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

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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.

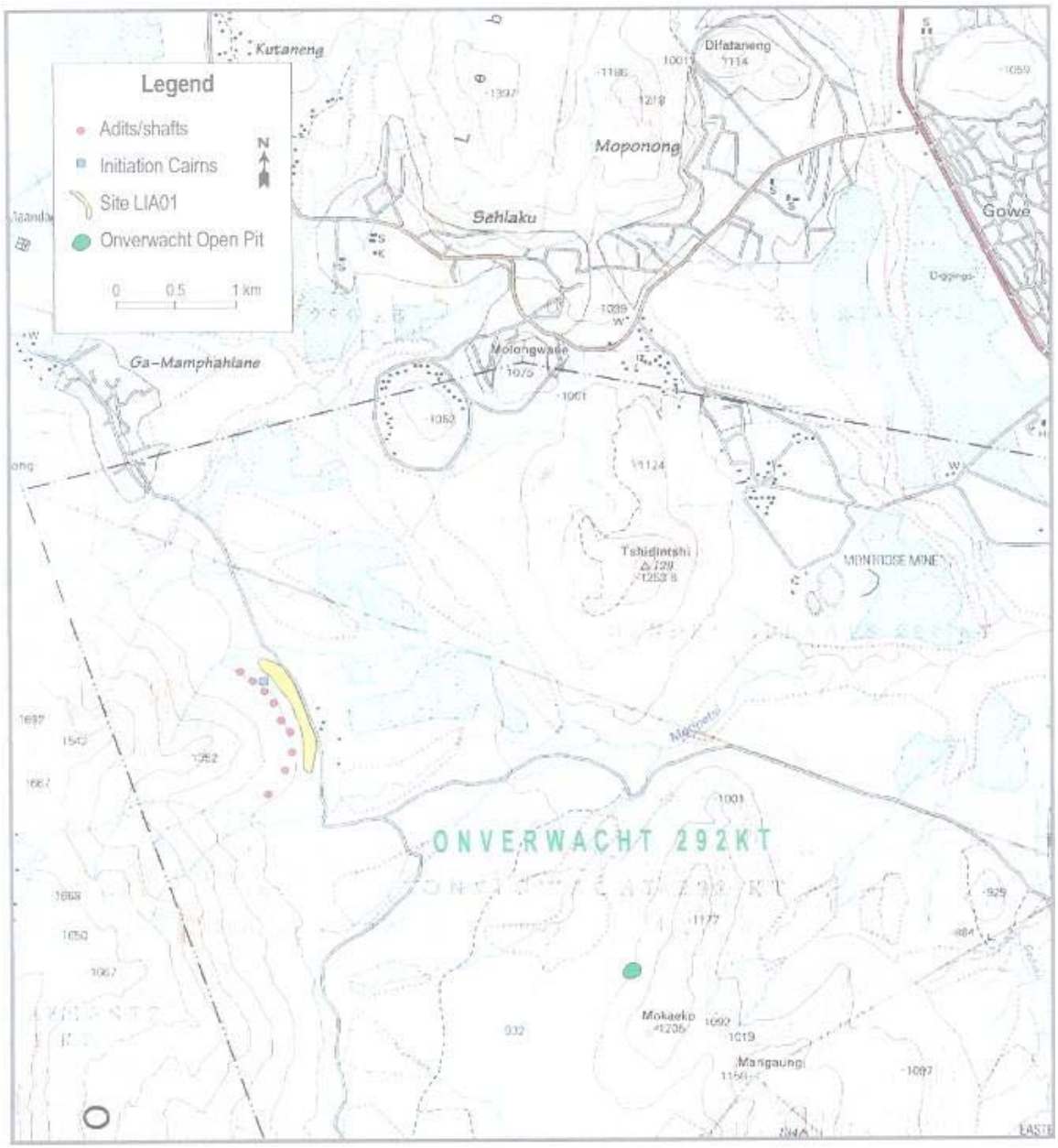


Figure 2- The Modikwa Platinum project area on the farm Onverwacht 292KT in the northern part of the Steelpoort in the Mpumalanga and Limpopo Provinces of South Africa. Note the geographical location of heritage resources that were investigated. These include part of a stone walled site (Site LIA01)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

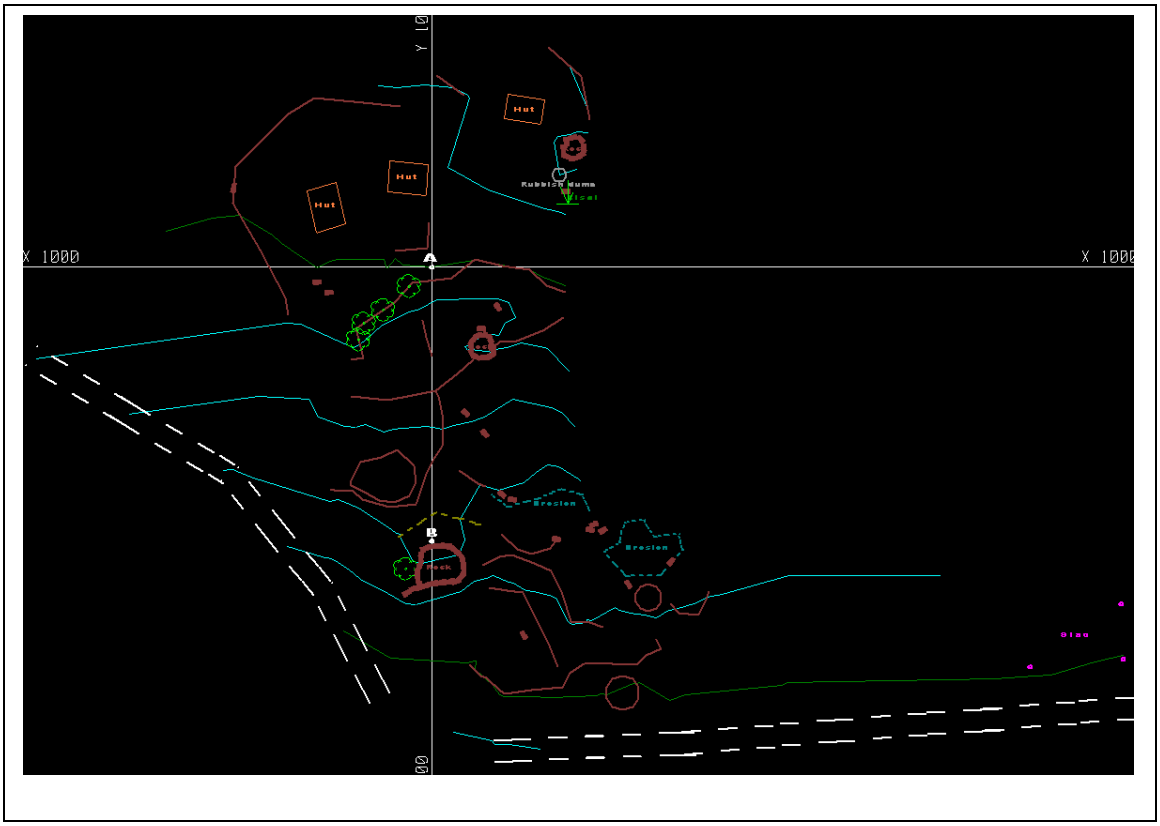


Figure 4- The spatial composition of Site LIA01 consists of three main spatial components, namely a Higher Upper Part (HUP), a Central Middle Part CMP) and a Lower Part (LP). These three components are composed of terraces that vary in size and construction and reflect a social hierarchy in the site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

A few days before the *bodika* commences the inner council of the chief will nominate a master (*rabadia*) and a deputy-master (*moditiana)* for the school. These men will control and direct the activities of the session. The previous initiates (*mediti*) are largely responsible for the initiation of the boys under the direction of the *rabadia*. A *thipana* (witch-doctor) is also appointed to perform the circumcision. After the functionaries were appointed the chief will provide then with a bag with the foreskins of the boys of the previous initiation school. These will be roasted and mixed with *tshidi* – the usual preventative medicine against witchcraft. This medicine will be used to treat the site where the new initiation lodge will be built.

The chief will announce the day of the commencement of the *bodika* and will invite neighbouring chiefs to attend the opening ceremony. The boy's hair will be shaven by their mothers and they will cast off their old clothes. Their fathers will provide them with new loin skins.

The boys will then gather in the *kgorong* and be instructed to go into the veldt for the day to collect fire wood for the chief and bark from the trees which are fashioned into small rings to be used the following day to tie up their genitals after circumcision to protect their wounds.

That night the initiates sleep in the *kgorong* with all the men of the tribe. Men are not allowed to have relationships with women during this period. The *mediti* engage in sham fights. One of the most important ceremonies of the whole initiation is performed this night and will be regularly repeated throughout this session of the initiation school.

During the night of the opening ceremony the initiates will line up in a single file with the *kgosana ya mphahto* in front. He is followed in descending order (rank) by the other boys of the royal *kgoro*. These are again followed in a similar fashion by the boys of the next *kgoro* in seniority and so on down to the lowest boy in

rank of the most inferior *kgoro*. The boys are made to bend over and each is lashed twice with a *moretlwa* switch by the *rabadia* starting with the *kgosana ya mphahto* and ending with the boy lowest in rank.

The purpose of this act is to indicate that status and rank (birth and social superiority) will henceforth be the factor that determines leadership and not strength and ability as the case was when leadership was determined by means of stick fights between boys. This ceremony, as many others during initiation, underlines the fact that initiation is not merely an educative institution, but that it is largely and institution of, and introduction of the candidates into the social and political structure and organisation of the tribe.

Before daybreak the following day the war horn (*phalaphala*) will be blown whereupon the boys, accompanied by the chief in front, *mediti* and all the tribesmen, in rank and file, will move to the river while singing to conduct the circumcision ceremony. The boys will be circumcised according to rank although a boy of low status (*molobi*) will be used as a model, in case of witchcraft, and be circumcised before the *kgosana ya mphatho*. The *molobi* will also proceed in all other activities during the initiation.

After circumcision all the boys are made to laid down in the shade of a tree for the rest of the day. During the night and the latter part of the *bodika* the boys remained naked. Each son is given a specially prepared leather skirt (*motshabelo*) by his father. Formerly, the wounds would remain unattended to, to heal of their own accord.

After the circumcision the boys return home to rest while the *mediti* are busy building the initiation lodge (*mphatho*) where the boys spend the nights for the duration of the ceremony. The lodges of successive *bodika* sessions are always built on more or less the same site. This place is taboo for all women and children.

When the lodge is completed and the fires burning the boys will march into the *mphatho*. Their march will be in the same rank and file in which they were lashed. They may only enter the lodge through their own entrance leaving their skirts outsides. Here they will gather every night for the duration of the ceremony which lasts approximately three months. During this period they may not be seen or come into contact with any women or uninitiated children.

For the first few days after circumcision they remain in the lodge to allow their wounds to heal. As soon as scabs have formed they start their daily routine. The fact that they are now in a dangerous and transitional phase is emphasised by various customs. They have to whiten their bodies with ash and chalk. They are taught a peculiar secret language. All the utensils they use and orders that are given have special names during this ceremony.

Excessive care is taken against witchcraft as can be seen in all the precautionary measures that are taken with their meals. Women from the village prepare their food which is left at a safe distance from the lodge.

The daily routine during the whole session changes very little. Most of the day-time activity is taken up by hunting and practising the crafts of men such as wood working and leather making.

Early and late afternoons as well as evenings are devoted to formal instructions and the singing of initiation songs. They are taught the essential manly qualities of cowage and endurance. They are also taught to be obedient to their fathers and disobedient to their mothers. Much stressed is laid on the essential attitude of deference towards and respect of the chief. They are taught the tribal history and the genealogies of the royal family. They are instructed in tribal law and in sex education. The aim of the formal instruction is to prepare the boy as a

potential adult for the social, political, jural and economic roles that will be expected from him as a man.

This formal instruction is done by teaching the boys traditional formulae which has to be learnt by heart in an archaic form of language. Boys of each *kgoro* are instructed by the *mediti* of their own group while sitting around their own fire in the *mphahto*.

Throughout the session the boys are subjected to various tests of endurance. The lashing according to rank continues daily. When they forget their formulae they are harshly beaten by the *mediti*. It occasionally does happen that boys may die during the initiation. Such incidents are accepted as a boy 'has been eaten by the *koma*'.

Shortly before the end of the session each age group will receive a regimental name as the group become a regiment (*mphatho*). The name of the regiment depends on the name of the leader.

As soon as the regiment has been formed the tribe will be informed of the closing of the session. Preparations are made for a feast with the chief inviting neighbouring chiefs for the homecoming of the boys.

> 'During these last days the boys will be shown how to break up a rock into smaller pieces by heating it with fire and subsequently cooling it with water. Every boy has to prepare a few of the slabs which break off in this manner by smoothing their surfaces. These flat slabs are then given to the *mediti*. On their last day, the boys are sent out to collect fire-wood, which they have to take to the chief on their return. In their absence, the *mediti* erect some cairns with the stones near the men's entrance to the lodge. They usually built three cairns, slightly conical in shape, one large, approximately three feet high, called *phiri* (hyena), and two smaller ones

> about half the size of the previous one, called *phiŝana* (hyena cub). In these cairns are placed some of the ashes of the *bodika* fires, those of the royal and principal groups in the *phiri*, and of the subordinate groups in the *phiŝan*a. When the boys return to the lodge they will be shown the cairns, which will remain as a visible monument to their regiment.‘ (Mönnig 1978: 120)

Early the next day all the men of the tribe will again gather at the lodge. The boys will bath to wash off the white colouring. Each father will cut his son’s hair and clothes him in a new loin-skin. Their bodies will be rubbed with a mixture of fat and red-ochre.

While the boys are being prepared the remaining men will break up the lodge. The boys are lined up according to rank and file and will be lashed for the last time. As they proceed towards the village in rank and file, not looking back, the *rabadia* will set the *mphatho* to fire.

On arrival in the village the boys are joyously greeted and a great tribal feast held in their honour. A short period of fasting is now observed by the boys, all mothers whose first sons are candidates and the girls of corresponding age group. This is ended when the boys are ritually bathed to clean themselves from the red ochre. The boys remain at the chief’s place for ten days where they are lavishly entertained. After this they are reminded of their duties and responsibilities before they return to tribal life.

6.3 Mining heritage remains

Two main types of mining heritage remains occur in the Modikwa Platinum project area, namely (Figure 2):

- The remnants of the abandoned Onverwacht Platinum Mine's open cast pit on Onverwacht 292KT; and
- A series of incline shafts sunk along the lower eastern slope of part of the Leolo Mountains on Onverwacht 292KT.

Only the shafts along the lower slope of the Leolo Mountains occur in the present Modikwa project area. However, a brief description of the Onverwacht Platinum Mine is also provided below.

The descriptions of the historical mining activities in the Steelpoort below is given in the English metric system, namely feet and inches as this was the measurement system used during the early 20th century.

6.3.1 The abandoned Onverwacht Platinum Ltd

The Onverwacht Platinum Mine is located along the western slope of a long, low bush clad ridge situated across a wide valley to the east of the Leolo Mountain and the shafts on Onverwacht 292KT. Both the shafts and the Onverwacht Platinum Mine date from the early decades of the 20th century when the exploration for and mining of platinum commenced in the Steelpoort (Figure 2).

The Onverwacht Platinum Mine originated from a vertical pipe which originally appeared as an outcrop, a small knoll or a platform of hortonolite-dunite on the western slope of a long, low bush clad ridge that rose 250 to 350ft above the plains surrounding the ridge.

By 1929 the amazing ore body that formed the basis of the Onverwacht Platinum Mine was exposed by means of shafts, tunnels and stopes to a vertical depth of nearly 800ft although a practically barren zone of some 250ft had to be passed to attain this depth which still carried platinum values.

Exposure of the ore body proved that it is an irregular parsnip-shaped segregation of hortonolite-dunite and hortonolite-wehrlite within a much larger body of olivine-dunite that exhibits a transgressive or discordant relation towards the rocks surrounding it. The Onverwacht platinum pipe had the character of a steeply inclined pipe as the hortonolite-dunite body was inclined at an average angle of 78º 30' in a direction S 28º E.

The diagrammatic geological section of the Onverwacht platinum pipe revealed the following geological features (Figure 10):

- 1-2: The ridge which is built of bronzite forming part of a huge sheet of that rock dipping to the west at about 13 degrees. It encloses at least two seams of chromite.
- 3: The olivine-dunite enclosing the hortonolite-dunite ‘pipe’ exhibits near the surface fairly advanced serpentinisation and is traversed by veins and seams of dense magnesite. The dunite exposed on the walls of the open mine is thus seen to be traversed by a roughly rectangular network of magnesite veins up to 9” in thickness which resent a striking contrast to the surrounding dark rock. The contrast between the hortonolite-dunite and olivine-dunite, while well defined, was extremely irregular. The main body of hortonolite-dunite created wedge-shaped, carrot-shaped and irregular ore shoots in the surrounding olivine-dunite.
- 4: The main body of hortonolite-dunite was roughly circular in plan at the outcrop and measured roughly 60ft by 60ft. The hortonolite-dunite was regularly jointed and in consequence weathered in big rectangular slabs.

- 4a & 5: Horizontal and steeply-inclined vuggy seams and veins of quartz, chalcedony and opal up to 4'' thick, or of a dense compact dull-white mixture of magnesite and opal occupying joints in the dunite were much in evidence between the surface and the 50ft level. Some extended to a depth of 100ft but below that depth there was no sign of them.

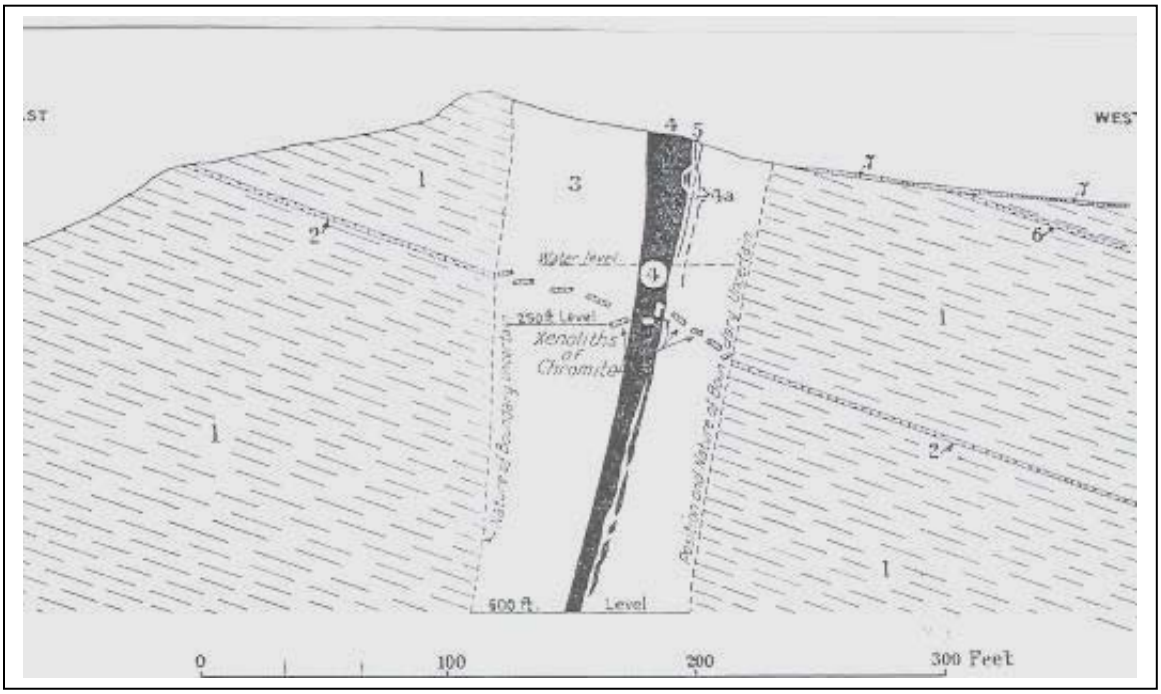


Figure 10- The Onverwacht platinum 'pipe' in vertical section (above) (Wagner 1973:65). The geological deposit associated with the 'pipe' is described in the text.

The Onverwacht platinum ‘pipe’ changed in shape as its depth increased. On the 100ft level the area of the pipe measured 2 925ft². Below this level it decreased steadily. The ‘pipe’ area now measured 2 270ft². Below the 350ft level the main body split into three smaller branches or roots. The biggest of these persisted below the level in a continuous body to the greatest depth attained and still had an area of approximately 420ft² on the 750ft level. The other roots was replaced below the 450ft level by irregular patches and seems of hortonolite-dunite which were located roughly parallel to the main root.

The platinum content of the hortonolite-dunite ranges from nil to 1 213 dwts per short ton. In the upper levels of the central part of the ‘pipe’ it averaged well over 1oz of platinum to the ton. The richest platinum was to be found between the 200ft and 250ft levels. The best average values were encountered on the 250ft level which showed an average of 18,4dwts over a pay area of 2 270ft. Below the 250ft level there was a steadily falling off in values and between 550ft and 700ft the pipe was practically barren. At 700ft good values were again struck. The pay averaged 11dwts over 420ft. These good values persisted to the 750ft level which averages 9,5dwts over a pay area of 420ft². On the 800ft level much lower values were again encountered.

The mining methods that were followed in the Onverwacht Platinum Mine were determined by the types of deposits that were encountered in this mine. Various types of platinum deposits such as the almost vertical dunite ‘pipes’ (Lydenburg district); big, irregular steeply-inclined lenses (Mokopane) and relatively narrow but very extensive tabular ore bodies with low moderate dips (Rustenburg and Lydenburg) usually determined the mining methods that were used to mine platinum in the early 20th century.

Figure 11- Side wall of the Onverwacht platinum 'pipe' showing the hortonolite-dunite walls of the open mine which is traversed by a roughly rectangular network of magnesite veins up to 9" in thickness. These white veins strike a sharp contrast against the surrounding dark rock.

The dunite occurrences at the Onverwacht Platinum Mine presented rather novel features to South African mining engineers. From the surface to depths ranging from 30-80ft the platinum-bearing dunite was broken in open quarries. The ore below this depth was attacked by three compartment shafts sunk well outside the area of enrichment. From these shafts cross-cuts were driven at intervals of 100ft to intersect the 'pipes'. From the cross-cuts levels were opened up and these in turn were connected by vertical development winzes sunk either within the 'pipes' or just outside them.

For the extraction of the great cylindrical bodies of ore thus blocked out the Onverwacht Mine employed the following. Thin concrete ‘mats’ or platforms’ were built across the ‘pipe’ at intervals of 50ft and the hortonolite-dunite between removed slice by slice by overhand stoping. As each ‘lift’ or slice of the ore body was stoped out the excavated area was filled with waste rock tipped from the development winze from the level above.

As stoping proceeded, a timbered ore-pass was constructed through the filled area. Down this the broken ore was sent to the level below to be trammed to the main shaft and hoisted to the surface.

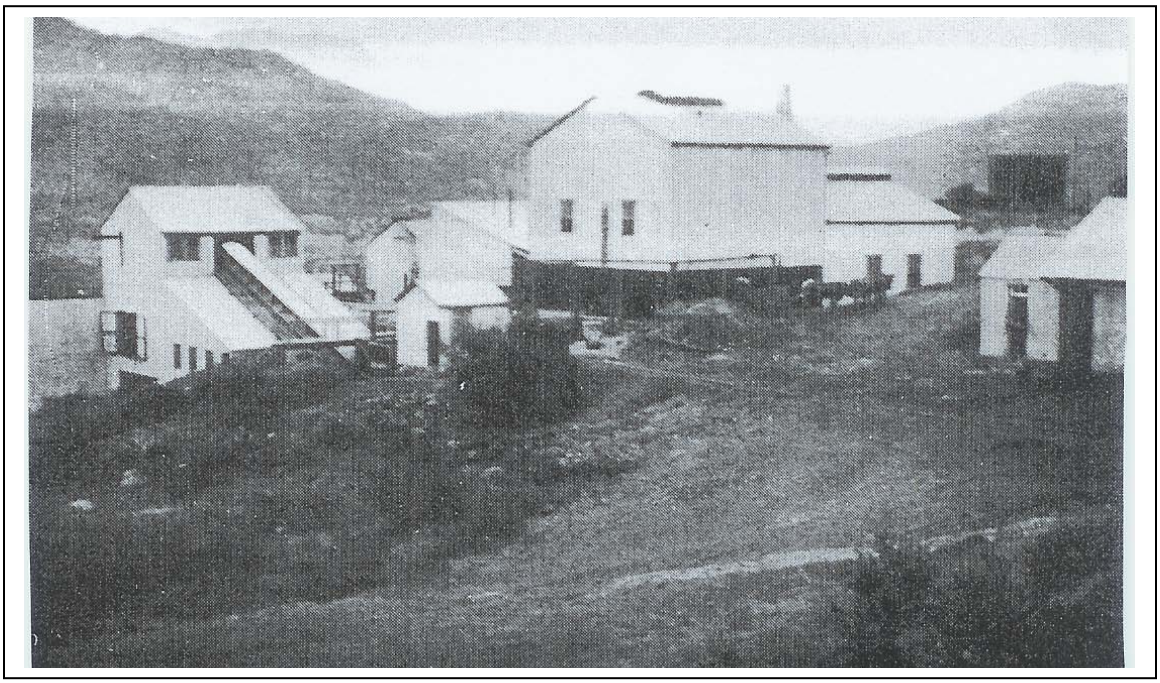


Figure 12- Infrastructure that used to be associated with the Onverwacht Platinum Mine (above). Important plants included treatment plants, power plants as well as mills. Other conspicuous structures were the towering headgear of vertical shafts (Wagner 1973:78, 96).

6.3.2 Shafts along Leolo Mountain

Up the lower slope of the Leolo Mountain range, above Site LIA01, a series of nine prospecting shafts are located from the north to the south along the base of the Leolo Mountain range on Onverwacht 292KT. At least three of these adits occur near Site LIA01 while the remaining six are situated further to the south along the base of the Leolo Mountains, outside the perimeters of Site LIA01 (Figure 2)

These shafts along the lower eastern foot slope of the Leolo Mountain range can be traced back to the search for the Merensky Horizon in the Lydenburg and Pietersburg districts during the early 20th century. A great deal of explanatory work consisting of putting down a number of inclines, several of which attained considerable depths and from which, in the sulphide zone, tunnels were driven on Umkoanestad, Maandagshoek, Forset Hill, Zeekoegat and Middelpunt were done in the years 1925, 1926 and 1927. The operation was finally suspended on 11 August 1927.

The Merensky Horizon was traced at intervals from Rooiboschbult 1965 on the Springbok Flats to Sterkfontein 221 in the southern part of Pietersburg, roughly for a distance of 100 miles.

On Rooiboschbult, the easternmost locality where the horizon was found, the strike was apparently east and west. The horizon did not outcrop but was located by means of prospecting beneath a considerable thick surface limestone deposit. Between Rooiboschbult and Doornvlei 612 where the horizon was next found a gap of some miles occurred. The horizon next appeared at Zeekoegat 312 from where it was traced, almost without a break, as far as Eestergeluk 348, a distance of 40 miles.

The horizon was opened up in this stretch on the following farms: Zeekoegat 312; Middelpunt 20; Umkoanestad 28; Brakfontein 84; Klipfontein 119; Pashashoek 126; Twickenham 336; Hackney 337; Forest Hill 342; Winnarshoek 349; Driekop 170; Maandagshoek 148; Onverwacht 330; Winterveld 424 and Eerstegeluk 348.

Figures 13 & 14- Two of nine incline shafts along the lower base of the Leolo Mountain range. These shafts were sunk during the second decade of the 20th century in search of the Merensky Horizon (above and below).

Figure 15- An incline shaft in operation on the Merensky Horizon during the early 20th century (Wagner 1973:151) (above). The shafts on Onverwacht 292KT had similar appearances and were used to penetrate the Merensky Reef in order to obtain platinum bearing deposits from this horizon (above).

The dip in the Zeekoegat-Eerstegeluk section ranged from 5 degrees to 25 degrees and in places, as far instance on Forest Hill 342, the horizon is disposed in gentle undulations.

A considerable amount of work was done on the horizon in the northern half of Eerstegeluk. The horizon in its normal development was again found in the southern part of Tweefontein 221, a distance of 21 miles, there is an almost continuous outcrop.

Three main facies were distinguished in the Merensky Horison, namely:

- The Maandagshoek facies was developed in the central part of the field. Here the layer consists of a comparatively thick layer of 'Merensky Reef' rather coarse grained in its upper portion which is platinum bearing and a lower portion which is barren of platinum.
- The Zeekoegat facies developed in the northern and north-western part of the fields where the horizon is made up of three layers of 'Merenky Reef' separated by two thin 'chrome bands'.
- The Helena facies as developed in the southern part of the fields in which an inconsiderable layer of coarse pegmatitic norite or feltspathic pyroxinite and thin 'chrome bands' are developed in the uppermost part of a thick body of 'Merensky Reef' – the platinum metals being concentrated here too in the uppermost part of the horizon.

It was found that the platinum horizon in the Maandagshoek facies, on Maandagshoek 148 and adjoining farms such as Onverwacht 292, consisted of a thick tabular body of pseudoporphyrithic pyroxinite diallage-norite carrying platinum in its uppermost portion. The platinum bearing reef (no 3) is variable as to grade and composition and in place encloses patches of coarse-grained pegmatitic norite. Only the uppermost 2 or 3 feet of the horizon carried platinum and, as elsewhere in this part of the Lydenburg district, the average platinum metals content of even this portion of the horizon did not exceed 2 dwts.

7 CONCLUSION AND RECOMMENDATIONS

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. Consequently, A Phase I Heritage Impact Assessment (HIA) study was done for Modikwa Platinum during April 2004. The Phase I report recommended that certain Phase II work be undertaken as the development project may impact on some of the heritage resources.

This report described the Late Iron Age site (Site LIA01), including initiation sites, and the mining heritage remains on Onverwact 292KT and provided, where possible, explanations for the meaning and the significance of these remains. As Modikwa Platinum is located in the heartland of the pre-historical and the historical Pedi chiefdom the description and explanation of Site LIA01 and the inisiation sites was done by using oral tradition and ethnographic information with regard to the historical origins and past life-ways of the Pedi. However, Modikwa Platinum is also associated with a rich mining heritage. Consequently, historical information was used to explain the significance of the mining heritage remains on Onverwacht 292KT.

Site LIA01 is marked by stone walled terraces that serve as retaining walls to create a stepped site located against the lower eastern slope of the Leolo Mountain Range. The site, however, is severely damaged in places as it was re-occupied in more recent times when a local community established their village on top of the older remains. It seems as if the terraces may have contained dwellings, such as huts, and that small enclosures may have been used to keep small stock. No large enclosures for cattle occur near the site. The presence of metal slag that is possibly derived from the smelting of iron may suggest that limited iron working was done in

certain parts of Site LIA01. Archaeological remains such as pot shards occur in limited numbers on the terraces. No grinding stones were observed although these could have been robbed by the inhabitants of the village that is superimposed on Site LIA01.

Site LIA01 seems to have been occupied during at least two periods, namely during the Late Iron Age (c. AD1700 onwards) into the historical period (c. AD1840 onwards, until the last few decades of the 20tth century). The second, recent occupational period explains the presence of tin plate, pieces of glass and the foundations of square mud dwellings on the High Upper Part (HUP).

The large terraces in the HUP of the site followed by the smaller, less complicated and spacious terraces in the Central Part (CP) and in the Lower Part (LP) of the site, suggests some form of social stratification of the site with the royalty (high status community members) living in the higher part of the village and the commoners down below.

At least two initiation sites, each with at least two stone cairns were mapped in the project area. 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. These sites can be linked with the initiation school for boys (*bodika*) and were used to keep the ashes from the initiation lodge (*mephatho*). The larger initiation cairn was called the hyena (*phiri*) and the smaller cairn the hyena cub (*phiŝana*) and respectively kept the ashes from the fire places of the boys that were part of the royalty and the boys that were from common rank.

Two main types of mining heritage remains occur in the Modikwa Platinum project area, namely the remnants of the abandoned Onverwacht Platinum Mine's open cast pit and a series of incline shafts sunk along the lower eastern

slope of part of the Leolo Mountains. Both the incline shafts and the Onverwacht Platinum Mine date from the early decades of the 20th century when the exploration for and mining of platinum commenced in the Steelpoort. The Onverwacht Platinum Mine (Ltd) was the third most important role player in the platinum industry in South Africa during the first half of the 20th century. After the collapse of the platinum industry in the 1930's, only two companies remained and amalgamated namely Rustenburg Platinums Ltd.

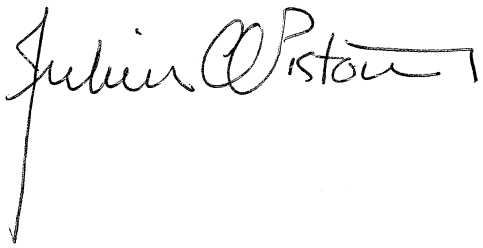
Since the Phase II investigation was undertaken Modikwa Platinum has altered their expansion programme to such an extent that no heritage resources will be affected by the new development project in the near future. Only one of the adits (shafts) along the side of the Leolo Mountain will be re-utilised as this shaft will be used to gain access into the platinum bearing deposits in the mountain range.

The graveyard [GY01] will also not be affected by Modikwa Platinum's proposed expansion activities. This feature will be left undisturbed in its present location where it will be accessible to family members and friends of the deceased to make pre-arranged visits to the graveyard. Modikwa Platinum should consider demarcating the graveyard with a fence in order to prevent that any accidental damage occur to this site.

The exceptionally deep Onverwacht open pit has been demarcated by Modikwa Platinum as part of the mine's safety regulations. This measures will simultaneously contribute to the conservation of this unique heritage site.

No specific mitigation measures are proposed for the heritage resources in the Modikwa Platinum Mine. However, it is recommended that Modikwa Platinum consider monitoring all heritage sites in the mine lease area by means of completing a checklist drawn up for each type/range of heritage resource. This checklist must be updated annually. New heritage sites that are discovered must

be added to this checklist which must serve as the basis of a cultural heritage register, which must be kept by reputed mines. This task must be undertaken by an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA).



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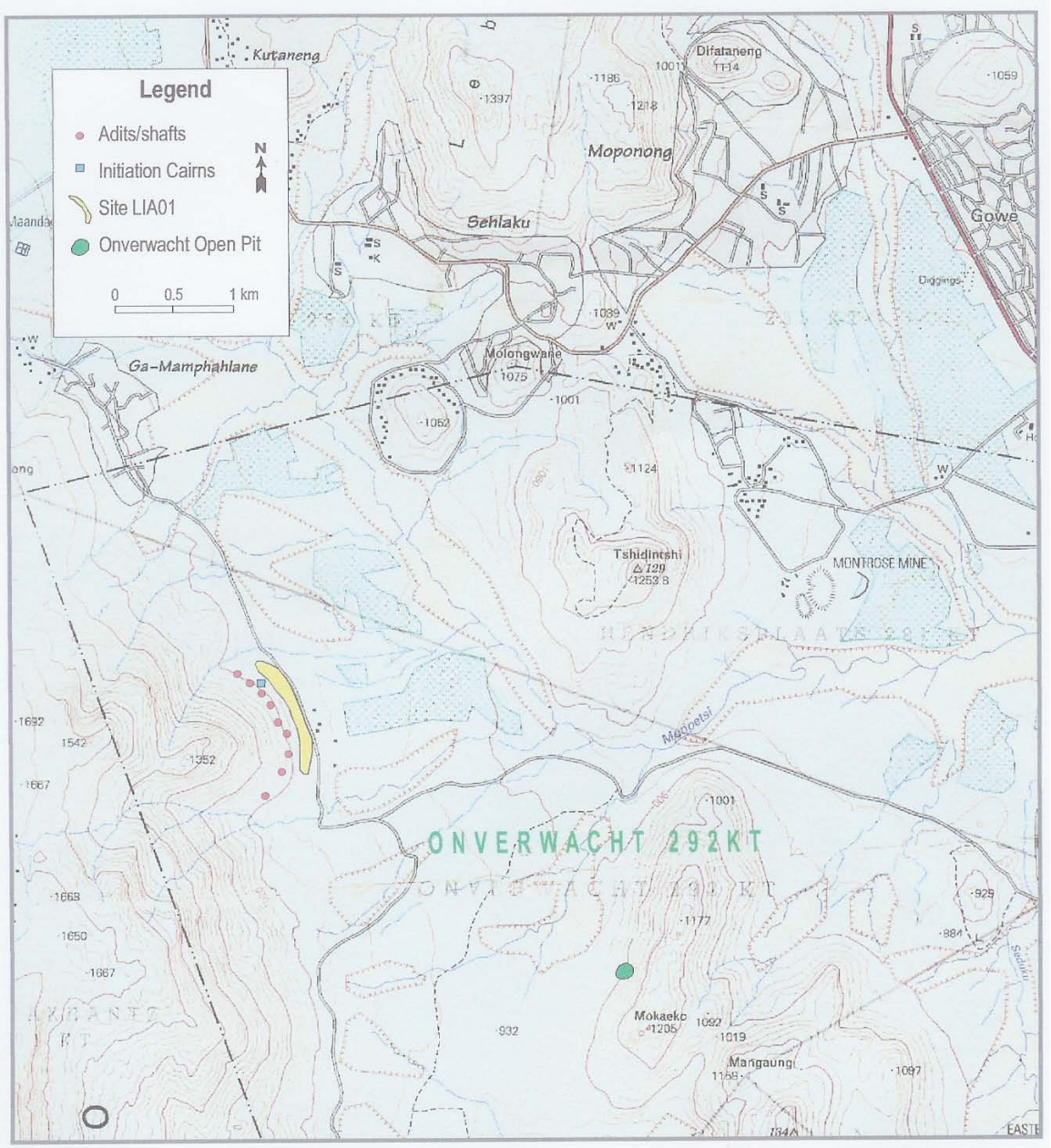

Figure 2- The Modikwa Platinum project area on the farm Onverwacht 292KT in the northern part of the Steelpoort in the Mpumalanga and Limpopo Provinces of South Africa. Note the geographical location of heritage resources that were investigated. These include part of a stone walled site (Site LIA01)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