Appendix A.

Site notices in English and Setswana were placed at key conspicuous positions in and around the proposed project area on 20 of January 2012. Block advertisements were placed in the Daily Sun and Rustenburg Herald newspapers on 19 January 2012. Photographs of the site notices and copies of the newspaper advertisements are provided in Appendix A.

In addition, the relevant municipal ward councillor, local shopping centre and Tharisa Mine were used to disseminate Background Information Documents (BIDs) and invitations to the scoping meetings.

6.1.2 BACKGROUND INFORMATION DOCUMENT

A background information document (BID) was compiled and distributed by post, by hand, e-mail and fax to all IAPs and authorities on the project's public involvement database. This database was developed using the databases from previous Tharisa EIA process, supplemented with a title deeds search and with information on IAPs provided in the scoping public and focused meetings as well as the social scan.

The purpose of the BID is to inform IAPs and authorities about the proposed project components, the environmental assessment process, possible environmental impacts, and means of providing input into the environmental assessment process. Attached to the BID is a registration and response form, which provides IAPs with an opportunity to submit their names, contact details and comments on the proposed project components. A copy of the BID is provided in Appendix A.

6.1.3 SCOPING MEETINGS

The public scoping meetings were held in February 2012 as per the table below.

TABLE 6-1: SCOPING PHASE PUBLIC MEETINGS

Organisation/ Community	Date	Time	Venue
Focussed meeting with Mr H. Bedwell and Mr J van Heerden	2 February 2012	11.15 - 12.15 pm	Mr H. Bedwell's Restaurant
Key stakeholder scoping meeting	16 February 2012	11.00 - 13.30 pm	Retief Primary School (Hall)
General public scoping meeting	16 February 2012	16.30 - 19.00 pm	Retief Primary School (Hall)
Regulatory authorities scoping and site meeting	21 February 2012	11.30 - 14.00 pm	Tharisa Mine (Farm House Boardroom)

At these meetings a presentation was given which provided information on Tharisa's intention to develop the proposed project components. These meetings were focussed on:

- Informing IAPs about the proposed projects;
- Providing a description of the key project elements;
- Informing IAPs about the stakeholder engagement process and how IAPs can have input into the process;
- Providing information about the baseline environment and obtaining IAP input;
- Providing information about the potential impacts of the project and obtaining IAP input; and
- Providing an opportunity for IAPs to raise issues and concerns. These issues and concerns have been clearly documented and used to inform the plan of study for the EIA Phase.

Meeting attendance registers, minutes, the meeting presentation and the issues and concerns report is provided in Appendix A.

6.2 IAPs CONSULTED DURING SCOPING PHASE

IAPs were identified using Tharisa's existing IAP database, and supplemented with information obtained from deeds searches for the relevant properties. The IAP list was also expanded with the list of attendees of the relevant meetings as well as during the social scan. A full list of IAPs consulted is provided in Appendix B.

6.3 IAP VIEWS ON EXISTING ENVIRONMENT

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

6.4 IAP VIEWS ON POTENTIAL IMPACTS

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

6.5 OTHER IAP CONCERNS

All views, issues and concerns raised throughout the scoping phase have been captured into the issues and concerns report provided in Appendix C.

6.6 MEETING MINUTES AND RECORDS OF CONSULTATIONS

Meeting attendance registers, minutes, the meeting presentation and the issues and concerns report are provided in Appendix A and Appendix C.

6.7 IAP OBJECTIONS

All views, issues, concerns and objections raised throughout the scoping phase have been captured into the issues and concerns report provided in Appendix C.

6.8 REVIEW OF SCOPING REPORT

The scoping report will be subjected to public review for a 30 day period commencing on 13 June 2012. Electronic of the scoping report copies will be made available on request. Hard copies of the scoping report will be placed for review at the following venues:

- Retief primary school (office);
- Marikana community hall;
- Hillside B&B;
- Ng Kerk (Madihlhokwa);
- Rustenburg library;
- Tharisa Mine; and
- SLR office (Johannesburg).

Summaries of the report will be provided in English and Setswana and sent by post or e-mail to all IAPs and authorities on the project's public involvement database that have provided correspondence addresses. Otherwise summaries will be left for general collection at the above-mentioned venues where the reports will be placed.

In addition, the report will be distributed to the following authorities for review:

- DMR;
- DEDECT;
- DEA;
- DWA;
- NWHRA;
- DOA;
- DRDLR;
- NWDPT;
- NWDTRCS;
- BPDM;
- RLM; and
- MLM.

7 FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY

This section describes the nature and extent of further investigations (section 7.4) required for Environmental Impact Assessment (EIA) including any specialist studies that may be required, and sets out the proposed approach to the EIA/EMP phase.

7.1 EIA PHASE OBJECTIVES

The main objectives of the EIA phase are to:

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

7.2 EIA PROJECT TEAM

The proposed EIA project team is outlined in Table 7 1 and is similar to the team used for the scoping phase with the inclusion of additional specialists.

TABLE 7-1: PROPOSED EIA TEAM

Team	Name	Designation	Tasks and roles	Company
Project management	Stella Moeketse	Project Manager	Management of the assessment process, stakeholder engagement and report compilation.	SLR
	Brandon Stobart	Project Reviewer	Report and process review	
	Rian Titus	Groundwater specialist	Groundwater impact assessment	
	Paul Klimczak	Hydrologist	Surface water impact assessment and water balance update	
	Stephen van Niekerek	Engineer	Closure cost estimate	
	Ben van Zyl	Noise specialist	Noise study	Acusolv
	Eric Kohler	Blasting consultant	Blast study	Cambrian CC
	Hanlie Liebenberg-Enslin	Air Quality impact specialist	Air quality impact assessment	Airshed

7.3 EIA/EMP PHASE ACTIVITIES AND TIMING

An overview of the EIA/EMP phase and corresponding activities are outlined in Table 7.2.

TABLE 7-2: EIA/EMP ACTIVITIES AND TIMING

Objectives	Corresponding activities
Further investigations (June to October 2012)	
Describe the affected environment.	<ul style="list-style-type: none"> ▪ Investigations by technical project team and SLR of issues identified during the scoping stage including investigations into alternatives as per the terms of reference outlined in sections 7.4, 7.5 and 7.6 (June to August 2012).
Define potential impacts.	
Assessment of potential environmental impacts.	Compilation of EIA/EMP report (June- October 2012).
Design requirements and management and mitigation measures.	
Give management and monitoring recommendations.	
EIA/EMP Report distribution and feedback on the applications (October 2012 to April 2013)	
Distribution of the EIA/EMP report to the DMR and other IAPs	Distribute EIA/EMP report to IAPs and other regulatory authorities for review (October 2012). Submit EIA/EMP report to DEDECT for their records.
Amendment of the EIA/EMP report and submission of the comments from the IAPs	Public feedback meetings with IAPs (if required) (October 2012) Record comments (November 2012).
Distribution of the EIA/EMP report to the DEDECT	Forward IAP comments to DMR (November 2012). Forward EIA/EMP report including IAP comments to DEDECT for review (December 2012)
Receive feedback on applications	Circulate record of decisions to all registered IAPs (April 2013).

7.4 SPECIALIST/FURTHER INVESTIGATIONS

The proposed terms of reference for further investigations required for the completion of the EIA study are discussed below.

7.4.1 CULTURAL AND HERITAGE RESOURCES

On finalisation of the location, footprint and associated activities for each of the proposed project components, the existing cultural and heritage specialist information will be used to identify and assess the potential impacts. The assessment and detailed management measures will be provided in the EIA/EMP amendment report by SLR.

7.4.2 PALEONTOLOGICAL RESOURCES

For paleontological impacts, it is proposed that a specialist opinion will be obtained to formalise the view on this issue. The assessment and detailed management measures will be provided in the EIA/EMP amendment report by SLR.

7.4.3 GEOLOGY: STERILISATION OF THE MINERAL RESOURCES

On finalisation of the location, footprint and associated activities for each of the proposed project components, the existing geology information will be used to identify and assess the potential impacts. The assessment and detailed management measures will be provided in the EIA/EMP amendment report by SLR.

7.4.4 LAND USE

On finalisation of the location, footprint and associated activities for each of the proposed project components, the existing land use information and the assessment of the impacts (environmental, cultural, social and economic) below will be used to identify and assess the potential land use impacts. The assessment and detailed management measures will be provided in the EIA/EMP amendment report by SLR.

7.4.5 BLASTING

Cambrian CC will conduct a specialist investigation prior to the commencement of the proposed project components. The investigation will include the following tasks:

- Assess the impacts of blast vibration, air blast and fly rock on surrounding people and property; and
- Provide input, together with SLR and the technical project team into project alternatives and management measures going forward.

7.4.6 TRANSPORT SYSTEMS

It is proposed that SLR will make use of the existing specialist information to provide the relevant assessment and detailed management measures in the EIA/EMP amendment report.

7.4.7 ECONOMIC ISSUES

It is proposed that a specialist opinion will be obtained to formalise the view on this issue. The assessment and detailed management measures will be provided in the EIA/EMP amendment report by SLR.

7.4.8 SOCIAL ISSUES

It is proposed that SLR will make use of the existing specialist information to provide the relevant assessment and detailed management measures in the amended EIA/EMP report.

7.4.9 TOPOGRAPHY

It is proposed that SLR will make use of the information available and provide the relevant assessment and detailed management measures in the EIA/EMP amendment report.

7.4.10 SOILS

It is proposed that SLR will make use of the available specialist information to provide the relevant assessment and detailed management measures in the EIA/EMP amendment report.

7.4.11 NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)

It is proposed that SLR will make use of the available specialist information to provide the relevant assessment and detailed management measures in the EIA/EMP amendment report.

7.4.12 HYDROLOGY (SURFACE WATER)

SLR will conduct a specialist investigation that will include the following tasks:

- Make use of the existing detailed baseline hydrological description of the mine area and immediate surroundings.
- Identification and assessment of potential sources of pollution and related impacts of the proposed project components on surface water resources (quantity, quality and flow characteristics);
- Development of management and mitigation measures including a detailed storm water management plan; and
- Provide input, together with the technical project team into project alternatives and surface water management measures going forward.

7.4.13 GROUNDWATER

SLR will conduct a specialist investigation that will address dewatering and pollution aspects from the proposed project components. The investigation will include the following tasks:

- Make use of the existing detailed baseline geology, geohydrology and groundwater information;
- Remodel dewatering impacts of the proposed increase of the high wall and associated activities;
- Remodel the potential seepage from the most relevant pollution sources;
- Assess the potential impacts; and
- Provide input, together with the technical project team into project alternatives and groundwater management measures going forward.

7.4.14 AIR QUALITY

Airshed will conduct a specialist investigation that will include the following tasks:

- Quantify the existing baseline air quality information;
- Model the potential impacts dust emissions from the current mine plus the of the proposed surface infrastructure;
- Provide the relevant mitigation measures; and

- Provide input, together with SLR and the technical project team into project alternatives and air quality management measures going forward.

7.4.15 NOISE

Acusolv Acoustic Engineers will conduct a specialist investigation that will include the following tasks:

- Survey will be conducted to evaluate the proposed location of the proposed infrastructure, as well as landscape and environmental factors which would influence the propagation of noise;
- Develop a model to simulate the emission and atmospheric propagation of noise from the existing and proposed operations;
- Evaluate the noise impact in terms of the criteria and guidelines of SANS10103 and the applicable noise regulation and provide mitigation measures; and
- Provide input, together with SLR and the technical project team into project alternatives and noise management measures going forward.

7.4.16 VISUAL ASPECTS

It is proposed that SLR will make use of the available specialist information and provide the relevant assessment and detailed management measures in the EIA/EMP amendment report.

7.4.17 CLOSURE COST ESTIMATE

Tharisa's closure cost estimate will be updated in accordance with the DMR requirements.

7.5 METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES

The proposed method for the assessment of environmental issues is set out in Table 7-3 below. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

TABLE 7-3 CRITERIA FOR ASSESSING IMPACTS

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

PART A: DEFINITION AND CRITERIA*		
Definition of SIGNIFICANCE	Significance = consequence x probability	
Definition of CONSEQUENCE	Consequence is a function of severity, spatial extent and duration	
Criteria for ranking of the SEVERITY of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.

	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PART B: DETERMINING CONSEQUENCE		

SEVERITY = L

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

SEVERITY = M

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

SEVERITY = H

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

			L	M	H
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
SPATIAL SCALE					

PART C: DETERMINING SIGNIFICANCE

PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE

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

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

7.6 METHODOLOGY FOR THE ASSESSMENT OF PROJECT ALTERNATIVES

7.6.1 ASSESSMENT OF THE “NO-GO OPTION”

The assessment of the implications of the “No-Go option” will require a high level comparison between the existing situation without the project and the possible future situation with the project, as assessed in the EIA/EMP report. This comparison will take existing and future impacts into account, including both positive and negative impacts.

7.6.2 ASSESSMENT OF PROJECT ALTERNATIVES

The realistic alternatives and associated assessment considerations for choosing between these alternatives are limited as has been discussed in section 5 of the scoping report. The proposed methodology for the assessment of these alternatives is a relative comparison that also applies the assessment method described above to each of the listed assessment criteria, where possible.

7.7 STAKEHOLDER ENGAGEMENT DURING THE EIA PHASE

The relevant authorities and public will be engaged during the EIA phase as described below.

7.7.1 AUTHORITY ENGAGEMENT

Proposed consultation meetings for the EIA phase include:

- A site visit and meeting with the DMR and DEDECT (if requested); and
- A general authorities meeting at the end of the EIA phase to present the main findings of the EIA prior to submission of the EIA/EMP report (if requested).

7.7.2 PUBLIC ENGAGEMENT

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

7.7.2.1 Focussed involvement

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

7.7.2.2 General involvement

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

At the end of the review period, a public feedback meeting/ open day will be arranged (if required). The purpose of this meeting will be as follows:

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

All comments received from IAPs in the review period will be forwarded to the DMR and included with the final report that is submitted to DEDECT.

Once the DMR and DEDECT have issued their respective records of decisions, the IAPs will be notified by fax, e-mail, post in accordance with the instructions from the relevant department.

The proposed consultation meetings for the EIA phase include:

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

8 SUMMARY AND CONCLUSIONS

The way forward for the remainder of the scoping phase is as follows:

- Distribute the scoping report and a summary thereof for review by the IAPs, the DMR and other regulatory authorities;
- Submit a copy of the scoping report that went out for public review to DEDECT for their records;
- Receive comments from IAPs and other regulatory authorities;
- Following the IAP review process, five copies of the final scoping report (with comments) will each be forwarded by SLR to DEDECT; and
- Receive comments from DEDECT and DMR and address in the EIA phase.

The scoping phase of the EIA has been completed for the proposed additional surface infrastructure, proposed changes to the design and characteristics of the tailings storage facility and general changes to the layout and operations of Tharisa Mine. The identified potential impacts will be investigated in accordance with the terms of reference presented in this report.

Stella Moeketse
Project Manager

Brandon Stobart
Reviewer

9 REFERENCES

Ben van Zyl, 2009: Noise Monitoring Survey 2009

Ben van Zyl, 2010: Noise Monitoring Survey 2010

Bojanala Platinum District Municipality (BPDM), 2010/2011: Integrated Development Plan.

Metago Environmental Engineers (Pty) Ltd (MEE), 2008: Environmental Impact Assessment and Environmental Management Programme for the proposed Platinum Group Mine (Tharisa Minerals (Pty) Ltd).

Rustenburg Local Municipality (RLM), 2010/2011 Integrated Development Plan.

Schulze, B.R., 1965: Climate of South Africa, Part 8, General Survey, Weather Bureau, Department of Environment Affairs, Pretoria, WB28

SGS, 2012: Test Report: Monthly Dust Deposition Monitoring Progress Report February 2012.

SLR Consulting (Africa) (Pty) Ltd, 2012: Water Quality Monitoring Report for January 2012 Quarterly Monitoring Exercise.

Quantec Data (Quantec Research (Pty) Ltd), 2009/2010.

Statistics South Africa, 2007: Community Survey.

B: IDENTIFICATION OF THE REPORT

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act as the case may be	
Full names and surname	Thulani Ntshanga
Identity number	820529 542 8087
Postal address:	Postal address: Postnet Suite 473, Private Bag X51, Bryanston, 2021, South Africa
Telephone No:	014 572 8104
Fax No:	014 572 8105
E-mail Address:	tntshanga@tharisa.com
Signature	

APPENDIX A: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS

- Applications: DEA and DEDECT
- Background information document (BID)
- Advertisements
- Photographs of site notices
- Correspondence with IAPs (including landowners)
- Correspondence with relevant authorities
- Scoping focused meeting attendance registers and minutes
- Scoping public meeting attendance registers and minutes
- Regulatory Authorities scoping meeting attendance register and minutes
- Scoping meeting presentation delivered at focused and public meetings

SLR

APPENDIX B: INTERESTED AND AFFECTED PARTY DATABASE

SLR

APPENDIX C: ISSUES AND CONCERNS REPORT



RECORD OF REPORT DISTRIBUTION

SLR Project Number:	T014-12/ 710.20002.00012
Title:	EIA/EMP Amendment I: For a chrome sand drying plant, changes to the tailings dam design and other operational and surface infrastructure changes
Report Number:	1
Proponent:	Tharisa Minerals (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Phumudzo Nethwadzi	Department of Mineral Resources (DMR)	1-7	June 2012	S Moeketse
Robert Nemanashi	North West DEDECT	8-9	June 2012	S Moeketse
Sebenzile Ntshangase	Department of Water and Environmental Affairs	10	June 2012	S Moeketse
Collette Scheermeyer	South African Heritage Resource Agency (SAHRA)	11	June 2012	S Moeketse
Anton Maluka	Department of Agriculture	12	June 2012	S Moeketse
Jacqueline Nkosi	Department of Land Affairs	13	June 2012	S Moeketse
Lerato Samson	North West Parks and Tourism (NWDPT)	14	June 2012	S Moeketse
H Niehaus and RS Maledu	North West Department of Transport, Roads and community safety (NWDTRCS)	15	June 2012	S Moeketse
James Mesebe	Bojanala Platinum District Municipality	16	June 2012	S Moeketse
Kelebogile Mekgoe	Rustenburg Local Municipality	17	June 2012	S Moeketse
Motlalekgomo Mmope	Madibeng Local Municipality	18	June 2012	S Moeketse
Chris De Bruin	North West Eco Forum	19	June 2012	S Moeketse
Siza Madihlaba	Retief Primary School (Reception)	20	June 2012	S Moeketse
Reverend Motaung	NG Kerk	22	June 2012	S Moeketse
Receptionist	Hillside B&B (Reception)	23	June 2012	S Moeketse
Dorina Lunderstedt	Rustenburg Library	24	June 2012	S Moeketse
Thulani Ntshanga	Tharisa Mine	25-28	June 2012	S Moeketse
Carol Kenyon	Metago/SLR Library	29-30	June 2012	S Moeketse

COPYRIGHT

SLR

Copyright for these technical reports vests with SLR Consulting (Africa) (Pty) Ltd unless otherwise agreed to in writing. The reports may not be copied or transmitted in any form whatsoever to any person without the written permission of the Copyright Holder. This does not preclude the authorities' use of the report for consultation purposes or the applicant's use of the report for project-related purposes.