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A Scoping Heritage Study for the Proposed Musina Copper Project Near Musina in the Limpopo Province

Prepared by:

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CONTENTS

1 INTRODUCTION

This preliminary Scoping Heritage study is one of a series of specialist study reports which are compiled in support of an Environmental Impact Assessment study which is being done by Golder Associates Africa (Pty) Ltd (Golder) for the proposed Musina Copper Project near the town of Musina in the Limpopo Province.

The preliminary study is based on literature sources and the author's experience in the Musina area only, as access to the relevant farms to undertake field work has not been obtained from the landowners. The field work will be undertaken and the preliminary study will be updated after access is granted.

Smarty (South Africa) Minerals Investment (Pty) Ltd Ltd (Smarty) has acquired prospecting rights for copper on seven farms close to Musina in Limpopo Province. Sufficient ore reserves to support a copper mine and ore beneficiation plant have been demonstrated and Smarty have appointed Golder Associates Africa (Pty) Ltd (Golder) to undertake the necessary environmental permitting process. In terms of the Mineral and Petroleum Resources Development (Act 28 of 2002) (MPRDA), a mining right application (MRA) must be accompanied by a Mining Work Programme (MWP) and a Social and Labour Plan (SLP). Golder Associates Africa (Pty) Ltd (Golder) and Ukwazi Mining Solutions have been appointed to assist with the development of the MWP.

The proposed Musina Copper Project may have a negative influence on any of the types and ranges of heritage resources which are listed in Section 3 of the National Heritage Resources Act (No 25 of 1999) (Box 1). Consequently, a Phase I Heritage Impact Assessment (HIA) study has to be conducted as required by Section 38 of the National Heritage Resources Act (No 25 of 1999). The aims of the Phase I HIA study are as follows:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (Box 1) do occur in the Project Area and, if so, to determine the nature and the extent of these remains.

- To establish whether any of the types and ranges of heritage resources which have been identified in the Project Area will be affected by Musina Copper's operations and, if so, to establish appropriate mitigation and management measures for these heritage resources.

Archaeological surveys and heritage studies have indicated that the Limpopo Province is rich in archaeological remains and in heritage resources.

Most of the types and ranges of heritage resources which are outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur across the Limpopo Province (see Box 1, next page).

Box 1: Types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act (Act 25 of 1999, Section 3) outlines the following types and ranges of heritage resources that qualify as part of the national estate:

a. Places, buildings structures and equipment of cultural significance;
b. Places to which oral traditions are attached or which are associated with living heritage;
c. Historical settlements and townscapes;
d. Landscapes and natural features of cultural significance;
e. Geological sites of scientific or cultural importance;
f. Archaeological and palaeontological sites;
g. Graves and burial grounds including-
    i. Ancestral graves;
    ii. Royal graves and graves of traditional leaders;
    iii. Graves of victims of conflict;
    iv. Graves of individuals designated by the Minister by notice in the Gazette;
    v. Historical graves and cemeteries; and
    vi. Other human remains which are not covered in terms of the Human Tissue Act (Act 65 of 1983);
h. Sites of significance relating to the history of slavery in South Africa;
i. Moveable objects, including -
    i. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, material, meteorites and rare geological specimens;
    ii. Objects to which oral traditions are attached or which are associated with living heritage;
    iii. Ethnographic art and objects;
    iv. Military objects;
    v. Objects of decorative or fine art;
    vi. Objects of scientific or technological interest; and
    vii. Books, records, documents, photographs, positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act (Act 43 of 1996).

The National Heritage Resources Act (Act 25 of 1999, Sec 3) also distinguishes nine criteria for a place and/or object to qualify as 'part of the national estate if they have cultural significance or other special value …'. These criteria are the following:

a. Its importance in the community, or pattern of South Africa's history;
b. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
c. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
d. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
e. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
f. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
g. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
h. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and/or
i. Its significance relating to the history of slavery in South Africa.

2 DETAILS OF THE SPECIALIST

Profession: Archaeologist, Museologist (Museum Scientist), Lecturer, Heritage Guide Trainer and Heritage Consultant

Qualifications:

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

Work experience:

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-date)

Accreditation: Member of the Association for Southern African Professional Archaeologists. (ASAPA)

Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal working spheres in Phalaborwa during the last 1 200 years. He has excavated more than twenty LIA settlements in North-West and twelve IA settlements in the Lowveld and has mapped hundreds of stone walled sites in the North-West. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He

collaborated with environmental companies in compiling State of the Environment Reports for Ekhurhuleni and Hartebeespoort, and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a long-standing working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine, etc. as well as with several environmental companies.

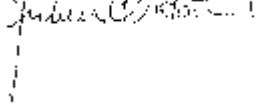
3 DECLARATION OF INDEPENDENCE

I, Julius CC Pistorius, declare that:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation **8** of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.



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Signature of the environmental practitioner:
Private Consultant

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Name of company:
5 August 2016

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Date:

4 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national and regional legislation which provides regulations, policies and guidelines for the protection, management, promotion and utilization of heritage resources. South Africa's 'national estate' includes a wide range of various types of heritage resources as outlined in Section 3 of the National Heritage Resources Act (NHRA, Act No 25 of 1999) (see Table 1).

According to the NHRA heritage resources are categorised using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRAs) which apply the National Heritage Resources Act together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies.

At a national level heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the National Heritage Resources Act (Act No 25 of 1999).

4.1 Legislation relevant to heritage resources

The identification, evaluation and assessment of heritage resources in South Africa are regulated by the following legislation:

- National Environmental Management Act (NEMA) Act 107 of 1998
- National Heritage Resources Act (NHRA) Act 25 of 1999
- Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
- Development Facilitation Act (DFA) Act 67 of 1995

4.2 The National Heritage Resources Act (NHRA)

According to the NHRA (Act No 25 of 1999) the 'national estate' comprises the following (see Table 1):

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Graveyards, burial grounds and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites of scientific or technological value.

Elaborating on the above, the 'national estate' also includes (Table 1):

1. Places, buildings, structures and equipment of cultural significance
2. Places to which oral traditions are attached or which are associated with living heritage
3. Historical settlements and townscapes
4. Landscapes and features of cultural significance
5. Geological sites of scientific or cultural importance
6. Archaeological and paleontological sites of importance
7. Sites of significance relating to the history of slavery
8. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military and ethnographic objects, books etc.)

4.3 Heritage Impact Assessment studies

According to Section 38 of the National Heritage Resources Act (Act No 25 of 1999) a Heritage Impact Assessment (HIA) process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m^2 or which involves three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m^2
- Any other category provided for in the regulations of SAHRA or a provincial heritage authority

4.4 Regulations with regard to heritage resources

The regulations outlined below are applicable to the types and ranges of heritage resources which are the most common in the region where the heritage study was conducted, namely:

4.4.1 Buildings and structures

According to Section 34(1) of the NHRA (Act No 25 of 1999) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc..

4.4.2 Graves and burial grounds

Graves and burial grounds are divided into the following:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

In terms of Section 36(3) of the NHRA (Act No 25 of 1999) no person, without a permit issued by the relevant heritage resources authority, may:

a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
b) destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place. Human remains can only be handled by a registered undertaker or an institution declared under the Human Tissues Act (Act 65 of 1983 as amended).

4.4.3 Archaeology, palaeontology and meteorites

Section 35(4) of the NHRA (Act No 25 of 1999) deals with archaeology, palaeontology and meteorites and states that no person without a permit issued by the responsible heritage resources authority (national or provincial) may:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite;
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite;
- trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites.
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from the South African Heritage Resources Agency (SAHRA). In order to demolish heritage resources the developer has to acquire a destruction permit from SAHRA.

5 THE PROJECT AREA

5.1 Location

The Musina Copper Project is located on several farms to the west, south-west and north-east of the town of Musina in the Limpopo Province. The focus of this heritage impact assessment study is confined to the farms Vogelenzang 3 MT,portions 9, 10, 11 and RE, Papenbril 205 MS and Hereward 203 MS. The project falls within the Musina Local Municipality which is located within the Vhembe District Council in the Limpopo Province (Figure 1) (Messina 2230 and Kamkusi 2230AA 1: 50 000 topographical maps; 2230 Messina 1:250 000 map and Google imagery).

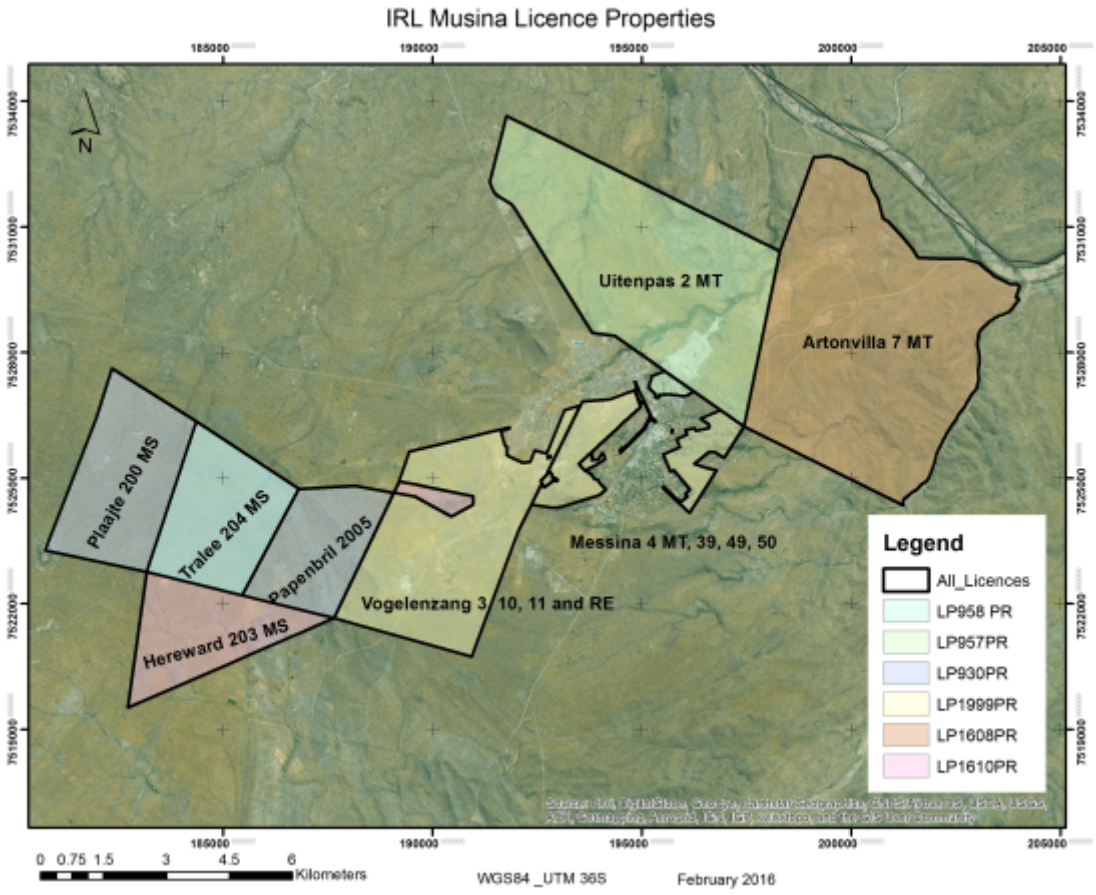


Figure 1- The Musina Copper Project in the Musina Local Municipality in the Vhembe District Council in the Limpopo Province. The Heritage Impact Assessment study will focus on the farms Papenbril 205MS, Hereward 203MS and Vogelzang 3MS, portions 9, 10, 11 and RE (above).

The Project Area is located approximately 50 km to the east of the Mapungubwe World Heritage site and is situated directly to the north of the Musina Nature Reserve and the Boabab Tree Reserve. Copper mines and older abandoned copper shafts such as Molly Too Mine and Campbell Mine occur on farms such as Vogelenzang 3 MS and Hereward 203 MS (Figure 1).

5.2 The heritage character of the Project Area hierso

The Musina Copper Project falls within a regional cultural landscape which houses a wide range of heritage resources as has been outlined by earlier archaeological and

heritage studies, a few of which are listed in this report (see ‘Part 8, Bibliography relating to earlier heritage studies’).

According to these studies, the most common types and ranges of heritage resources in close proximity to the proposed Project Area are the following:

- Settlements dating from the Stone Age.
- Settlements dating from the Iron Age or the last two thousand years.
- Historical farmsteads with houses older than sixty years are not uncommon and also occur within the town of Musina itself.
- Graveyards and graves, many of an informal nature, which are scattered across the wider Project Area.
- The pre-historical copper mining remains of Musina, which have been observed and reported by geologists during the first half of the twentieth century. These remains have not been archaeologically investigated and large parts were destroyed in order to make way for contemporary copper mining activities.

The cultural and historical context of the Musina Copper Project is broadly outlined in Part 6 of the report, ‘Contextualising the Project Area’

5.3 The nature of the Musina Copper Project

Smarty (South Africa) Minerals Investment (Pty) Ltd (Smarty) has acquired prospecting rights for copper on seven farms close to Musina in Limpopo Province. Copper will be mined on the farms Papenbril 205,MS, Hereward 203,MS and Vogelenzang 3 MT.

The project components will include an opencast mine, an ore beneficiation plant comprising crushing, screening, flotation and/or heap leaching, possibly electro-winning and/or solvent extraction, tailings disposal and supporting infrastructure.

6 CONTEXTUALISING THE PROJECT AREA

A brief overview of pre-historical and historical information below contextualises the project area. This description, in conjunction with earlier heritage surveys which were done in the general area, illuminates possible types and ranges of heritage resources that may occur in the project area.

6.1 The Stone Age (hunter gatherers)

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA) (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (the period from 22 000 years ago to 200 years ago). The LSA is also associated with rock paintings and engravings which were done by the San, Khoi Khoi and in more recent times by Iron Age farmers (Inskeep 1978).

In and near the project area

Surveys, although limited, have recorded scattered finds of Stone Age sites whilst rock paintings sites are limited to rocky outcrops such as those in the Limpopo Valley in the Mapungubwe cultural landscape. In the Soutpansberg mountain range further to the south, numerous rock art sites have been recorded over the years (Eastwood & Cnoops 1999).

Stone Age hunters occupied the area from the Acheulian period judging from Acheulian hand axes which were recorded in the Mapungubwe cultural landscape to the west of Musina (Roodt 2009) and near the Soutpansberg, eighty kilometres further to the south-west (Matodzi, Matenga, & Pikirayi. 2013).

It can be expected that MSA sites, which are quite common over large parts of South Africa, will exist in or near the Project Area. LIA sites also have been recorded by the University of Pretoria in the Mapungubwe cultural landscape.

6.2 The Iron Age (earliest farmers)

Hunter-gatherers were followed by the first agro-pastoralists who lived in semi-permanent villages and who practised metal working during the last two millennia, the so-called Iron Age. The Iron Age is usually divided into the Early Iron Age (EIA) (covers the 1st millennium AD) and the Later Iron Age (LIA) (covers the first 880 years of the 2nd millennium AD).

Whilst the EIA is marked by small scattered sites with (elaborately) decorated pottery and in many instances with iron smelting, LIA sites may occur in clusters covering large tracts of land constituting cultural landscapes. These sites are mostly marked by stone walls and (undecorated) pottery. Metal working during the LIA occurs when this activity has attained specialised status. Historical links between LIA complexes and communities close to the sites can usually be pointed out. (This provides opportunities for oral traditions, cultural landscapes and aspects of living [tangible and intangible] heritage to be investigated as well).

EIA sites are limited to the northern and eastern parts of the country whilst LIA farmers' settlements cover a large part of South Africa – except the far western low-summer rainfall region and the southern extreme of the country.

In and near the project area

Early Iron Age farming sites have been recorded to the north of the Soutpansberg, but little is known about these early farming communities. An EIA site known as Klein Afrika, which dated from AD300 and one of the earliest dated IA sites in South Africa, used to exist on the farm Marius 732MS near the Soutpansberg. This site has since been destroyed by agricultural activities (Pistorius 2008).

Precursor settlements to the Mapungubwe chiefdom (AD900 to AD1200), which arose *prior* to the second millennium AD in the Limpopo Valley, include Schroda, Skutwater and K2. Mapungubwe sat at the top of a hierarchy of more or less contemporary settlements which were more or less similar with regard to their spatial layout and plans. These settlements also include Little Muck and Mmamagma Hill, respectively located ten and forty kilometres to the west of Mapungubwe and Mapela, eighty-five kilometres to the north-west of Mapungubwe (Hall 1987).

Mapungubwe, which flourished during AD900-AD1200, represents the first complex socio-political community in Southern Africa. At this flat-topped sandstone hill farmer-herders established a royal kinship which dominated the Limpopo Valley and which was characterised by an intricate and experienced gold working industry which

contributed to it being part of an Indian Ocean trade network (Hall 1987; Huffman 1996).

The vast outstretched bushveld between the Soutpansberg and the Limpopo Valley also served as home for many of today's contemporary Bantu speaking communities who have Sotho-Tswana, Venda and Lemba ancestors (Hammond Tooke 1993).

6.3 Pre-historic copper working

Books and writings by early European travellers and more specifically prospectors, geologists and mine inspectors very often refer to 'ancient workings' or 'pre-European mines' in the interior of South Africa. Enough information on the topic was already available in 1920 for Percy Wagner to compile a map which outlined pre-European iron, tin, copper and gold mines and the workings of these early smelters in the interior of South Africa (Friede 1980).

Pre-historic copper working activities in and around Musina were first described by Trevor who remarked that these remains were extensive and that they occur in an almost continuous line stretching for more than 29km from Musina in a south-westerly direction. 'In this area there are at least five or six very large groups of ancient workings. That at the Messina Mine which was so successfully opened is, the writer thinks, the largest but the others are not very much smaller' (Trevor 1912:270).

All the workings had been filled up and appear as cup-like hollows varying in shape and extending for about one mile in length and sometimes running along three parallel lines. Approximately one hundred and twenty of these mines occurred, all of which were centred on a lens of copper glance (chalcocite) or bornite. It was estimated that several tens of thousands of tons of copper were mined from these workings (Trevor 1912).

The technology that was used to mine copper probably did not differ much from mining technological practises that were found in most pre-historic South African

mines and also did not change fundamentally for nearly a millennium. The general methods of mining mainly comprised of the following:

> ‘Generally surface outcrops were cleared first, and then trenches were dug. Pits were carried down to depths from 4m to 15m. The lodes or reefs were followed in trenches or underground drives, sometimes branching off into short tunnels. In the larger copper and tin mines, vertical and inclined shafts were sunk to considerable depths, but not deeper than 25m when water, bad ventilation, or transportation difficulties stopped further work’ (Friede 1985:163). The technology of the Musina copper miners was recorded in detail by Van Warmelo (1940).

The copper mining industry in Musina was founded by the Musina and Thsope people who came from the Phalaborwa region where a large ancient copper working industry existed, probably contemporary with that in Musina. According to radio carbon dating, mining and copper working in Phalaborwa may have continued, although perhaps intermittently, over a period of more than a thousand years, from AD700 to AD1850 (Van der Merwe & Scully 1971; Pistorius 1989). No dates are available for the Musina copper mines or smelting activities. Trevor (1912) suggests that the Musina copper workings proceeded on a small scale at various intervals for longer than a thousand years.

According to G. H. Stanley it was possible that the Musina copper was smelted at settlements on the slopes of neighbouring hills. ‘There is no sign of the smelting floors above surface now, but at a depth of six inches or so layers of ash, cinders, slag, etc. with fragments of twyers made of a mixture of clay and quartz, are to be found in several places. … I did not find anything which could be identified as part of a crucible, and as the twyer noses were covered with slag stained with copper oxide and containing beads of copper, it would appear that smelting was performed in some sort of hearth ’ (Trevor 1912:371).

It is said that the Musina miners maintained a monopoly on copper working and that they became wealthy and proud, but also unpopular with their neighbours and, after a severe mine accident in which several mine workers were killed, the industry came to an end (Van Warmelo 1940).

6.4 Historical period

The two Voortrekker parties of Hans van Rensburg and Louis Trichardt reached the southern slopes of the Soutpansberg in 1836. As the two parties had quarrelled along the way, the Van Rensburg party moved eastwards in search of a route to Lourenço Marques (now Maputo) in Mocambique.

Whites moved into the Musina area first as hunters, traders and missionaries, with settlers following closely on their heels. The Musina area has a long history of ivory hunting during the eighteenth century, while prehistoric and historic mines occur across the Musina region, e.g. on the farms Jooste and Dorothy (Murimbika 2006).

From 1898 the Musina area with the rest of the Soutpansberg was placed under direct control of the ZAR following the defeat of the Venda kingdom. From 1917 most of the farms in the area have been in the hands of commercial family farmers. Today the area is predominantly occupied by Sotho-Tswana and Venda speaking communities (Loubser 1991).

The copper deposits in the Musina area were investigated in 1903 by Colonel John P Grenfell, who then set about to establish the Messina (Transvaal) Development Company Limited in 1904 to exploit the copper deposits. Most of the deposits were revealed by investigating the ancient workings, although many new sources were also identified. Mining commenced in 1906 and continued until the closure of the mine in 1991. In 1950 control of the mine moved from London to South Africa. The plant was modernised and ore production reached a peak of 1.7Mt per annum in the early nineteen seventies (Wilson & Anhaeusser 1998).

The town of Messina (renamed Musina in 2002) was founded in 1904 on the farm Berkenrode as a result of the exploitation of the copper deposits. It was proclaimed as town in 1957 (Hammerbeck & Schoeman 1976:143; Raper 2004:238).

7 THE PHASE I HERITAGE SURVEY

The Phase I Heritage Impact Assessment study for the Musina Copper Project entails the following:

7.1 Desktop study

Review of literature relating to the pre-historical and the historical unfolding of the Musina area.

Heritage studies which were done for developers near the Project Area provide information with regard to the general heritage characteristics of the larger Project Area as already outlined in this report.

The desktop study also involves consulting heritage data banks maintained at institutions such as the Limpopo Provincial Heritage Resources Agency in Polokwane, the Archaeological Data Recording Centre at the National Flagship Institute (Museum

Africa) in Pretoria and the national heritage resources register at the South African Heritage Resources Agency (SAHRIS) in Cape Town.

7.2 Fieldwork and research

The Project Area will be surveyed with a vehicle and by means of pedestrian surveys as soon as access to the land is obtained from the landowners. A track log will be registered with a mounted GPS instrument.

All coordinates for heritage resources will be recorded with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

7.3 Baseline description

A baseline description will be compiled by means of a synthesis of the evidence derived from the desktop study (heritage data bases and literature research for contextual evidence) with the fieldwork evidence (GPS recording, describing, photographing and evaluating heritage resources encountered in the field).

7.4 Proposed activity description

It is assumed that certain project activities resulting from the Musina Copper Project may have a bearing (impact) on heritage resources. If such activities exist they will be described and assessment in terms of their possible influence on any heritage resources that may occur in the Project Area.

7.5 The heritage impact assessment

The significance of heritage resources in the Project Area is indicated by means of stipulations derived from the NHRA (Act No 25 of 1999) as well as criteria derived from the historical and cultural context of the heritage resources that may be impacted by the Musina Copper Project.

The significance of potential heritage impacts will be determined using a generic ranking scale which is used in most environmental and heritage impact assessment

studies and which is based on various criteria (see Part 8.1, 'The significance of potential impacts on the heritage resources').

7.6 Heritage management measures

Recommendations for the mitigation and management of heritage resources which may be affected by the Musina Copper Project will be provided. These heritage management measures are based on guidelines derived from the National Heritage Resources Act (Act No 25 of 1999), from guidelines provided by the South African Heritage Resources Authority (SAHRA) and recommendations put forward by the Association for Southern African Professional Archaeologists (ASAPA)..

7.7 Heritage monitoring plan

Heritage monitoring measures are based on principles associated with best practise and guidelines and are derived from practical experience with regard to the monitoring of heritage resources. Guidelines for best practise are formulated by SAHRA and ASAPA and are recommended to and applied by heritage researchers and consultants.

8 THE SIGNIFICANCE, POSSIBLE IMPACT ON AND MITIGATION OF THE HERITAGE RESOURCES

8.1 The significance of potential impacts on the heritage resources

The significance of any potential impacts on the heritage resources will be determined using a generic ranking scale which is used in most environmental and heritage impact assessment studies and which is based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may/will occur?), and
  - Duration of occurrence (how long may/will it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and

- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	Duration: 5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

The significance of each potential impact was assessed using the following formula:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

The maximum value is 100 Significance Points (SP). Potential impacts are rated as very high, high, moderate, low or very low significance on the following basis:

- More than 80 significance points indicates VERY HIGH environmental significance.
- Between 60 and 80 significance points indicates HIGH environmental significance.
- Between 40 and 60 significance points indicates MODERATE environmental significance.

- Between 20 and 40 significance points indicates LOW environmental significance.
- Less than 20 significance points indicates VERY LOW environmental significance.

8.2 Mitigating the impact on the heritage resources

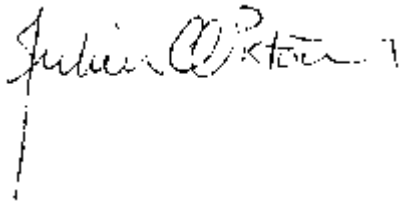
Mitigation and management measures will be recommended for those types and ranges of heritage resources which may exist and which may be affected by the proposed Musina Copper Project.

9 CONCLUSION AND RECOMMENDATION

It is clear from the cultural historical context of the Project Area that the Musina region is rich in heritage remains. These heritage resources include a wide range and various types which are all outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). From a heritage point of view this implies that a Phase I Heritage Impact Assessment (HIA) study, the aims and methodology of which have been outlined in this report, has to be conducted, as is required by Section 38 of the National Heritage Resources Act (No. 25 of 1999), for the proposed Musina Copper Project.

The Phase I HIA study will identify all possible types and ranges of heritage resources in the Project Area and will determine the significance of these remains. The HIA study will also determine the significance of the impact on these heritage resources according to criteria and guidelines which have been outlined in this report. Lastly, the HIA study will recommend mitigation and management measures

for those heritage resources which may be impacted by the proposed Musina Copper Project.



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