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Phase 1 Heritage Impact Assessment for the proposed parking area at the Borwa Shaft Complex of the Mototolo Mine on the portion 7 of the farm Thorncliffe 374 KT in the Limpopo Province

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Declaration of independence

This report has been compiled by Siegwalt Küsel and Sidney M Miller. We declare that as independent consultants we have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which the appointment was made other than fair remuneration for work performed in connection with the activity or application.

Note that a copy of the report must be lodged with SAHRA as stipulated by the NHRA (Act No. 25 of 1999), Section 38 (particularly subsection 4).

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List of acronyms

AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
BAR	Basic Assessment Report
BIF	Banded Ironstone Formations
BP	Before Present
CFP	Change Find Procedure
EMPr	Environmental Management Programme
ESA	Earlier Stone Age
HIA	Heritage Impact Assessment
LCTs	Large Cutting Tools
LSA	Later Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act (No. 25 of 1999)
OES	Ostrich Eggshell
PGM	Platinum Group Metals
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
STPs	Shovel Test Pits
ToR	Terms of Reference
ya	years ago
ZAR	Zuid-Afrikaansche Republiek

1 Executive summary

This Phase 1 Heritage Impact Assessment (HIA) was conducted for the proposed Mototolo Mine parking lot (3.3 ha) that will be situated at the Borwa Shaft Complex near Steelpoort in the Limpopo Province. The authors of this report are confident that the heritage resources of the property under review were adequately documented and assessed during the Phase 1 HIA.

Only a single localised scatter of MSA lithics that qualifies as a site was located during the Phase 1 HIA. The site is afforded a field rating of **Grade IIIC, Not Conservation Worthy (NCW)** and has been adequately documented as part of this Phase I Assessment. **It is recommended that the site be granted destruction authorisation at the discretion of the relevant heritage authority outside of the formal permitting process.**

It is not expected that the study area will yield subsurface heritage or burial sites. However, in the event that construction activities do reveal subsurface sites, the Change Find Procedure (CFP) must be implemented and the heritage authorities informed.

2 Terms of Reference

Shangoni Management Services (Pty) Ltd (Shangoni) appointed Siegwalt Küsel and S.M. Miller as independent specialists to conduct a Phase 1 Heritage Impact Assessment (HIA) for the proposed Mototolo Mine parking lot that will be situated at the Borwa Shaft Complex near Steelpoort in the Limpopo Province.

Currently the mine infrastructure of Mototolo Mine consists of 2 decline shafts, Lebowa and Borwa. Ore is extracted from the 2 shafts and transported by overland conveyors to the concentrator and chromite processing plant.

3 Study Area

The project study area is located on portion 7 of the farm Thorncliffe 374 KT situated approximately 35 km south of Steelpoort in the Limpopo Province. It forms part of the Groot Dwarsrivier Valley that is extensively mined for chrome and Platinum Group Metals (PGM). The study area is situated in the Greater Tubatse Local Municipal area that forms part of the Greater Sekhukhune District Municipality.

The study area is situated in a valley between several large hills. The site consists of a low rise between several drainage lines. The proposed project involves the construction of a parking area at the existing Borwa Shaft Complex of the Mototolo Mine. According to the brief the parking space will have a footprint of approximately 19 000 m^2.

Figure 1. *The study area (red) as seen from the northern approach with the Borwa Shaft Complex directly behind it.*

Figure 2. *Detail of the farm Thorncliffe 374 KT with the study area indicated in red to the north of the Borwa Shaft.*

Figure 3. *General view across the project study area.*

Figure 4. *General view along the eastern boundary of the site next to the existing access road and conveyor belt (looking north).*

3.1 Contact details

Landowner	**Glencore operations South Africa (Pty) Ltd** **Reg nr 199701799807**
Project owner	**Rustenburg Platinum Mines Ltd: Mototolo Platinum Mine**
Client representative	**Sharron Mkhabela** Sharron.Mkhabela@angloamerican.com **Karabo Motene** Karabo.Motene@angloamerican.com

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4 Assessment Methodology

4.1 Methodology

Prior to conducting the site assessment a desktop survey of existing literature on the wider region was conducted to assess the heritage context. These included published research articles, unpublished reports, and other online information. The SAHRIS data base was also accessed for previous heritage reports that relate to the general region of the survey.

The relevant 1:50 000 topographical maps were sourced, and consulted for pointers to possible heritage resources. The study area is covered by a series of aerial photography data sets that can be used to assess the occupations of this particular landscape. Several spatial data sources are available that provide important historical information on settlement pattern across the landscape. These include Job No. 131 of 1938 and Job No. 325 of 1954. In addition, Google Earth, Bing and Apple provide a series of aerial photos from 2001 onwards. Historical imagery and maps were also systematically scrutinised to identify potential sites, areas of disturbance and vegetation anomalies, and for any evidence of structural remains, or likely areas for archaeological features.

Prior to the field work all maps and diagrams of the proposed mine infrastructure provided by the Client were mapped and plotted on Google Earth and high-resolution aerial imagery, and converted to .gpx format. The data were transferred to the mobile App GPS HD (Motion X) to allow for georeferencing during the field survey via Ipad and Iphone. GPS coordinates were recorded with a Garmin e-Trex 30 (Datum WGS84).

4.2 Surveyed area

The project site was visited on the 6th of April 2022. The study area is a proximity 3.2 ha in extent. The study area and immediate surrounds were systematically searched and inspected on foot to identify any potential areas that could contain heritage resources.

Figure 5. *The survey area with the survey track in yellow.*

5 Legislative Framework

5.1 National Heritage Resource Act (NHRA)

The National Heritage Resources Act (NHRA) (Act No. 25 of 1999) is the primary legislative act dealing with the conservation and management of heritage resources. In brief the Act aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that this may be bequeathed to future generations.

The NHRA clearly defines the national estate and sets out principles for the management of heritage resources, determines the constitution, powers, functions, and duties of heritage authorities and provides a framework for the enforcement of the Act. All sites, heritage resources and archaeological remains are protected in terms of the National Heritage Resources Act (NHRA) Act No. 25 of 1999:

- All archaeological remains, artefactual features, and structures older than 100 years and historical structures older than 60 years are protected by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999, section 35). No archaeological artefact, assemblage, or settlement

(site) may be moved or destroyed without the necessary approval from the South African Heritage Resources Agency (SAHRA).

- Human remains older than 60 years are protected by the National Heritage Resources Act Section 36. Human remains that are less than 60 years old are protected by the Human Tissue Act (Act 65 of 1983 as amended).

The following sections of the South African Heritage Resources Act, 1999 (Act 25 of 1999) must be noted:

In terms of section 3 (1 & 2) of the NHRA, heritage resources of South Africa that are of cultural significance or other special value for the present community and for future generations and are considered part of the national estate and fall within the sphere of operations of heritage resources authorities include:

(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, 1983 (Act No. 65 of 1983);

(h) sites of significance relating to the history of slavery in South Africa;
(i) movable objects, including—
  (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and 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, photographic 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, 1996 (Act No. 43 of 1996).

Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of —

(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
(i) sites of significance relating to the history of slavery in South Africa.

5.1.1 Grading and field rating

Section 7 of the NHRA distinguishes between three grades of declared (formally protected) heritage resources.

- National **(Grade I):** Heritage resources with qualities so exceptional that they are of special national significance.
- Provincial **(Grade II)**: Heritage resources which, although forming part of the national estate, can be considered to have special qualities that make them significant within the context of a province or a region. All other declared heritage resources in the province are by default Grade II.
- Local **(Grade III):** Other heritage resources worthy of conservation. The **Grade III tier** is further split into three sub-categories, with **IIIa = high, IIIb = medium and IIIc = low local significance** (SAHRA 2005/2007, 2016; Wiltshire 2013: 325).

Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I resources are intended to be managed by the national heritage

authority. Provincial heritage resources authorities would manage Grade II sites. Grade III resources would be managed by the relevant local planning authority (Wiltshire 2013: 325). These bodies are responsible for grading, but anyone may make recommendations for grading. Unfortunately, only a few Provincial Heritage Resources Authorities (PHRAs) are fully functional.

While **grading** is actually the responsibility of the heritage resources authorities, all reports must include Field Ratings for the site(s) discussed (proposals for grading), to comply with section 38 of the national legislation (SAHRA Draft Minimum Standards 2016: 25–26):

a) **Proposed Field Rating/Grade 1 National Resource:** This site is considered to be of Field Rating/Grade I and must be nominated as such (mention must be made of any relevant international ranking), a protected buffer zone must be proposed, these sites must be maintained in situ and a CMP must be recommended for the in situ conservation of the site;

b) **Proposed Field Rating/Grade II Provincial Resource**: This site is considered to be of Field Rating/Grade II and must be nominated as such, a protected buffer zone must be considered, these sites must be maintained in situ and a CMP must be recommended for the in situ conservation of the site;

c) **Proposed Field Rating/Grade IIIA Local Resource:** The site must be retained as a heritage register site (High significance) and so mitigation as part of the development process is not advised, a protected buffer zone must be considered, these sites must be maintained in situ and a CMP must be recommended for the in situ conservation of the site;

d) **Proposed Field Rating/Grade IIIB Local Resource:** This site could be mitigated and (part) retained as a heritage register site (High/Medium significance). Mitigation of these sites must be subject to a formal permit application process lodged with the relevant heritage resources authority;

e) **Proposed Field Rating/Grade IIIC Local Resource:** These are sites have been assigned a Low field rating which, once adequately described in the Phase I Assessment, may be granted destruction authorisation at the discretion of the relevant heritage authority outside of the formal permitting process, (with regard to section 38(8) cases, this will be subject to the granting of the Environmental Authorisation).

5.2 National Environmental Management Act, 1998 (Act 107 0f 1998)

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and subsequent regulations provide for co-operative, environmental governance by establishing principles for

decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and all matters connected therewith.

The content of the Specialist Report must be in accordance with the specifications of NEMA EIA Regulations (GNR 982 of 4 December 2014), with specific reference to *Appendix 6: Specialist Reports* and must contain the following:

(a) details of-

(i) the specialist who prepared the report; and

(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;

(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;

(c) an indication of the scope of, and the purpose for which, the report was prepared;

(d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;

(e) a description of the methodology adopted in preparing the report or carrying out the specialised process;

(f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;

(g) an identification of any areas to be avoided, including buffers;

(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;

(i) a description of any assumptions made and any uncertainties or gaps in knowledge;

(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;

(k) any mitigation measures for inclusion in the Environmental Management Programme (EMPr);

(l) any conditions for inclusion in the environmental authorisation;

(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;

(n) a reasoned opinion-

(i) as to whether the proposed activity or portions thereof should be authorised; and

(ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;

(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;

(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and

(q) any other information requested by the competent authority.

5.3 International treaties, conventions and charters

South Africa is signatory to a number of international agreements, which have implications for heritage conservation and management including the World Heritage Convention that places certain obligation on the state and civil society for the management of heritage resources.

South Africa as a member of the United Nations Organization for Education, Science and Culture (UNESCO) subscribes to and takes part in a number of the subsidiary programs including the International Council of Museums (ICOM), International Committee for Monuments and Sites (ICOMOS) and various other international conservation bodies under the umbrella of UNESCO.

Of these the most important and pertinent is the ICOMOS Charter for the Conservation of Places of Cultural Significance, commonly known as the Burra Charter (2009, 2013). Although first adopted in 1979, the Charter remains current with the latest version adopted in October 2013. The Charter is considered to be the international blueprint on the conservation of places of cultural significance. The Burra Charter accordingly sets the international standard for standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians. (Australian ICOMOS Charter for places of Cultural Significance 2013).

6 Archaeological and Historical Context

6.1 The Stone Age archaeology

Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) lithics occur widely within the Sekhukhune region (PGS 2021a). The materials used for the stone tools derived from water-borne nodules and outcrops of the 2050 Ma Bushveld Complex basement rocks (Eriksson et al. 1994). Several rock paintings that date to the LSA are present in the wider region.

6.2 The Iron Age

African farmers moved into the region during the Iron Age. The term Iron Age is widely used in the South African context to describe the agropastoral (mixed farming) way of life associated with

speakers of Bantu languages that contrasted with the Stone Age hunter-gatherer lifestyle (Huffman 2007). The Iron Age within sub-Saharan Africa has been divided into the Early Iron Age (AD 200–900), Middle Iron Age (AD 900–1300) and Late Iron Age (AD 1300–1840) (Huffman 2007; Küsel 2009). Although these divisions are somewhat arbitrary, they are useful in defining broad-based cultures, changing world views and technological advances.

The Steelpoort Valley was extensively settled by African farming communities from around 1600 years ago as evidenced by two facies of EIA ceramics, namely Mzonjani (AD 450 – AD 750) and Doornkop (AD 750–AD 1000 (Huffman 2007; Van Schalkwyk 2007a; Küsel 2009; Huffman & Schoeman 2011). The term Iron Age is widely used in the South African context to describe the agropastoral (mixed farming) way of life associated with speakers of Bantu languages that contrasted with the Stone Age hunter-gatherer lifestyle (Huffman 1980, 1989, 2007, 2017, 2020).

Agropastoral lifestyles are characterized by the production of both crops and domestic herds and may be implicit in a lifestyle that included annual or seasonal migration to compensate for depletion of local resources. Broadly speaking, the Iron Age can be separated from the preceding Stone Age in terms of distinguishing characteristics that included a reliance on food production through agriculture or animal husbandry, a settled village life, the manufacture of large quantities of pottery in distinct styles and, in particular, metal-working (Mitchell 2002).

The evidence accumulated to date strongly suggests that the Iron Age and the associated settlement of farming communities in the sub-continent can most convincingly be explained in terms of population movement from further north. Within the South African context this model is largely based on ceramic typology, with the most widely used approach being the model developed by Tom Huffman (Mitchell 2002).

6.2.1 The Early Iron Age

There are several Early Iron Age (EIA) settlements where ceramics diagnostic of the Doornkop facies in the Steelpoort Valley (Van Schalkwyk 2007a; Huffman & Schoeman 2002). Our knowledge of EIA sites and cultural remains in Southern Africa is based on a relatively small statistical sample from a handful of sites and by no means comprehensive. The current body of archaeological data demonstrates that EIA communities were essentially subsistence farmers with the dominant crops being millets and sorghums, although cucurbits, groundnuts and beans were also produced.

Figure 6. *Early Iron Age Doornkop facies ceramics from Tšate (Küsel 2009).*

Several Early Iron Age hollow ceramic masks were excavated at the Lydenburg Heads site (Maggs & Davison 1981; Evers 1982; Whitelaw 1996; Huffman 2012). The design elements on some of the masks closely resemble the Doornkop facies of the EIA.

Figure 7. *One of the original Lydenburg Heads redrawn from a photograph (Huffman 2012: 132).*

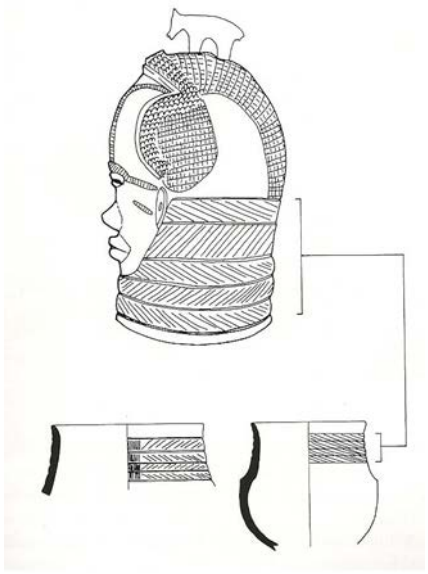

Figure 8. *Lydenburg Head mask with associated pottery (Huffman 2007: 107).*

6.2.2 The Middle to Late Iron Age

Various Sotho and Ndebele African farming communities inhabited the Steelpoort Valley and Groot Dwarsrivier Valley, including the Ndundza Ndebele, Swazi, Koni and Pedi. The Pedi, of Sotho-Tswana origin, mainly settled the land between the Olifants and the Steelpoort rivers (Mönnig 1963, 1978;

Bergh 1990; Van der Ryst & Meyer 1999). Küsel (2006a, 2006b, 2008, 2012) provides detail on the origin of the first Sotho–Tswana groups and on the rise of the Pedi Empire during the reign of successively Thulare, Sekwati and Sekhukhune.

One of the various early trade routes in the interior was along the Steelpoort Valley (Hunt 1931; Evers 1974; Davison & Clark 1976; Bergh 1999).

6.3 The Historical Period

The Historical Period marks the history of the first white settlers who acquired land from the African farmers, the role of the missionaries and the skirmishes and wars that derived from acrimonious relationships between the various role players. The history of the influential Maroteng Paramountcy is closely connected to the missionaries and the Anglo-Pedi War of 1879 (Delius 1984; Delius & Schoeman 2009, 2010).

The first contact between the Pedi and Boers under the leadership of Louis Trichardt was in 1837. In 1845 another group under Hendrik Potgieter settled at Ohrigstad. The land around Lydenburg was traded by the first white settlers from the Swazi in die middle 1800s (Bergh 1999). Initially relationships between the various African communities and the Boers were amicable, but deteriorated over time. Accusations and counter accusations of stock theft and encroachment of land soon began and culminated in skirmishes and battles.

When the remnants of the Pedi returned to their country after they had been driven from their land by the Matabele, Sekwati strengthened the tribe so that attacks by the Boers, Zulus and Swazis were repulsed. After the death of Sekwati in 1861 his preferred heir, Mampuru, was defeated by his brother Sekhukhune in the succession struggle (see Küsel 2008, 2012). When Sekhukhune succeeded to the chieftainship in 1861, he expanded the influence of the Pedi (Smith 1969). Under the rule of Sekhukhune there was strife and unrest and he accumulated a large hoard of guns and ammunition. His early relations with the Boers and missionaries were friendly, and they recognized the Steelpoort River as the boundary. Inter-tribal warfare however did not cease. Unrest and skirmishes between the Pedi and the Boers with competing claims to the land were a major source of conflict and grievance and culminated in the Sekhukhune Wars (Delius & Rüther 2010).

6.4 The missionary endeavour

In 1860 Alexander Merensky of the Berlin Mission Society visited Sekwati, who allowed him to build a mission station. On 14 August 1860 Merensky and Grützner established their first mission station at Gerlachshoop among the Kopa tribe of chief Boleu. In 1861 two more missionaries, Nachtigal and Endemann, joined them. It is of note that Nachtigal's diaries of 1861–1899 contain genealogical tables of the Pedi, Swazi and tribal chiefs. In 1861 Merensky again visited Sekwati, and obtained permission to build a mission station a few miles from Tšate at a hill, Khalatlolu. Merensky and Nachtigal immediately began with the work, and on 22 September 1861 Merensky held the first service at the new station. Sekwati died on that same evening.

Under Sekhukhune who became paramount of the Pedi, relations with the missionaries prospered to such an extent that they were allowed to build another station, Ga-Ratau, much nearer to Tšate. As a result of Sekhukhune's friendship with the missionaries and their success in treating the ill and wounded, the mission made progress beyond expectations. Among the important converts was one of Sekhukhune's wives and also his half-brother Kgalema (baptised Johannes) Dinkwanyane. The converts, however, antagonized Sekhukhune, who realized that his absolute authority was being undermined. He began to impose restrictions on Pedi Christians. The situation worsened and finally Sekhukhune drove the Christians away.

During this time Merensky was appointed as representative of the Zuid-Afrikaansche Republiek (ZAR). He had at first been well received by the chief. Soon afterwards all the belongings of Christians were confiscated. The missionaries were forbidden to continue their missionary work. Finally, on the night of 18 November 1864, the Christians, led by Merensky and Dinkwanyane, fled to the south. They bought a farm near Nazareth (that later became the town of Middelburg) (Delius 1984) and started the mission station Botshabelo.

Dinkwanyane later on challenged the authority of the missionaries and left Botshabelo with his followers to settle at Mafolofolo in the Lydenburg district (Delius 1984). Their settlement was on the margins of the domains of the Boers and the Pedi. They therefore did not recognise the legitimacy of the ZAR in relation to land, labour and taxation (Delius & Rüther 2010). Sekhukhune openly acknowledged Dinkwanyane as a Pedi chief, in consequence extending his empire beyond the Steelpoort River. Relations between the Boers and the Pedi became more and more strained.

6.5 The Sekhukhune Wars

On 16 May 1876 the Boers declared war against the Pedi. They first seized the village of Dinkwanyane, who was slain in the battle. They then advanced on Sekhukhune's stronghold, Tšate. Though the Boers managed to take and raze part of the village, they were unable to dislodge the Pedi. The Boers retreated and built Fort Weeber, west of the Leolo Mountains (Smith 1969). It later became known as Ferreira's Horse. A second fort was built and named Fort Burgers at the Steelpoort River. From these two forts the Boers continuously harassed the Pedi. Sekhukhune, realising that his position had become untenable, sent for Merensky and asked him to mediate with the ZAR. Early in February 1877 the two parties met at Botshabelo to discuss peace terms. It was agreed that the Pedi were to pay 2000 head of cattle to the ZAR, that the Pedi would become subjects to the ZAR, and that the Steelpoort River would form the boundary between their land and that of the Boers. On 15 February 1877 Sekhukhune signed the treaty.

Later that year Sir Theophilus Shepstone annexed the Transvaal on behalf of the British Crown. After the Zulu War, Sir Garnet Wolseley stipulated that Sekhukhune should recognise the British Crown. He considered the treaty between the Boers and the Pedi as valid and demanded the payment of the 2000 head of cattle previously agreed on. Sekhukhune refused, and the situation deteriorated. In March 1878 the Pedi went on the warpath. Groups of hastily raised volunteers managed to contain the Pedi in their strongholds. The failure of a British expedition in October 1878 caused the offensive operations to be abandoned until the end of the fever season in April–May 1879 (Smith 1969). After the arrival of Garnet Wolseley in the Transvaal in September 1879, he personally directed operations against Sekhukhune. Wolseley mobilised his task force of a number of regiments, aided by 8000 Swazi warriors and Mampuru's men, a total force of 12 000 men. A massive assault was made on the Pedi stronghold on 28 November 1879. The Pedi suffered a crushing defeat and the chief Sekhukhune was captured (Küsel 2012).

6.5.1 Events after the War

Sekhukhune's people were forced to leave Tšate and to build a new village on the plains, far removed from any hills that could be fortified. This village was eventually named Manoge. Mampuru and Nkopedi were appointed as joint chiefs of the Pedi. The latter ruled the tribe at Manoge, while Mampuru settled at Kgono in the Middelburg district (Küsel 2008, 2012).

After the Sekhukhune Wars the Berlin Lutheran Mission was re-established at Lobethal. They were now allowed to build a new mission station on the ruins of the old capital Tšate. A young missionary, J.A. Winter was sent to this station, from where he exercised considerable influence on later events

and fulfilled an important role in Pedi politics. Winter soon became dissatisfied with the attitude of his fellow missionaries towards the Pedi, wishing to give his converts greater control in the church. He finally adopted the Pedi way of life, which forced the mission authorities to expel him. He established the Lutheran Bapedi Church in 1890, one of the first of the separatist church movements in South Africa (Malunga 2003; Delius & Rüther 2010; Lebaka 2020).

After the first Anglo Boer War the ZAR regained its independence on 8 August 1881. One of the stipulations was that Sekhukhune be released from prison. He immediately went back to Manoge where he took over the chieftainship. Mampuru remained at Kgono, but when he refused to acknowledge the ZAR he had to flee to avoid arrest. Abel Erasmus was appointed Native Commissioner for the area and had to collect taxes. Sekhukhune assisted him by providing several men to act as police.

Mampuru, dissatisfied with the tribe being divided, sought to rid himself of Sekhukhune, who had wrested the chieftainship from him On the night of 13 August 1882 he and a group of his men stole into Manoge and killed Sekhukhune. This did not have the desired effect of uniting the Pedi under Mampuru, who now had to flee for his life. He sought refuge under Nyabele, the Ndebele chief. When the government requested Nyabele to hand over Mampuru he refused. Boer forces attacked the Ndebele at their fortified settlement. The blockade lasted nine months. Nyabele surrendered on 11 July 1883 and handed over Mampuru. The latter was found guilty of murder and hanged in Pretoria on 22 November 1883.

6.6 The mining history

The mining history and current mining operations are not discussed for the purpose of this report. A brief overview of the discovery of platinum is, however provided. The Maandagshoek locality is of particular historical interest. The first occurrence of platinum in the eastern Bushveld Complex has been noted at Maandagshoek by William Betel, who reported on his find in the 10 November 1906 edition of a journal, South African Mines, Commerce and Industries, which was then published weekly in Johannesburg (Molyneux 1974; Cawthorn 2006; Machens 2009).

Publication of this earliest authenticated scientific report on platinum in rocks from the Bushveld Complex resulted in extensive prospecting for chromite-rich rocks to be mined for platinum during the period 1906 to 1923, but these ventures were fraught with difficulties. It was only in 1924 when Dr Hans Merensky received a sample of a white concentrate panned from a stream on the farm

Maandagshoek by the then owner, Andries Lombaard, and on which he performed a mineralogical study, that he realized that the platinum at this locality had a grain size different from that in the chromite layers, indicating a different source rock (Cairncross & Dixon 1995; Cawthorn 2006). This resulted in his location of the eponymous Merensky Reef, followed by mining at this locality, which subsequently had an enormous impact on the world platinum industry. Significantly, the mining of platinum along the Merensky Reef continued for more than a century. The occurrence of platinum in the chromite-rich pipes and high demands for the platinum group metals drive the current extensive mining operations in the region (Eriksson et al. 1994; Hancox et al. 2004; Van der Ryst & Kruger 2007, 2008) (see also Pistorius 2005 for more detail and photographs on the historical mining at Onverwacht 292 KT).

The Dwarsrivier geological heritage site is located approximately 10 km north of the study area.

Figure 9. *The Dwarsrivier chromite exposure geological heritage site.*

7 Previous HIAs

Archaeological Impact Assessments (AIAs), Heritage Impact Assessments (HIAs) and academic publications on the prehistory and historical period generated a data base for the general area. These sources demonstrate a diverse cultural landscape with settlement and utilization of the local resources starting from the deep past over a period of time that spans millions of years up to recent

times. The report document the earliest occupations of hominins, Stone Age settlement, the migrations of African farmer groups, and the later movement of white farmers into the region, mining, industrialization, urbanization, warfare and conflict.

A desktop study of existing literature on the wider region was conducted to assess the heritage context. The SAHRIS data base was also accessed for previous heritage reports that relate to the general region of the survey. A great many heritage surveys were conducted in the Steelpoort Valley, the general Tubatse area and the Groot Dwarsrivier Valley. Whereas numerous Iron Age and historical era sites have been recorded, only a few Stone Age open-air sites that mostly date to the MSA have been found. The following investigations describes a selection heritage resources within the broader study area.

2002

Huffman & Schoeman (2002) conducted an AIA of the Der Brochen Project. At the Mareesburg Tailings Dam a few scattered MSA artefacts were identified across the lower section within a calcrete exposure. Typical MSA tool types such as convergent flakes, a blade and weathered core were noted. The lithics occurred dispersed 50 to 100 m apart. Since the artefacts do not form a site, a value of no significance was assigned. At the Booysendal Shaft and Waste Rock Dump a few MSA artefacts were noted. The content of rock engravings (Site 22A: 25 05 31.9S 30 07 20E) of people and geometric shapes were probably of more recent origin (Huffman & Schoeman 2002: 5).

2006

Roodt (2006) in conducting a HIA, identified MSA lithics rated as of high significance. SAHRA requested that a Stone Age specialist should investigate the occurrences. Van der Ryst and Kruger (2007) were appointed by Roodt. Maandagshoek lies in the Steelpoort Valley, west of the town of Burgersfort in the Limpopo Province. Maandagshoek is of particular historic significance as the earliest sampling of platinum in the eastern Bushveld Complex took place at this locality during the 1920s.

2007

During the survey and assessment of the Maandagshoek site documented by Roodt (2006), a representative and relatively extensive MSA and a low incidence of Later Stone Age (LSA) archaeological occurrences were identified in context of erosion dongas (Van der Ryst & Kruger 2007). The mitigation measures recommended in this report includes a second phase of investigation to be

carried out by a suitably qualified Stone Age archaeologist in view of the high significance rating for this locality based on its historic and archaeological scientific importance.

Matakoma (2007) identified three Iron Ages sites on the farm Mareesburg 8 J during an AIA. They recommended small test excavations.

Van Schalkwyk (2007a) recorded the Mototolong Early Iron Age site, Sekhukhuneland. Van Schalkwyk (2007b, 2007c) undertook an HIA for the planned Steelpoort Pumped Storage Station. He recorded several Late Iron Age and early historical period sites that would be impacted on by the proposed development. He recommended several mitigation measures.

2008

Roodt (2008) noted relatively high concentration of MSA lithics at Der Brochen Mine Richmond 370 KT. LSA lithics were present in the erosion gully. A bored stone (S24° 58' 26.0" E30° 08' 17.7") in association with a lower grinding stone were recorded.

2009

Van Schalkwyk (2009) during surveys and archaeological mitigation excavations recorded a number of cultural heritage resources that would be impacted on by the development of the De Hoop Dam. Van der Walt (2009a) recorded several LIA stone-walled site during an AIA at Booysendal Platinum Mine On The Farms Booysendal 43 JT and Der Brochen 7JT, Steelpoort. In another AIA (van der Walt 2009b) conducted at Steelpoort Extension 20 on portions of the farm Sterkfontein 318 KT, a low concentration of decorated and undecorated ceramics was found in a disused field and on the banks of the Steelpoort River.

2016

Pelser (2016) investigated Iron Age stonewalled feature that would be impacted by the Eskom Steelpoort-Tubatse-Marble Hall Powerline: on the farm Steynsdrift 145 JS, near Tiegershoek. The sites are located at approximately S25 06 29.48 E29 50 30.66 (T15) & S25 06 09.11 E29 50 37.61 (T17).
Exigo (2016) conducted an AIA at the proposed Smokey Hills opencast mining project and storm water control dams on the farm Maandagshoek 254 KT, Steelpoort area. A rectangular stone structure was recorded within the proposed opencast area on Hill 3 (Site EXIGO-SHP-FT02).

2017

Exigo (2017) conducted an AIA on portions of the farms Thorncliffe 374 KT, Helena 6 JT, De Grooteboom 373 KT and St George 2 JT for the proposed Glencore Eastern Mines Expansion Project, Steelpoort Area. Two small Iron Age settlement areas were present at Site EXIGO-GTT-IA01 and Site EXIGO-GTT-IA02. Four burial sites or assumed burial sites occurred within, or in close proximity of the proposed Thorncliffe TSF development area (Site EXIGO-GTT-BP01, Site EXIGO-GTT-BP02, Site EXIGO-GTT-BP02, Site EXIGO-GTT-BP04). It was pointed out in the report that the larger heritage landscape of the area and intangible heritage are important. For example, the Gamawela Cave Site approximately 6 km south-west of the Thorncliffe Mine on the farm St George 2 is considered a heritage site for local communities.

Archaetnos (2017) conducted a cultural heritage impact assessment (HIA) for the proposed mining activities on Portion 1 and the Remaining Extent of the farm De Grooteboom 373 KT. This lies approximately 10 km to the south-west of the town of Steelpoort. Three historical mine shafts were recorded.

PGS Heritage (2017) was appointed by Anglo American Platinum for the relocation of graves on Portion 7 of the farm Mareesburg 8 JT, Limpopo. The three possible graves will be adversely impacted upon by planned mining of Der Brochen Project Platinum Mine (SAHRA CaseID: 11858, Permit ID: 2648).

Van Schalkwyk (2017) conducted a Phase 1 HIA for the proposed upgrade of a section of the R37 road between Modikwe Mine and Burgersfort. A large cemetery with probably >200 graves was recorded. Recent graves were noticed.

2018

Van der Walt (2018) conducted an HIA for the proposed Booysendal South, Phase 2 Expansion Project, Steelpoort. The project area was assessed through a desktop study of mostly the SAHRIS data base and a field survey. The combined studies recorded 68 heritage sites/features consisting of Iron Age sites, ruins, cemeteries and graves, stone cairns and terracing. Low density scatters of Stone Age lithics were noted.

Heritage Practitioner Marais (2018) was appointed by Bokamoso Landscape Architects & Environmental Consultants CC to carry out a Phase 1 HIA for the proposed Malekane Mall on Portion 7 of the Farm Steelpoortdrift 365 KT. No heritage resources were identified.

Vhufahashu Heritage (2018) conducted a Phase 1 HIA for the proposed establishments of a new 132 kv power line from Steenberg Everest Platinum Mine (substation) to Booysendal, within the greater Tubatse Local Municipality. The proposed power line route start from an existing Anglo Platinum (Everest Platinum Mine) substation across various farms such as De Kafferskraal 53 JT, Vygenhoek 10 JT, Mareesburg 8 JT, Thorncliffe 374 KT, Helena 6 JT, Der Brochen 7 JT and Booysendal 43 JT. Four rectangular/square stone walled complex sites; a cluster of two graves; and a formal grave yard with more recent graves were identified.

2019

PGS Heritage was appointed by Samancor Chrome Limited to undertake the investigation and relocation of 13 grave areas with test excavations as claimed by the family representatives, and of 11 possible unknown grave areas located on Spitskop 333 KT, in Steelpoort. The grave areas will be affected by mining-related activities of the Samancor Chrome Limited - Eastern Chrome Mines project area (SAHRA 2019b Permit 3442).

PGS Heritage (2019a, 2019b, 2019c) conducted HIAs at the proposed Der Brochen Amendment Project located on certain sections of the farms Helena 6 JT, Der Brochen 7 JT and Mareesburg 8 JT, south of Steelpoort where several MSA sites were documented, and some Iron Age and historical occurrences, including cemeteries. Nine sites with graves and cemeteries were identified (DBAP 11, DBAP 16, DBAP 21, DBAP 25, DBAP 33, DBAP 43, DBAP 44, DBAP 51 & DBAP 52). The various heritage resources include: two sites comprising historic black homesteads (where the risk for unmarked graves exists), confirmed graves and cemeteries (DBAP 9 & DBAP 19); five sites comprising surface occurrences of Iron Age or historic potsherds (DBAP 17, DBAP 18, DBAP 20, DBAP 34 & DBAP 35); two Iron Age stonewalled sites (DBAP 48 & DBAP 50); a multi-component site comprising Iron Age stonewalling as well as what appears to be a historic black homestead (DBAP 38); a multi-component site comprising a historic farmstead associated with two unmarked graves (DBAP 15); an Iron Age stonewalled site and/or historic black homestead associated with possible rock engravings (DBAP 2); a Stone Age site (DBAP 7); two sites where adits, shafts, and workings relating to historic mining activities were identified (DBAP 12 & DBAP 13); three sites where grinding surfaces with little associated cultural material or features were recorded (DBAP 4, DBAP 24 & DBAP 46); a historical structure that may have been associated with the historic farmstead at DBAP 15 (DBAP 14); a site comprising a single stonewalled enclosure that may have been associated with the nearby Iron Age stonewalled sites (DBAP 49); a site comprising a single stonewalled enclosure which may have had a military association

(DBAP 53); two sites identified during a previous study undertaken by Samancor that could not be located during the present fieldwork. These sites appear to comprise a grave (DBAP 36) and a historic black homestead (DBAP 41) (PGS Heritage 2019a: vi-vii). A Stone Specialist, Dr M.M. van der Ryst undertook an assessment of some of the MSA lithic localities (PGS Heritage 2021a).

2021

Van der Walt (2021) conducted an HIA for the proposed pipeline (SE2) between Spitskop Pump Station and Mototolo Mine, Steelpoort, Limpopo Province. The four identified heritage resources within or adjacent to the proposed development footprint comprise a possible ephemeral Iron Age stone-packed terrace that has already been impacted, of low heritage significance, and three burial grounds of high heritage significance (SAHRA Case 17429). The recorded burial sites LWUA 1, LWUA 2, LWUA 3 are all located more than 30 meters from the proposed pipeline and will not be directly impacted. An unmarked stone cairn (possibly grave) was identified in 2003 (Mototolo Mine, St George (-24.986839, 30.098194) (SAHRA Site No. BRO08, Site Auto ID: 36931).

PGS (2021a) identified Stone Age Iron Age and historical remains during a HIA for the Der Brochen Amendment Project located on certain sections of the farms Helena 6 JT, Der Brochen 7 JT and Mareesburg 8 JT. The Der Brochen Mine with associated infrastructure is located approximately 25 km south-west of Steelpoort and 40 km west of Mashishing (PGS 2019a, 2019b, 2019c,2021a, 2021b). The development includes the construction of a buttress wall at the existing Helena TSF and the additional filter press plant at the existing Mototolo Concentrator Plant, two new decline shafts with three ventilation shafts per new decline shafts, a central ventilation complex to service both shafts, a Dense Medium Separation (DMS) Plant and a DMS Stockpile area with associated pollution control dams (PCDs), conversion of the existing Mototolo chrome plant to an inter-stage arrangement, additional Run of Mine stockpiles and associated silos, change houses and office complex to be located at each of the proposed decline shafts areas and additional linear infrastructure along with staff accommodation facilities to be located near the Der Brochen Dam (SAHRA 2019 Case ID 13976). The lithics recorded at Der Brochen Site DBAP 7 were subsequently analysed by a Stone Age archaeologist (PGS 2021a).

PGS Heritage (2021b) recorded 24 separate heritage sites at the Samancor Chrome's Tubatse Ferrochrome Smelter. These comprise five burial grounds, a stone feature that could possibly be a grave, nine historical structures and nine archaeological sites. African farmer ceramics associated with

the Doornkop facies of the Iron Age were recorded. Late Iron Age stone foundations, walls and ceramics were also present at some of the identified sites.

2022

PGS Heritage was appointed for the relocation of a possible 13 graves with test excavations at 11 from Samancor Chrome Limited on the Farm Spitskop 333 KT, in Steelpoort (SAHRA Case ID: 17937, Permit ID: 3443). PGS Heritage was also appointed by Anglo American Platinum – Der Brochen for the relocation of five graves located on the farm Helena 6 JT, in Steelpoort (SAHRA Case ID: 18253).

PGS Heritage was appointed for the relocation of 5 graves from Anglo American Platinum – Der Brochen on the farm Helena 6 JT, in Steelpoort within the Sekhukhune District Municipality Limpopo Province DBAP 21 (SAHRA 2017).

Coetzee (2022) undertook a Phase 1 AIA for the Proposed ECM Mareesburg Mining Development on Portions of the Farm Helena 6 JT and Mareesburg 8 JT, Steelpoort. ESA, MSA and LIA lithics, and stone walling from the Historical Period were recorded.

8 Findings

During the site survey conducted on 6 April 2022, several isolated archaeological artefacts were noted. An isolated ESA handaxe on felsite[1] were recorded in a small tributary of the north-flowing drainage line at -24.997986°S 30.110657° E. Despite an extensive search no other ESA tools could be located. The presence of the single tool may indicate an ephemeral presence of hominins across this landscape and the find does not constitute a site.

[1] Rooiberg felsites were commonly used for MSA lithics in areas with sources of this toolstone (van der Ryst 2006; Wadley et al. 2016). Rooiberg felsite and metamorphosed brown or dark red felsite (leptites) of the earlier-formed felsites occur within the Sekhukhune area (Molyneux 1974).

Figure 10. *Isolated ESA handaxe Note the differential weathering of the upper and lower surfaces.*

Several angular chunks and nodules with highly weathered flake scars are present in low densities of less than >1 /5m^2 across the site. These are generally associated with rocky material that accumulated through erosion on the surface of in situ igneous rocks towards the drainage line. The rock types present in these exposures include dark brown igneous rock and lighter quartzite-feldspar mixtures associated with granitic rocks. Despite an extensive search no formal tools and cores with characteristic MSA or LSA attributes could be located. The material also contrasts significantly with the lithics recorded during several HIAs on the immediately surrounding farms (for example, see PGS 2021a).

Figure 11. *Rocky material accumulated on top of in situ igneous rock through erosion are present across the study area.*

Figure 12. *Several examples of broken and weathered Stone Age lithics.*

A single isolated MSA blade core was noted at 24.996838°S 30.111082°E. These isolated pieces reflect an ephemeral presence of MSA people across the landscape.

Figure 13. *Irregular MSA core.*

Natural cupule-like erosion structures are present in a small area of the site. Cupules are defined as hemispherical, cup-shaped, and non-utilitarian cultural marks that have been pounded or pecked onto a rock surface by human hand and is thus regarded as a form of petroglyph or rock art (Ouzman et al. 1997; Bednarik 2001; van der Ryst et al. 2004; Schoeman 2006). In the central part of the study area six holes of varying diameter (55 mm–20 mm), similar to cupules, were recorded. They are located on the exposed surface of a batholith and are situated in small pan-like depressions where water accumulates. Along the rim of each of these holes percussion or bruise marks are apparent. The depressions appeared unusually fresh but despite an intensive search no similar structures or associated tool could be located. Closer investigation demonstrated that the apparent fresh scars are in fact caused by the crumbling of the rock through natural erosion processes. During the evaporation process accumulated rock salts cause the splintering of the edges of these hollows.

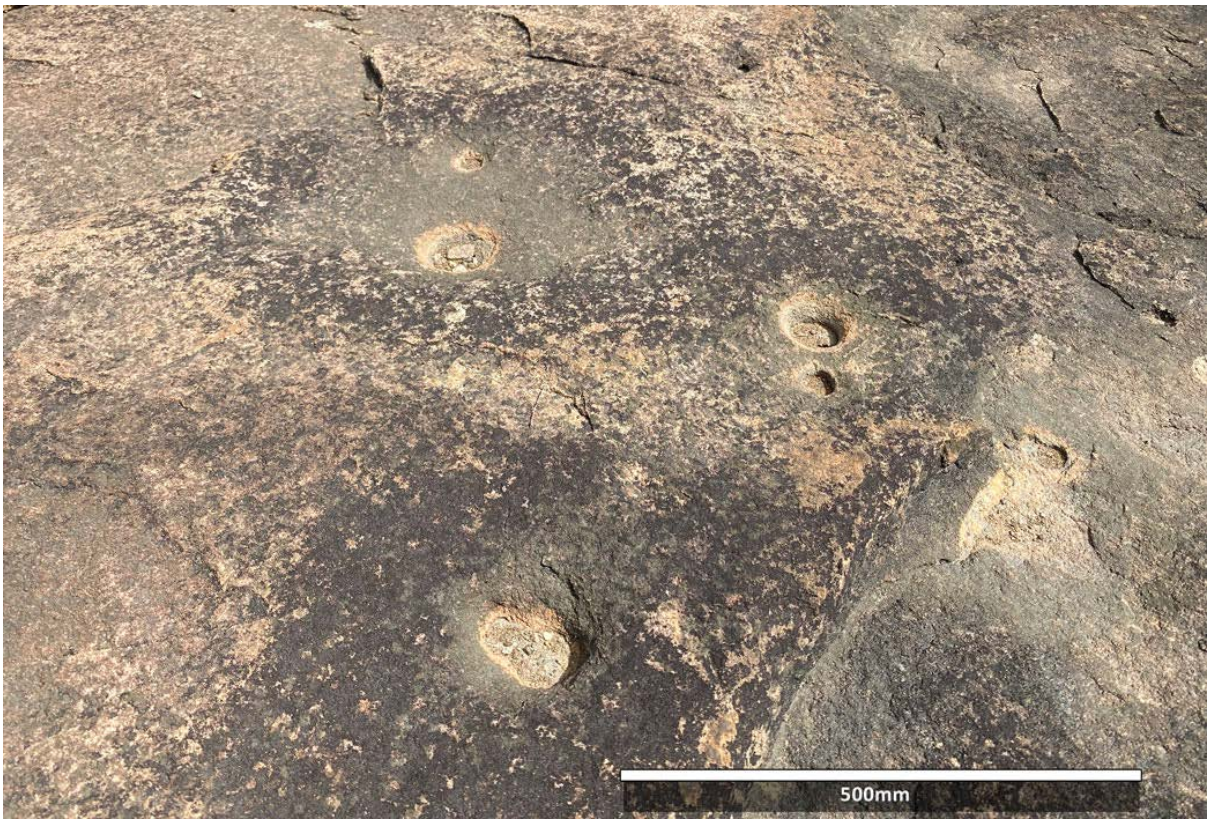

Figure 14. *Several natural hollows similar t cupules. Note that the double hollow closest to the scale bar show the same erosion as the other more circular depressions.*

Figure 15. *Detail of one of the erosion hollows that initially appeared to be cupules.*

Historically several African homesteads were settled in the surrounding area (but outside the study area) as is evident from the 1938 and 1954 aerial photography. The only material remains recorded that may have been associated with African homesteads are two large upper grinders found at 24.996534°S 30.111092°E. Upper and lower grinders are used to crush and grind cereal crops, to process pigments such as ochre, and also to process medicinal plant materials. No lower grinders were present.

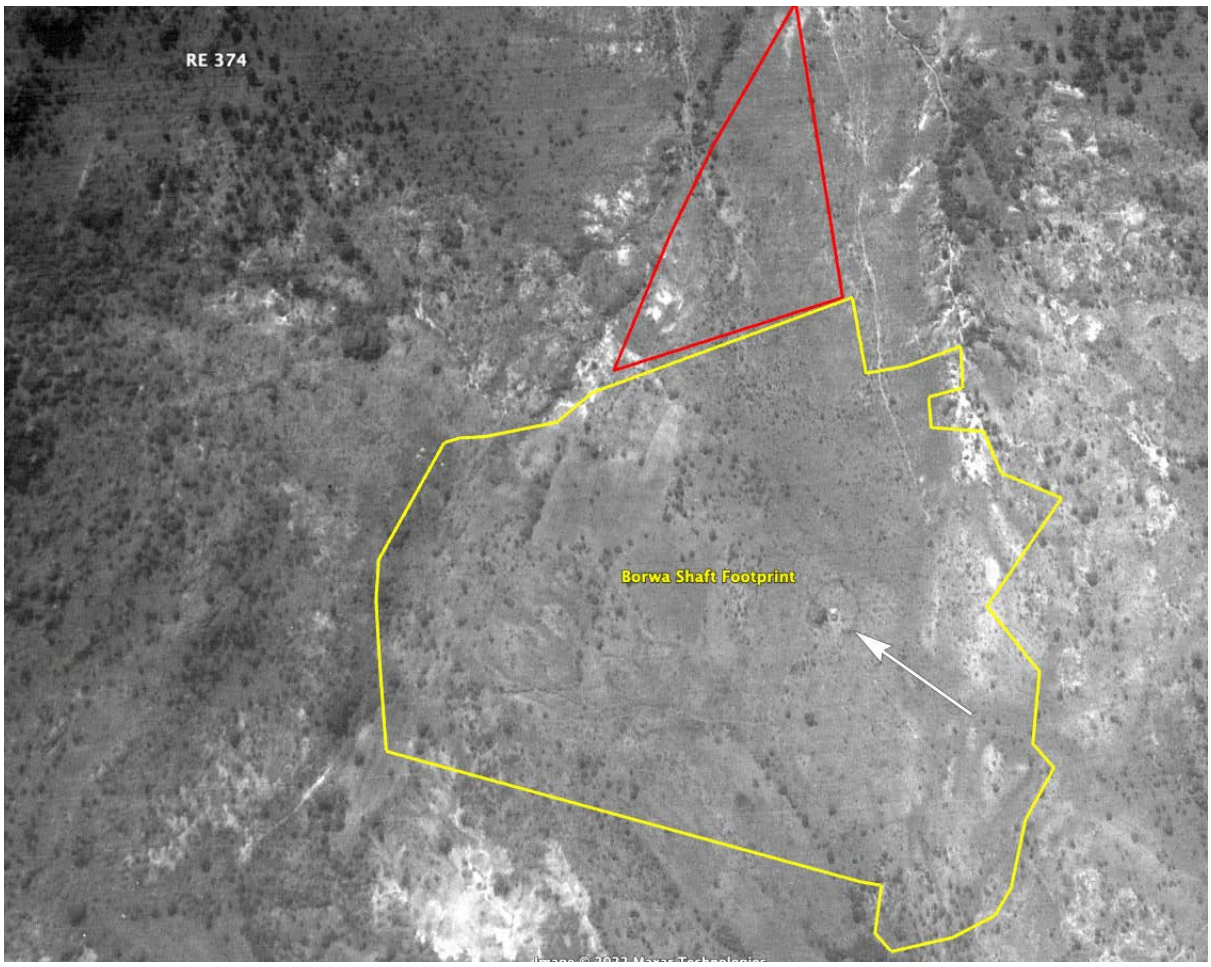

Figure 16. *Extract from the 1938 aerial photography illustrating the current shaft footprint in relation to the study area and the former homestead highlighted by the arrow*

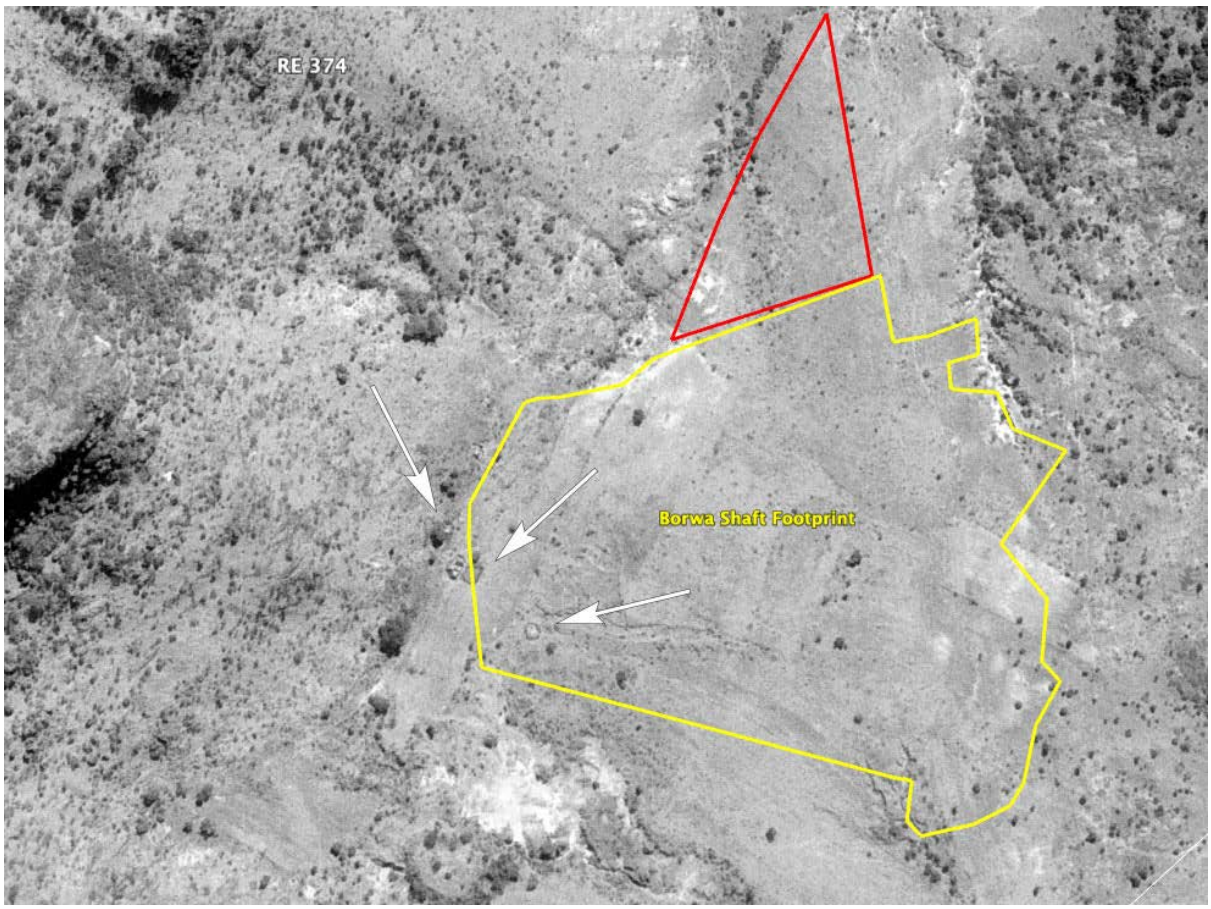

Figure 17. *Extract from the 1954 aerial photography illustrating the current shaft footprint in relation to the study area and the former homestead and associated stock enclosures highlighted by the arrows.*

Figure 18. *Example of an upper grinder recorded on site.*

Note that none of the isolated finds discussed above are regarded to represent a heritage resource or archaeological site.

8.1 Middle Stone Age (MSA) site

A single small, localised exposure of typical MSA material was located at MB001 24.997345°S 30.110841° E. The loose scatter of lithics distributed across approximately 5x5 m (25 m^2) comprised around 30 surface lithics. This equates to a density of 1.2 lithic fragments /m^2. Only one formal tool, classified as a sidescraper that retains some cortex, exhibits secondary retouch. Limited utilization marks are present on some flakes. The loose scatter seems to be a depositional accumulation as a result of the finer material being removed by localized sheet erosion.

Figure 19. *The location of MB001 within the study area.*

The site is afforded a field rating of **Grade IIIC, Not Conservation Worthy (NCW)** and has been adequately documented as part of this Phase I Assessment. **It is recommended that the site be granted destruction authorisation at the discretion of the relevant heritage authority outside of the formal permitting process.**

Figure 20. *Several examples from the lithic scatter MB001. The sidescraper with secondary retouch is highlighted in red.*

Figure 21. *Part of a scatter of lithic flakes distributed over approximately 2 5m^2*

9 Impact Significance Rating and Methodology

Impact assessments must take account of the nature, scale and duration of actions and their effects on the environment. These effects or impacts may be beneficial (positive) or detrimental (negative). Impacts may occur during different project stages, namely planning, construction, operation and

decommissioning. The impact of an action must be considered both with and without mitigation. Impacts are usually considered for the pre-construction, construction and operational phases.

The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24 and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments.

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance. The impacts will be ranked according to the methodology described below.

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the frequency of the aspect, the availability of a pathway to the receptor, and the availability of the receptor (thus: Sum of the three column scores below ÷ 3)

Table 1. Probability

Frequency of aspect/ impact	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5

Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors below (thus: Sum of all six column ratings below ÷ 6)

Table 2. Magnitude

Source								Receptor			
Duration of impact	Score	Extent	Score	Intensity	Score	Destruction Effect	Score	Reversibility	Score	Significance of heritage	Score
Lasting days to a month	1	Effect limited to the site	1	Very small	1	No loss	1	Reversable	1	No/low significance Grade IIIc	1
Lasting 1 month to 1 year	2	Effect limited to site and immediate surround-dings	2	Small	2	Small loss at local level	2	Local impact but still reversible	2	Medium local significance Grade IIIb	2
Lasting 1 – 5 years	3	Impacts extend beyond site boundary	3	Modera te	3	Moderate loss at local level	3	Partially reversible	3	High local significance Grade IIIa	3
Lasting 5 years to Life of Organiza-tion	4	Impact on regional scale / adjacent sites	4	Large	4	Regional loss	4	Potentially irreversible	4	High regional significance Grade II (Provincial)	4
Beyond life of Organiza-tion/Per-manent impacts	5	Extends widely (nationally or globally)	5	Very large	5	National loss	5	Irreversible	5	High National significance Grade II (National)	5

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below

Table 3. Severity

ENVIRONMENTAL IMPACT RATING/PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3	Low	Medium	Medium	High	High

Possible					
2 **Unlikely**	Low	Low	Medium	Medium	High
1 **Rare**	Low	Low	Low	Medium	Medium

10 Impact Assessment

A single small, localised exposure of typical MSA material was located at MB001 24.997345°S 30.110841° E. The site is afforded a field rating of Grade IIIC, Not Conservation Worthy (NCW) and has been adequately documented as part of this Phase I Assessment. It is recommended that the site be granted destruction authorisation at the discretion of the relevant heritage authority outside of the formal permitting process. The rocky nature of the area makes it highly unlikely for any graves or burials to be present.

The proposed development of the parking lot will thus have the following impacts on heritage resources:

Table 4. Probability assessment

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5
				Impact probability	**2**

Table 5. Magnitude assessment

Source								Receptor			
Duration of impact	**Score**	**Extent**	**Score**	**Intensity**	**Score**	**Destruction Effect**	**Score**	**Reversibility**	**Score**	**Significance of heritage**	**Score**
Lasting days to a month	1	**Effect limited to the site**	**1**	**Very small**	**1**	**No loss**	**1**	Reversable	1	No/low significance Grade IIIc	1
Lasting 1 month to 1 year	2	Effect limited to site and its immediate surroundings.	2	Small	2	Small loss at local level	2	Local impact but still reversible	2	Medium local significance Grade IIIb	2
Lasting 1 – 5 years	3	Impacts extend beyond site boundary	3	Moderate	3	Moderately loss at local level	3	Partially reversible	3	High local significance Grade IIIa	3
Lasting 5 years to Life of Organisation	4	Impact on regional scale / adjacent sites	4	Large	4	Regional loss	4	potentially irreversible	4	High regional significance Grade II (Provincial)	4
Beyond life of Organiza-tion/ Permanent impacts	**5**	Extends widely (nationally or globally)	5	Very large	5	National loss	5	**Irreversible**	**5**	High National significance Grade II (National)	5
Impact Magnitude											**2**

Table 6. Severity assessment

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	**2 Low**	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	**Low**	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

From the impact assessment tables above, it is evident that the impact of the proposed project on heritage resources will be of **Low Environmental Significance** without mitigation.

11 Risk Mitigation

SAHRA (2007: 4) defines mitigation as '[t]he act or effort by a qualified heritage specialist appointed by a developer to lessen the impact of a development on heritage resources within or near the development footprint'. The authors of this report are confident that the heritage occurrences of the property under review were adequately documented and assessed during the HIA.

The HIA field study surveyed the surface only, a procedure than cannot locate buried archaeological and/or palaeontological sites. While not detracting by any means from the extensiveness of the fieldwork undertaken by the authors, it is necessary to point out that heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors may account for this, such as ephemeral indications of graves, dense vegetation cover in some parts of the surveyed area, and the subterranean nature of certain archaeological sites that are buried through sediment accumulations.

Table 7. Risk mitigation table

No.	Aspect affected	Activity	Potential Impact	Reversibility	Irreplaceable loss	Phase	Size and scale of disturbance	Significance pre-mitigation			Mitigation Type	Significance post-mitigation		
								Probability	Magnitude	Significance		Probability	Magnitude	Significance
1	Heritage impact	Construction of parking area	Destruction of heritage resources including potentially unknown resources	Permanent	High Degree	Construction, Operational	3,3 ha	2	2	Low	Chance Finds Procedure	1	1	Low

12 Recommendations and Mitigation Measures

Only a single localised scatter of MSA lithics that qualify as a site was located during the Phase 1 HIA. The site is afforded a field rating of **Grade IIIC, Not Conservation Worthy (NCW),** and has been adequately documented as part of this Phase I Assessment. **It is recommended that the site be granted destruction authorisation at the discretion of the relevant heritage authority outside of the formal permitting process.**

It is not expected that the study area will yield subsurface heritage or burial sites. However, in the event that construction activities do reveal subsurface sites, the Change Find Procedure (CFP) must be implemented and the heritage authorities informed.

12.1 Archaeological Chance Finds Procedure (CFP)

There is also a low to very low probability of finding/exposing more heritage resources during the construction and operational phases of the proposed development.

- In the event that any sub-surface heritage resources or graves are unearthed all work has to be stopped until an assessment as to the significance of the site (or material) in question has been made by a professional archaeologist. Note that no archaeological material that has been uncovered may be removed.

- This applies to human remains, formal and informal graves and cemeteries. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply. If human remains are uncovered, or previously unknown graves are discovered, a professional archaeologist needs to be contacted and an evaluation of the finds made.

- If any archaeological material is uncovered during the course of development, then work in the immediate area should cease. The find will need to be reported to the relevant heritage authority and may require investigation and possibly mitigation by a professional archaeologist.

- If any area that contains stone artefacts in reasonable numbers (e.g. more than 10 within a few metres of one another) or in high concentrations is noted during the proposed developments this should be inspected by a professional archaeologist prior to any

disturbance.

- If any engraved rocks or rock paintings are noted, the find should be reported.

All finds or suspected finds must be reported to a professional archaeologist and to the relevant heritage authority

13 References

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14 Annexure A: The southern African chronological sequence

The following table provides an overview of the southern African chronological sequence, the main attributes associated with a particular period, and cultural groups associated with each of the periods.

The southern African chronological sequence		
Cultural period and approximate ages	Cultural groups	Technological attributes and tool types
Earlier Stone Age (ESA) >2 m—>200 000 ya[2]	Early hominins Australopithecines *Homo habilis* *Homo erectus* archaic *Homo sapiens*	Large cutting tools (LCTs), scrapers and flaked forms. Some use of flaked bone as tools.
Middle Stone Age (MSA) <300 000 —>20 000 ya	Archaic and fully modern *Homo sapiens*	A reduction in tool size. Blades, convergent points and awls made on prepared core types to produce uniform tool forms, also scrapers and other tool types. Flaked products were often further shaped through secondary retouch to produce a range of formal tool types. Decorative items, body ornaments and ochre use become apparent. Rare engravings and rock art.
Later Stone Age (LSA) <40/20 000 ya up to historical times	*Homo sapiens* San hunter-gatherers Khoekhoe herders	An extended range of microlithic tool types, often used as inserts for bow-and-arrow hunting. Characteristic tools include scrapers, borers, and arrow heads. Ostrich eggshell (OES) beads and flasks — sometimes decorated— are prolific. Trade/barter items include glass, iron and copper beads, and pigments. Leather working, basketry, bone implements and armatures for arrows are common. Bow-and-arrow hunting and snaring. San and herder ceramics. Domestic animals: sheep, goats, cattle and dogs. Rock art. Polished stone tools and grooved stones used to shape different bone implements.
Early Iron Age (EIA) c. AD 200—c. AD 900	Bantu-speaking African farming communities	Distinct pottery styles for the various pottery expressions, metal working, subsistence agriculture, domestic animals, trade and barter. Upper and lower grinding stones.

[2] Ya = years ago

Middle Iron Age c. AD 900—c. AD 1300	Bantu-speaking African farming communities	Distinct pottery for the various ethnic groups, metal working, subsistence agriculture, domestic animals, trade and barter.
Late Iron Age (LIA) c. AD 1300 – c. AD 1840 Stone-walled LIA sites: c. AD 1640—c. AD 1840	Bantu-speaking African farming groups and Europeans	Characteristic pottery traditions associated with each of the main divisions, metal working, subsistence agriculture, domestic animals, trade and barter. Upper and lower grinding stones and other stone implements. Farmer rock art. Stone-walled settlements.
Colonial Period c. 1650	Bantu-speaking African farming groups and Europeans	Historical structures, industrial metals, glass, porcelain and ceramics.
Historical Period c. 1850	Various African groups, groups of mixed origin and Europeans	Historical structures, industrial metals, glass, porcelain and ceramics.

The following section provides a synthesis of the cultural succession of settlements within the southern African archaeological context.

14.1.1 Stone Age

Archaeological traces in the form of mostly stone tools suggest a widespread presence for tool-producing Plio-Pleistocene hominins in southern Africa. The South African Stone Age sequence is chronologically divided into the Earlier Stone Age (ESA), the Middle Stone Age (MSA) and the Later Stone Age (LSA) based on the concept of techno- or industrial complexes. Each of the subdivisions is formed by a group of industries where the assemblages share attributes or common traditions (Deacon & Deacon 1999; McNabb et al. 2004;Hardaker 2011; Lombard et al. 2012; Dusseldorp et al. 2013).

The australopithecines were gradually displaced by *Homo habilis*, a genus that evolved into the more advanced *Homo ergaster/erectus* by 1.8 million years BP. The large stone cutting tools (LCTs) associated with these hominins form part of the Oldowan and Acheulean industries of the ESA. Most ESA localities with stone tools in South Africa are associated with the hominin species known as *Homo erectus*, and the more recent ESA assemblages with archaic *Homo sapiens* (Barham & Mitchell 2008).

By >250 000 years BP, the large cleavers and handaxes (large cutting tools or LCTs of the ESA were discontinued and replaced by a larger variety of smaller tools and weapons of diverse shapes and sizes and made by using different techniques. The MSA typologies following on the ESA represent greater

specialization in the production of stone tools, in particular flake, blade and scraper tools and also in a more extended range of specialized, formal lithic tool types (Thackeray 1992; Wadley n.d., 1993, 2005, 2013a, 2013b, 2015, 2016; McBrearty & Brooks 2000van der Ryst 2006; Mitchell 2008; Wadley et al. 2009; Macdonald & Wilkins 2010; Van der Ryst & Küsel 2013). These changes in technology mark the beginning of the MSA.

The MSA is known for typically prepared centripetal cores that delivered specific convergent/pointed flakes and a range of flake blades (Soriano et al. 2007). Flaked products often retain the characteristic faceted striking platform that derives from this technique. Several other core types were also used to produce blank forms. Many of these were shaped by secondary trimming to produce a range of formal tool types. This period is moreover characterized by regional lithic variability, evidence for symbolic signalling, polished bone tools, portable art and decorative items.

The main developments during the MSA are cognitive, cultural and physical modernity (Wadley 2013a, 2013b, 2015, 2016; Chazan 2020; Feathers et al. 2020). The MSA, which lasted almost half a million years, is associated with early modern humans with complex cognition, novel behaviours and transformative technologies. During the MSA early humans still settled in the open near water sources but also in caves and shelter localities. The MSA marks the transition from the more archaic *Homo* species to anatomically modern humans, *Homo sapiens sapiens* (Jurmain et al. 2013).

It is now generally accepted that the MSA was fully replaced by a mostly microlithic LSA marked by a series of new technological developments and cultural innovations (Wadley 2013a, 2013b). The LSA is marked by a series of technological innovations, social transformations and also noticeable demographic changes (Mitchell 2002a). The transition from the MSA to the LSA is vague. Dates proposed for the transitional period range from around 60/40 000 – 20 000 years ago based on a series of dates obtained through diverse dating methods, palaeoclimatic inferences as well as lithic technologies and diagnostic tool types as artefactual markers of a particular period.

The major changes comprise the replacement of MSA lithic technologies by LSA microlithic stone-working traditions and more widespread signs of symbolic and ritual activity in the form of art and decorative items, specifically objects made for personal adornment, such as pendants and the ubiquitous ostrich (*Struthio camelus*) eggshell (OES) beads (Mitchell 2002a; Forssman 2013; Mitchell 2016). During the LSA small (microlithic) tools, bone tools and weapon armatures and a range of decorative items as well as rock art were produced.

Hunter-gatherer societies (and the later San) relied to a large extent on bow-and-arrow hunting with poisoned tips, and also snaring. Veld foods and medicinal plants were gathered. Ceramics were used and/or produced by hunter-gatherers and Khoekhoe herders towards the terminal phases of the LSA over a period of around 2000 years. Many of these stone tools and other material cultural items were still manufactured and used when the first Europeans settled in southern Africa in the 17th century AD. Information recorded about the lifestyles of the Khoekhoe herders and the San (Bushmen) at the time of the arrival of Europeans provides some insight into the immediate past history of these indigenous people.

Evidence for Stone Age communities within the broader region comprises the complete sequence of the southern African Stone Age (Mason 1962).

14.1.2 Rock Art

Thousands of painted and engraved sites dating from the LSA have been documented throughout Southern Africa and many more are still being found every year. Paintings and engravings were also executed on loose slabs of stone and some were used as markers for storage pits and in burials. Rock art in the form of paintings, but in particularly the many and diverse categories of engravings on the highveld, is not well represented in the general region (Mason 1962, 2002; RARI Wits Database Moodley 2008).

14.1.3 Settlement by African farmers

The migrations into southern Africa and the expansion of Early Iron Age (EIA) African farming societies are apparent from AD 400 onwards. Pioneer Sotho-Tswana and other ethnic groups settled in semi-permanent villages, cultivated a range of crops, raised livestock, made ceramic containers, mined ore and smelted metals and engaged in trade or barter. Our understanding of EIA sites relies heavily on ceramic assemblages as the most archaeologically visible remains of the EIA cultures (Küsel 2012).The Late Iron Age was accompanied by aggregations of large numbers of communities (Huffman 2007, 20017, 2020; Boeyens 2003, 2016) that were often marked by extensive stonewalled settlements, or enclosures demarcated with poles and brushwood.