the dme
Department:
Minerals and Energy
REPUBLIC OF SOUTH AFRICA

Case ID: 1774

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Directorate Minerals Regulations: Limpopo Region

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Reference nr: 6/2/2/477
Date: 25 August 2008

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Attention: Mr. Donald Lithole/ Victor Netshiavha

CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) FOR THE SCOPING REPORT IN RESPECT OF THE FARM ONVERWACHT 292 KT, SITUATED IN THE MAGISTERIAL DISTRICT OF SEKHUKHUNE, LIMPOPO REGION.

APPLICANT: MODIKWA PLATINUM MINE(PTY) LTD

Attached herewith, please find a copy of the scoping report received from the above-mentioned applicant, for your comments.

It would be appreciated if you could forward any comments or requirements your Department may have in the case in hand to this office and to the applicant within 30 days as from **25 August 2008 to 25 September 2008**, failure of which will lead to the assumption that your Department has no objection(s) or comments with regard to this application and this Department will in that instance proceed with the finalisation thereof.

Consultation in this regard has also been initiated with other relevant State Departments. In an attempt to expedite the consultation process please contact **Ms Naum Kekana** of this office to make arrangements for a site inspection or for any other enquiries with regard to this application.

Your co-operation will be appreciated.

Mfistana

THE REGIONAL MANAGER
LIMPOPO REGION – POLOKWANE

MODIKWA
PLATINUM MINE

DME REFERENCE: LP 6/2/2/477

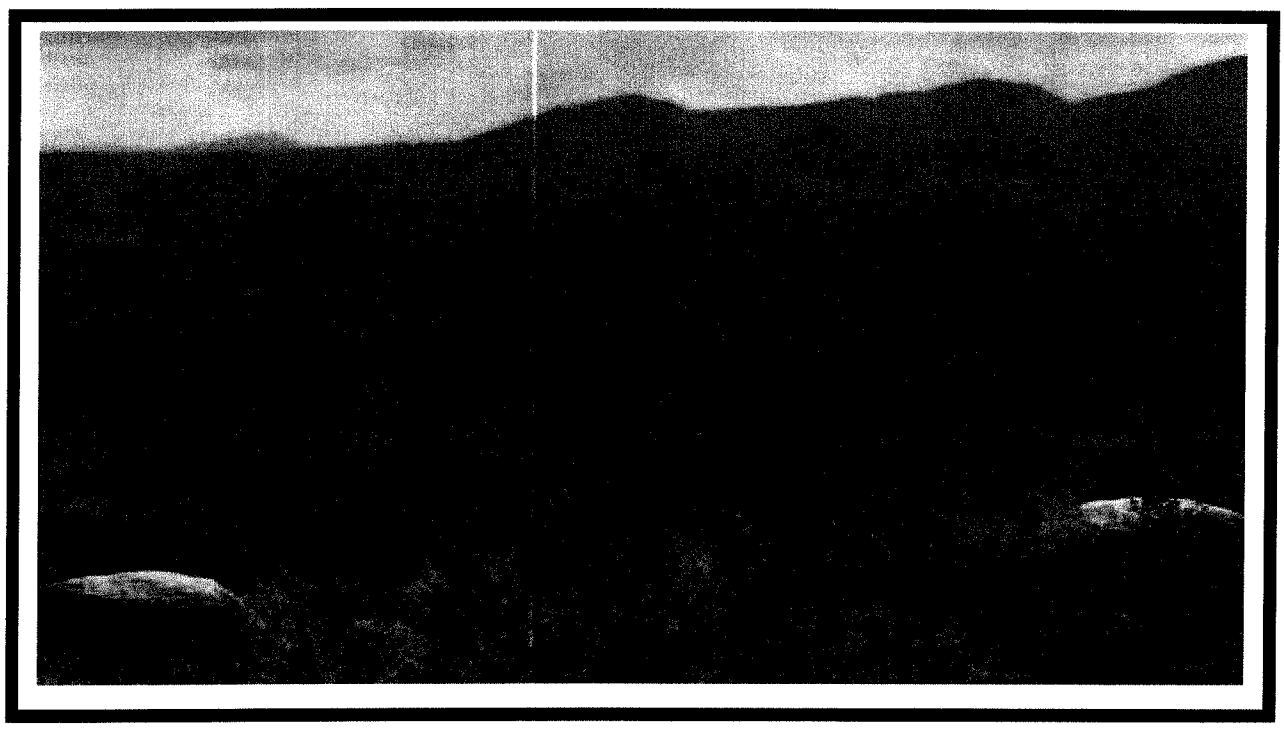
SCOPING REPORT

AMENDMENT TO ENVIRONMENTAL MANAGEMENT PROGRAMME

PROPOSED EXPANSION PROJECTS: MODIKWA PLATINUM MINE OPENPIT MINING, SOUTH 2 SHAFT, NEW FINE RESIDUE DEPOSIT

FARM ONVERWACHT 292 KT, GREATER TUBATSE LOCAL MUNICIPALITY

Prepared for



Prepared by:

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ENVIRONMENTAL PRACTITIONER'S DETAILS:

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Professional Affiliation	IAIA – South Africa
Expertise of the EAP to carry out the Scoping Process	Mr. Setenane Nkopane has the following expertise to carry out the proposed project: ❖ Masters in Environmental Management (University of Cape Town) He has 10 years of experience in the field of environmental management and assessments

DETAILS OF THE APPLICANT:

Name of Applicant	Modikwa Platinum Mine
Mine Manager	Mr. Sean O' Connor
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Contact Details	Tel: 013 – 230 0000 Fax: 013 – 230 2036

Scoping Report for South 2 Shaft, Openpit, and Fine Residue Deposit

PURPOSE OF THIS DOCUMENT

The purpose of the Scoping Report is to make the following information available for stakeholder and authorities for decision-making:

- A description of the proposed project.
- An outline of the proposed process to be followed.
- Information on the applicant, consultant, and stakeholders who have chosen to participate in the project.
- An outline of the environment in which the project is proposed.
- Information on the proposed specialist studies to be undertaken.
- Information on the potential environmental impacts to be studied in more detail during the EMP amendment phase of the project.
- Information on the issues and concerns raised to date.

Should you have any comments on the contents of the Scoping Report please direct them to:

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Gudani Consulting
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Faunapark, Polokwane
0787

Tel: 015 – 297 6719
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Executive Summary

Introduction

Modikwa Platinum Mine is situated within the Tubatse Local Municipality. The mine is a joint venture between Anglo Platinum and African Rainbow Minerals (ARM). The mine is located 15 kilometres north of Burgersfort and 15 kilometres east of Steelpoort, along the border between the Mpumalanga and Limpopo Provinces.

Modikwa Mine is on the eastern limb of the Bushveld Complex and currently exploits the UG2 reef, which has an average width of 603 centimetres and occurs as a chromitite layer. The shallower, but lower grade, Merensky reef also outcrops on the mine property. The operation comprises an underground mine, some 450 metres deep, three decline shafts and a concentrator. All metal produced is smelted and refined by Anglo Platinum in terms of the joint venture agreement: 50 percent is attributable to Anglo Platinum and 50 percent is purchased by Anglo Platinum in terms of an agreement. Approximately 5700 people are employed at the Mine, including contractors.

The mine is operating under an approved environmental management programme, which must be amended as per the proposed expansion projects.

Legal Framework

In order to comply with the requirements of the National Environmental Management Act, 1998, and the respective EIA Regulations, 2006 this report will be submitted to the Department of Economic Development, Environment & Tourism (DEDET, Polokwane). This is to ensure also that the environmental impacts (negative or positive) of the proposed expansion projects at Modikwa Mine are addressed, and management plans put in place.

The Environmental Management Programme (EMP) for the proposed expansion projects is undertaken in accordance with the Mineral and Petroleum Resources Development Act (Act 28 of 2002). The act stipulates the responsibilities of the Modikwa Mine (as the applicant) in terms of environmental and social aspects, as well as the requirements of the management of impacts generated by the mining operations.

Therefore, the Modikwa Mine expansion project must undertake the Scoping EIA/EMP Amendment processes to satisfy both the MPRDA and NEMA regulations.

Scoping Process

The Scoping Process for the Modikwa Mine expansion projects is a legal requirement in terms of Regulation 49 of the MPRDA, 2002 and the NEMA Regulations 386 and 387. The Scoping Report has been formatted to satisfy the MPRDA regulations. Scoping is the process for determining issues and concerns related to the proposed project, and involves consultation with the public and relevant authorities. In addition, the Scoping Phase includes the identification of required specialist studies and potential environmental aspects for further investigation. The Scoping Phase outlines a plan for the EIA/EMP study and facilitates the input from stakeholders and authorities to inform the EMP amendment process.

Study Approach

The current Scoping Report required the collating of desktop information and stakeholder consultation to determine the required specialist studies to be undertaken during the EIA/EMP Amendment Phase. The baseline studies will be undertaken through a multi-phased process. This included the review of all available data over the extent of the expansion projects, and the determination of preferred alternatives.

Baseline Studies

The baseline studies addressed all aspects of the receiving environment, including: climate, topography, surface water resources, geology and soils, land capability and use, terrestrial fauna and flora, sensitive landscapes and visual impacts. The level of confidence required for decision-making determines the level of detail of baseline studies.

Document Review

This document will be submitted to the Department of Mineral and Energy (DME) as well as the Limpopo Department of Economic Development, Environment and Tourism (DEDET), Lydenberg Department of Water Affairs and Forestry, Limpopo Department of Agriculture, and Limpopo SAHRA for review.

Way Forward

This Scoping Report will be submitted to stakeholders for comment. The comments will be addressed within the report and attached as a component of the Stakeholder Engagement Process. Concerns and issues raised will be addressed in the EMP Amendment process and report.

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1.0 INTRODUCTION

Modikwa Platinum Mine (MPM) is situated in the Burgersfort/ Steelpoort region of the Limpopo Province and Mpumalanga on the farms Maandagshoek 254 KT, Driekop 253 KT, Hendriksplaat 281 KT, Onverwacht 292 KT and Winterveld. 293 KT. Modikwa Mine is current an underground mining operations consisting of the following sections:

1. North Shaft (Decline)
2. North Shaft
3. Middle Shaft (Decline)
4. South Shaft (Decline)
5. South Shaft
6. Onverwacht Hill Adits
7. Concentrator Plant
8. Slimes Dam (existing FRD)
9. Central Office
10. Montrose Village
11. Clinic

This Scoping Report is part of the fourth amendment to the approved EMPR has been compiled by Gudani Consulting on behalf of Modikwa Platinum Mine and concerns the expansion projects involving the following:

1. South 2 (Decline) Shaft and associated infrastructure
2. Open Pit
3. New Fine Residue Deposit (FRD)

Modikwa Platinum Mine currently operates under the following approved environmental management programme report (EMPR) and EMPR amendments:

- Approved EMPR dated September 2000

  The approved EMPR concerned the establishment of a concentrator plant, two mine decline shafts, a tailings dam and associated infrastructure.

- First EMPR amendment dated April 2001 (The Hill mining project)

  The first EMPR amendment concerned the development of the Onverwacht hill deposit situated on the farm Onverwacht 292 KT in close proximity to the South shaft complex. The development required the establishment of four adits and a short decline. No additional infrastructure was established as the operation would be serviced from the South shaft complex and concentrator.

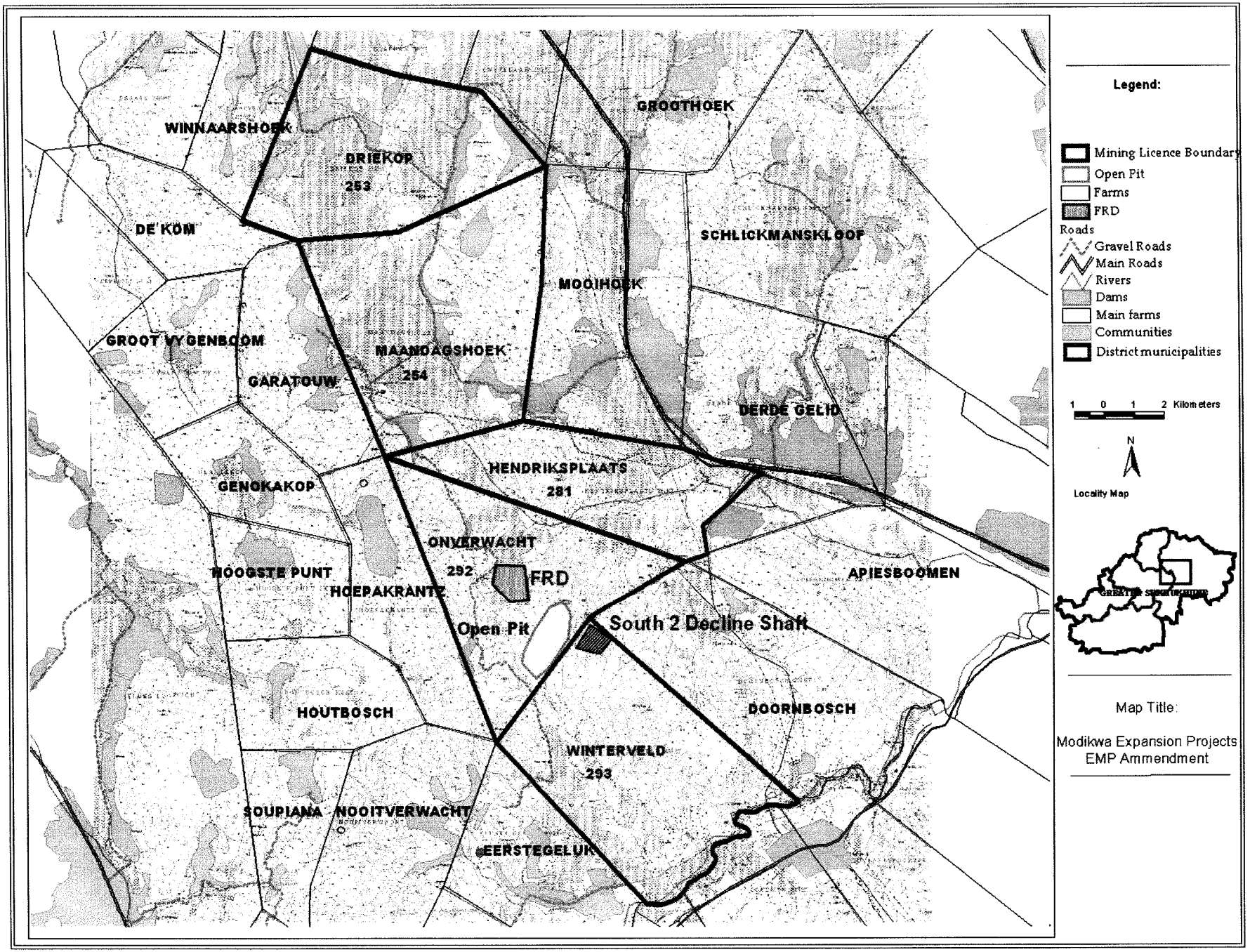
- Second EMPR Amendment dated August 2002 (The Surface Winze project)

  The second EMPR amendment concerned the establishment of portals, terraces and associated infrastructure approximately 250 m north of the existing office block and stores complex. No additional

surface infrastructure was established for the new shafts, as they would be serviced by existing infrastructure.

- Third EMPR Amendment dated February 2003

  The third EMPR amendment concerned the extension of surface infrastructure at the hill mining operations. The additional infrastructures involved the extension of the terrace at lower adit (Adit D) to construct offices, lamp room and change-house.


WINNAARSHOEK
DRIEKOP
253
GROOTHOEK
DE KOM
SCHLICKMANSKLOOF
MOOIHOEK
GROOT VYGENBOOM
MAANDAGSHOEK
254
GARATOUW
DERDE GELID
HENDRIKSPLAATS
281
GENOKAKOP
ONVERWACHT
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Farms
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Roads
Gravel Roads
Main Roads
Rivers
Dams
Main farms
Communities
District municipalities
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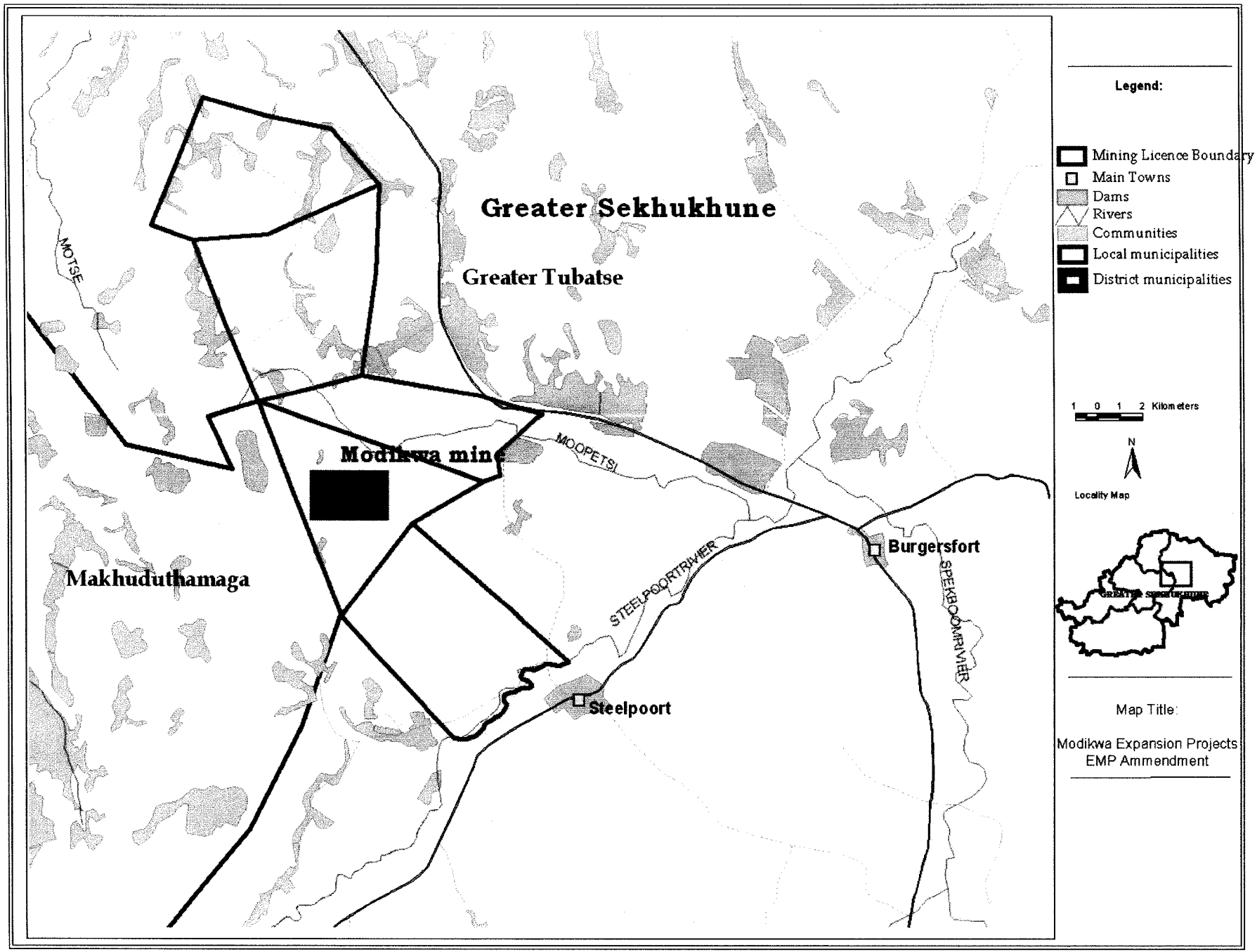
Locality Map
Map Title:
Modikwa Expansion Projects
EMP Ammendment


Greater Sekhukhune
Greater Tubatse
MOTSE
Modikwa mine
MOOPETSI
Makhuduthamaga
STEELPOORTRIVER
Burgersfort
SPEKBOOMRIVER
Steelpoort
Legend:
Mining Licence Boundary
Main Towns
Dams
Rivers
Communities
Local municipalities
District municipalities
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N
Locality Map
Map Title:
Modikwa Expansion Projects
EMP Ammendment

1.1 Modikwa Expansion Projects – Are they feasible?

Modikwa Mine produces a concentrate of platanoid minerals, namely platinum, rhodium, palladium, ruthenium, iridium and osmium with gold, copper, nickel and cobalt as by-products in the final concentrate and chrome.

The current production rate for the underground operations is 200Kt/m of UG2 ore giving a total annual production of 2.4 x 10^6 tonnes per annum (tpa) with an annual production of approximately 162,000oz of Platinum. Modikwa Mine came into full production in 2002, and it is expected to continue in full production for in excess of 50 years before production will start to decrease. The proposed open pit will be developed for the mining and extraction of the Merensky reef and outcrop.

The ore from the proposed expansion projects viz the open pit and South 2 Shaft will be included in the above annual production, and the existing concentrator plant has the capacity to process the additional ore from these new sources. The open pit, South 2 Shaft and new fine residue deposit (FRD) area are all within the existing approved mining area. The open pit will cover an area of approximately 37 hectares, and be mined to a depth of 60m; South 2 Shaft and associated infrastructure covers 10 hectares; and the new FRD 115 hectares.

1.2 Who is the Proponent?

The Project proponent is Modikwa Platinum Mine.

Modikwa Platinum Mine is situated within the Tubatse Local Municipality. The mine is a joint venture between Anglo Platinum and African Rainbow Minerals (ARM). The mine is located 15 kilometres north of Burgersfort and 15 kilometres east of Steelpoort, along the border between the Mpumalanga and Limpopo Provinces.

Modikwa Mine is on the eastern limb of the Bushveld Complex and currently exploits the UG2 reef, which has an average width of 603 centimetres and occurs as a chromitite layer. The shallower, but lower grade, Merensky reef also outcrops on the mine property. The operation comprises an underground mine, some 450 metres deep, three decline shafts and a concentrator. All metal produced is smelted and refined by Anglo Platinum in terms of the joint venture agreement: 50 percent is attributable to Anglo Platinum and 50 percent is purchased by Anglo Platinum in terms of an agreement. Approximately 5700 people are employed at the Mine, including contractors.

1.3 Who are the Consultants?

Gudani Consulting (GC) has been appointed to carry out the EMP Amendment process for the proposed expansion projects at Modikwa Platinum Mine.

GUDANI Consulting was founded in 2001. However, the key members have vast experience in environmental assessments and evaluations dated back to 1997. GC offers environmental consulting services to the small and large organizations and companies whose activities impact on the environment and other related domains within South Africa. The company confines itself to consulting services. It is not owned by and does not hold equity in other companies and organizations. Therefore, GC is well positioned to provide services to its clients in an objective, a fair-minded and a conflict-of-interest-free manner. These attributes are considered to be crucial where the client's project interests might be in conflict with those of other organizations.

Our work has spanned several industries including the sustainable development, eco-tourism, mining, chemical, power-generation and telecommunications industries. Our services include Social Surveys and Impact Assessment, Strategic Environmental Assessments, Environmental Impact Assessment, Environmental Management Programmes, Enviro-Social Feasibility Studies, Environmental and Social Auditing, Compilation of Management Systems, Monitoring and Evaluation, Project Management, Establishment and Management of Information Management Systems such as GIS, and specialist Environmental Studies.

1.4 Regulatory Context

1.4.1 National Environmental Management Act (Act 107 of 1998, amended 2006)

National Environmental Management Act (NEMA) can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development.
- Natural and cultural resources, use and conservation.
- Pollution control and waste management.

The law is based on the concept of sustainable development. The object of NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- the procedures for state decision-making on the environment; and
- the institutions of state which make those decisions.

The NEMA principles serve as:

- a general framework for environmental planning;
- guidelines according to which the state must exercise its environmental functions; and
- a guide to the interpretation of NEMA itself and of any other law relating to the environment.

What are the NEMA principles?

Some of the most important principles contained in NEMA are that:

- environmental management must put people and their needs first;
- development must be socially, environmentally and economically sustainable;
- there should be equal access to environmental resources, benefits and services to meet basic human needs;
- government should promote public participation when making decisions about the environment;
- communities must be given environmental education;
- decisions must be taken in an open and transparent manner and there must be access to information;
- the role of youth and women in environmental management must be recognised;
- the person or company who pollutes the environment must pay to clean it up;
- the environment is held in trust by the state for the benefit of all South Africans; and
- the utmost caution should be used when permission for new developments is granted.

The NEMA is enforced by the Department of Environment, Affairs and Tourism. In the Limpopo Province this delegated role is fulfilled by the Limpopo Department of Economic Development, Environment and Tourism. Regulations 386 and 387 promulgated under NEMA the following activities require an Environmental Impact Assessment or Basic Environmental Assessment:

- Reconnaissance, prospecting, mining or retention operations as provided for in the MPRDA (Act 28 of 2002), in respect of such permissions, rights, permits and renewals thereof;
- In relation to permissions, rights, permits and renewals granted in terms of the above, or any other similar right granted in terms of previous mineral or mining legislation, the undertaking of any prospecting or mining related activity or operation within a prospecting, retention or mining area, as defined in terms of Section 1of the MPRDA (Act 28 of 2002);
- The abstraction of groundwater at a volume where any general authorisation issued in terms of the National Water Act (Act No 36 of 1998) will be exceeded;

- The construction of facilities or infrastructure, including associated structures or infrastructure, for any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice R386 of 2006;
- The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2001 (Act No. 10 of 2004);

1.4.2 *Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002)*

Immediately prior to 1st of May 2004 the principal legislation governing mineral rights in South Africa was the Minerals Act (Act No 50) which came into effect in 1991. The MPRDA that came into effect on the 1st of May 2004 replaced the Minerals Act. The MPRDA contains certain transitional measures with regard to mineral rights, prospecting permits, and mining authorisations (old order rights) obtained prior to the 1st of May 2004.

Mineral Rights Immediately Prior to the 1st of May 2004.

Over the years, the South African system of mineral rights developed into a system in terms of which mineral rights could have been owned by either the State or by private holders. The law also developed so that this right to minerals could be separated from the title to the land. As a result, mineral rights were often held under a separate title (a Certificate of Right to Minerals) that may have included all the minerals in the land or only a particular mineral or minerals. Mineral rights could be bought or sold, and the holder of mineral rights was able to give consent to prospect under a prospecting contract or grant mineral lease. The exploiter of minerals normally paid the mineral rights owner a royalty as compensation for a mineral lease.

The holder of the mineral rights had the exclusive right to prospect and mine for that mineral in the land concerned, subject to having obtained a prospecting permit or mining authorization from the State. A prospecting permit or mining authorization could not be granted unless the applicant was the holder of the relevant mineral right or had acquired the holder's consent to prospect or mine. These permits and authorisations were not transferable and were aimed at regulating health and safety and environmental management matters. The Minerals Act also required the holder of a prospecting permit or mining authorisation to have an Environmental Management Programme (EMP) in place before commencing prospecting or mining operations.

The system of private ownership of mineral rights was abolished with the enactment of the MPRDA and replaced with a system of statutory rights in respect of minerals granted by the new custodian of all mineral rights, namely the State.

The Minerals and Petroleum Resources Development Act.

There are four principal authorisations available under the MPRDA with respect to minerals – a reconnaissance permission, a prospecting right, a retention permit, and a mining right.

Any substantiated mining lease, consent to mine, permission to mine, claim, license, mining authorisation or right in force immediately before the date the MPRDA took effect and in respect of which mining operations were being conducted at such time, is considered an "old order mining right" under the MPRDA. Any old-order mining will continue to be in force for a period of five years from the 1st of May 2004, subject to the terms and conditions under which it was granted, provided that the holder lodges the right for conversion within a five-year period together with certain prescribed information. EMP's approved under the Minerals Act remain in force under the MPRDA.

Conversion applicants must provide an undertaking that, and details of the manner in which, effect will be given to the objectives of the MPRDA pertaining to empowerment of HDSAs and economic growth and development as outlined below.

Black Economic Empowerment Legislation.

The MPRDA introduced a broad-based socio-economic charter, the Mining Charter, that sets a framework, targets and timetable for effecting the entry of HDSAs into the mining industry. Targets, timeframes and commitments are set for human resource development; employment equity; non-discrimination against foreign migrant labour; mine community and rural development; housing and living conditions; procurement; ownership and joint ventures (which has a target of 26% equity ownership by historically disadvantaged South Africans within 10 years); and beneficiation. In addition, applicants for a mining right must have a labour and social plan approved as part of the application process and community issues are usually prominent in such plan.

Environmental Management.

Applicants for a mining right are required to conduct an environmental impact assessment and submit an EMP Report, while applicants for a prospecting right, mining right or reconnaissance permit have to submit an environmental management plan. Prospecting and mining rights only become effective under the MPRDA on the date that the corresponding environmental management plan or program has been approved. Requirements for making financial provision for the remediation of environmental damage as well as for the issuing of a closure certificate are included in the MPRDA and include the requirement that financial provision must be in place

before approval of the environmental management plan or program and the fact that an application for a closure certificate now becomes compulsory upon lapsing of the right or cessation of activities.

The MPRDA requires that the holder of a mineral right give effect to the general objectives of Integrated Environmental Management addressed within the National Environmental Management Act (Act 107 of 1998).

1.4.3 ***National Water Act (NWA) (Act 36 of 1998, amended 2006)***

In terms of the NWA, the national government, acting through the Minister of Water Affairs and Forestry ("the Minister"), is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The Minister is responsible to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values. The national government, acting through the Minister, has the power to regulate the use, flow and control of all water in South Africa.

The majority of the provisions of the National Water Act came into effect as of 1 October 1998 and at the same time various provisions of the 1956 Water Act were repealed. The remaining provisions of the National Water Act commenced on 1 January 1999 and 1 October 1999 (and the remaining provisions of the 1956 Water Act repealed).

The most fundamental departure from the old legislation is the removal of the concept of water as private property. Instead, water will be made available through user licences, which may be issued for a maximum period of 40 years, subject to renewal. A priority of users has been established for the allocation of licences, with the environment near the top of the list of priorities.

Section 21 of the National Water Act indicates that "water use includes":

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

- disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- altering the bed, banks, course or characteristics of a water course;
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- using water for recreational purposes.

A person may only use water:

- without a licence:
  - if that water use is permissible under Schedule I;
  - if that water use is permissible as a continuation of an existing lawful water use; or
  - if that water use is permissible in terms of a general authorisation issued under section 39;
- if the water use is authorised by a licence under the National Water Act; or
- if the responsible authority has dispensed with a licence requirement (which may be done if the responsible authority is satisfied that the purpose of the National Water Act will be met by the grant of a licence, permit or other authorisation under any other law).

A person who uses water:

- must use the water subject to any condition of the relevant authorisation;
- is subject to any limitation, restriction or prohibition in terms of the National Water Act or any other law;
- in the case of the discharge or disposal of waste or water containing waste, must comply with any applicable waste standards or management practices prescribed by regulations, unless the conditions of the relevant authorisation provide otherwise;
- may not waste that water; and
- must return any seepage, run-off or water containing waste which emanates from that use to the water resource from which the water was taken, unless the responsible authority directs otherwise or the relevant authorisation provides otherwise.

1.4.4 ***National Heritage Resources Act (No 25 of 1999)***

In terms of Section 38 of the National Heritage Resources Act (Act No 25 of 1999) the following developments require a Heritage Impact Assessment prior to proceeding with construction:

- Any development or other activity which will change the character of a site
  - Exceeding 5 000 m^2 in extent; or

- Involving three or more existing erven or subdivisions thereof; or
- Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

➲ Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

All the proposed Modikwa Mine expansion projects will be more than 5000m^2 and therefore will require a Heritage Impact Assessment in terms of this Act. The HIA for the expansion project was conducted during December 2005, and the report is appended in Appendix C.

1.5 EIA and EMP Processes

The authorisation process to be followed for the Modikwa Mine expansion projects has been designed to meet the requirements of both the Mineral and Petroleum Resource Development Act (Act 28 of 2002) and National Environmental Management Act (Act 107 of 1998; amended 2006). The authorisation process will include:

➲ Scoping Phase:
- Stakeholder Notification;
- Authority Consultation;
- Capturing of Issues and Concerns;
- Compilation of a Stakeholder Database;
- Identification of Potentially Significant Impacts;
- Identification of Potentially Sensitive Environmental Aspects;
- Identification of Required Specialist Studies;
- Compilation of a Scoping Report (this document), including:
  - Plan of Study for EIA/EMP Amendment.
  - Issues Report; and
- Stakeholder Review of Documentation;
- Submission and approval of Scoping Report by relevant authorities.

➲ Impact Assessment Phase:
- Undertake necessary specialist studies;
- Assessment of environmental impacts;
- Compilation of management plans;
- Compilation of an EMP Amendment Report;
- Stakeholder document review and comment;

- Submission of final report for decision-making.

The EMP Amendment Report for the will include a description of the proposed project, a list of identified environmental aspects that will potentially be impacted upon by the excavation of the expansion projects, an Impact Assessment for these aspects, and an Environmental Management Programme for the mitigation and management of the identified impacts.

2.0 DESCRIPTION AND MOTIVATION FOR THE PROJECT

Modikwa Platinum Mine proposes to expand its mining operations on the farm Onverwacht 292 KT, and the said expansion projects will involve the following:

2.1 South 2 (Decline) Shaft and associated infrastructure

South 2 Shaft will consist of a conveyor decline for rock clearance and for transport of persons both in and out of the mine; a service decline for the transport of material and equipment. Manriding conveyors and trackless haulage – will be used throughout the life of the mine. No vertical hoisting shafts will be required. However, ventilation shafts will be constructed.

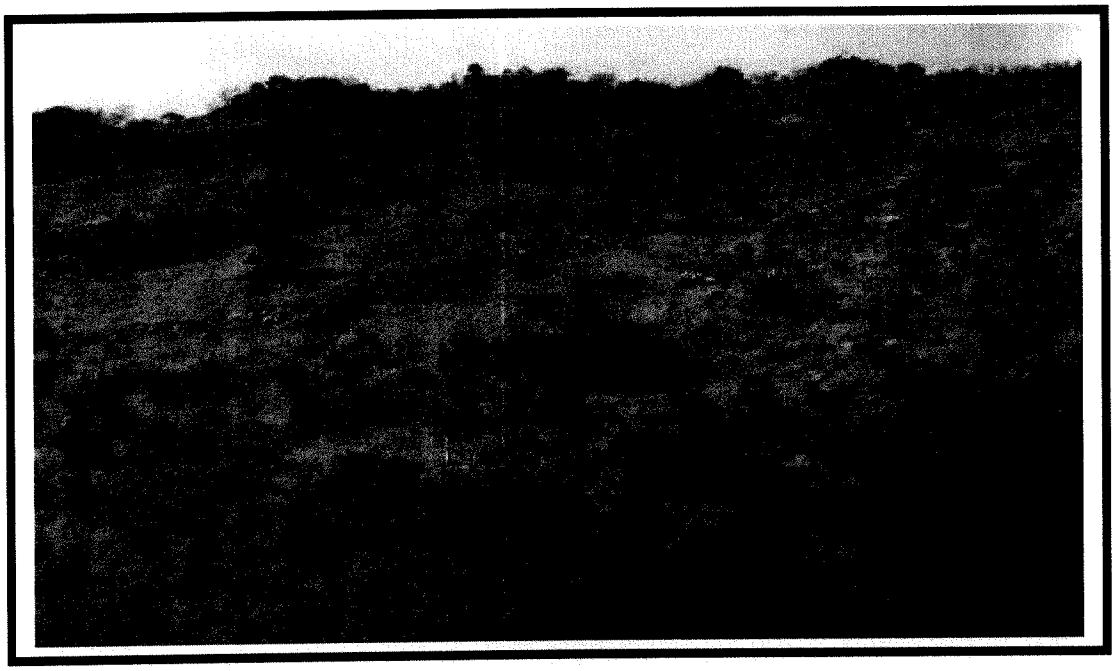

Plate 1: Site for proposed South 2 Decline Shaft

2.2 Open Pit

The proposed open pit will cover an area of 37 Hectares. The pit will be mined to a depth of 60 m, going down in benches of approximately 12m high x 8.3m wide to extract the Merensky reef and outcrop on Onverwhacht 292 KT.

The Merensky reef and outcrop will be mined using conventional open cast methods and the ore will be extracted by a combination of excavation, crushing, washing and concentration. The waste and ore mining will take place in 12m high benches blasted in the country rock and Merensky. The blasted material is loaded into large mechanical drive trucks by either a large hydraulic shovel or rope shovels. The ore will be transported to the primary crusher stockpile and waste rock to waste dumps on surface.

The height of bench to be mined was selected to minimise the non-productive activities in the mining cycle such as ; (1) moving drills between blast holes, (2) establishing and maintaining bench roads.

Consideration of the tonnages of ore and waste to be handled and the criteria adopted for the selection of equipment led to the decision to adopt a bench height of 12m; this is considered to be the most economic.

The width of roadways will be relative to the size of haul truck selected and nominal width of 30m will be investigated. In compliance with the design parameters used generally by truck manufacturers a maximum main haul road gradient of 10% has been used in the open-pit road system design.

The overall slope will varies between 40-45° for waste and 50° in ore. The nominal bench width with 12m high benches is 8,3m. All final faces will be pre-split to improve the stability of the high walls.

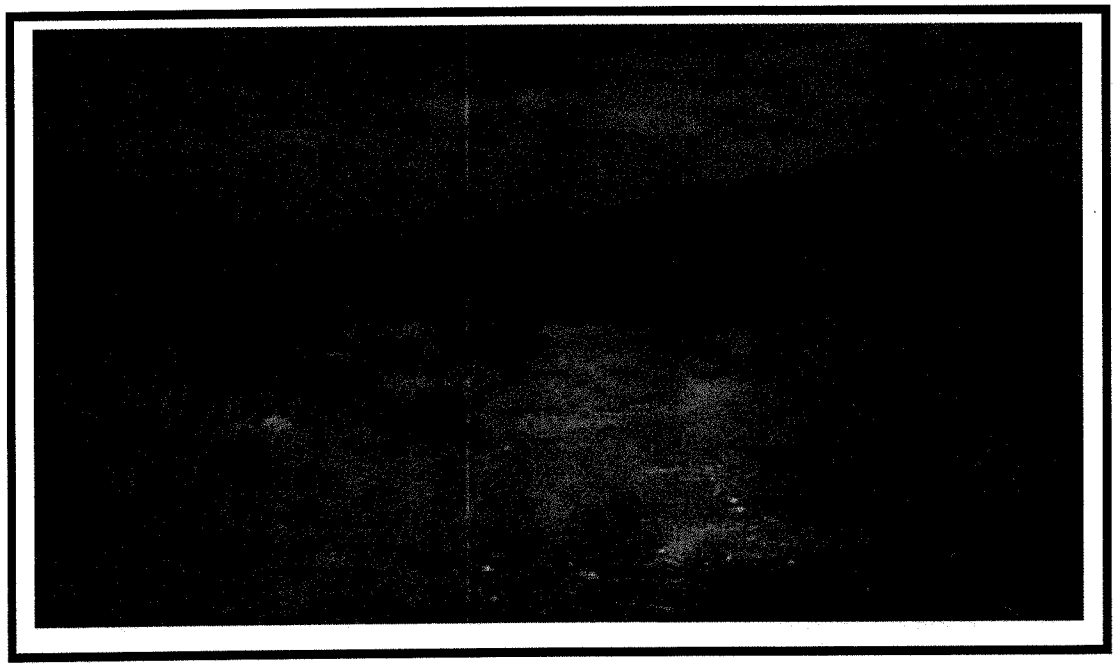

Plate 2: Site for Proposed Open Pit

2.3 New Fine Residue Deposit

The proposed new FRD facility will cover an area of 115 Hectares. It will be situated west of the open pit site in the flat valley area between the Onverwacht Hill and the Leolo Mountain Range (See Figure 2).

Fine residue (tailings) from the concentrator plant is pumped to the FRD for disposal. The fine residue will be deposited in the dam using either spiggoting or central discharge methods. Water will be returned to the plant via the return water dam located adjacent to the FRD. The FRD will be operated and maintained by a specialized contractor.

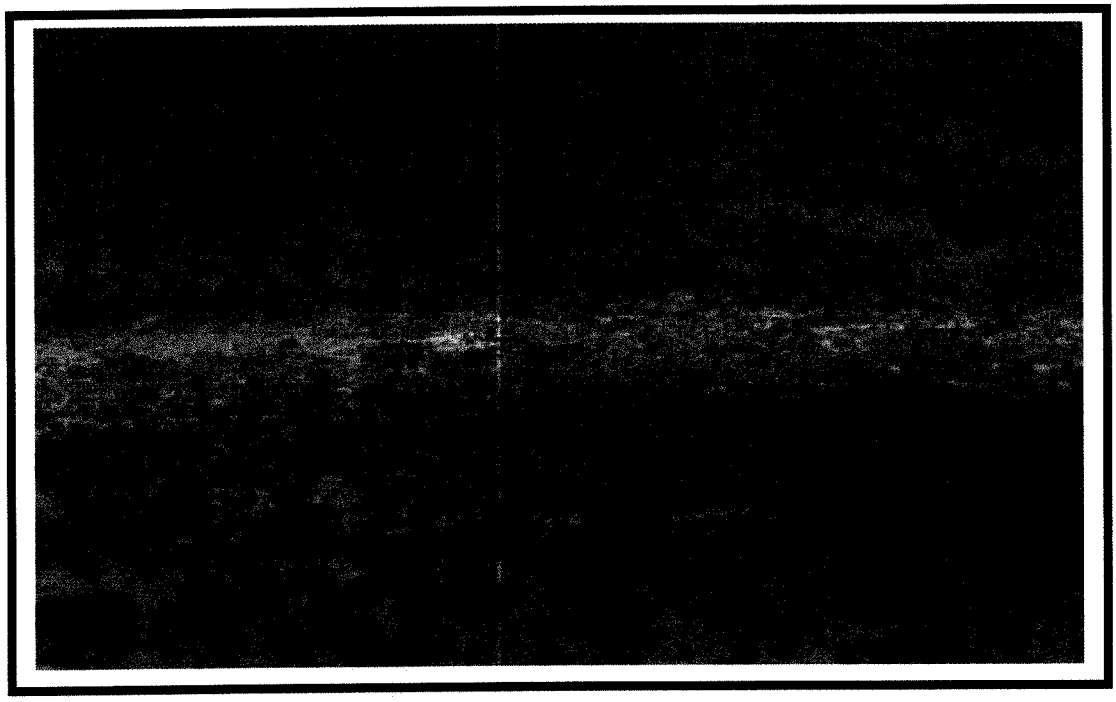

Plate 3: Site for Proposed new Fine Residue Deposit

3.0 ALTERNATIVES CONSIDERED

3.1 Strategic Alternatives

3.1.1 No go Option

To ensure a constant and adequate supply of platinum to the market, which has grown at a rate of about 2% per year, it is important that new and existing mines are established to exploit economically viable reserves. This expansion projects will supply the growing platinum demand whilst generating economic returns for stakeholders such as employees, their dependants, shareholders, the community, local, provincial and national government. This project will thus sustain Modikwa Mine to continue to increase the economic activity in the area and will earn valuable foreign exchange for the country. If the project does not go ahead, none of these economic benefits will be realised.

3.1.2 Continue with Project

The expansion project will secure employment for many of the existing staff over the 50 year expected life on mine. In addition, the platinum and the platinum group metals mined will attract capital to the Limpopo Province and to South Africa through local and international diamond trade.

There will be some bio-physical environmental impacts due to the upgrade, however these can be managed and mitigated. The positive economic multiplier benefits and alleviation of poverty are significant.

3.1.3 ***Selection of sites***

Sites for the proposed Shaft 2 Shaft and the open pit were selected based on availability of platinum minerals to be mined. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites.

The site selection for the new FRD was chosen based on the area extent needed to construct a 115 hectare facility and which is not in close proximity to surface water channels and structures, and sensitive environments – including settlements.

Table 3-1: Criteria Matrix with Biophysical and Social Environmental Aspects for the Modikwa Expansion Projects

Environmental Element	Level of Detail Required for Decision Making	Available Information	Specialist Study Required / Information Gap
Climate	Regional average temp, rainfall, wind speed and direction	Local Weather Station Records Weather Bureau Data	
Geology	Regional geology Geology of the area Potential safety risks of road construction & operation	Geotechnical Report Geological Report	
Topography	Contour lines at 5m intervals 1m contours within 100m of water course Identification of watercourses	1:50 000 Topographic Maps Site Layout Plan	
Soils	Soil agricultural potential Current soil utilisation project site Local soil utilisation adjacent to D4370	1:50 000 Topographic Maps	Soil Survey
Land Capability	Agricultural potential and other possible uses around Onverwacht 292 KT and Modikwa Mine	Site investigations	Land Capability Study
Land Use	Current land use and other possible uses around Onverwacht 292 KT and Modikwa Mine	Project Land use Plan 1:50 000 Topographic Maps	Land Use Assessment
Flora	Vegetation composition, potential for RD species and high biodiversity	Desktop literature survey, field investigations	Vegetation Survey

Environmental Element	Level of Detail Required for Decision Making	Available Information	Specialist Study Required / Information Gap
Fauna	Regional potential for RD species Observed faunal species within the expansion project sites, Habitat for faunal species, Coping Capacity of faunal communities to expected Impact	Field investigations	Mammal Survey Invertebrate Survey Ornithology study Herpetology Survey
Surface Water	Identify sensitivity of surface water bodies and potential risks of stormwater collection at shaft mouth Assess water input and output	Water resource maps	Stormwater Management Plan Water Balance
Groundwater	Predicted quantity and quality of groundwater make Current quality of groundwater make Water quality and quantity of groundwater make Quantification and qualification of the impact to the groundwater reserve and potential borehole yields.	Existing borehole levels within the mining site and proposed expansion projects sites and water monitoring results	Geohydrology Characterisation Water Balance
Sensitive Landscapes	Biodiversity of habitats on mine Sensitivity of landscape at shaft site Coping Capacity of environment to be impacted	Field investigations	Biodiversity Assessment Landscape Ecology GIS Sensitivity Mapping
Air Quality	Existing air quality data with levels of pollutants to assess the sensitivity of the local atmosphere and evaluate potential cumulative impacts	Field investigations	Ambient Air Quality Data Fallout dust Monitoring Data
Noise	Proximity of local residential villages Potential decibel generation of construction equipment & increased traffic during operation Assess impacts to residents & sensitive faunal communities	Field investigations	GIS Mapping

Environmental Element	Level of Detail Required for Decision Making	Available Information	Specialist Study Required / Information Gap
Archaeology	Identify any sites of cultural heritage significance Assess risks of impact to these sites	Field investigations	Cultural Heritage Impact Assessment
Visual Aspects	Proximity of local residential villages Risk of impacting on existing aesthetic quality project site	Field investigations	GIS Veiwshed Analysis Photographic Analysis and modelling
Regional Socio-Economic Structure	Employment Information Local Socio-economic information Economics and employment statistics for Limpopo Province, and project area.	Field surveys	Baseline Social Impact Assessment Limpopo Demographic Data

4.0 EXISTING ENVIRONMENT

4.1 Topography

The farm of Onverwacht 292 KT lie in a relatively flat north south trending valley bounded to the east and west by steep rugged terrain. The valley floor dips gently to the north at an average gradient of approximately 1:110 from an elevation of 980mamsl.

The topography is highly influenced and in most cases, is directly related to, the underlying geology, as well as the climatic conditions prevailing in the past and the present. The valleys are characterised by the less resistant lithological units (norites and anorthosite) that are well fractured and in places faulted, while the ridges and high lying areas are associated with the more resistant and more competent lithological units.

4.2 Climate

Modikwa Platinum Mine is situated in the eastern side of Limpopo Province, which is characterized by generally warm to hot climate and a fairly high relative humidity in summer. The summer days can be very oppressive due to the humidity. Cooler weather is experienced against the escarpment. The rainy season lasts from about November to March, with maximum precipitation normally occurring in January. On average about 70 rain days per year occur over the Lowveld, whilst 120 rain days may occur against the escarpment. The mean monthly rainfall for the area varies between 5.5mm and 111.4mm. Average daily temperatures vary from 32°C in January to 24°C in July.

In winter the skies are usually clear, with cloud cover varying between 0.9 and 2.3 eighths. In summer, cloud cover varies between 2.5 and 4.7 eighths. Wind direction is mainly from the south-south east to north-north-west and can (infrequently) reach gale force against the mountains.

4.3 Geology

The area is underlain by the mafic phase of the Bushveld Igneous Complex (Eastern Limb). Specifically this comprises the upper part of the critical zone and the lower part of the main zone of the Rustenburg Layered Suite of the Bushveld Complex. The Critical Zone (Norite-Anorthosite) and the Main Zone (Norite-Anorthosite) consist of alternating layers of pyroxenite, anorthosite and norite.

The entire layered sequence strikes NNW to SSE and dips to the southwest at between 10° and 12°, with local deviations in dip of up to 20°. There are several instances where the gentle rolling of the horizons have been recorded and abnormally steeper dips have been noted near the outcrop as opposed to at depth.

A number of intrusive bodies have been recognized in the area. These include the platinum bearing ultra-mafic hortonlite dunite pipes of Maandagshoek, and Onverwacht farms.

4.4 Soils

The soils in the area have been developed by the weathering and decomposition of the underlying bedrock. The weathered or oxidised layer has a general thickness of approximately 30m. The soils mapped in the project area comprise in-situ residual soils, transported soils and pedogenic soils. Re-working of the residual in-situ soils has occurred giving rise to the unconsolidated transported material associated with the lower slopes and riverine environments (ie. the alluvial and colluvial deposits).

The soils are deep and well drained, characteristic of deep sandy / loamy soils of good quality. These soils are suitable for most agricultural and grazing land. The soils in gthe area include those of the Hutton, Clovelly, Swartland, Valsrivier, Rensburg, Bonheim, Willowbrook, Mayo, Arcadia, Sepane, Westleigh, Kroonstad, Glencoe, Mispah and Katspruit Forms.

The agricultural potential of the soils is classified as moderate to poor. These soils are of moderate quality due to the moderate natural fertility, soil structure, chemical properties, depth and rockiness in places.

4.5 Air Quality

Existing sources of dust in the project area are limited to unsealed public roads on the five farms in the project area. The road to be upgraded is in semi rural residential areas with networks of gravel roads. These unpaved roads. Although accurate vehicular movements is not known, making conservative assumptions the baseline dust concentrations are generally high with the 24 hour TSP average over the entire area is about 30.0 $\mu g/m^3$.

Current sources of dust from Modikwa Mine operations, include:

- Disturbed land, especially during mining activities.
- Unsealed access roads (tailings dam and northern access roads).
- The ore and waste rock stockpiles at the decline shaft sites.
- Conveyor belt transfer points.
- The ROM pad and plant site.
- The dry surfaces of the slimes dams.
- Vent decline shafts.

4.6 Surface water

There are no visible surface natural water structures and channels that were identified at the site where the proposed activity is going to take place. Therefore no surface water entities will be affected by the proposed development of the Modikwa expansion projects.

A few non-perennial water channels occur in this region. The highly variable runoff from the non-perennial water sources strongly restricts the direct utilization of runoff-river abstraction on a large scale from these channels. The main non-perennial river in the study area is the Moopetsi River which is situated along the northern boundary of Onverwacht 292 KT and approximately 2 km north of the proposed expansion projects sites.

4.7 Groundwater

The natural groundwater depths generally vary between 10 and 80 meters below surface. There is a linear relationship between topography and groundwater levels. The depth to the groundwater level below surface is therefore related to the topography, with the deeper water levels at higher topographic elevations and vice versa. Hydraulic gradients thus tend to follow the topography.

Groundwater in the area is mostly used for domestic purposes and the constituents exceeding the South African Quality Guidelines for Domestic Use are highlighted. The sample from the mine monitoring boreholes indicates contamination or that the water has a poor quality as a result of stagnation and non-usage.

The water of the surrounding area can be characterised as Calcium/Magnesium – Bicarbonate water. Relatively high concentrations of nitrate were observed in all the groundwater supply boreholes, possibly as a result of contamination by septic systems, unprotected borehole area and cattle kraals (especially when there in little vegetation to absorb the NO_3). NO_3 contamination, common in these populated areas, confirms aquifer recharge and the vulnerability of the groundwater system. Concentrations of minor and trace elements, such as metals, are low in all boreholes sampled.

Aquifers are mainly of secondary nature and are associated with fractures/faults. The major structures (dykes and faults) around the area of the proposed expansion projects have north-north east – south-south west traces. Weathering is mostly associated with the secondary structures, especially in the low-lying areas and especially associated with pyroxenite (mainly along the contact of the Critical and Main Zone rocks) and other mafic intrusions. Weathering of up to ±45 meters were noted, and these weathered zones and alluvial deposits are important aquifer storage.

The aquifers in the expansion projects area are minor aquifer systems in that they comprise fractured or potentially fractured rocks, which do not have a high permeability, or other formations of variable permeability. Aquifer extent may be limited and water quality variable. Ground water flow data indicates that these aquifers are not supplying flow to the rivers.

4.8 Fauna and Flora

4.8.1 Floral Composition

The vegetation that occurs in the expansion projects area may be divided into a series of sub areas where the vegetation present has been influenced/controlled by the topography, soil types and present/past land use.

In the valleys, where the land has been used or is currently being used for agricultural purposes, these areas have become degraded or are being degraded and are dominated by sparse grass cover, low plant diversity and bush encroachment. Common vegetation species in these areas include Sickle Bush, various species of Acacia, Common Tree Euphorbia, Mountain Aloe, Grewia spp. And exotic invaders such as Sisal and Prickly Pear. These areas also show signs of overgrazing, deforestation (for firewood) and erosion.

In the valleys, along the base of the hills and where the land has not been developed or is characterised by areas of rocky ground and outcrops, there is good botanical diversity with protected species such as Cat's Tail Aloe, Mountain Cabbage Tree, Bramble Leaf Karee (*Rhus bataphylla*), *Aloe Cryptopoda* and *Aloe Marlothii.* Larger rock outcrops have different plant communities with *Xerophyta retinervis, Aloe Burgersfortensis, Gladiolus woodii* and *Euphorbia spp.* In some locations rare and endemic plants such as *Sutera macrantha, Burgersfort aloe*, Mountain Cabbage Tree, Hairy Fingerleaf and Tree Wisteria may be found. These plant types are probably representative of the original valley vegetation in the project area that has been subsequently destroyed by anthropomorphic influences.

Along the hillsides in the project area, a similar diversity of plant types as described above for the valley rocky outcrops may be found. In addition, some rare and protected flowering plants (*Gladiolus* and *Aloe*) and very rare trees (*Euphorbia barnardii*) may also be found. All the hills in the project area have the rare *Euphorbia sekukuniensis* on the peaks.

4.8.2 *Faunal Communities*

There is existence of domestic livestock around Mooihoek, Maandagshoek and Matimatjatji. These are various villages, settlements and homesteads in the immediate vicinity of Modikwa Platinum Mine. Most areas around Modikwa Mine are heavily disturbed, and with exception of avifauna, very few mammals, insects, reptiles and amphibians are available. Some wildlife may still be surviving in the higher slopes of the Leolo mountains, but this will be restricted to the mountain range. The field investigations identified signs of skinks and geckos in the expansion projects sites.

The dominant animals around the area are domestic livestock – such as cattle, goats, donkeys and horses. There are no endemic or red data species recorded in the area. This is again attributed to the high disturbance.

4.9 Noise

Existing noise levels at the proposed expansion projects sites are relatively low. The major noise generation activities include the processing at the concentrator plant, loading and depositing of rock and heavy vehicle traffic. The noise pollution seems to have affected the bird communities on site, while mammalian species seem to have accepted the mining operation background noise. The distance of the mine from formal residential settlements ensures that noise will not have an impact on local communities.

Employees working under high decibel conditions must be provided safety gear including ear plugs.

4.10 Visual

Due to the distance of the Modikwa mine from formal residential settlements, the aesthetics of the mine infrastructure does impact on local communities. The proposed sites for the, South 2 shaft, new FRD and open pit development are within the mine area and will have a significant visual impact. However, the proposed expansion projects will not be visible from the R37 main road from Polokwane to Burgersfort.

4.11 Traffic

Existing access roads exist in the area to provide access to the proposed expansion projects. The roads are predominantly dirt and will require to be upgraded, widened and dust management. The access roads will not impact on any private travellers as the vehicles and machinery are stored within the Modikwa Mine property and access to expansion projects sites is from within the mine.

4.12 Cultural Heritage

Modikwa Platinum is located along the eastern slopes of the Leolo Mountain range in the northern part of the Steelpoort Valley in the Mpumalanga and the Limpopo Provinces of South Africa. This region is the heartland of the pre-historical and the historical Pedi chiefdom and is associated with a wide range of heritage resources. The archaeological remains and the initiation cairns on Onverwacht 292KT was studied by means of utilizing historical and ethnographic information in order to contextualise and to explain the meaning and significance of these remains.

The proposed expansion projects sites within Modikwa Mine mining area are not pristine pieces of land any longer as communities have lived in this area for a prolonged period of time. In fact, some villages from the more recent past were built on top of the remains of Late Iron Age and historical sites. Artefacts on the surface of proposed expansion sites included a limited number of pot shards while slag concentrations were observed some distance to the north of the site. Other material observed include metal plate and glass from the historical period as well as from the recent past. However, no material was collected from the surface of the site.

The mining heritage remains on Onverwacht 292KT consist of the open pit and a decline of shaft (adits) along the south eastern slope of the Onverwacht Hill. These remains were studied by means of an investigation of historical literature about early mining in the Steelpoort and by photographing as well as the mapping of these remains (see Appendix C).

4.13 Socio-Economic

Modikwa Platinum Mine is situated in the vicinity of 31 villages, the largest of which are Ga-Kgwete (12 000 people), Magakala (12 000 people) and Ga-Mashishi (11 125 people). Matimatjatji is situated south of the proposed expansion projects. The nearest urban settlements are Burgersfort (15km) and Steelpoort (36km). Polokwane, the Provincial capital is located approximately 150km to the northwest of the mine.

Small enterprises characterize the main type of business activity in these villages which offers a range of basic consumer goods and services. This informal economic activity is also an important source of income in the villages, although by definition it is difficult to quantify income and employment generated in this informal sector. Dominant businesses are filling stations, shops, sheebens, taxis, and crèches. Burgersfort is the main centre with services, economic, educational and health facilities in the area.

Despite the large population for a rural area, both services and infrastructure are poor. Although there is a good range of occupation types as well as industry sectors, unemployment is high. Indications are that employment opportunities in the area have declined over the last 30 years. Both individual and household incomes are particularly low, indicating a high level of poverty.

5.0 STAKEHOLDER ENGAGMENT PROCESS

5.1 Why do we consult?

Public participation is a continuous two way communication process aimed at promoting full public understanding of the processes and mechanisms through which environmental problems and needs are investigated and solved by the responsible agency. It is aimed at keeping the public informed about the status and progress of the studies conducted and the implications of the project thereof as well as document all issues, comments and concerns voiced by the public and their preferences regarding resource use and alternative development or management strategies and any other information and assistance relative to the decision.

The Stakeholder Engagement Process as it is referred to by the Department of Environmental Affairs and Tourism (DEAT) is a *"...process leading to a joint effort by stakeholders, technical specialists, the authorities and the proponent who work together to produce better decisions than if they had acted independently"*. The process aims at improving *"...communication between stakeholders – including the proponent – in the interest of facilitating better decision-making and or sustainable development"*.

Sustainable developments requires some level of trade-off between economic growth, social equity and ecological integrity. The stakeholder engagement process provides an opportunity for Interested and Affected Parties (I&APs) to participate in an informed bases and ensure their needs and requirements are considered and allows the decision-making authority to understand to what degree stakeholders are willing to accept and live with the tradeoffs involved.

The objectives of the stakeholder engagement process for the Modikwa Mine expansion projects can thus be summarised as follows:

- to inform and provide the public with information and an understanding of the project, issues and solutions;
- identify relevant individuals, organisations and communities who may be interested in or affected by the proposed mine expansions;
- identify key issues and concerns, raised by I&APs, that should be addressed in the subsequent specialist investigations which are part of the EIA;
- identify shortcomings and gaps in existing information;
- identify viable project alternatives that will assist the relevant authorities in making an informed decision;
- clearly outline the scope of the project, including the scale and nature of the proposed activity; and

- highlight the potential for environmental impacts, whether positive or negative.

5.2 Approach to Stakeholder Engagement

Our approach to stakeholder engagement is based on the following principles outlined by the Department of Environmental Affairs and Tourism:

- undertake meaningful and timely participation of I&APs;
- focus on important issues during the scoping and stakeholder engagement phases;
- due consideration of alternatives should be undertaken;
- accountability for information used for decision-making should be provided;
- encouragement of co-regulation, shared responsibility and a sense of ownership should be developed over the project lifecycle;
- application of "due process" particularly with regard to public participation in environmental governance as provided for in the Constitution is essential; and
- the needs, interests and values of I&APs must be considered in the decision-making process.

5.3 Methodology

Stakeholder engagement varies given the technical nature of the activity, the geographical location, extent, duration, intensity and frequency of potential impacts associated with the proposed activity, as well as the capacity of the receptive community to participate in the project. The processes outlined below are specific to this study.

5.3.1 Identification of I&AP

I&APs were identified through several mechanisms. These include:

- Networking with local business owners, farmers associations, non-governmental agencies, community based organisations, and local council representatives;
- Advertising in the press, placement of community notices, and distribution of background information documents (discussed separately); as well as

All I&AP identified were registered on the stakeholder database. The environmental consultant endeavoured to ensure that individuals / organisations from referrals and networking were notified of the project, in addition to efforts to notify and identify stakeholders at a geographical level. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

5.3.2 *Creating Awareness*

Newspaper Advertisements

Advertisements were placed in the following newspapers to announce the project and invite stakeholders to register:

- An English advertisement was placed in the Steelburger newspaper issue for the following week:
  - 27th June 2008;

Refer to Appendix A for copies of the newspaper advertisement.

Community Notices

English and Sepedi A3 sized colour notices, to announcement the project and invite stakeholders to register, where erected on the 20th June 2008 at various shops and community places.

Background Information Document

The purpose of a Background Information Document (BID) is to provide stakeholders with introductory information on the proposed expansion projects, the EMP Amendment and the stakeholder engagement process. The BID also provides stakeholders who are interested in the project with the opportunity to register as stakeholders by way of requesting and completing the registration sheet distributed with the BID. Information on the registration sheet has been used to register stakeholders on a database so that they will receive all future project-related information and invitations to meetings. The registration sheet includes a section for comments and issues, which allows stakeholders an opportunity to provide the consultants with written comments and feedback.

BIDs produced distributed via the postal services, fax, email, and hand delivered. For a copy of the BID please refer to Appendix B.

5.3.3 *Focus Group Meetings*

The following focus group meetings and informal interviews will be held during the stakeholder engagement process for the compilation of the EMP Amendment Report:

- Authorities pre-application consultation meeting:
  - Department of Minerals and Energy – Limpopo Regional Office;
  - Limpopo Department of Economic Development, Environment, and Tourism;
  - Department of Water Affairs and Forestry – Lydenberg Regional Office; and

- National Department of Agriculture – Limpopo Regional Office;

➲ Authorities Meeting was held with the following authorities:

- Department of Minerals and Energy – Limpopo Regional Office;
- South African Heritage Resources Agency – Limpopo Regional Office;
- Department of Water Affairs and Forestry – Lydenberg Regional Office; and
- National Department of Agriculture – Limpopo Regional Office;
- Department of Economic Development, Environment and Tourism.

5.3.4 Document Review

The Scoping Report will be made available at public places for review prior to finalisation and submission to authorities for decision-making. Stakeholders on the database will be notified of the availability of these reports via email, fax and post. The report will be made available at the following public places: Tubatse Local Municipality Offices.

5.3.5 Ongoing Communication

Throughout the process the consultant has communicated with registered stakeholders by means of telephone conversations, email correspondences, faxes, and registered mail. All comments received through the process have been documented in the Issues Register. This method of communication will be continued throughout the process until a decision is reached by authorities.

6.0 ANALYSIS OF STAKEHOLDERS

This section contains an analysis of stakeholders and issues / comments raised during the process to date.

6.1 Who are the stakeholders?

In total there are 423 stakeholders registered on the database. A breakdown of these stakeholders is given in **Table 6-1** below. The majority of the stakeholders on the database are comprised of individuals, community groups and members, councillors in communities, and government departments.

Table 6-1: Breakdown of the stakeholders registered on the database.

Representative Sector	Further explanation	No. of I&APs registered
Non-governmental organisations and community based organisations	Churches, Agricultural Unions, Environmental NGOs such as Health and Social Services, SANCO, Environmental Justice Forum.	3
Business and Consultants	Local businesses dependant on or affected by the expansion projects e.g. services, shops, schools, clinics , food and beverage supplies etc.	15
Media	Newspapers with local coverage such as the Steelburger	1
Government	All tiers of government e.g. National Government, Provincial Government, Local Government,	5
Individuals	Adjacent communities, and individuals who may have an interest in the project (Matimatjatji village)	400

6.2 What are the stakeholders' capacity to participate?

Although the BID was only distributed in English it is the consultants' opinion that all those on the database have sufficient understanding to participate in the process. Advertisements and site notices were placed in English and Sepedi. To date no requests have been received to communicate in any other language.

7.0 Most pressing issues

From the responses received to the BID and informal interviews there has been little concern raised by the proposed project to date. In fact most of the community members are delighted that there will be a possibility of jobs from the expansion projects. This may change upon review of the Scoping Report, and such issues will be addressed further in the EIA/EMP Amendment phase of the project. It is most likely that most pressing issues will be raised during the public meeting to be held with the Matimatjatji community during August 2008.

8.0 PLAN OF STUDY FOR THE EIA

The Environmental Impact Assessment component will aim at:

- Addressing any issues that have been highlighted during the Scoping Phase;
- Assessing all identified impacts to determine the potential significance of the impact; and
- Recommending mitigation measures for minimizing the significance of each impact.

The EIA phase will comprise of the following activities:

1) Stakeholder Engagement;
2) Assessment of Alternatives;
3) Baseline and Specialist Studies;
4) Identification of potential impacts;
5) Impact Assessment;
6) Identification and Description of mitigation measures; and
7) Reporting and decision-making.

8.1 Stakeholder Engagement during the Impact Assessment

The stakeholder engagement process is initiated during the Scoping Phase, but will be continued through the impact assessment phase to keep Interested and Affected Parties (I&APs) informed of the developments within the project, and to maintain liaison with authorities. During the impact assessment phase stakeholder engagement activities will include:

- The Registration of any additional I&APs;
- The placement of newspaper advertisements in local papers, as identified during the Scoping Phase, for a 2 week period;
- The placement of on-site notices to notify stakeholders;
- A public meeting or focus group meeting will be held where required to dispatch project information to key stakeholders and facilitate communication between stakeholders and the proponent;
- Communication through letters, email, telephonic conversations will be maintained with authorities and stakeholders throughout the EIA process until a Record of Decision (ROD) by the DME has been issued; and

The EIA/EMP Amendment Report will be made available for review prior to submission of the document to authorities for decision making. Comments received from I&APs will be included and addressed within the Final Report. The Final Report will be submitted to Department of Minerals and Energy (DME) for review.

8.2 Potential environmental impacts

Through the Scoping Phase, and stakeholder engagement processes have highlighted potential impacts that will be addressed during the EIA Phase.

Due to the state of the biophysical environment where the expansion projects will be constructed, it is unlikely that any Red Data Species or sensitive landscapes will be impacted upon. However, the proposed activity will completely remove the natural habitat from the site, and it is therefore, important to undertake rapid assessments of the environmental aspects that will be exposed to irreparable damage in order to ensure that the expansion projects have minimal impact to the environment, and that any impacts that may be identified can be adequately mitigated.

All the project sites were assessed during a field visit, and various mammal species were identified in the area. Due to the movement of domestic animals within the un-fenced mining area, it is important to ensure that these mammals are not reliant on the preferred site for breeding or foraging. Small predatory mammals are important in conserving the balance in the faunal population on site.

An assessment of the habitat available and the mammals utilising the expansion projects sites will provide important information to inform the management plans require to minimize the impacts – such as fencing to keep domestic livestock away from the mining area.

Similarly, the vegetation over the entire area for the proposed expansion projects will require a Rapid Assessment to ascertain the significance of the flora community and its provision of habitat to potentially significant species. The Rapid Assessment will investigate the potential for Red Data Species on the sites and will evaluate the importance of the flora community in terms of conservation status.

The soil around the expansion projects sites will be exposed to various construction materials that may pollute the soil. These include hydrocarbons in oils, other lubricants and chemicals, and compaction. It is important to assess the potential for these pollutants to spread through the soil and impact on groundwater and on habitats adjacent to these sites. The clay content of the soil will give an indication of the risk of transmission of pollutants toward the groundwater system. A review of the existing soil information may highlight any other potential issues in terms of soil contamination and pollutant conduction.

8.3 Baseline studies

8.3.1 Scope of Investigations

The primary objective of this phase is to collect adequate baseline information to accurately describe the receiving environment prior to the road upgrade project being initiated. The level of detail for each aspect of the baseline studies will be determined by the level of confidence required for decision-making. The existing approved EMP (2000) gives detailed description of the baseline environmental information for Modikwa Platinum Mine, and will be referred to in the EMP Amendment Report. The following aspects of the biophysical environment will be considered in the baseline studies:

- Geology;
- Soil;
- Climate;
- Topography;
- Soil
- Land Use;
- Vegetation and Fauna;
- Surface Water;
- Ground water;
- Air Quality;
- Noise;
- Visual Aspects; and
- Cultural Heritage.

8.3.2 Methodology

Desktop Studies

Desktop studies will be the departure point of data collation of various aspects of the baseline environment. The following published resources will be consulted for this purpose:

1) Environment Potential Atlas (ENPAT);
2) 1:50 000 Government Topocadastral Maps;
3) 1:10 000 Ortho Photos;
4) Land Type Maps of the Region;
5) Municipal Demarcation Board;
6) Statistics South Africa;
7) The Binomial Soil Classification System;
8) Red Data Books for Fauna and Flora;
9) WR90 published by the Weather Research Commission; and
10) Climate Data from the Weather Bureau.

Field Visits

Field visits will be undertaken to verify the information collected at the desktop study level, and will facilitate:

- The location of dust fallout buckets (if any);
- The collection of water samples.
- The mapping and ground verification of impact receptor sites;
- The verification of adjacent and current land cover and land use;
- The verification and status of Red Data Species that may occur on site; and
- Interviewing and surveying of adjacent land owners and local inhabitants that may be affected by the proposed expansion projects.

Specialist Studies

Specialists will be appointed to undertake the necessary specialist studies that have been identified during the Scoping Phase. At this stage of the study, the specialist studies that are expected to be required for decision making are listed in **Table 8-1** below.

Table 8-1: Specialist Studies Required for the Expansion Projects at Modikwa Mine

Specialist Study	Specialist Considered	Objective of the Study
Ecological and Biodiversity Assessment	Gudani Consultants	A Rapid Mammal Assessment to provide: ➲ Description of the habitat integrity. ➲ Identification of the presence or likelihood of occurrence of Red Data floral or faunal species. ➲ Identification of "no-go" areas and ecologically valuable habitats on a sensitivity map.
Soil and Land Capability Assessment	Gudani Consultants	A revision of existing soil studies to provide: ➲ Compilation of a soil distribution map. ➲ Identification of areas of soil disturbance on site. ➲ Identification of soil sensitivity, and erosion potential. ➲ Identification of suitable land capability categories. ➲ Compilation of a land use and distribution map.
Vegetation Assessment	Gudani Consultants (Dr Fan van Wyk)	A Rapid Vegetation Survey to: ➲ Identify the potential for Red Data Book Species; ➲ Provide a description of the floral communities on site.
Heritage Impact Assessment	Dr Julius Pistorius	A Cultural Heritage Impact Assessment to: ➲ Identify whether any features occur on site which might have cultural of historical value; ➲ Provide recommendations on development.

8.4 Environmental Impact Assessment

During the EIA Phase impacts will be ranked according to the methodology described below. Where possible, mitigation measures will be provided to manage impacts.

In order to ensure uniformity, a standard impact assessment methodology will be utilised so that a wide range of impacts can be compared with each other.

The impact assessment methodology will make provision for the assessment of impacts against the following criteria:

NATURE The character of the impact			
Area	Time Frame	Likelihood	Implication
TYPE Description as to whether the impact is negative or positive or neutral			
MITIGATION Possible impact management, minimization and mitigation			

A combined quantitative and qualitative methodology will be used to describe impacts for each of the aforementioned assessment criteria. A summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given below.

Nature

Describes the character of the impact in terms of its effect on the relevant environmental aspect

Spatial Extent

Measures the area extent over which the impact will occur. This implies the scale limited to the Modikwa Mine nining authorization area (expansion projects area), or over the entire Burgersfort town (localized), or the Greater Tubatse Local and Greater Sekhukhune District Municipalities (regional) or the entire Limpopo Province (Provincial).

Duration

Measures time frame whether the impact occurs immediately, in the short term (0-10 years), medium term (10-20 years), long term (20- 50 years after construction activity), or permanent (persists beyond life of mine) due to the activity.

Probability

Measures the probability or likelihood of the impact actually occurring, as either low (less likely), medium (distinct probability), high (very likely) or definite (impact will occur regardless of preventative measures).

Significance

Measures the significance of the impact of the proposed expansion projects, both with and without mitigation measures. The significance on the aspects of the environment is classified as:

- Low significance: where the impact would not have any influence on the decision to proceed with expansion projects;
- Moderate significance: where the impact should influence the decision to proceed with the expansion projects unless it is effectively mitigated. This will require modification of the project design or determination of mitigation measures;
- High significance: where the impact would influence the decision to proceed with the expansion projects regardless of any mitigation measures

8.4.1 Cumulative Impacts

The impact assessment will take cognisance of any existing impact sustained by the current environment due to the existing gravel road, and the current impact of the said gravel road on communities located adjacent.

The impact assessment will also take cognisance of any mitigation measures already in place, any additional impacts expected to the environment through the proposed road upgrade project, and the residual impact after mitigation measures.

8.5 Environmental Management Programme

The EMP will be specifically focused on the management and mitigation of potential environmental impacts generated by the construction and operation of the expansion projects and associated infrastructure. .

The Environmental Management Programme (EMP) will provide an overview of the environmental objectives to prevent, minimise and mitigate the impacts on the environment that were identified and discussed in the Impact Assessment. The EMP will include the following sections:

1) Description of Environmental Objectives including –
    - Relevant Environmental Legislation;
    - Management of Environmental Impacts;

- Socio-Economic Impacts; and
- Historical and Cultural Impacts.

2) Operational Phase Management of each Environmental Aspect;
3) Closure Phase Management of each Environmental Aspect;
4) Tabular format of EMP;
5) Emergency Response Plan;
6) Environmental Monitoring Recommendations;
7) Environmental Management Programme Performance Assessment; and
8) Financial Provision.

9.0 CONCLUSIONS

This Scoping Report has identified the potentially sensitive environmental aspects of the area and has recommended specialist studies for inclusion in the EIA process. The EIA/EMP Amendment reports has triggered both the MPRDA and NEMA legislation and the final EIA/EMP Amendment reports will satisfy both sets of regulations for authorisation.

The proposed expansion projects at Modikwa Mine will have few significant negative environmental impacts and these can be managed and mitigated through the implementation of the management programme that will be provided within the EIA/EMP Amendment Reports. The proposed expansion projects will enhance and maintain the life of mine for Modikwa Platinum Mine and have positive social and economic impacts in terms of improved economic activity, provision of goods and services, and employment opportunities. In addition, should the management of the environmental impacts be carried out in accordance with the relevant EIA/EMP Amendment Report the negative impacts of the expansion projects can be minimised.

Appendix A:

EIA Advertisements – Newspaper and Site Notices

GEWINGS - NOTICES

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IN THE MAGISTRATE'S COURT FOR THE DISTRICT OF SEKHUKHUNE HELD AT SEKHUKHUNE
CASE NR: 20/2008
In the matter between:-
FIRST NATIONAL BANK OF S A LIMITED Plaintiff
and
MONAPHEFO RESTAURANT
1st Defendant
SEPEKE DANIEL MALOMA
2nd Defendant
NOTICE OF SALE IN EXECUTION
BE PLEASED TO TAKE NOTICE that in pursuance of a Judgment granted in the above action on 13 May 2008, the goods listed hereunder will be sold in execution to the highest bidder at SEKHUKHUNE MAGISTRATE on the 18 JULY 2008 at 11:00 namely:-
TOYOTA HILUX (GREEN) DLV 834N
TERMS : C A S H
DATED AT PRETORIA ON THIS THE 10 DAY OF JUNE 2008 (SGD) MNR R MEINTJES
RORICH WOLMARANS &
LUDERITZ INC
Block C, Equity Park
257 Brooklyn Road
Brooklyn
PRETORIA
REF R MEINTJES.
B3/F30156
TEL: (012) 362-8990

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Notice in terms of Section 18(5) of the General Regulations published in Government Notice R.510

Notice is hereby given in terms of the provisions of Section 18(5) of the General Regulations, dated the 10th April 2003, made in terms of the Medicines and Related Substances Act, No 101 of 1965 (as amended), that it is the intention of Sr L Engelbrecht.
Practice as an Occupational health nurse at Everest South Platinum mine Boschfontein turn off on R 577 Roosenekal/Lydenburg, to apply to the Director-General, Department of Health, to supply her a license to dispense medicines
Dated at Witbank on this 17th day of June 2008.

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NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT

Notice is given in terms of Regulation 50 of the Minerals and Petroleum Resource Development Act (MPRDA, Act, 28 of 2002) of the intention of Modikwa Platinum Mine to expand its mining operations with a development and construction of a new shaft, opencast mining and fine residue deposit facility on the farm Onverwacht 292 KT in Limpopo Province. Comments and/or concerns can be submitted to Gudani Consulting at 082 828 3412 or P.O. Box 714, Polokwane, 0787 or Fax: 015 4471. Parties wishing to comment or formally object to this project are requested to forward their objections with reasons to the above address or M Kekana, Department of Minerals and Energy, Limpopo Province, Fax: 015 287 4729. Objections and/or comments should be forwarded later than 13th July 2008.

MODIKWA PLATINUM MINE

Appendix B:
Background Information Document (BID)

BACKGROUND INFORMATION DOCUMENT
AMENDMENT TO ENVIRONMENTAL MANAGEMENT PROGRAMME – PROPOSED OPEN CAST MINING, SOUTH 2 SHAFT, AND FINE RESIDUE DEPOSIT - FARM ONVERWACHT 292 KT– MODIKWA PLATINUM MINE

PURPOSE OF THIS DOCUMENT

The purpose of this document is to:

- Provide stakeholders with information about a proposed EMPR amendment by Modikwa Platinum Mine to expand its mining operations on the farm Onverwacht 292 KT in the Greater Tubatse Local Municipality of the greater Sekhukhune District Municipality, Limpopo Province

- Introduce and explain the Environmental Impact Assessment and public participation process to be followed for the proposed development, in terms of applicable environmental legislation National Environmental Management Act: NEMA, 1998(Act No. 107 of 1998) and (Minerals and Petroleum Resource Development Act(MPRDA) (Act No.28 of 2002), and

- Invite all stakeholders to comment on any aspect related to the proposed EMPR amendment.

PROJECT DESCRIPTION

Modikwa Platinum Mine is an existing underground mining operation situated near Burgersfort, and has an approved Environmental Management Programme. Gudani Consulting has been appointed to undertake the proposed EMP amendment process. Modikwa proposes to undertake and implement the following expansion projects:

1. The development of open cast mining on the farm Onverwacht 292 KT
2. Shaft sinking – South 2 Shaft, and associated infrastructure
3. Development of stockpile storage area, and later transformed into a fine residue deposit (FRD) site.

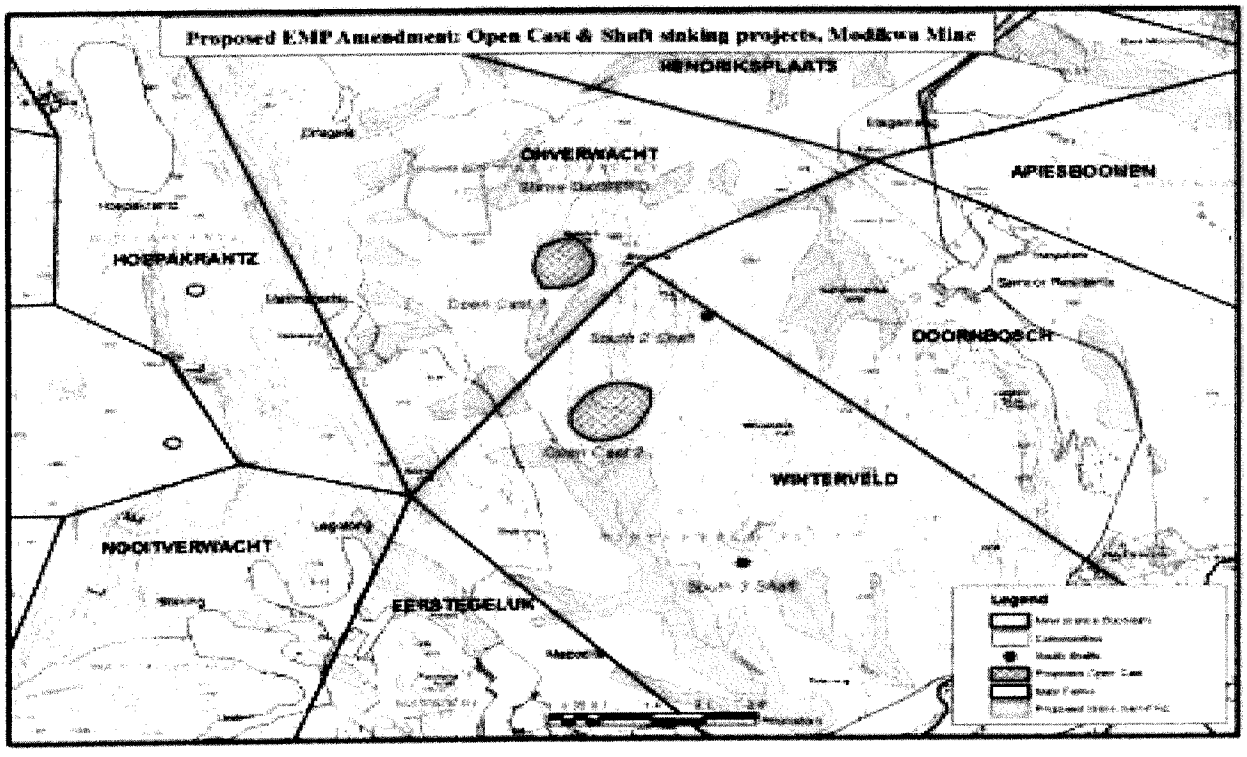
MOTIVATION OF THE PROJECT

The mining project will produce minerals that will be sold even to the outside markets including overseas markets and as a result contribute to the economy of the area. Labour will, as far as it practically possible, be recruited locally. Apart from the permanent directly created job opportunities there will be scope for other entrepreneurial jobs to be created by the local population.

LOCALITY

Modikwa Platinum Mine is situated within the Tubatse Local Municipality. The mine is a joint venture between Anglo Platinum and African Rainbow Minerals (ARM). The mine is located 15 Kilometres north of Burgersfort and 15 Kilometres east of Steelpoort, along the border between the Mpumalanga and Limpopo Provinces. The proposed project will be located on the farm Onverwacht 292 KT.(see locality map Fig.1)below

Fig1. Locality Map



DESCRIPTION OF TASKS TO BE PERFORMED

Mining operations and amendments to approved EMPs is regulated and authorized by the Department of Minerals and Energy, in consultation with the Departments of Water Affairs and Forestry, Environmental Affairs, and Agriculture, therefore this proposed EMP amendment process will follow the requirements of the MPRDA. Section 37 and 38 of the MPRDA, 2002 requires compliance with the National Environmental Management Act, 1998. The process will therefore be aligned with the requirements of the said NEMA, 1998. Submission, processing and final approval of the proposed EMP amendment will however be done through the DME Office, Polokwane:

1. Prepare the Scoping Report in accordance with Regulation 49 of the MPRDA. Submit the Scoping Report to DME for consideration and allow I&APs to review and comment the scoping report (30 days). Scoping process must include consultation with interested and affected parties. DME and other government departments may require amendments or additional information.
2. Conduct the required public meeting as part of scoping process, in conjunction with Modikwa Mine under the auspices of the existing community liaison and communication channels. Conduct at least one authorities meeting to brief about the proposed project.
3. Compile Environmental Impact Assessment Report (EIAR) in accordance with Regulation 50 and specialist reports (2 – 3 months). The EIA report will include the Environmental Management Programme (EMP) (Regulation 51) to mitigation any envisaged impacts. Conduct a public meeting, in conjunction with Modikwa Mine under the auspices of the existing community liaison and communication channels. Conduct an authorities meeting to brief on findings of the EIA/EMP.

4. Submission of the EMP Amendment report to DME. DME will forward the report to other government departments for comments, giving them 60 days. After 60 days, if no objections, DME will forward the amended EMP to DME, Pretoria Office for final approval. MPRDA does not prescribe the timeframe for EMP amendment evaluation once referred to DME Head office, Pretoria, however this part of the approval process may take 1 – 3 months with continuous follow-ups.

5. The entire EMP amendment process will take 7 – 8 months to complete and obtain decision from DME.
6. EMP performance assessment report for 2007 will be required as
7. Details of the financial provision to show how the proposed extensions will be included in the provision for rehabilitation.

POTENTIAL ENVIRONMENTAL ISSUES

Environmental issues that will be addressed in the scoping report include:

- visual impact
- risk of fires and explosions
- atmospheric pollution
- surface and ground water contamination
- traffic implications
- soil contamination
- health impact
- socio-economic impacts

PUBLIC PARTICIPATION

In terms of the NEMA, public participation forms an integral part of the environmental assessment process. The public participation process provides people who may be affected by the proposed development with an opportunity to provide comment and to raise issues of concern about the project or to make suggestions that may result in enhanced benefits for the project. Comments and issues raised during the public participation process will be captured, evaluated and included in a Comment and Response Report, which will be incorporated into the Scoping and Environmental Impact Reports (EIR) that will be made available for public review.

DELIVERABLE

The environmental assessment will culminate in the compilation of a Scoping Report and an EIR. The Scoping Report and the EIR will be submitted to Department of Minerals and Energy (DME) the regulatory authority responsible for the review of the report.

INVITATION TO PARTICIPATE

Gudani Consulting is appointed by Modikwa Platinum Mine as independent environmental practitioners to facilitate the environmental impact assessment and public participation process for the proposed project. We would like to invite and encourage all stakeholders to complete and return the enclosed registration sheet and submit any comments to:

Gudani Consulting
Ms Ivy Takalo
P. O. Box 714
POLOKWANE
0787

Tel: 015 – 297 6719
Fax: 015 – 296 4471
Email: setenane.nkopane@gmail.com

NATIONAL ENVIRONMENTAL MANAGEMENT ACT (Act No. 107 of 1998), AS AMENDED

Environmental Assessment

The National Environmental Management Act (NEMA) (Act No. 107 of 1998) identifies the proposed EMP amendment as an activity that may have significant detrimental effects on the environment with the following listed activities: Government Notice No. R.387 of 2006:

Item 7: "*Reconnaissance, exploration, production and mining as provided for in the Mineral and Petroleum Resources Development Act, 2002(Act No. 28 of 2002), as amended in respect of such permits and rights*"

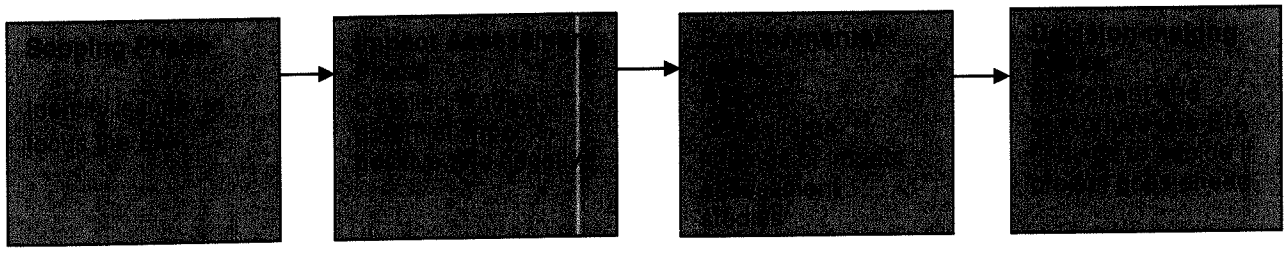
DEFINITION OF AN ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

An environmental impact assessment is a good planning tool to assist in the identification, evaluation and assessment of potential positive and negative impacts of a proposed development on the environment. It also recommends ways to avoid or reduce negative impacts, and ensure that developments are sustainable without affecting people's lives and the environment adversely. As mentioned, an EIA is undertaken in terms of the NEMA (Act No 107 of 1998) as amended, and the EIA Regulations.

An EIA produces an Environmental Impact Assessment Report (EIR), which must:

- identify the potential impacts of the proposed development;
- illustrate the issues, concerns and suggestions raised by I&APs; and
- outline the measures that must be taken to avoid or reduce negative impacts, and enhance positive impacts.

The steps of a typical EIA are outlined below.



TIME FRAMES

1. Project announcement to key stakeholders and I&APs	
2. Consultation with key stakeholders and community	
3. Compilation of Comment and Response Report	
4. Compilation of Draft Scoping Report	
5. Circulation of the draft scoping report for public review	
6. Finalise Scoping Report and Plan of Study for Impact Assessment and submit to decision-making authority for comment/approval	
7. Make Scoping Report and Plan of Study for Impact Assessment available at public places	
8. Commission specialist studies upon receipt of approval of Plan of Impact Assessment from decision making authority	
9. Compilation of Draft EIR	
10. Announce availability of Draft EIR and make report available for public review	
11. Convene I&AP meetings if and as necessary	
12. Incorporate I&AP comment into final EIR	
13. Submit final EIR to decision making authority for a decision	
14. Advise all registered stakeholders of Record of Decision	

REGISTRATION / COMMENT FORM

PROPOSED EMP AMENDMENT– GREATER TUBATSE LOCAL MUNICIPALITY

PARTICULARS OF INTERESTED & AFFECTED PARTY			
Name:			
Postal Address:			
		Post code:	
Street Address:			
		Post code:	
Tel:		**E-Mail:**	
Cell:		**Fax:**	
Language Preference:			

COMMENTS
1. Comments, concerns or suggestions:

2. Do you require any specific additional information? If YES, please specify:
3. Is there any other information that the project team should be made aware of:
4. If you are aware of any additional people who should be contacted in this process, please provide their details here:
5. Any other:
Please add additional pages if required.

Return to: Ms Ivy Takalo
Gudani Consulting
P.O. Box 714
Polokwane, 0787

Tel : (015) 297 6719
Fax : (015) 296 4471
Email : setenane.gudani@gmail.com

Appendix C:
Heritage Impact Assessment

Prepared for:

MODIKWA PLATINUM

THE SOUTH AFRICAN HERITAGE RESOURCES AUTHORITY (SAHRA)

Results of a Phase II Heritage Impact Assessment Study: AN INVESTIGATION OF LATE IRON AGE (INCLUDING INITIATION CAIRNS) AND MINING HERITAGE REMAINS ON THE FARM ONVERWACHT 292KT IN THE MPUMALANGA AND LIMPOPO PROVINCES OF SOUTH AFRICA

Prepared by:

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Archaeologist and Heritage

Management Consultant

Member of ASAPA

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Lynnwood 0081

Pretoria

Tel and fax 012 3485668

December 2005

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1 INTRODUCTION

Modikwa Platinum intends to expand its mining activities on part of the farm Onverwacht 292KT in the Steelpoort Valley in the Mpumalanga and Limpopo Provinces of South Africa. The development project will include the establishment of a new (decline) shaft, a mobile office, roads and a compression. This development will be concentrated along the lower eastern foot of a part of the Leolo Mountain range running from the north towards the south along the western border of the farm Onverwacht 292KT.

Consequently, A Phase I Heritage Impact Assessment (HIA) study was done for Modikwa Platinum during April 2004. The results of the Phase I HIA study was summarised in the 'Executive Summary' which reads as follows:

> 'A Heritage Impact Assessment (HIA) study as required in terms of the National Heritage Resources Act (Act 25 of 1999) was done for Modikwa Platinum on the farm Onverwacht (292KT) in the Limpopo Province of South Africa. The aim with the HIA study was to determine whether any of the types and ranges of heritage resources (national estate) as listed in the National Heritage Resources Act (Act No 25 of 1999) occur in the project area.
>
> The following types and ranges of heritage resources were found during the survey on foot: an Informal Graveyard (GY01) with three graves that dates from the recent past; several mine adits along the lower eastern foot of the Leolo Mountain range that may be linked with the earliest exploration for platinum in the Steelpoort area and a Late Iron Age site (Site LIA01) with possible (iron) smelting furnaces and two stone cairns used in initiation schools for boys.
>
> There is little doubt that Modikwa Platinum's proposed activities will have an impact, whether coincidental or inevitable, during the short- or long term on these heritage resources. Legislation requires mitigation whenever heritage resources are to be affected by development activities. The relevant legislation with regard to the graveyard includes the National Heritage Resources Act (Act No 25 of 1999),

the Ordinance on Exhumations (Ordinance No 12 of 1980) and the Human Tissues Act (Act No 65 of 1983 as amended). Legislation that bears significance on the adits and the Late Iron site (Site LIA01) consist of the National Heritage Resources Act (Act No 25 of 1999).

It is recommended that the Late Iron Age site (Site LIA01) be investigated before it is destroyed by Modikwa Platinum's new development project while the graveyard either be relocated or be preserved *in situ* by fencing this feature and providing controlled access to families or friends who want to visit the graveyard. The adits can be destroyed as these features have been recorded on mine maps and in literature on early platinum mining in the Steelpoort area [e.g. Lombard (1945) and Wagner (1973)].

The archaeologist undertaking the Phase II investigation for Modikwa Platinum Mine has to apply for a permit from the South African Heritage Resources Agency (SAHRA) before the Late Iron Age site and the adits are destroyed by the proposed new mining development'.

Consequently, the aim with this report is to discuss the results of the Phase II investigation of the Late Iron Age site (Site LIA01) (including the initiation cairns) and the mining heritage remains which has now been completed.

(The graveyard [GY01] will not be affected by Modikwa Platinum's proposed expansion activities. This report therefore does not report on any mitigation measures that have to be applied to these sensitive remains any longer).

2 AIMS WITH THIS REPORT

The Steelpoort area is under enormous economic pressure as the eastern limb of the Merensky Reef runs through this part of the Mpumalanga and Limpopo Provinces of South Africa. Various minerals such as platinum, chrome and other by-products are mined from the Reef with the result that numerous heritage sites have been lost in this area in more recent times due to modern mining development. Mining development is also attracting large numbers of workers to the area resulting in the establishment of new residential areas or the expansion of the numerous small villages that have occurred in the Steelpoort Valley for centuries. The historical village of Burgersfort, e.g. has changed, overnight, in a modern residential town with several suburbs currently under construction. The combined results of mining infrastructural development and an increase in the population of the area is inevitable leading to the destruction of heritage resources as many of the informal developments in particular are not necessarily accompanied by environmental impact assessment studies.

Although mining development has became the biggest source of income for the Steelpoort it is also changing, at a rapid rate, the appearance and character of this part of the country whilst taking a heavy toll on the enormous wealth in heritage resources that are to be found in this part of the Limpopo and Mpumalanga Provinces of South Africa.

Heritage resources in the Steelpoort are characterised by all types and ranges as listed in Section 3 of the National Heritage Resources Act (No 25 of 1999). Most abundant in the Modikwa Platinum mining area is the presence of Iron Age remains continuing into the historical period as well as the remains of historical mining activities. Whilst the stone walls date back to the Late Iron Age and the early historical period which can be associated with one of the many clans that were part of the 19th century Pedi chiefdom, the historical mining remains can be related to

the first prospecting and mining for platinum in the Steelpoort during the early decades of the 20th century.

The aim with this report is to describe the Late Iron Age (including the initiation sites) and the mining heritage remains on Onverwact 292KT and to provide, where possible, explanations for the meaning and the significance of these remains. This is achieved by using oral tradition and ethnographic information with regard to the historical origins and past life-ways of the Pedi in order to understand the significance of the Late Iron Age remains and the initiation sites whilst historical information have been used to explain the significance of the mining heritage remains on Onverwacht 292KT.

3 METHODOLOGY

3.1 Literature survey and documenting

The archaeological remains (Site LIA01) and the initiation cairns on Onverwacht 292KT was studied by means of utilizing historical and ethnographic information in order to contextualise and to explain the meaning and significance of these remains (see 'Select Bibliography', Part 8). A limited part of Site LIA01, which covers a large surface area, was also surveyed (mapped) with a theodolite and documented by means of photographing the most conspicuous remains associated with the site.

No excavations were conducted in Site LIA01 as these remains, in contrast with what Modikwa Platinum initially decided, will not be destroyed by the proposed mining expansion programme. It was therefore thought best to leave these remains unaffected until proper excavations of the site, supported with an accompanying budget, can be undertaken.

Artefacts on the surface of Site LIA01 included a limited number of pot shards while slag concentrations were observed some distance to the north of the site. Other material observed include metal plate and glass from the historical period as well as from the recent past. However, no material was collected from the surface of the site.

The mining heritage remains on Onverwacht 292KT consist of the open pit of the Onverwacht Platinum Mine and a series of shafts (adits) along the eastern slope of the Leolo Mountain range. These remains were studied by means of an investigation of historical literature about early mining in the Steelpoort and by photographing as well as the mapping of these remains (see 'Select Bibliography', Part 8).

3.2 Some remarks on terminology

Only a few terms relevant to this report needs wider clarification, namely:

The term 'pre-historical' refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the project area, to the first appearance or use of 'modern' Western writing brought to the Lydenburg-Ohrigstad-Steelpoort area by the first Colonists who settled in this area after c. 1840.

The term 'relatively recent past' refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources. It is not always possible, based on observations alone, to distinguish clearly between archaeological remains and historical remains, or between historical remains and remains from the relatively recent past. Although certain criteria may help to make this distinction possible, these criteria are not always present, or, when they are present, they are not always clear enough to interpret with great accuracy. Criteria such as square floor plans (a historical feature) may serve as a guideline. However, circular and square floors may occur together on the same site.

The Heritage Impact Assessment (HIA) referred to in the title of this report includes a survey of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999, see Box 1).

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.

Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types of heritage resources in any given area.

Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of bodies and the relocation of graveyards, etc. Phase II work may require the input of specialists and requires the co-operation and approval of SAHRA.

A farm homestead refers to all buildings, structures, utilities and spaces that comprise a single farm. The farm homestead therefore would not only incorporate the core structures associated with the farm such as the farmstead and outbuildings but also structures further afield such as enclosures used to shelter domestic stock, spaces (fields) utilized for agricultural activities, roads leading to the farmstead, etc. The term farm homestead therefore is a holistic concept encompassing part of or a total cultural landscape.

Mining heritage remains refer to all diggings, workings and infrastructure left on the landscape as a result of the retrieval of earthly resources to be used for the benefit of mankind. These remains may be older than sixty years or even younger considering their strategically importance at a certain point in time.

4 THE PROJECT AREA

4.1 Location

Modikwa Platinum is situated approximately thirty kilometres to the north-west of Steelpoort in the Steelpoort River Valley. The mine's proposed new development will be focused in the north-western corner of the farm Onverwacht 292KT, between Hendrikplaats 281KT in the north-east and Hoepakrantz 291KT in the south-west (Steelpoort 2430CA and Moroke 2430AC 1: 50 000 topographic maps) (Figure 1).

The Steelpoort Valley's name is derived from the Steelpoort (Tubatse) River, one of the main geographical features in this valley. The Steelpoort River is a southern tributary of the Olifants River. It flows from an altitude higher than 1 800m on the Highveld near Wonderfontein in the Belfast district northwards and then north-eastwards to join the Olifants River before the latter cuts through the Drakensberg to enter the Lowveld. Other prominent beacons in the wider study area include the Chromite Hills to the north-east of the study area and the imposing Leolo Mountain range in the study area. The Leolo Mountain range is known as a beacon in the origin history of the Pedi.

Formal and informal villages are scattered throughout the Steelpoort Valley. These communities, some of which are still practising mixed subsistence farming, have occupied the Steelpoort Valley without interruption for decades and perhaps even for centuries. This is definitely the case in the village of Tšate, situated to the west of the Leolo Mountain range outside the project area, which already existed in the late 18th century.

4.2 The developed nature of the project area

The project area is not a pristine piece of land any longer as communities have lived in this area for a prolonged period of time. In fact, some villages from the more recent past were built on top of the remains of Late Iron Age and historical sites such as Site LIA01 in the project area.

The people who occupied the Steelpoort area practised hunting, gathering, cultivating and stock farming for many centuries. Many of the people occupying the area still depend on agriculture and stock farming for a livelihood. Agricultural plots are still utilized by local communities. In the past, chiefs allocated pieces of land to the heads of wards that then provided plots to married men. The sizes of plots were determined by the number of wives a man had, but each plot was usually 1 to 2 hectares, which is the maximum that a woman could cultivate using a hoe. The introduction of the plough allowed families to cultivate larger areas of land, up to about 4, 5 hectares.

Crops included sorghum (*mabele*) and millet (*letsoa*), which were later largely replaced by maize (*mahea*) as a staple food. Supplementary crops included pumpkins (*marotse*), various varieties of gourd (*maraka*), beans (*dinawa*) and a type of groundnut (*ditloo*). Tobacco and sugarcane were also planted.

Although each person usually possessed his own stock, pasturage was used on a communal basis. At a fixed time the tribal ruler declared the reaped grain fields open for use as winter grazing. Grazing cattle in particular disturbs heritage resources, as deposits on sites are churned underhoof and low stone foundations are broken and scattered.

The uninterrupted occupation of the project area over a long time therefore is contributing to the destruction and disturbance of heritage resources on an increasing scale.

4.3 In a cultural landscape

Modikwa Platinum is located along the eastern slopes of the Leolo Mountain range in the northern part of the Steelpoort Valley in the Mpumalanga and the Limpopo Provinces of South Africa. This region is the heartland of the pre-historical and the historical Pedi chiefdom and is associated with a wide range of heritage resources.

It is therefore necessary that the archaeological and historical significance of this cultural landscape be described and explained in more detail before the results of the Phase II HIA study is discussed (see Part 5, 'Contextualising the project area').

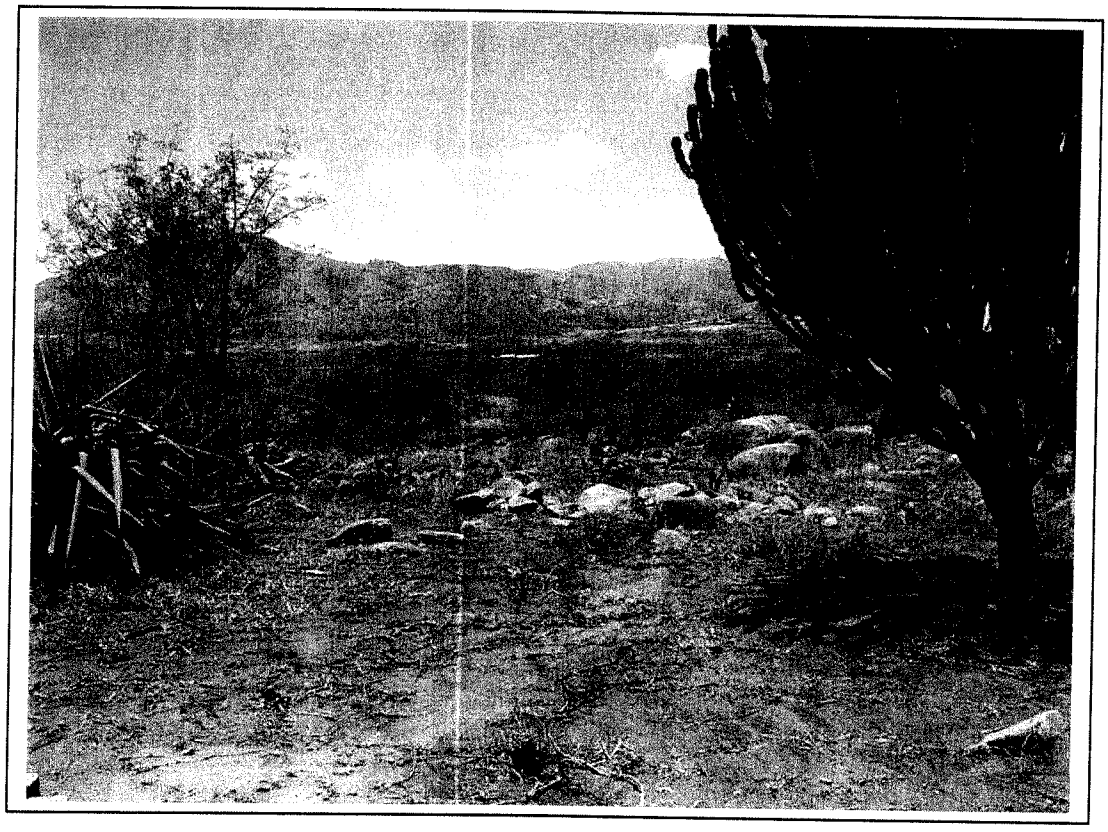


Figure 1- The Modikwa Platinum project area in the northern part of the Steelpoort Valley as seen from the highest terrace of Site LIA01 (above).

5 CONTEXTUALISING THE PROJECT AREA

Modikwa Platinum is located in the heartland of the Steelpoort Valley which is renowned for its rich and diverse range of heritage resources. The following background information is aimed at contextualising the Modikwa Platinum project area particularly with regard to the Late Iron Age and mining heritage remains which have been studied during this Phase II investigation.

5.1 Pre-historical context

Stone Age sites are scattered in the extensive network of dongas which occur across the wide valleys floors between the Leolo and other mountain ranges in the northern part of the Steelpoort Valley. Some sites have been observed by the author of this report on farms such as Hendriksplaats 281KT, Derde Gelid 278KT and Apiesboomen 295KT. These stone tools date from the Early Stone Age (500 000 to 200 000 years ago), the Middle Stone Age (200 000 to 40 000 years ago) and from the Late Stone Age (40 000 to 200 years ago).

However, no purposeful archaeological survey for Stone Age sites as part of any extensive or in-depth research project has to the knowledge of this author been done in the Steelpoort area as yet.

5.2 Pre-historical and early historical period

The origins of the first Bantu-Negroid farming communities who practised agriculture, live-stock herding and metal working can be traced to the Steelpoort Valley. These Early Iron Age farming communities whose settlements have been recorded on amongst others Hendriksplaats 281KT and Derde Gelid 278KT were related to Early Iron Age communities who, contemporaneously, c. AD500 to AD900, settled further towards the east in the Lydenburg Valley. One of the

settlements belonging to the Early Iron Age Lydenburg culture won international acclaim as the Lydenburg clay masks were discovered at this next to the Sterkspruit, south of Lydenburg.

The historical period in the Steelpoort Valley is associated with the second millennium AD when a predominantly Northern Sotho-speaking population occupied the Steelpoort. These people are part of a larger Northern Sotho-speaking community who occupy a vast area between the Limpopo River in the north, the Drakensberg in the east and the Sekhukhune Mountains in the west. Although they share a common language and certain traditions and customs, these people have never shown an awareness of a national identity. Numerous divisions and groups or clans therefore occupy this vast region. The history of the people of this area can be divided into several periods:

The earliest period of settlement is characterized by small groups of Bantu people who started to drive the San and Khoi Khoi from the area and who are difficult to identify. From approximately c. AD1700 ancestral groupings of the present inhabitants of the land began to arrive in the area. Groups that can be distinguished include:

- A large group of Sotho who came from the north-eastern parts of the Lowveld and who settled on the plateau to the north and to the south of the Strydpoortberge.
- Small groups of Kgatla and Huruthshe-Kwena origin moved from the Tswana area (Brits and Rustenburg) into the territory. Amongst them were the present Pedi (or Rota) who moved into what is now Sekhukhuneland, where they subjected the Sotho already living there.
- During these times Sekhukhuneland was also penetrated by Sotho arriving from the south-east.
- After c. AD1600 the Northern Ndebele arrived from the south-east and settled in what is now the Mokerong district.

It is assumed that during the period from c. AD1700 to AD1826 the Pedi took political control over the territory previously known as Lebowa, but to the south of the Strydpoortberge. The Pedi chiefdom reached its zenith during the reign of Thulare who died in 1824.

During the disruption of the *difaqane* (c. 1822 to 1828) Mzilikazi attacked the Pedi from the south-east in 1826 and in 1827/1828. This caused large-scale depopulation of the southern part of the Northern Sotho territory. The Pedi sought refuge in the Soutpansberg in 1822 and only returned in 1828.

After the wars with Mzilikazi there were wars with the Swazi. The Voortrekkers arrived in the Steelpoort area in the late 1840's. Several armed struggles between the Voortrekkers and the Pedi ensued.

5.3 The historical period

After the British annexed the Transvaal (1877 to 1881) the Pedi was subjugated by the British who were supported by the Swazi during the war of Sekhukhune in 1879 (see more detail below).

In 1842 Andries Hendrik Potgieter wished to move from the British sphere of influence and to establish trade relations with Delagoa Bay. He moved with his followers from Potchefstroom to the Eastern Transvaal and founded Andries Ohrigstad (named after himself and Gergios Gerhardus Ohrig, a merchant from Amsterdam who was well disposed towards the Voortrekkers). The name was later abbreviated to Ohrigstad. The town also served as the seat of the Volksraad.

During 1848 to 1849 Ohrigstad was abandoned when many people died of malaria. The town of Lydenburg was founded further to the south near the

confluence of the Sterkspruit and the Spekboom River. This area was located on higher ground and was therefore healthier than Ohrigstad.

The railway line between Steelpoort and Lydenburg was constructed in 1924 due to an increase in the mining of chrome and magnetite. The name Steelpoort is derived from a hunting expedition that took place either in the late 19th century or the early 20th century. When a group of Voortrekkers from Natal under Frans Joubert had settled there, a man called Scholtz shot an elephant at dusk and on returning next morning found that the tusks had been removed. When the wagons were searched, the tusks were found in the possession of a man called Botha, after which the farm Bothashoek was named. Because an elephant had been killed there, the poort was named Olifantspoort. The river flowing through the poort was called Steelpoort River ('steel' meaning steal).

The Pedi were governed by Thulware until his death in 1824. His main village was Manganeng on the banks of the Tubatse River. His son, Sekwati, fled to the Soutpansberg in the north during the raids of Mzilikazi in 1822. He returned in 1828 and occupied the mountain fortress Phiring, his capital from where he united the Pedi.

The Pedi initially maintained good relations with the Voortrekkers who arrived in Ohrigstad from 1845. However, after a clash with Andries Hendrik Potgieter in 1852 Sekwati moved his capital to Thaba ya Mosego. Border disputes with the Zuid-Afrikaansche Republiek (ZAR) were settled in 1857 with an accord that stated that the Steelpoort River served as the border between Pedi land and the Lydenburg Republic.

Sekwati gave the Berlin Missionary Society permission to establish the Maandagshoek missionary station in Pedi territory. After Sekwati's death in 1861, his son Sekhukhune succeeded his father and also established his village at Thaba Mosego. He ordered the Berlin Missionary Society to discontinue their

work and the mission station was burn down. Alexander Merensky, one of the missionaries, thereafter established the well-known Botšabelo missionary station at Middelburg.

The good relationship between the ZAR and the Pedi was gradually weakened. The period from 1876 to 1879 was one of conflict and war, first with the ZAR and then with the British who annexed the Transvaal in 1877. During the First Sekhukhune War in August 1876, the Voortrekkers attacked Thaba Mosego and partly destroyed the settlement.

The Second Sekhukhune War followed in November 1879 during which Sekhukhune was captured in the Mamatamageng cave and sent to prison in Pretoria. Two divisions attacked the Pedi. The main division, comprised of 3 000 whites and 2 500 black allies, attacked from the north-east. The Lydenburg division consist of 5 000 to 8 000 Swazi impis, 400 other black allies and 400 white soldiers who attacked from Burgersfort in the south. The Second Sekhukhune War is associated with the settlements of Thaba Mosego and Tšate, a new village established by Sekhukhune close to Thaba Mosego.

5.4 Historical beacons near the project area

Several outstanding significant historical beacons are located in or near the Leolo Mountain range, in the peripheral area (outside the project area) which deserves specific reference, namely:

- The mountain Thaba Mosego is part of the Leolo Mountain range. It was here that the British and their allies subjugated the Pedi of Sekhukhune in 1879 during the Battle of Sekhukhune. The Sekhukhune Wars of 1876 and 1879 were both fought near/on this mountain (and in the Leolo Mountain range) where the Pedi chiefs Sekwati and Sekhukhune also established their mountain fortresses.

- One of the main Pedi villages (*mošate*) during this war, namely Tšatse, is also located along the western foot of the Leolo Mountains range.
- The missionary station known as Maandagshoek (or Ratagou) was established in the middle of the 19th century on Maandagshoek, to the north of the project area.
- Two mountains in the Leolo Mountain chain are known as 'Modimolle'. The name 'modimolle' implies that these mountains are sacred places. It is possible that Pedi chiefs (and possibly their wives as well) were buried near one or both of these mountains. (These mountains are probably still sacred places nowadays). The spirits of deceased chiefs (*badimo*) are venerated at these places and sacrifices are made annually at such places.
- The mountain Monganeng on Winterveld 293KT may be where Thulare one of the greatest Pedi chiefs of all time lived during the early 19th century. The remains of his villages may be located near the Tubatse (Steelpoort) River. Names such as 'Badimo' and 'Badimong' are recorded on a mountain close to Monganeng. These names refer to forefathers ('*badimo*') and the place of the forefathers ('*badimong*') and therefore possibly to important settlements and graveyards that have important significance in the origin history of the Pedi.

5.5 The early mining period

Modikwa Platinum's proposed new expansion activities are located on the eastern limp of the Merensky Reef in the northern part of the Steelpoort Valley. Today it is known that the Merensky Reef is composed of the crescent-shaped Bushveld Complex that stretches across the central part of South Africa. This Reef is known for its wealth of mineral resources, generally referred to as the platinum-group metals (PGM's).

The first discovery of the eastern limb of the Merensky Reef can be traced back to the early decades of the 20th century when the reef was exposed from the Leolo Mountain range in the north to where the Steenkampsberg, west of the Dwars River (Dwars River range), commences as a continuation of the Leolo Mountain range in the south.

The norite zone in which the Merensky Reef outcrops is a rugged mountainous terrain, except in the extreme north-western sector. The area is dominated by high, rough-looking scrub-covered hills and ridges that alternate with flat-bottomed valleys. Four perennial streams, the Olifants, Tubatse, Dwars and Moopetsi Rivers traverse the platinum fields with a number of powerful springs in them.

5.6 The discovery of platinum

The first reference to platinum is found in a narrative published in 1748 by Don Antonio de Ullou y Gracia de la Torre, in which he mentioned that a heavy silvery metal occurred together with gold in New Granada (now called Columbia). The metal was described by Sir William Watson, an English physicist, as a semi-metal or metalloid in 1750. Experiments showed that platinum-rich grains consist of a mixture of several metals, namely platinum (Pt), palladium (Pd), iridium (Ir), ruthenium (Ru) and osmium (Os).

The discovery of platinum in South Africa dates back to the late 19th century. In 1892, William Bettel identified osmium-iridium alloy particles in concentrate from the Witwatersrand gold mines. Bettel and Hall and Humphrey also recorded the presence of platinum in the chromatite layers of the Bushveld Complex. Wagner reported the presence of sperrylite in the ore bodies at Vlakfontein near the Pilanesberg. However, none of these discoveries were considered to be of any economic significance. The first deposits that were economically viable, called the Waterberg Platinum, were found by Adolf Erasmus in the Rooiberg fellsites

between Nylstroom and Potgietersrust. These deposits did not prove to be significant. Andries Lombaard's discovery of platinum nuggets in the Moopetsi River on the farm Maandagshoek in the Steelpoort area in 1924 can be considered the initial discovery of the Merenky Reef.

The Merensky Reef occurs, geographically, in the westerly and the easterly parts of the Bushveld Complex. These two limbs of the Complex are confined to the North-West Province and to the Northern and the Mpumalanga Provinces of South Africa.

The Merensky Reef has been traced for a total distance strike extent of 283km, 138 kilometre of which is in the eastern limb and 145 kilometre in the western limb of the Bushveld Complex. Vertical depths of 1 900m have been registered along the Reef, which also indicates its continuity. The eastern limb of the Reef is geologically less well known than the eastern limb, because mining activities in this part of the Reef have been limited.

5.7 Platinum's uses and strategic importance

The platinum-group metals (PGM's), along with nickel and cobalt, are in high industrial demand in the developed world. The platinum group metals are amongst the least abundant elements on earth. However, their properties (density, strength, catalytic features and high melting temperature) give these elements unique applications in complex technology engineering. Some of these elements are irreplaceable in industrial processes, enhancing their strategic importance.

Due to the unique physical and catalytic properties of platinum, the metal is used in a number of applications. It is used in the industrial, chemical, electrical and electronic industries as well as in the manufacture of jewellery, glass and glass

fibre. It is also very important in petroleum refining. In the automobile industry platinum and palladium are used in autocatalysts. This application is expected to increase, due to strict emission control legislation in Europe, North and South America and Japan. A second major (and growing) use of platinum is in stationary phosphoric acid cell (PAFC) and mobile proton exchange membrane (Pem) fuel cells, the latter absorbing hydrogen and converting it into electrical and heat energy. The cell is already being used to power vehicles and this use is expected to grow.

5.8 The decline of early platinum mining

During the great platinum boom of 1925 over fifty companies were started in the Union of South Africa to exploit the mineral resources of the Bushveld Complex and the Waterberg district. Oxidized ores were initially taken from the Merensky Reef. When these ores had been exhausted, they were replaced by sulphide ores.

The world's consumption of platinum and its price became extremely depressed by 1930. This led to the collapse of all the mining companies in the 1930's. Many of the companies faded from memory. More prosperous companies absorbed others, while some companies transferred their activities from the Lydenburg district to the more favourably circumstanced Rustenburg district, while retaining their Lydenburg properties. Some companies went bankrupt and suspended their operations, which they never resumed.

Further fluctuations in the price of platinum during the 1940's and 1950's did not encourage an expansion of mining activities. The demand also did not support or necessitate the enormous scale of mining now seen around the Bushveld Complex until the early 1970's.

The most important actual and potential platinum producers still in existence in 1929 were:

1 Potgietersrust Platinum Ltd.
2 The Lydenburg Platinum Areas Ltd.
3 Onverwacht Platinum Ltd.
4 Waterval (Rustenburg) Platinum Ltd.
5 Platinum Exploration Company Ltd.
9 Nortern Platinum Exploration Company Ltd.
10 Platinum Propriety Company of Lydenburg Ltd.

It is clear from this rating that Onverwacht Platinum Ltd was the third most important role player in the platinum industry in South Africa during the first half of the 20th century.

5.9 Platinum mining resurrected

After the collapse of the platinum industry in the 1930's, only two companies remained and amalgamated namely Rustenburg Platinums Ltd. This mine remained in production until the 1970's when three other companies developed mines to join the platinum market, which again experienced a boom.

6 THE PHASE II HERITAGE IMPACT ASSESSMENT STUDY

The Phase II investigation of the archaeological and historical remains consisting of a Late Iron Age/historical stone walled site (Site LIA01), initiation cairns and mining heritage remains consisting of the Onverwacht Platinum Mine and a series of nine incline shafts along the eastern slope of the Leolo Mountain range is now discussed. These heritage resources have been geo-referenced and mapped (Figure 2).

6.1 The Late Iron Age site (Site LIA01)

6.1.1 Location

Site LIA01 is located along the lower eastern base of the Leolo Mountain range on the farm Onverwacht 292KT and covers a long, narrow surface area as the site stretches over several hundreds of metres from the north to the south. Only a section of the site measuring approximately 100mx100m was investigated. This section of Site LIA01 is demarcated with two dirt roads respectively running to the north and to the east of Site LIA01. Both these roads have been constructed through the larger part of Site LIA01.

Lower down Site LIA01, on the plain below the Leolo Mountain range conspicuous dongas, so characteristic of the Steelpoort Valley, stretches further to the Moopetsi River in the east. In many places these dongas have exposed large numbers of stone tools during earlier surveys. Most of the se stone tools date from the Middle Stone Age.

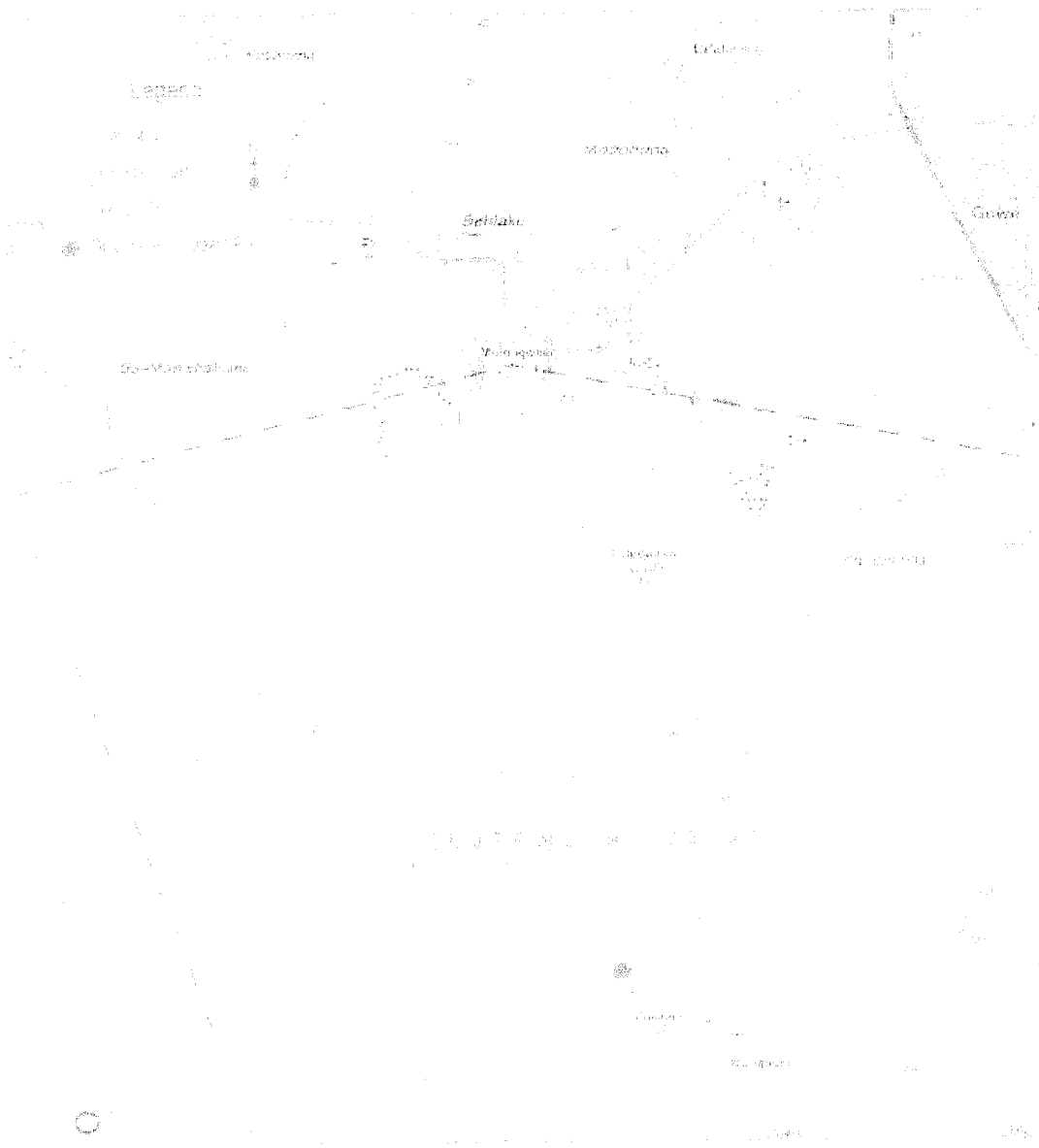


Figure 2- The Modikwa Platinum project area on the farm Onverwacht 292KT in the northern part of the Steelpoort in the Mpumalanga and Limpopo Provinces of South Africa. Note the geographical location of heritage resources that were investigated. These include part of a stone walled site (Site LIA01) which date from the Late Iron Age/historical period, inflation cairns that are probably associated with Site LIA01 and mining heritage remains consisting of a series of mine adits along the eastern slope of the Leolo Mountain range and the Onverwacht Platinum Mine.

6.1.2 State of preservation

Site LIA01 is not in a pristine condition any longer as the site has been damaged by dirt roads and a village which was partly constructed on top of Site LIA01 along the lower foot slope of the Leolo Mountain range. The stone walls of Site LIA01 were utilized in the new village to construct dwellings while some of the walls were readapted to serve as terraces, courtyards around dwellings and as hedges demarcating various dwelling units from each other. The dirt road that passes through the village has been constructed through the lower part of Site LIA01. A dirt road running up the Leolo Mountain has also been bulldozed through Site LIA01 (Figures 3 & 4).

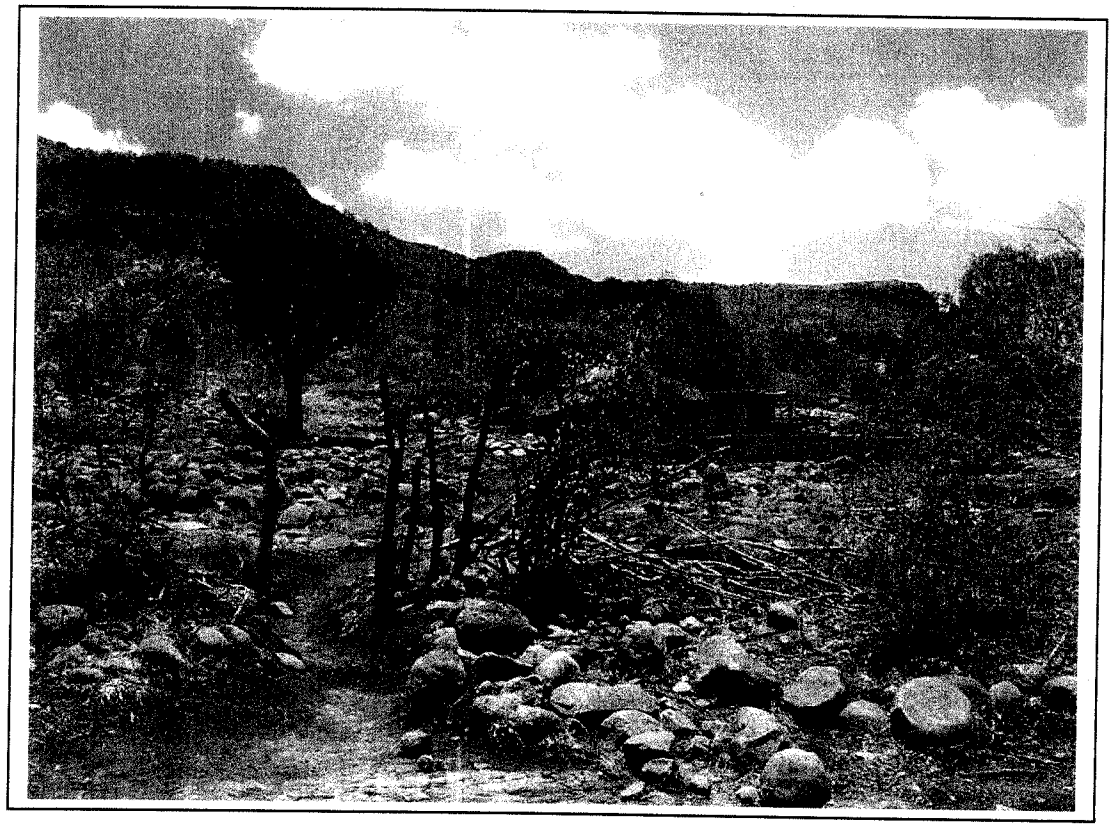


Figure 3- A dwelling in the village which was partly constructed on top of Site LIA01. The old stone walls were used to build dwellings, court yards, hedges and terraces in the contemporary village (above).

6.1.3 General characteristics

Site LIA01 is composed of a number of platforms or terraces that are running from level ground at the base of the Leolo Mountain up the lower slope of the Leolo Mountain. These terrace walls vary in length. They are mostly straight, slightly curved or circular constituting either long narrow terraces, slightly curvaceous and therefore spacious terraces or smaller circular terraces. These terrace walls were back-filled with rubble and soil in order to create level surfaces on which dwellings could be constructed while small enclosures were probably used to keep small stock such as goat (Figure 4).

Most of the terrace walls in the lower part of the site are composed of single lines of stones – sometimes large *in situ* stones were incorporated in these terrace walls. The higher upper part of the site's terrace walls, however, were constructed of several layers of stone and therefore constitute the more elaborate, aesthetically pleasing part of the site. The higher walls are also associated with large platforms or personal spaces and therefore were occupied by the high-status people who lived in this part of Site LIA01.

The spatial composition of Site LIA01 mainly consists of staggered terraces that were built up the lower foot slope of the Leole Mountain while at least two small enclosures with diameters varying between 1,5m to 2,0m occur in the lower part of the site. These structures also exist elsewhere in Site LIA01 and were probably used to shelter small stock.

Other conspicuous features associated with Site LIA01 are the presence of a large scatter of metal slag on several terraces outside the perimeter of the part of Site LIA which was investigated. Although the slag was not chemically investigated it seems to be derived from iron smelting. The slag's occurrence close to living quarters suggests that iron smelting and living quarters may not have been separated in Site LIA01.

6.1.4 The spatial composition of Site LIA01

Site LIA01 can be divided into three spatial units, namely:

- The Higher Upper Part (HUP) which is composed of the two largest terraces in Site LIA01.
- The Central Middle Part (CMP) which is composed of the two middle levels of terraces.
- The Lower Part (LP) of the site which is also composed of at least two levels of terraces.

The three units can primarily be distinguished from each other on the basis of the diminishing quality that is noticeable in the construction of the descending terrace walls that are associated with Site LIA01.

Other lesser structures, artefacts and features are associated with Site LIA01 such as small circular enclosures, concentrations of slag, potsherds, tin and metal plate and glass ware.

The three spatial components are now briefly discussed and illustrated with photographs (see Figure 4 and 1:250 map attached to report).

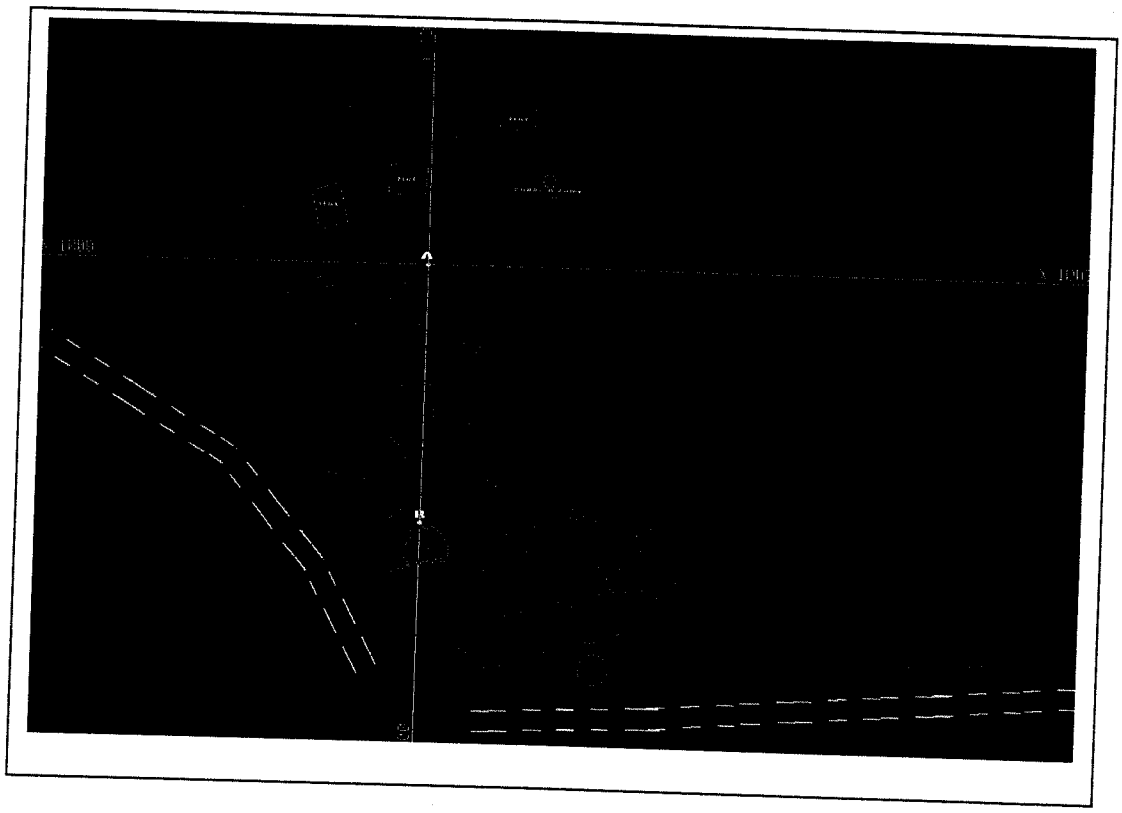


Figure 4- The spatial composition of Site LIA01 consists of three main spatial components, namely a Higher Upper Part (HUP), a Central Middle Part CMP) and a Lower Part (LP). These three components are composed of terraces that vary in size and construction and reflect a social hierarchy in the site (above).

The remains of square mud dwellings, metal plate and glass ware in Site LIA01 also indicate that the site was occupied in more recent times.

Brown: terrace walls; blue: contour lines; white: dirt track roads; orange: contemporary dwellings; pink: midden; red: rocks.

(See 1: 250 scaled map for more detail [appended to the report]).

6.1.4.1 The Higher Upper Part (HUP)

The Higher Upper Part (HUP) of Site LIA01 is composed of two large terraces that are both demarcated with conspicuous high walls at the back and to the front of these two levels of terraces. These largest terraces in Site LIA01 are also situated at the highest level in Site LIA01. The second largest terrace is situated directly below the highest and largest terrace. Several large *euphorbia* trees occur along the elaborate terrace wall that separates these two most conspicuous terraces from each other.

Whilst the lower second terrace contains no visible surface material the largest terrace is associated with the following structures and features:

- At least three square mud residences occur on the surface of this platform. These dwellings are now dilapidated and represent intrusive structures that were superimposed on the older stone walls in more recent times.
- A large midden is located in a sisal bush near a few protruding boulders on the western end of the large terrace.
- A prominent entrance is located on the eastern end of the large terrace. This feature as well as the adjoining walls on the opposite ends of the opening have been readapted in more recent times and consequently do not represent the original entrance of Site LIA01 any longer.

A few undecorated potsherds occur on the surface of the large terrace.

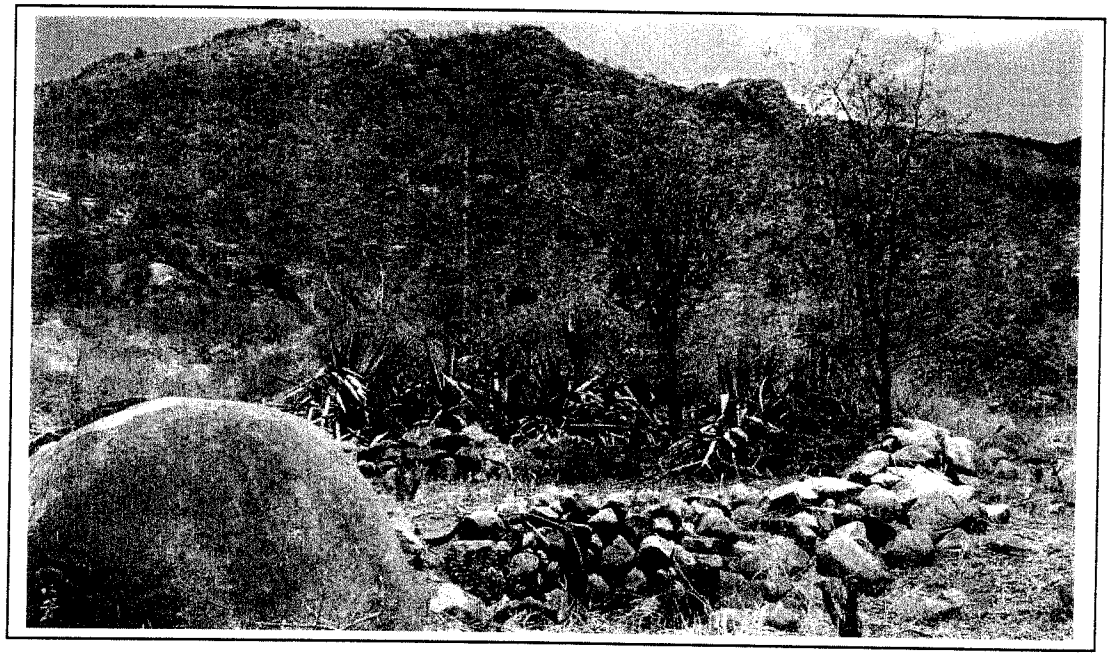
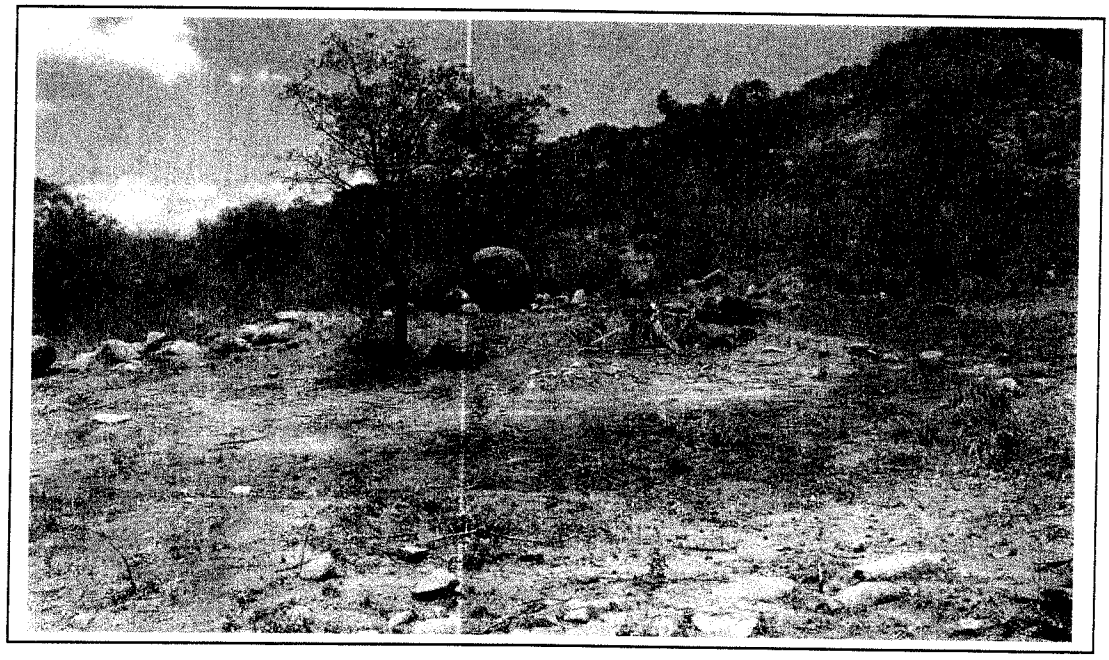


Figure 5 & 6- The Higher Upper Part (HUP) and the Central Middle Part (CMP) of Site LIA01 is demarcated with a conspicuously high wall. The remains of mud dwellings from the more recent past occur on the HUP of Site LIA01 (above and below).



6.1.4.2 The Central Middle Part (CMP)

The Central Middle Part (CMP) of Site LIA01 is also composed of two levels of terraces. However, these terraces are less impressive than the higher terraces as they are much smaller than the higher located terraces. Their walls are also low in comparison with those of the higher terraces. The surfaces of these terraces are not level any more as parts of these terraces have been washed away due to erosion.

The CMP of Site LIA01 is characterised by the presence of a large boulder and an ant heap. No potsherds or any other material were observed on the surface of these terraces.

Figure 7- The Central Middle Part (CMP) of Site LIA01 is constructed with lesser impressive terraces that the HUP of the site (above).

6.1.4.3 The Lower Part (LP)

The Lower Part (LP) of Site LIA01 is the most inferior part of the site and is composed of at least two terraces that were constructed with single stone lines while natural rocks, left *in situ*, help to demarcate the few terraces that are confined to this part of the site.

No archaeological material was observed on the surfaces of the Lower Part of Site LIA01.

Figure 8- Pieces of slag outside the perimeters of Site LIA01. No evidence for any reduction (smelting) furnaces was observed at Site LIA01 (above).

6.2 Initiation sites

6.2.1 Location

At least two initiation sites, each with at least two stone cairns were mapped in the project area. These sites occur higher up the slope of the Leolo Mountain range than Site LIA01 and are situated between the stone walls of Site LIA01 and the shafts along the base of the mountain range (Figures 2 & 9).

It seems as if the initiation cairns can either be associated with the people who occupied Site LIA01 or with descendants of the people who lived in the stone walled site and who already have abandoned the site but who erected these cairns in close proximity of Site LIA01.

If the initiation cairns were contemporaneous with Site LIA01 it would mean that they were constructed and used by the people who occupied this site during the Late Iron Age and/or early historical period. It is also possible that the initiation cairns may have been used after Site LIA01 was abandoned, perhaps in the late 19th century or during the early 20th century by descendants of the original occupants of the stone walled site. The use of abandoned sites for rituals of any kind, such as the *bodika* ceremony for boys, would have emphasised the tradition of continuity that is associated with the *bodika* ceremony as the abandoned site (and the deceased forefathers) would have had a powerful influence on the ceremony.

The initiation site on Onverwacht 292KT is not unique. It is expected that many of these sites would still be found in the Steelpoort area. An initiation site with several stone cairns similar to those under discussion was recorded on a low hill on the farm Derde Gelid 278KT in 1992.

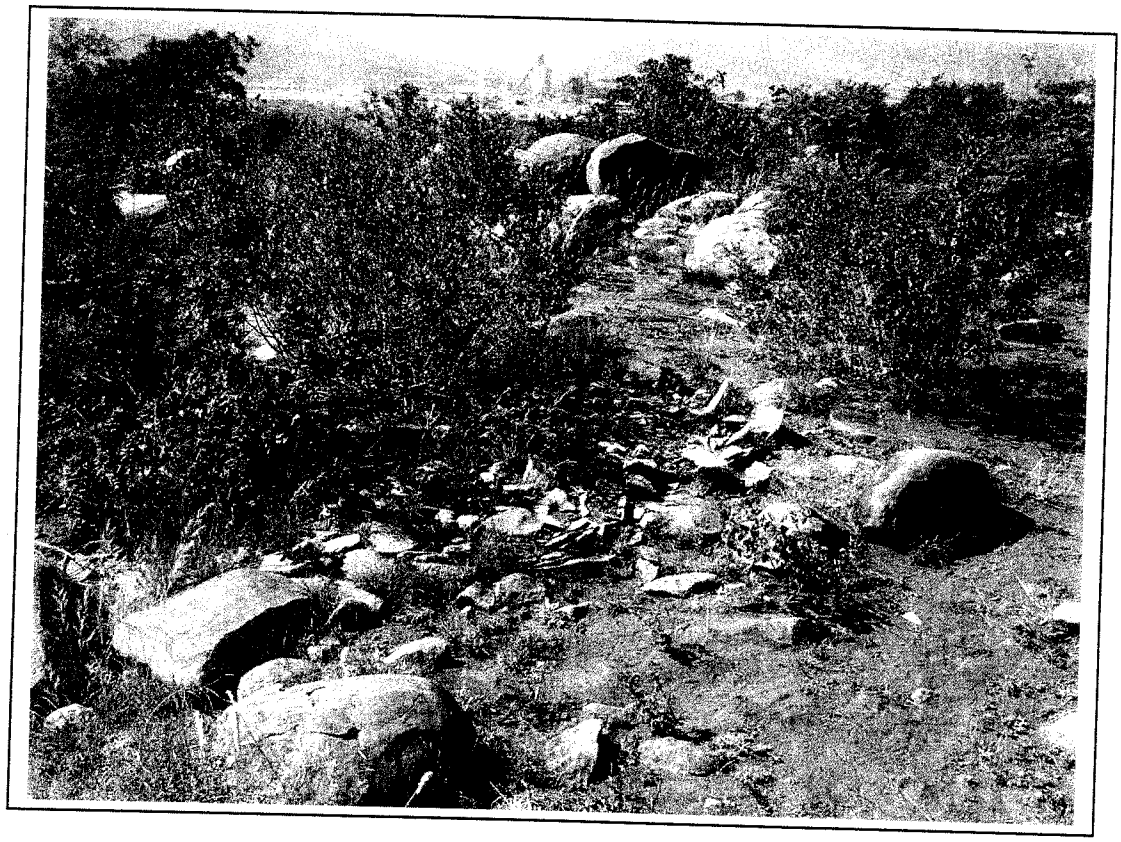


Figure 9- The dilapidated remains of two initiation cairns next to each other on the lower slopes of the Leolo Mountains range, above Site LIA01 (above).

The larger (*phiri*, hyena) and smaller cairns (*phiśana*, hyena cub) were used, respectively, to keep the ashes of the high ranking and the commoner boys' fire-places after they have attended the *bodika*. The *mphatho* (lodge) where the *bodika* was held was probably built higher up the Leolo Mountain, away from Site LIA01.

6.2.2 Initiation sites amongst the Pedi

The uninitiated youth amongst the Pedi forms an own community within the tribe and has certain functions to perform within the community. They are looked down upon by adults as they are considered useless and as a lawless gang. As they grow older they have to be incorporated in the tribe. This is achieved by means of the initiation ceremony which serves as a rite of passage allowing them full membership of the tribe.

Initiation amongst the Pedi is termed '*koma*'. This literally means to circumcise. The term is derived from '*lebêllo*', from the verb '*go bollo*,' which means to be hurt. Initiation consists of three ceremonies, namely two ceremonies for boys called the *bodikwa* and the *bogwera* and a third ceremony for girls called the *byale*. Normally four to five years elapse between initiation ceremonies while the period covering all three the ceremonies lasts from one to two years. The normal age of initiates is between twelve (12) to sixteen (16) years. The initiation school centres on the son or grandson of the king or a boy of high royalty and rank who bears the title of little chief (*kgosana ya mphatho*) of the initiation lodge. This boy will remain the life long leader of this age group (regiment).

The discussion here only focuses on the first ceremony of the initiation school for boys, namely the *bodika* as the stone cairns on Onverwacht can be related to this session of the initiation ceremony for boys.

As soon as the time for initiation arrives, the young initiates must make them available for free work in the chief's village. During this period the boys are allowed complete freedom. However, their behaviour becomes increasingly intolerable. They will steal openly and will take by force sugarcane or melons from women returning from the veldt.