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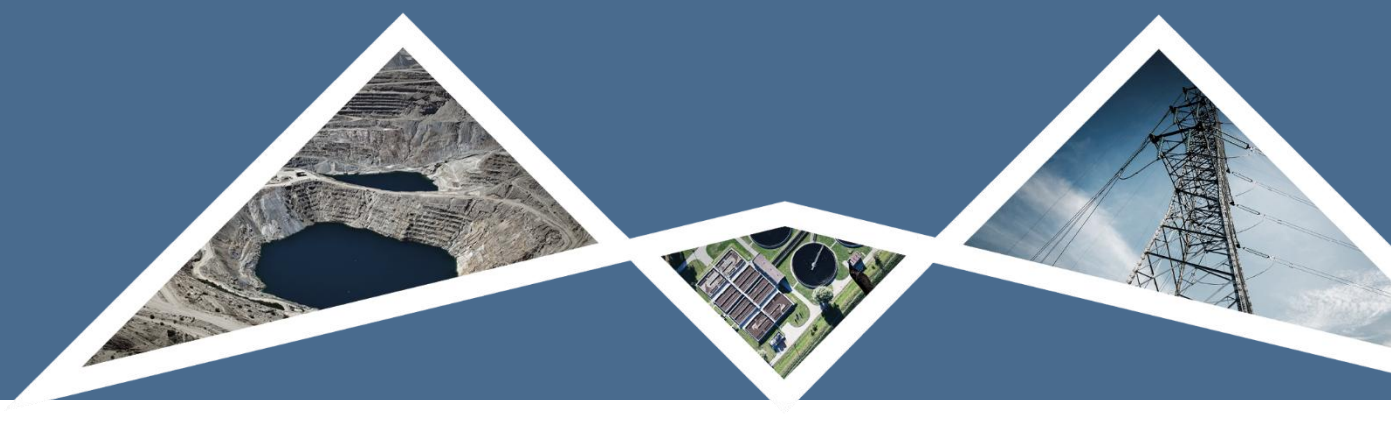
GLENCORE RCM MINE INFRASTRUCTURE PROJECT, KROONDAL, NORTH WEST PROVINCE

PHASE 1 HERITAGE IMPACT ASSESSMENT REPORT



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Abbreviations

AD	*Anno Domini*
ASAPA	Association of South African Professional Archaeologists
BPDM	Bojanala Platinum District Municipality

CDNGI	Chief Directorate of National Geo-spatial Information
CRM	Cultural Resource Management
LiDAR	Light Detection and Ranging
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner Association of South Africa
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Services
EMPr	Environmental Management Programme
ESA	Earlier Stone Age
IFRAO	International Federation of Rock Art Organisations
LCT	Large Cutting Tool
LSA	Later Stone Age
MPRDA	Mineral and Petroleum Resources Development Act
MSA	Middle Stone Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
RCM	Rustenburg Chrome Mines
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WCM	Western Chrome Mines
ya	Years ago

1 Executive Summary

Glencore Operations South Africa (Pty) Ltd – Western Chrome Mines (WCM) plans to acquire mining and surface rights from Clover Alloys Rustenburg Chrome Mine (RCM). The project aims to enhance productivity by reducing the time it takes taken for miners to travel to the face at the Kroondal Mine. In addition to utilizing the existing infrastructure at Clover Alloys RCM, new facilities are proposed, including parking areas, a sewage plant, an explosives delivery bay, access roads, and other infrastructure.

A comprehensive assessment was conducted to evaluate the potential impact on archaeological and heritage resources. The study included a literature review, desktop assessment, and field survey including two separate days on site.

Three LSA lithic pieces were found, including a core, a shaped flake, and a scraper. A potsherd from the Iron Age was also identified. These finds are not of high significance but indicate the potential for more significant below-ground heritage resources. Historical farm infrastructure was identified on site, however, these are approximately 70m from the proposed activities and therefore is not expected to be impacted.

The construction activities will likely affect the identified artifacts which have been previously disturbed, and not worth further conservation. A Chance Find Procedure is recommended to manage any further discoveries during development should finds be discovered during the proposed activities. This includes halting activities if significant finds are discovered, recording their location, and consulting a qualified archaeologist for further evaluation.

No significant heritage impacts were identified. The proposed mitigation measures should adequately address any potential impacts on heritage resources. Therefore, from an Archaeological perspective, the development will not have significant foreseeable impacts.

2 BACKGROUND INFORMATION

This section provides an overview of the proposed project as well as details of the Archaeologist, the terms of reference, and legislative background informing this assessment.

2.1 DESCRIPTION OF PROJECT

Glencore Western Chrome Mines (WCM) is in the process of acquiring a portion of the mining and surface rights from the Clover Alloys Rustenburg Chrome Mine (RCM) to reduce the time taken to travel to the face at its Kroondal Mine and increase the mining facetime which will in turn increase productivity. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine. The proposed new developments as well as existing infrastructure include (but are not limited to):

- A parking area for permanent employees
- A parking area for visitors and contractors
- Employee drop-off/pick-up zone
- Salvage yard
- Sewage plant
- Use of existing Pollution Control Dam and licensing this dam under the NWA
- Shaft Laydown Area / Explosives Delivery Bay
- Surface laydown area
- Meeting venue hall (Lekgotla Hall)
- Access and escape roads
- Two water storage dams
- Compressor house
- One 11kV Powerline
- Administration Offices
- Change houses
- Engineering workshop
- Stores
- Temporary laydown area (historic LanXess Chrome Mining village area)

Clover Alloys RCM together with the proposed development are in the Rustenburg Local Municipality in the Bojanala Platinum District Municipality of the North-West Province. The Clover Alloys RCM operation is located on farm Rietfontein 338 JQ, Portion 62. See Figure 1 for Locality Map.

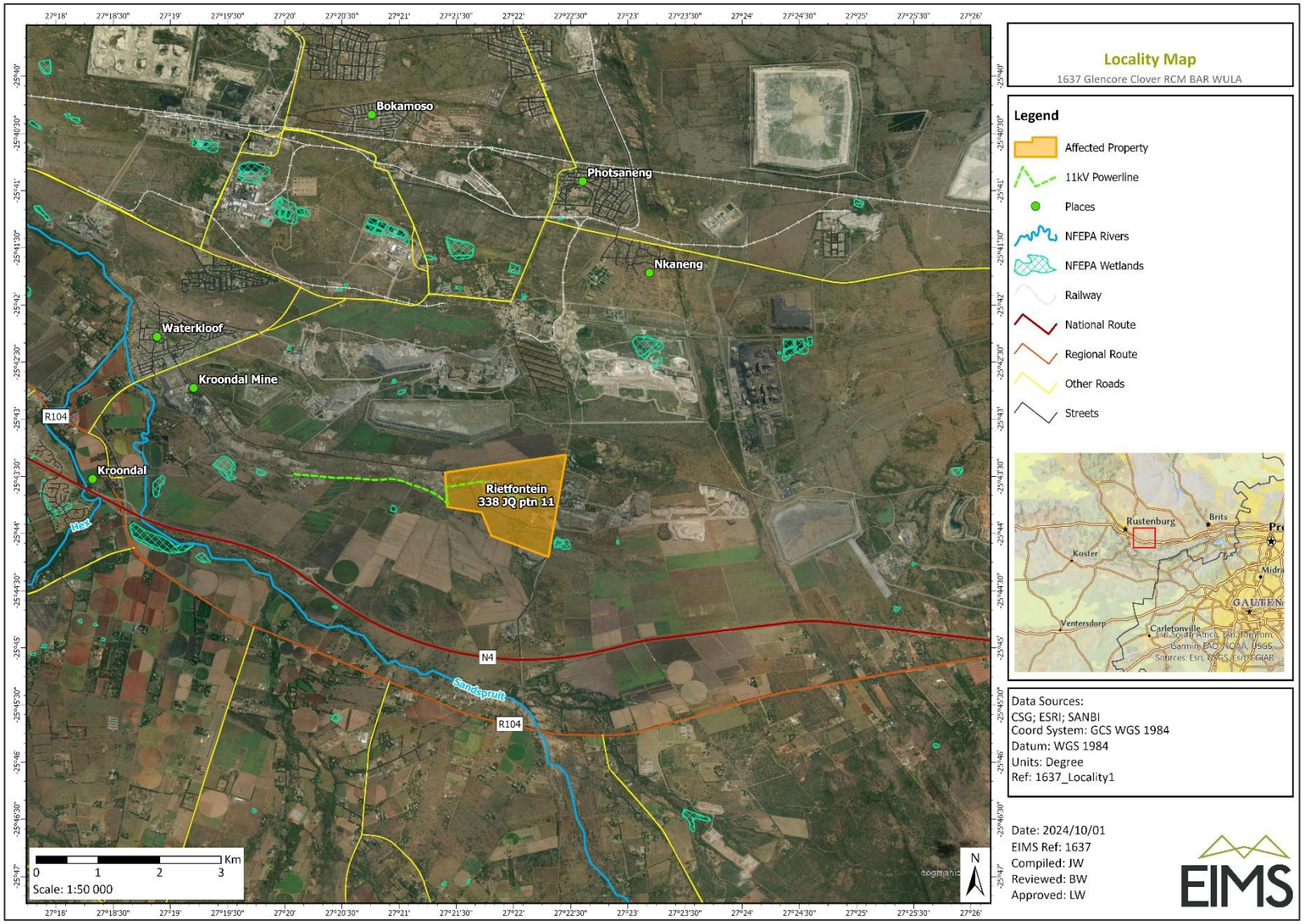

Figure 1: Locality Map

2.2 HERITAGE SPECIALIST DETAILS

As prescribed by the SAHRA Minimum Standards (2007), a Heritage Specialist (Professional Archaeologist) was appointed for the undertaking of the Archaeological Impact Assessment. Dr Lucien James was appointed in this regard. The following is a summary of the Heritage Specialist's details. Table 1 provides a summary of the Archaeologist's contact details, qualifications, and professional membership. Refer to Appendix 1 for full CV of Archaeologist.

Dr Lucien James is an Environmental Consultant and Archaeologist with experience in different fields across the Arts, Social Science, Natural Science, and academia. He has been employed by EIMS as an environmental consultant since March 2023 working on several projects under various roles. He is registered with EAPASA as a Candidate EAP. Lucien has obtained a BSc (Hons) in Geography, Archaeology and Environmental Studies (Archaeology-focused) and is accredited as a Professional Archaeologist with Association of South African Professional Archaeologists (ASAPA). He holds a MSc in Geography having done research on phytoremediation and the mining industry. In 2024, he completed his Ph.D. through research with a focus on collaborative River Basin Management in South Africa. He has worked as a Teaching Assistant (TA) and researcher since 2018 and engages in academic work through publications and conferences. He has taught 1st year, 2nd year, 3rd year and Honour's Archaeology and Geography courses. His research has been funded by the National Research Foundation (NRF) and the Water Research Commission (WRC). He is also actively publishing new papers in international academic journals. He has presented his research at a national level through various conferences in South Africa and has participated in other conferences and workshops on Climate Change and Climate Change Adaptation.

Table 1: Details of the Archaeologist

Name:	**Dr Lucien Nicolas James**
Tel no.	+27 11 789 7170
E-mail	lucien@eims.co.za
Professional Qualification/ Training:	BA (Archaeology and Geography); Wits University, 2017
	BSc (Hons) Geography, Archaeology and Environmental Studies; Wits University, 2018
	MSc (Geography, Archaeology and Environmental Studies); Wits University, 2021
	Ph. D; Wits University, 2024
Professional Membership/ Registrations:	Registered Candidate Environmental Assessment Practitioner (EAPASA reg. no. 2023/6772)
	Accredited Professional Archaeologist (ASAPA member no. 0619)

2.3 DECLARATION

Refer to Appendix 2 for Declaration of the Archaeologist.

2.4 TERMS OF REFERENCE

This report achieves several pre-defined objectives as per the prescription of the SAHRA Minimum Standards (2007):

a) Identifies the sites as well as potential associated Heritage objects within and in close proximity of the footprint of a study area,

b) Assesses the significance of sites and Heritage objects,

c) Comment on the impact of the development,

d) Make recommendations for the mitigation or conservation of sites and associated Heritage objects

To address the terms of reference, a methodology has been adopted. This methodology is further elaborated on in sections to follow.

2.5 LEGISLATIVE REQUIREMENTS

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the National Environmental Management Act (Act 107 of 1998 – NEMA), and Mineral and Petroleum Resources Development Act (Act 28 of 2002 – MPRDA). In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The NEMA 23(2)(b) gives effect to the NHRA and states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage". A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken into account of in the EIA Regulations under the NEMA relates to the Specialist Report requirements (Appendix 6 of EIA Regulations 2014, as amended) which apply to Heritage Impact Assessments.

The MPRDA also gives effect to the NHRA as this Act defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the MPRDA requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

3 ARCHAEOLOGICAL BACKGROUND

This section presents the archaeological background to the study. A review of literature is presented to contextualise archaeology in South Africa. Available information on databases and collections as well as previous relevant assessments is presented.

3.1 LITERATURE REVIEW

Prior to the implementation of the methodology to be discussed, a comprehensive literature review was conducted to understand the archaeological and historical background of the site. Two main components were considered, that is, (1) the pre-historical, and (2) historical linkages between people and the area in question. A brief overview of South Africa's Archaeology is necessary to contextualise this report.

3.1.1 OVERVIEW OF ARCHAEOLOGY IN SOUTH AFRICA

South Africa's Archaeology is characterised by pre-historic events for the most part of the record. In this regard, the earliest archaeological evidence is mainly associated with the presence of hunter-gatherers and precolonial pastoralism. It is mainly in the last 2000 years when major social changes take place, including migrations, colonialism, industrialisation, and the establishment of complex societies and associated settlements (Huffman, 1982; Hall, 1993; Huffman, 2004; Mitchell and Whitelaw, 2005; Huffman, 2007). The country is characterised by three main periods, which are each associated with corresponding material evidence. These periods include:

1. The Stone Age (as early as 2.6 Million ya to as late as the last 100 years)
2. The Iron Age (100 AD to as late as the 19th century)
3. Historical Period (last 500 years)

This literature review considers these periods expanding on the context of each in terms of the current development and associated site.

3.1.2 THE STONE AGE

South Africa's Stone Age stretches as far back as 2.6 Million ya, pre-dating modern humans. South Africa's Stone Age can be divided into three phases, namely:

A. Earlier Stone Age (ESA)
B. Middle Stone Age (MSA)
C. Later Stone Age (LSA)

A) EARLIER STONE AGE

The ESA represents the oldest material evidence in the archaeological record of South Africa. The phase can be divided according to different stone tool industries which are characterised by differing lithic technologies and assemblages. Specifically, ESA examples identified and studied in South Africa mainly relate to (a) Oldowan and (b) Acheulean stone tool industries (Klein, 2000).

The Oldowan dates as far back as 2.6 Million ya and examples of this industry can be found across Africa (Leakey, 1971; Chazan *et al.*, 2012; Kuman *et al.*, 2018; Stollhofen *et al.*, 2021; Favreau, 2023). The industry includes the earliest examples of key lithics such as hammerstones, manuports, cores, and flakes among other stone tool types. Figure 2 illustrates some of the different tools of this industry. Oldowan examples can be found across South Africa with some archaeological sites being the origins of some of the key examples of the type of lithics specifically found (Chazan *et al.*, 2012; Kuman *et al.*, 2018). These archaeological sites include Wonderwerk Cave in the Northern Cape and, Swartkrans Cave which forms part of the Cradle of Humankind near the Johannesburg area. Both of these sites are National Heritage Sites.

The Acheulean stone tool industry differs from the Oldowan since it includes examples of Large Cutting Tools (LCTs). This includes tools such as handaxes, picks, and cleavers. As highlighted by Li *et al.* (2018), the Acheulean is characterised by the handaxe, which has been extensively studied. Differing from the Oldowan, these LCTs dating as far back as 1.7 Million ya (Kuman and Gibbon, 2018). Once more, the Cradle of Humankind and associated Sterkfontein hominid sites are key locations where some of the best examples of Acheulean stone tools have been found (Kuman and Gibbon, 2018; Li *et al.*, 2018). Figure 2 includes examples of the Acheulean LCTs (labelled v-z).

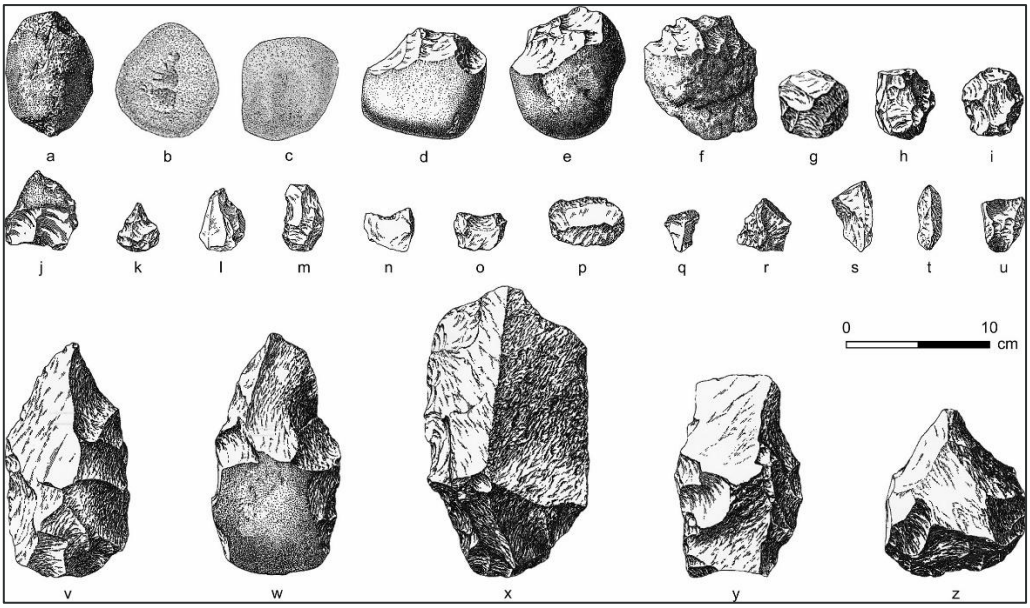

Figure 2: Examples of ESA lithics. Typical Oldowan tools (a-f). Acheaulean LCTs (v-z) (after Kuman and Gibbon, 2018).

B) MIDDLE STONE AGE

Following the ESA, a phase related to very specific industries and stone tool examples chronologically occurs. The MSA represents one of the most interesting prehistoric periods of, not only South Africa's archaeological record, but of global significance. The MSA brought with it new material evidence which suggests changes in lifestyle and complexity being inspired by environmental changes (Wadley, 2015). Dating between 280 000 and 30 000 ya, the MSA is characterised by a material culture that includes lithic technology, as well as an emerging material culture including artefacts such as shell beads (Villa *et al.*, 2009; Henshilwood, 2012). While MSA sites occur across South Africa, key sites include Blombos Cave, Sibudu Cave, and Klasies River. Figure 3 offers an illustrative overview of the material associated with the MSA.

Figure 3: Examples of MSA material evidence or artefacts after Wadley (2015). Abalone (*Haliotis midae*) shell with traces of an ochre-rich liquid (A); engraved ochre slab (B); perforated shells (C); Still Bay points (D). (after Henshilwood, 2012)

In terms of Stone tool technology, flake-based lithics are characteristic of the MSA (Jacobs *et al.*, 2008). In this regard, stone tool industries of the MSA include examples of worked stone flakes knapped off cores. Notable MSA examples include Still Bay and Howieson's Poort tools. Both Still Bay and Howieson's Poort lithics include examples of pointed tools, with the idea that such would have represented the earliest examples of hafted tools in South Africa (Jacobs *et al.*, 2008; Villa *et al.*, 2009; Henshilwood, 2012; Wadley, 2015). Still Bay technology (as seen in Figure 3), for example, includes examples of bifacial sharpened points which differ from past technologies such as the Acheulean (Henshilwood, 2012). Other examples of hafted stone tools are also associated with this phase, particularly those found at Klasies River (Wurz, 2002; Morrissey, Mentzer and Wurz, 2022).

C) LATER STONE AGE

The LSA represents a phase in the Stone Age which includes the widest record of material evidence. Dating between 43 000 ya and as late as the last 100 years, the LSA is associated with a period in South Africa's prehistory and history during which modern human ways of life, particularly hunter-gatherer activity is observed. Since South Africa was mainly occupied by hunter-gathering groups for the most of this period, LSA material culture has been studied in this regard. In other words, LSA material culture and artefacts have been associated with the lives of the San, for example (Mitchell, 2012; Villa *et al.*, 2012; Mesfin, 2024).

Key archaeological finds associated with the LSA are, firstly, a broad array of lithics. All LSA lithics include features of advanced shaping and working, otherwise referred to as retouch. Key tools include blades, bladelets and scrapers as pictured in Figure 4. Other tools include segments and adzes which are specific to the LSA. As previously stated, the LSA includes a large array of material evidence such as ostrich eggshell beads, bone tools, digging sticks, as well as other material which are also associated with Iron Age archaeology (Figure 5).

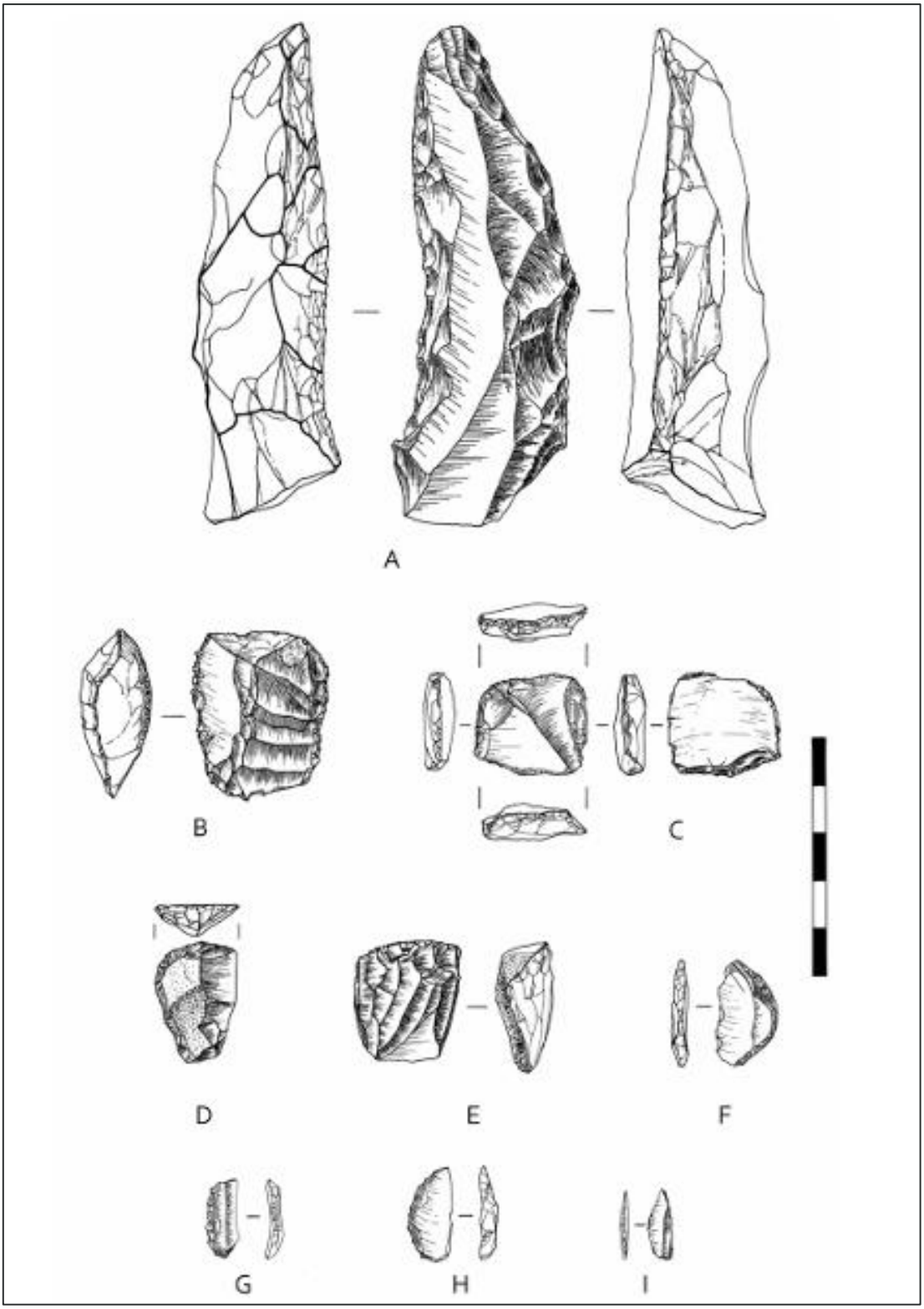

Figure 4: Examples of an adze (A), scrapers (B-D, G), backed bladelets (I), bladelet cores (e), and segments (F, H). Typical pieces associated with the LSA (after Forssman *et al.*, (2010))

Figure 5: Some examples of LSA organic material remains from Border Cave. Bone awls and points (1-7), Ostrich Eggshell beads (8-21), tick shell beads (22-23), bound organic material (24), digging stick (25), poison applicator (26), implement made from warthog or bushpig lower canine (27), and notched bone tools (28-30)(after Backwell *et al.* (2023) and d'Errico *et al.* (2012))

3.1.3 THE IRON AGE

South Africa's archaeological record diversifies as interactions, migrations, and major changes take place over the last 2000 years. While hunter-gatherers continue to occupy most of the southern African landscape, the area becomes a melting pot with pastoralists gradually moving in from the North, and changes in hunter-gather lifestyles take effect. Bantu pastoralists bring with them iron working, together with key associated markers of pastoralist lifestyles. Unlike hunter-gatherer lifestyles in South Africa which are generally nomadic, and without distinct settlement patterns, pastoralists transform the landscape, introducing structures and complex societies. Altogether, the Iron Age is characterised by materials that signify the depth of change that takes place across southern Africa over the last 2000 years.

The Iron Age can be divided into three phases:

A. Early Iron Age

B. Middle Iron Age

C. Late Iron Age

A) EARLY IRON AGE

Coinciding with the LSA, the Early Iron Age is characterised by the arrival of Bantu-speaking pastoralists, as well as Khoe herders. Dating between 200 and 1000 AD (200 to 900 AD according to Huffman (2007)), the Early Iron Age represents a period which transforms the southern African landscape with more people coming into the area, more interaction taking place, and the earliest examples of complex societies developing. The Early Iron Age and associated material evidence represent the first signs of migration and exchanges between hunter-gatherers, sheep herders, and pastoralists.

As summarised by Huffman (2007), during this period, the first occurrences of material culture related to groups originating from central to northern Africa can be observed. Huffman (2007) relates this occurrence to the spread and diffusion of Bantu languages across most of southern Africa. Above all, Huffman (2007) argues for the relationship between the spread of language to the spread of material culture and tradition observable through the stylistics of pottery and ceramic tradition.

Key ceramic types relate to the broader Kalundu and Urewe traditions, that is, the two main traditions associated with the Eastern and Western streams of migration supported by migration theories (Figure 6). Associated ceramic styles include Silver Leaves, Happy Rest, and Lydenberg, all related to similarly named sites. Another key ceramic tradition that occurs during this period is Bambata pottery which is indicative of hunter-gatherer and pastoralist interaction. Figure 7 provides an illustration of some examples of Bambata potsherds.

B) MIDDLE IRON AGE

The Middle Iron Age sees the rise of complex societies relating to interaction events, particularly those around the Shashe-Limpopo confluence area. As iconic markers in South Africa's Archaeological record, sites such as K2 and Mapungubwe represent examples of the Middle Iron Age which has been associated with dates between 1000 and 1300 AD. Several studies have considered the dynamics of the ways of life associated with the Shashe-Limpopo confluence area and its complex societies (Calabrese, 2000; Huffman, 2000; Meyer, 2000; Huffman, 2009). While this period marks more interaction between hunter-gatherers and farmers, its material culture becomes very specific.

In terms of ceramic tradition, Huffman (2009) suggests a development of ceramic styles throughout the Middle Iron Age (Figure 8). Huffman (2009) suggests that the phase is indicative of developing complex societies. Altogether, the Middle Iron Age is a period in South Africa's archaeological record that is indicative of some of the earliest examples of trade and interaction as well as the inception of complex societies in the country. This phase also sees the first occurrences of the use of gold and golden implements (Figure 9).

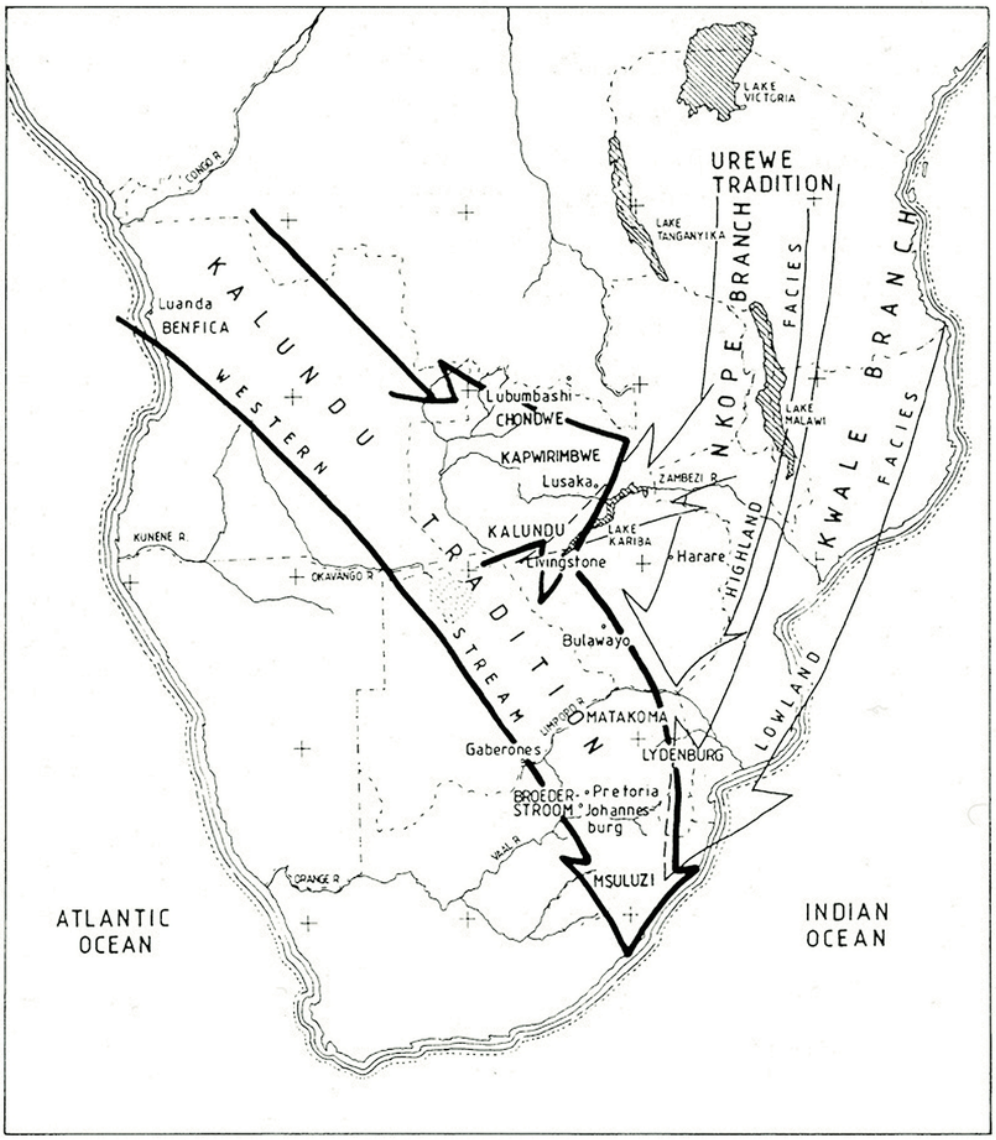

Figure 6: General understanding of Bantu migrations related to the larger ceramic traditions, Kalundu (Western Stream) and Urewe (Nkope and Kwale Branches) (After Huffman, 1989).

C) LATE IRON AGE

Moving towards and intersecting with the historical period of South Africa's archaeological record, Huffman (2007) emphasizes the importance of the occurrence of Great Zimbabwe following K2 and Mapungubwe. While Great Zimbabwe forms a cornerstone in understanding the life ways of the Late Iron Age, this phase, dating between 1300 until as late as 1840 AD, is associated with extensive migrations and diffusions of groups. These migrations and diffusions eventually result in the formation of a large part of the contemporary cultural makeup of South Africa. Above and beyond anything else, stone wall structures represent the archaeological evidence of these cultural developments.

Representing Late Iron Age community organisation and structure, stone wall structures have been studied extensively (Maggs, 1976; Huffman, 1989, 2002; Sadr, 2012; Sadr and Rodier, 2012). A main aim of these studies has been to date stone wall structures, as unlike most archaeological remains, these cannot be easily chronologically placed nor definitively associated with specific groups. Research has developed over the years, leading to the classification of stone wall structures based on their layout and patterning.

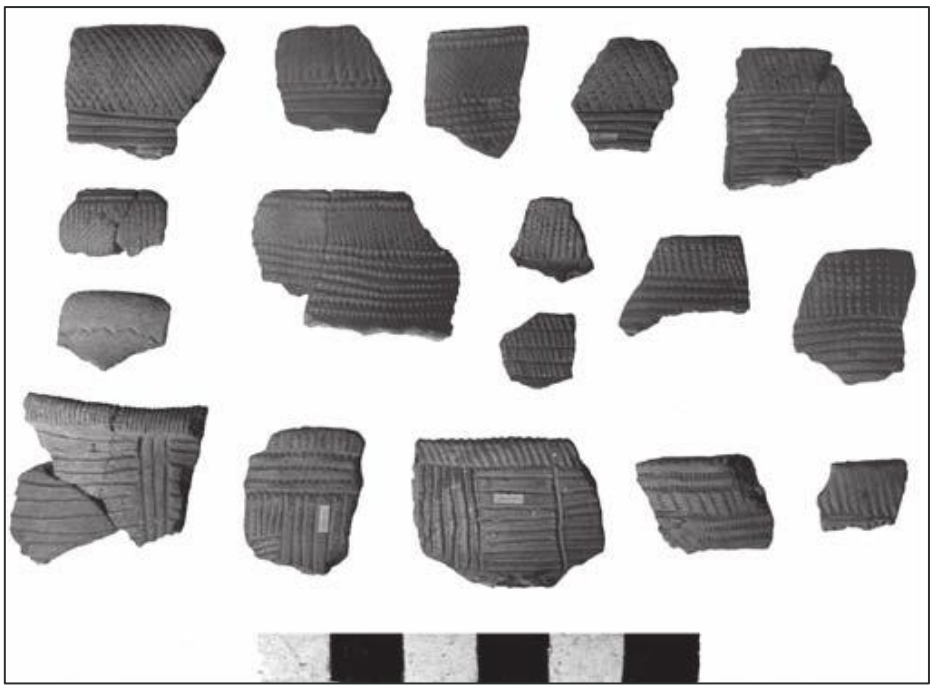

Figure 7: Examples of Bambata Potsherds (Huffman, 2005).

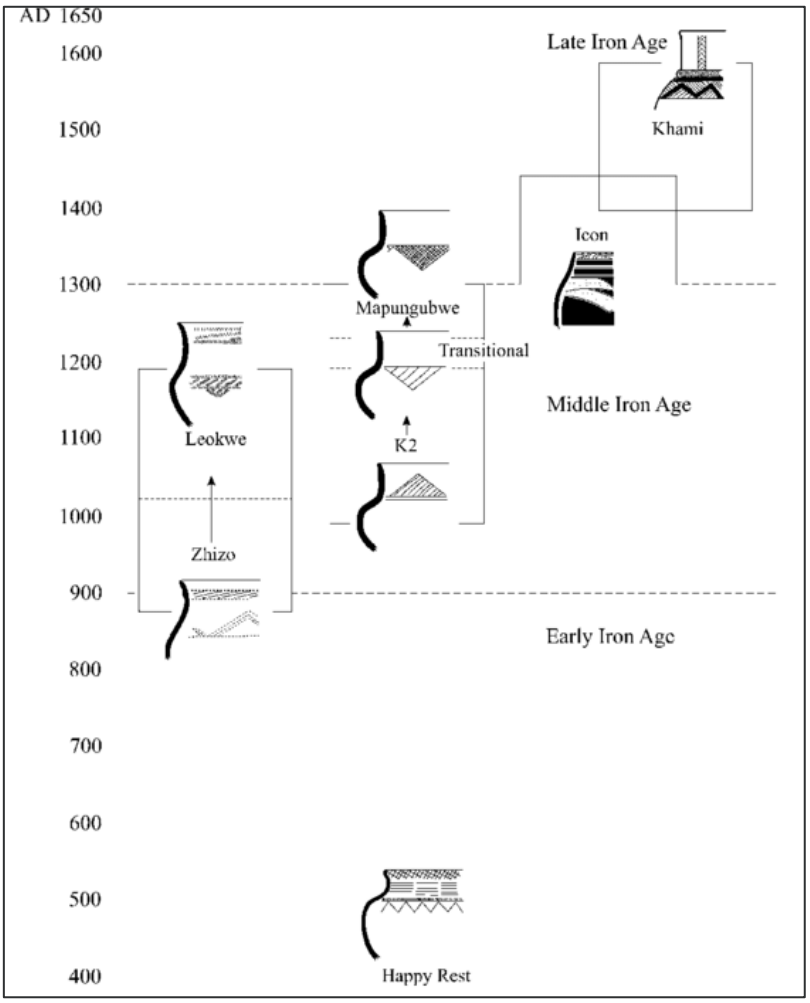

Figure 8: An Iron Age ceramic sequence demonstrating transitions between K2 and Mapungubwe ceramic styles (Huffman, 2009).

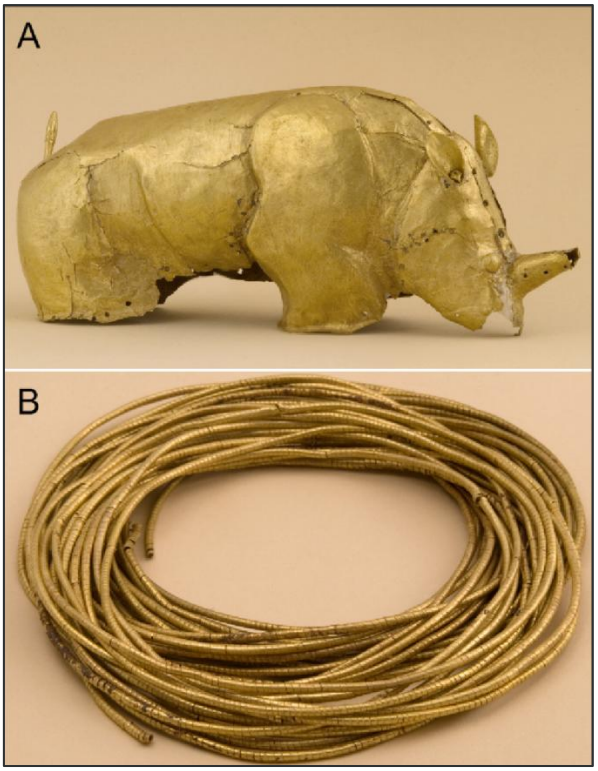

Figure 9: Famous golden implements of Mapungubwe (A - Golden Rhinoceros, B - Golden anklets) (Woodborne *et al.*, 2009).

Sadr and Rodier (2012) provide one of the most direct classifications of stone wall structures, drawing from previous understandings (Maggs, 1976; Huffman, 2007). Grouping stone wall structures into three groups (I, II and III), Sadr and Rodier (2012) argue for differences between stone wall structures. Group I stone wall structures are considered the earliest of the structures chronologically. These have also been classified as Type N structures, mainly being described as consisting of several cattle kraals in the centre linked by other walls (Maggs, 1976) (Figure 10). These structures have been noted in areas such as Klipriviersberg, south of Johannesburg, which has been related to early agropastoral activities in the area (James, 2018) (Figure 11).

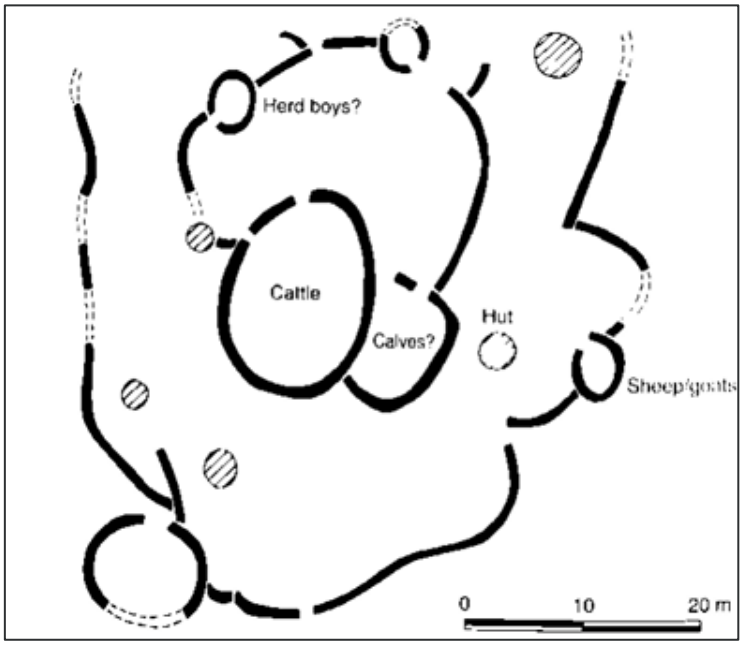

Figure 10: Type N stone wall structures as illustrated by Maggs (1976).

Figure 11: An on-site photograph of a Group I or Type N stone wall structure at Klipriviersberg Nature Reserve (James, 2018).

Representing later events of occupation during the Later Iron Age, Group II and III stone wall structures consist of more complex layouts and clustering. Group II and III structures include structures that make up the Bokoni (Mpumalanga) (Figure 12) and Kweneng (Suikerbosrand Nature Reserve, Gauteng) complexes (Figure 13).

Figure 12: An aerial photograph of stone wall structures part of the Bokoni complex, Mpumalanga (after Delius *et al.* (2012)).

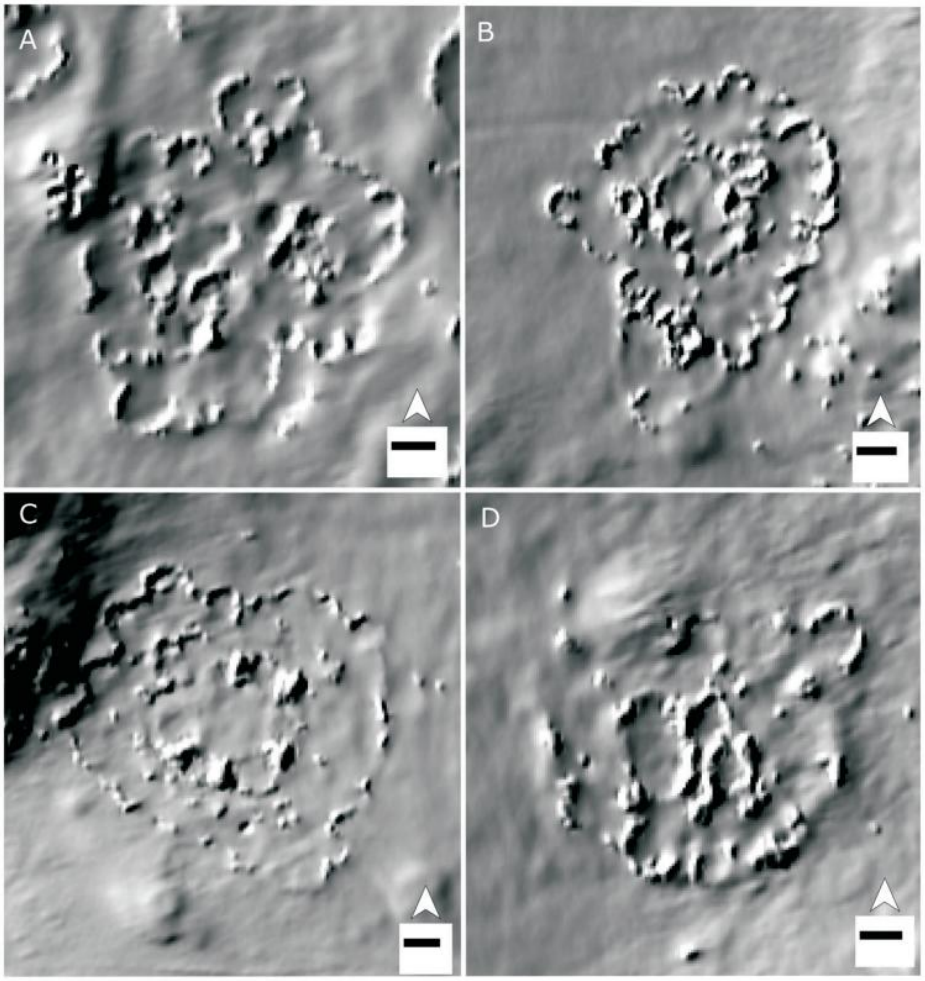

Figure 13: LiDAR imagery of Molokwane stone wall structures of Kweneng, a lost city discovered at Suikerbosrand Nature Reserve (after Sadr and Mshuqwana (2020)).

Different material culture is associated with the Late Iron Age including burials, ceramic remains, as well as LSA tools which continued to be used by different groups. The Late Iron Age and the groups associated coincide with the Historical Period of South Africa, which involved events including colonialism, industrialisation, various conflicts and social movements, ultimately leading to the development of the state as at present.

3.1.4 HISTORICAL PERIOD

A) PORTUGUESE MARINERS AND SHIPWRECKS

Marking the documented history of South Africa, the Historical Period starts when the first European settlers arrive. Thompson (2001) provides an overview of the historical events in South Africa which have contributed to the archaeological record and overall heritage profile of the country.

The country's first encounter with Europeans is allocated to the first Portuguese expeditions which rounded the Cape of Good Hope in the sixteenth century. During their expeditions, several ships were wrecked given the harsh conditions the small vessels had to endure (Thompson, 2001; Gribble, 2002; Werz, 2010). Gribble (2002) provides a brief overview of the extent of shipwrecks off the South African coast, stating that over 3000 shipwrecks have been recorded. Shipwrecks represent the first signs of historical European interactions with South Africa.

B) THE CAPE COLONY

While Vasco de Gama and Bartolomeu Dias represent two of the first Portuguese mariners to round or interact with the South African coast, the country's history is transformed with the formation of the Dutch Cape Colony. The Dutch East India Company, establishing a port of call at Table Bay through the arrival of Jan van Riebeeck, intended for Cape Town to become a base for the rapidly growing enterprise. In the mid-1600s, the company encouraged some individuals to participate in farming and food production, in the hopes of solidifying and establishing the Cape Colony (Thompson, 2001). The Cape Colony developed into a melting pot of different people due to the expansion of the colony through slave trade, and arrival of other European groups. In terms of archaeology, research of some of the early homesteads of the Cape Colony such as Vergelegen provide more understanding of the extent of interaction between different groups from as far as East Asia, to Brazil (Markell *et al.*, 1995) (Figure 14).

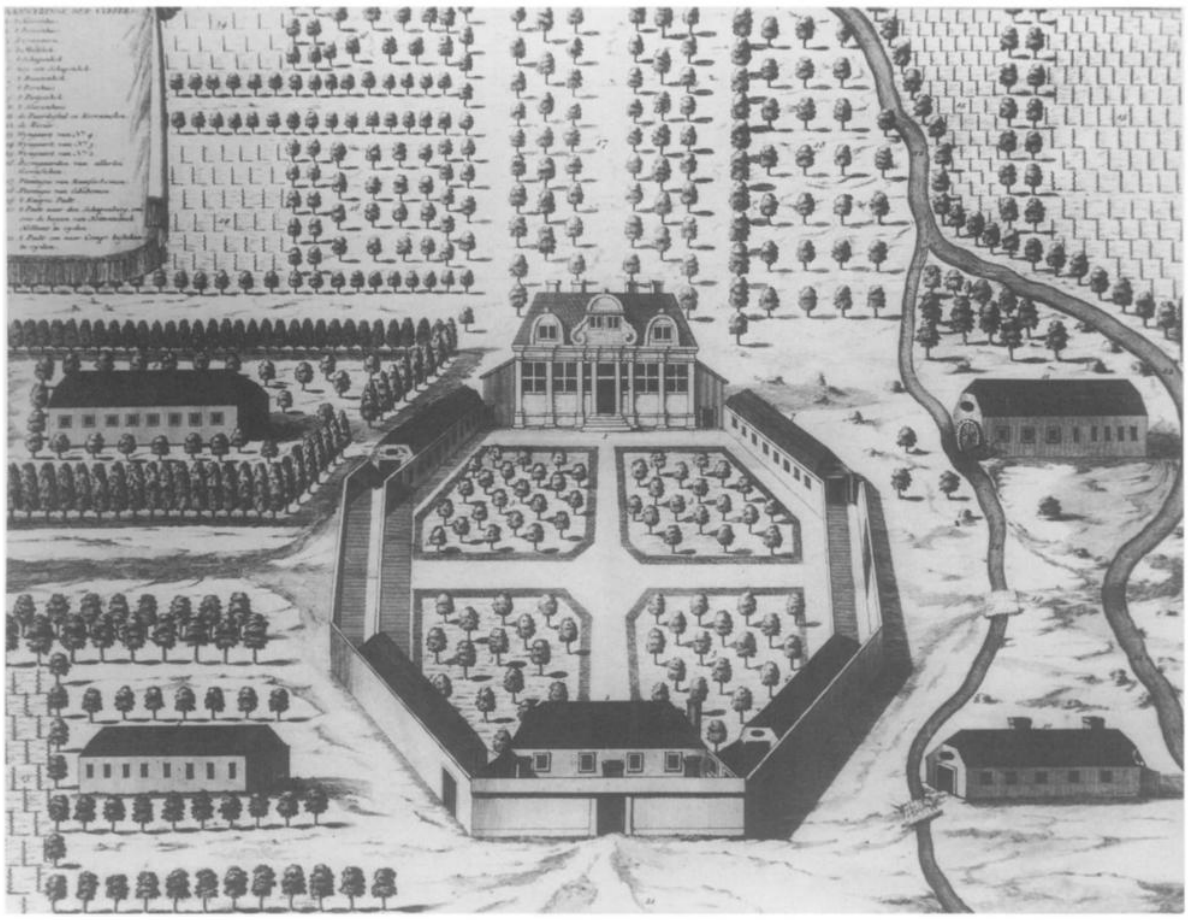

Figure 14: A 1700s drawing of Vergelegen, a Cape Colony homestead including multiple buildings including slave lodges. (after Markell *et al.* 1995).

It was through these first extensive events of interaction that essentially led to the formation of the Afrikaans language, and Afrikaner culture. In short, through extensive interaction and influence, Afrikaans was formed, with the first written scripts of the language curiously having been written in Arabic script (Figure 15).

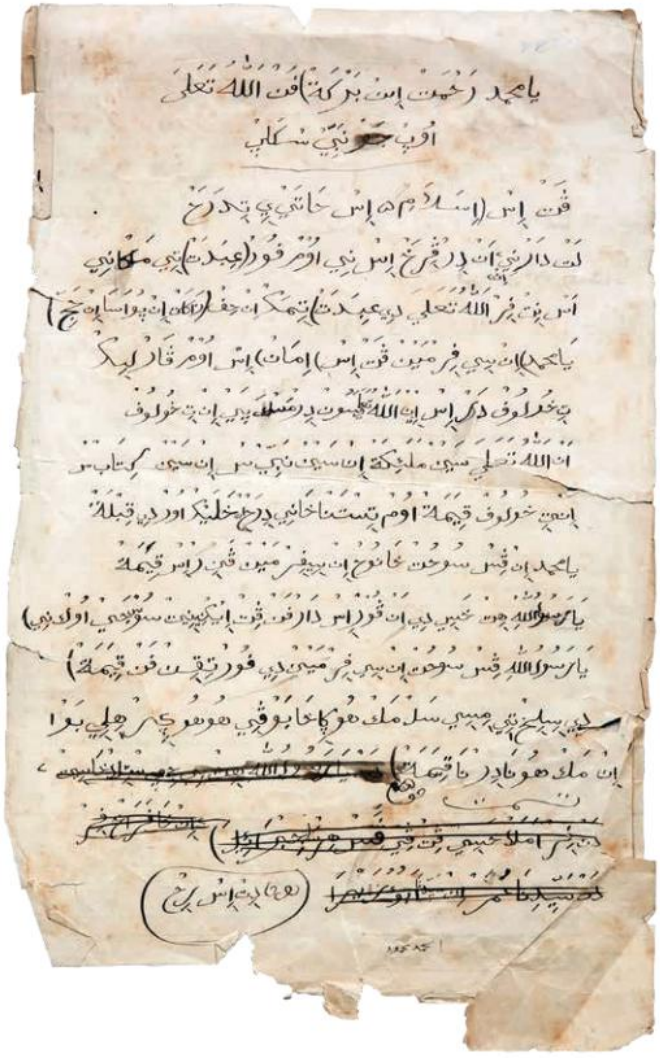

Figure 15: An Arabic script representing the first written texts of the Afrikaans language (late 19th Century) (after Davids (2018))

C) DEVELOPMENT OF THE SOUTH AFRICAN MINING INDUSTRY

It was in the late 1800s that South Africa's economic development reached a point of rapid acceleration. While the coast was represented by a richly diverse Cape Colony, the central landmass of the country had been heavily invested in for the exploitation of mineral resources following key discoveries. Diamonds and gold were of particular interest. It was only later when platinum was discovered as part of the Bushveld Complex to the north of the country, which further inspired investment in mining and mining infrastructure (Cawthorn, 2010). Given the complex nature of the deep gold reefs of key locations such as Johannesburg, investments of substantial time and money were necessary, ultimately leading to the establishment of merged and expansive mining companies (Durand, 2012; Harrison and Zack, 2012). This fact led to the development of key settlements which have since developed into modern cities such as Kimberley and Johannesburg (Figure 16).

As South Africa's influence in the world economy grew, so did colonial interest. This essentially initiated the first colonial and civil conflicts recorded in the modern history of the country. Essentially, these conflicts involved the British Empire's efforts towards colonising the country, being opposed by Afrikaans Boers and associated powers.

Figure 16: A photograph of Johannesburg from the 1890s (after Chirisa and Matamanda (2019))

D) CONFLICTS OF SOUTH AFRICA

As the country continued to economically expand, several conflicts arose prior to the intense colonial imposition the country was about to face. In the early 1800s, conflict had arisen among Nguni groups, essentially being driven by environmental pressures as well as the injection of trade activities. Shaka Zulu becomes a key figure in what has come to be known as the Mfecane, or the period of "the crushing". The period is marked by the conquests and rise of the Zulu kingdom which essentially had a bearing on the lifestyle and organisation of groups across the country. Given that this conflict had taken place during a period when South Africa was being extensively documented, the events of the Mfecane have formed part of historical records.

Near the turn of the 20th century, conflict between colonial powers took form. One of the most notable of these conflicts was the Anglo-Boer War, or the South African War. Between 1899 and 1902, this war was largely supported by the British Empire's push towards controlling the country and its many smaller colonies. As Thompson (2001) highlights, the war essentially ended in the favour of the British. The influence of the British had since transformed the South African landscape with much of its cultural and colonial history being founded on the Empire's rule. It is important to note this conflict as it presents opportunity in terms of archaeological and cultural heritage resources.

Locations such as Mafikeng have become key in recounts of the South Africa War. The war also led to the movement of people, which has been recorded, for example, Springfontein, which saw the formation of a war refugee camp (Figure 17). As many battle sites have been recorded, key archaeological finds related to these events can still be found. These resources, and in some cases, monuments, tell the story of South Africa's early struggles of colonialism and the origins of racial laws and regulations.

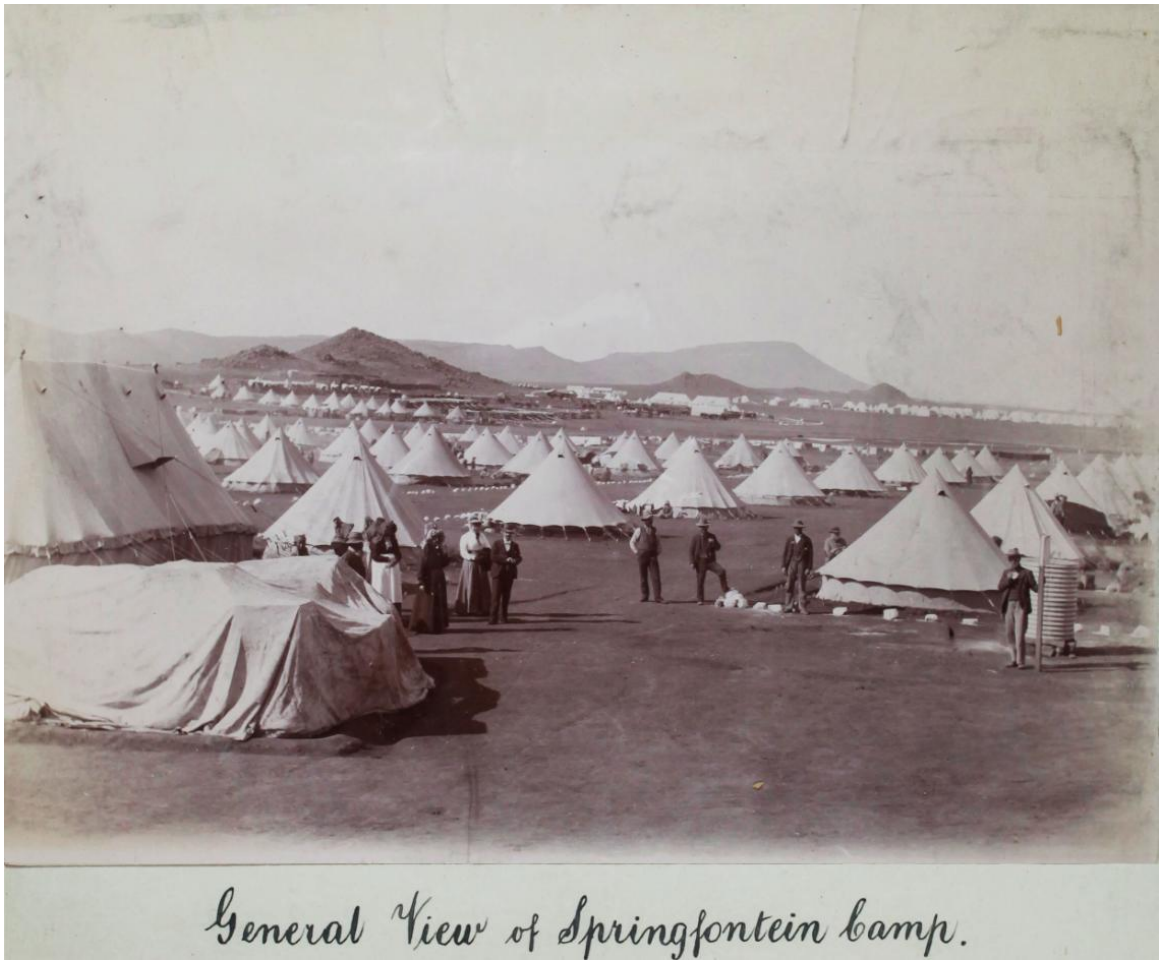

Figure 17: A picture of Springfontein, a refugee war camp which was established as a repercussion of the war's influence (after British National Archives).

E) APARTHEID AND CONTEMPORARY HISTORY

It was after the Anglo-Boer War that the initial motions towards racial segregation through law and regulation came to be. The establishment and expansion of mining towns led to the marginalisation of different racial groups. By the mid-20th century, the Apartheid regime had been put in place, controlling the movement and settlement of people. For one, new documentation was required for many racially marginalised people to move into areas that were otherwise restricted. Such laws inspired revolutionary responses (Figure 18), ultimately leading to the struggle against apartheid, which has characterised the 20th century of South Africa ((Thompson, 2001).

After being abolished in 1994, the legacy of Apartheid has been argued to have had a lasting effect on society. This has been argued beyond the context of history, being observed in social dynamics, contemporary infrastructure, as well as urban growth and development. Leading to contemporary history and modern approaches to development, Apartheid is seen as the most recent event having shaped and formed South Africa as we know it today.

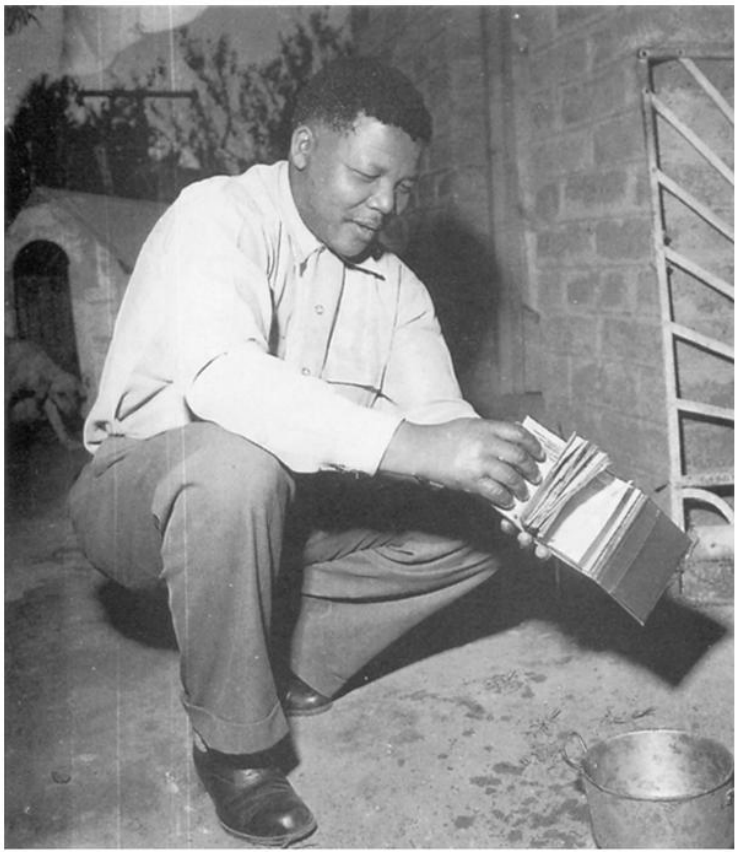

Figure 18: Nelson Mandela burning his pass in 1959. A pass was a requirement for people to move across the country. Such documents have now become items representing the Apartheid regime.(Thompson, 2001)

3.2 SITE-SPECIFIC BACKGROUND

The North West Province is associated with a long archaeological record that spans across pre-colonial and colonial periods. Most notable is the area's significance during the South African War (1899-1902). The closest town to the site in question being Kroondal, is specifically important in this regard.

3.2.1 IRON AGE STONE WALLED STRUCTURES

Firstly, Kroondal 304JQ (all portions included), that is the property with which the settlement shares a name, has been associated with Bafokeng or Batswana stone walled structures (Pistorius, 1999). The structures have been studied extensively with three main sites identified. These have been named KRO001, KRO002, and KRO003 respectively, with KRO002 being the subject of mapping and excavations. Figure 19 is adapted from Pistorius' (1999) study, indicating the locations of the three structures. It is important to note that over the years, the three sites have been extensively disturbed by surrounding mining activity, however, much of these structures are still intact. Figure 21 provides an illustrated understanding of the present-day context of these sites. Notably, these sites are now located adjacent to a Tailings Storage Facility. Given their distance from the project area in question, no further investigation or assessment of these structures was undertaken.

Although no further assessment was undertaken as part of the desktop assessment, the research done on these structures was of interest to contextualise the heritage significance of the greater area. KRO002 was of particular interest in Pistorius's (1999) study, with a large section (KRO002.1) of the structure having been mapped and excavated. The structure is an example of more complex stone walled structures, which would have included multiple huts, cattle kraals, and courtyard areas. Figure 20 is a map of the structure itself.

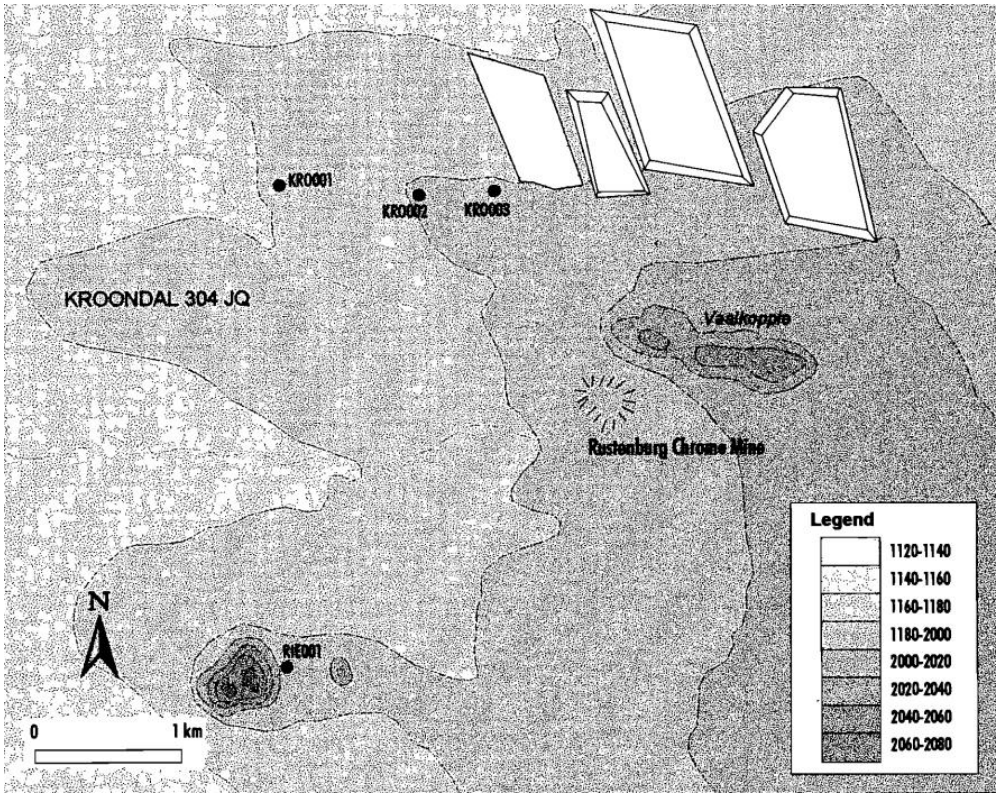

Figure 19: Location of the three stone walled structures (KRO001, KRO002, KRO003) identified on Farm Kroondal 304JQ (after Pistorius, 1999)

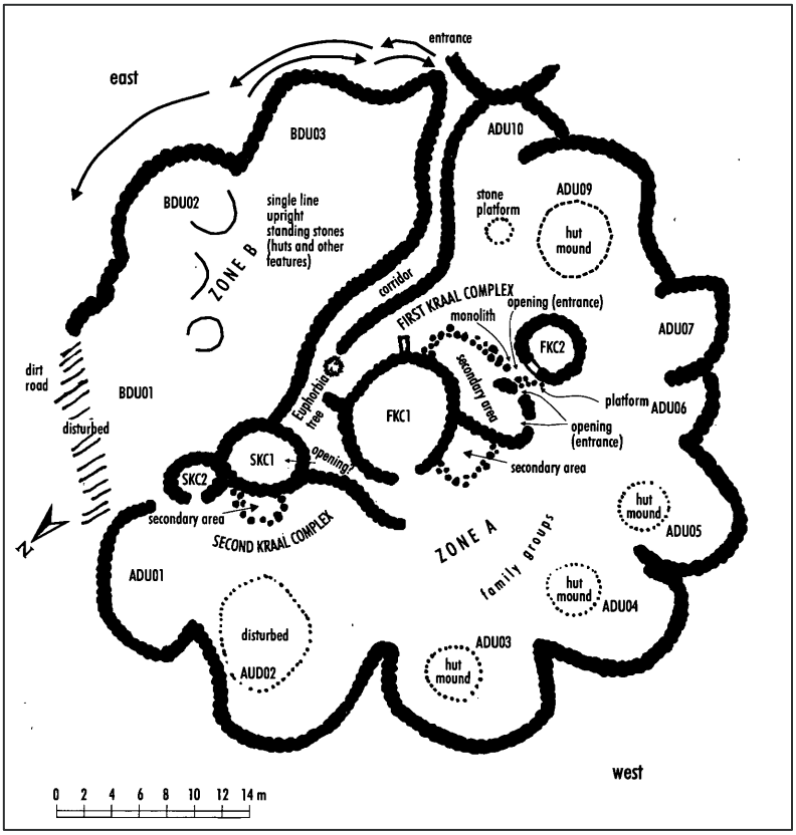

Figure 20: Mapped layout of KRO002.1, a section of KRO002. Layout includes different sections of the stone walled complex. (After Pistorius (1999)).

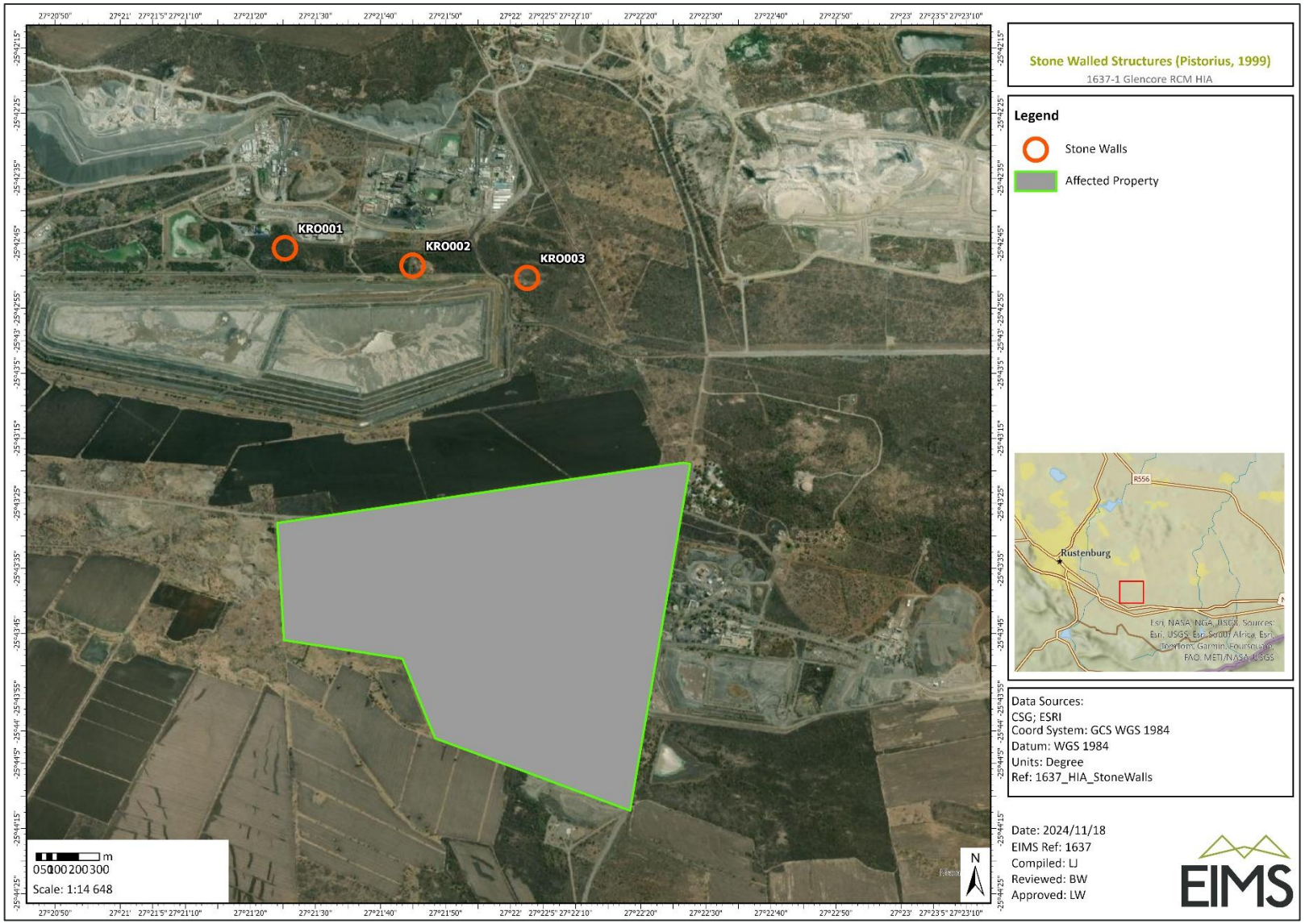

Figure 21: Stone walled structures identified by Pistorius (1999) on Farm Kroondal 304JQ. Location and integrity of the sites was not confirmed during this assessment.

3.2.2 CULTURAL HERITAGE OF KROONDAL

Kroondal, the closest town to the study site, is associated with a unique cultural heritage background. Dating back to the late 1800s, Kroondal was founded by German missionaries (the Hermannsburg Mission)(Melck, 2012). Kroondal continued to develop during the 1800s, remaining exclusively German until and even throughout the South African War. Many of Kroondal's inhabitants participated in the war, and this had repercussions on the cultural integrity of the town, which at a point during the war was almost deserted or abandoned. However, the town remained and still is to this day, a rare representation of German culture in South Africa.

Key landmarks and tangible representations can be observed through the architecture of the town. The Kroondal Church, having been constructed in 1896, is a key feature and testimony of the town's German heritage (Figure 22). The integrity of the church has been preserved despite its age as a monument and symbol of Kroondal's German cultural heritage. The building is still in use with many German-speaking residents of the town continuing to attend religious events held at the church (Figure 23).

Figure 22: Photograph of Kroondal Church taken in 1896 (after www.ruralexploration.co.za/kroondal).

Figure 23: Photograph of Kroondal Church taken in 2014.

3.2.3 BATTLE SITES OF THE SOUTH AFRICAN WAR (1899-1902)

As previously noted, the overall area's heritage significance is mainly related to the events of the South African War. The Magaliesberg was a strategic battleground during the war as the mountain range stretches between Pretoria and Rustenburg. The mountain range's rugged terrain provided several benefits during combat such as natural barriers and locations from which surprise attacks could be launched. Surrounding towns and settlements were often involved with the conflicts that took place around this area. However, the most notable heritage features of this area related to the South African War are the battle sites. While none of these battle sites are located near the site in question, it is important to highlight the closest of these heritage markers.

The closest battle site related to the battle of Olifantsnek, is approximately 15km away from the study site. The battle itself was a key conflict related to British movement and occupation of major towns such as Pretoria and Rustenburg. Olifantsnek was a strategic pass between Pretoria and Rustenburg during the war. The Olifantsnek Dam has been since constructed in the area.

3.3 DATABASES AND COLLECTIONS

As a key resource centre, the Mafikeng Museum represents the largest collection found in the North-West Province. While this museum is further away from the site, it represents much of the history of the province. Further, the Paul Kruger Country House Museum is a key location capturing historical contexts of Rustenburg, the closest large town or city to the site.

3.4 PREVIOUS RELEVANT IMPACT ASSESSMENTS

In the context of the current assessment, a background examination of previous historical finds and associations was conducted. Considering available information through the SAHRIS database and previous Archaeological assessments of the area, the following key reports on finds have come to light:

A report on a Cultural Heritage Impact Assessment for a Proposed Filling Station Development on Portion 140 (A portion of Portion 73) of the Farm Kroondal 304 JQ close to Rustenburg, North-West Province.

The report above was identified as one of the closest Cultural Heritage Studies conducted in proximity to the project site in question. No key finds were noted.

A survey for Heritage Resources in the Lonmin Marikana Mine Lease Area in the Brits (Madibeng) and Rustenburg (Bafokeng) districts in the North-West Province.

This report involved a large-scale assessment of Archaeological sites and finds across the Lonmin Marikana Mine Lease Area. It represents one of the biggest studies done in the area. The assessment identified numerous sites across the larger area. These include stone wall structures, evidence of historical settlements, historical houses, graveyards, Stone Age sites, as well as LSA sites. While these sites only include examples which are further from the proposed development, these provided some context on the nature of the material anticipated.

4 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

This section discusses the overall environmental attributes of the site in question. This includes key aspects of the landscape and general conditions associated with the area.

4.1 TOPOGRAPHY

The development area falls in an area between 1180 and 1200 m above sea-level in elevation. The landscape gently slopes towards to the West. A high point or hill is noted about 1 km to the East, at 1278 m above sea-level. It is on this hill that significant Archaeological or Cultural Heritage sensitivity is noted. Figure 25 provides an overview of the elevation of the proposed development site as well as surrounding areas indicated by contour lines.

4.2 DRAINAGE AND CATCHMENT

The closest river to the site is the Sandspruit approximately 3,5 km to the South. The proposed development falls within the A22H Quaternary Catchment.

4.3 CLIMATE

The climate of the North-West Province is characterized by hot summers and cool sunny winters, with the rainy season usually occurring from October through to March. Temperature and precipitation vary from the eastern and mountainous areas receiving a rainfall of between 600-700 mm per annum to the drier western areas receiving less than 300 mm per annum.

The climate in the region is a Highveld climate, characterized by hot summers during the months of September to March and cold winters starting from April to August, with thunderstorms occurring in the late afternoons of the summers and with frontal rain occurring in the winter months.

Figure 24 provides an understanding of the general climatic conditions of the area, including an understanding of monthly temperatures and rainfall.

4.4 LAND USE AND LAND COVER

Figure 26 provides an overview of the land uses and land cover of the proposed site. Land uses of the surrounding area include for the most part, commercial agriculture, mines, mine surface infrastructure, as well as mine tailings. The proposed development site itself is located in a highly disturbed grassland area, including existing mine surface infrastructure, and mine quarries.

Sections of the site are densely vegetated forming almost impenetrable woodland areas. Trees include small shrubs or trees no taller than 3 meters. Some sections of the area are completely covered by grass species, while others have been cleared as part of the Clover RCM's operational activities. It is important to note that Clover RCM has existing infrastructure on site which has contributed to the overall disturbance of the area. Further,

majority of the area to be developed has been previously cleared as part of the activities related to the existing infrastructure potentially having an impact on all above-ground heritage features.

4.5 GEOLOGY

Falling within the parameters of the Bushveld Complex, the main geology of the proposed development site is characterised by feldspathic pyroxenite rich in chromitite. Most of the site falls within the Ruighoek Pyroxenite and Mathlagame Norite Geological Subgroups. Refer to Figure 27 for a simplified breakdown of the geology of the area.

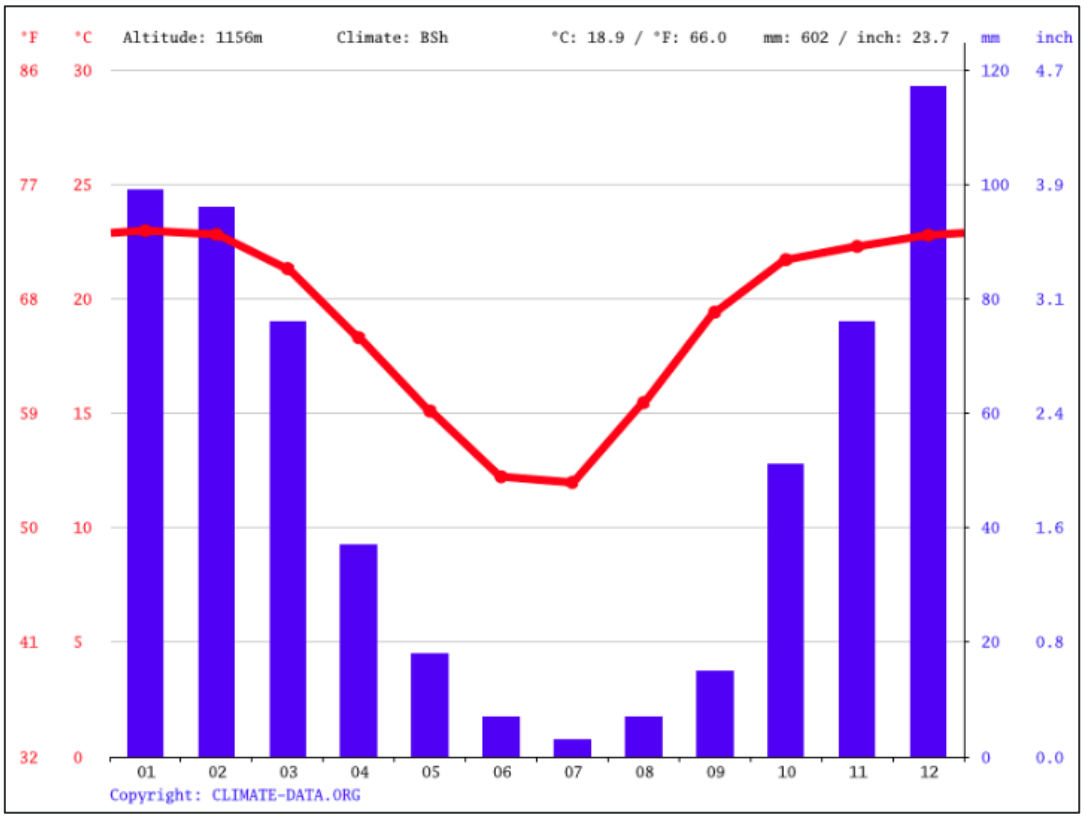

Figure 24: Annual Climatic conditions typical of the Rustenburg area (x-axis: 01=January, to 12=December)

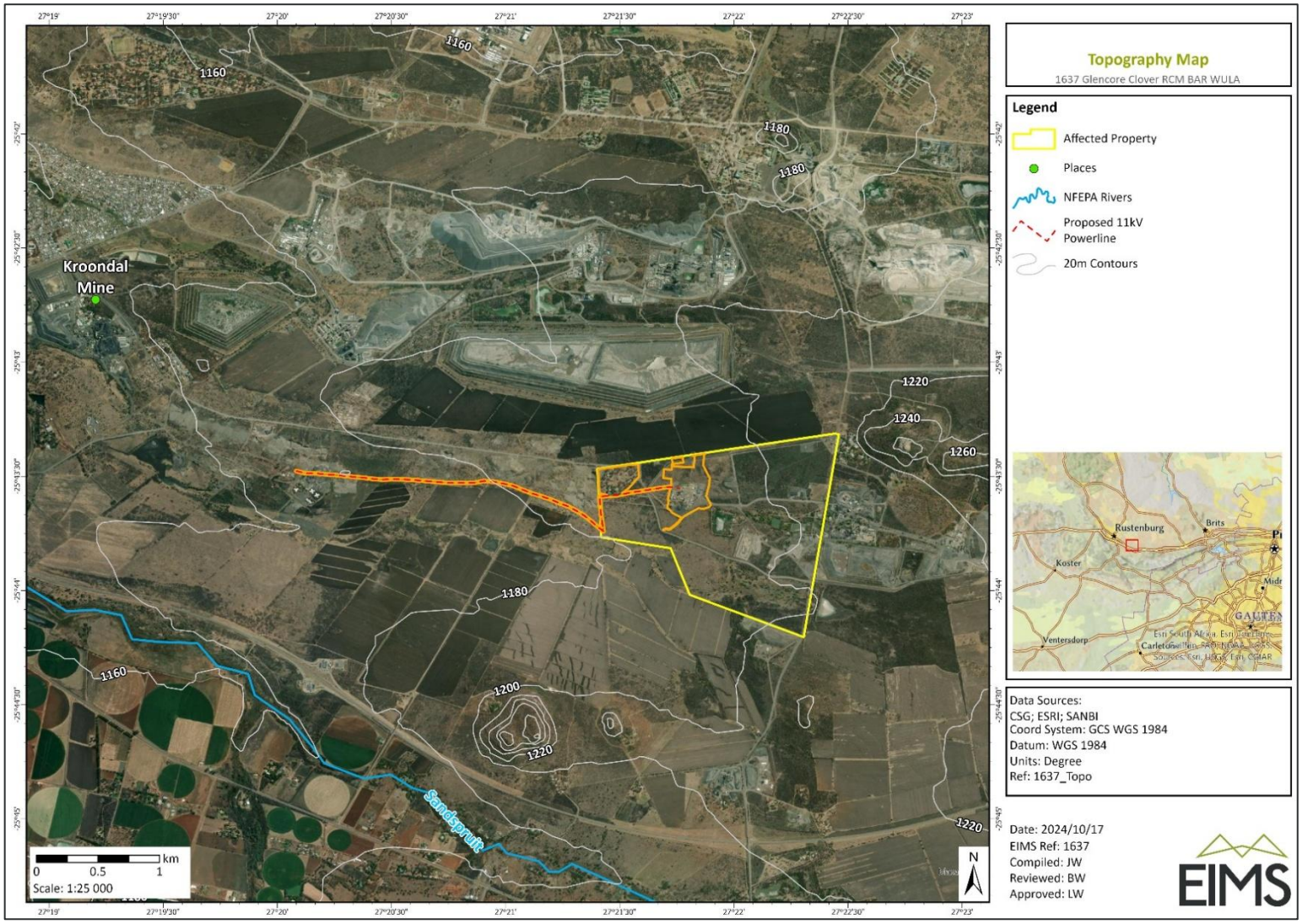

Figure 25: Topography Map of the Proposed development and surrounding areas.

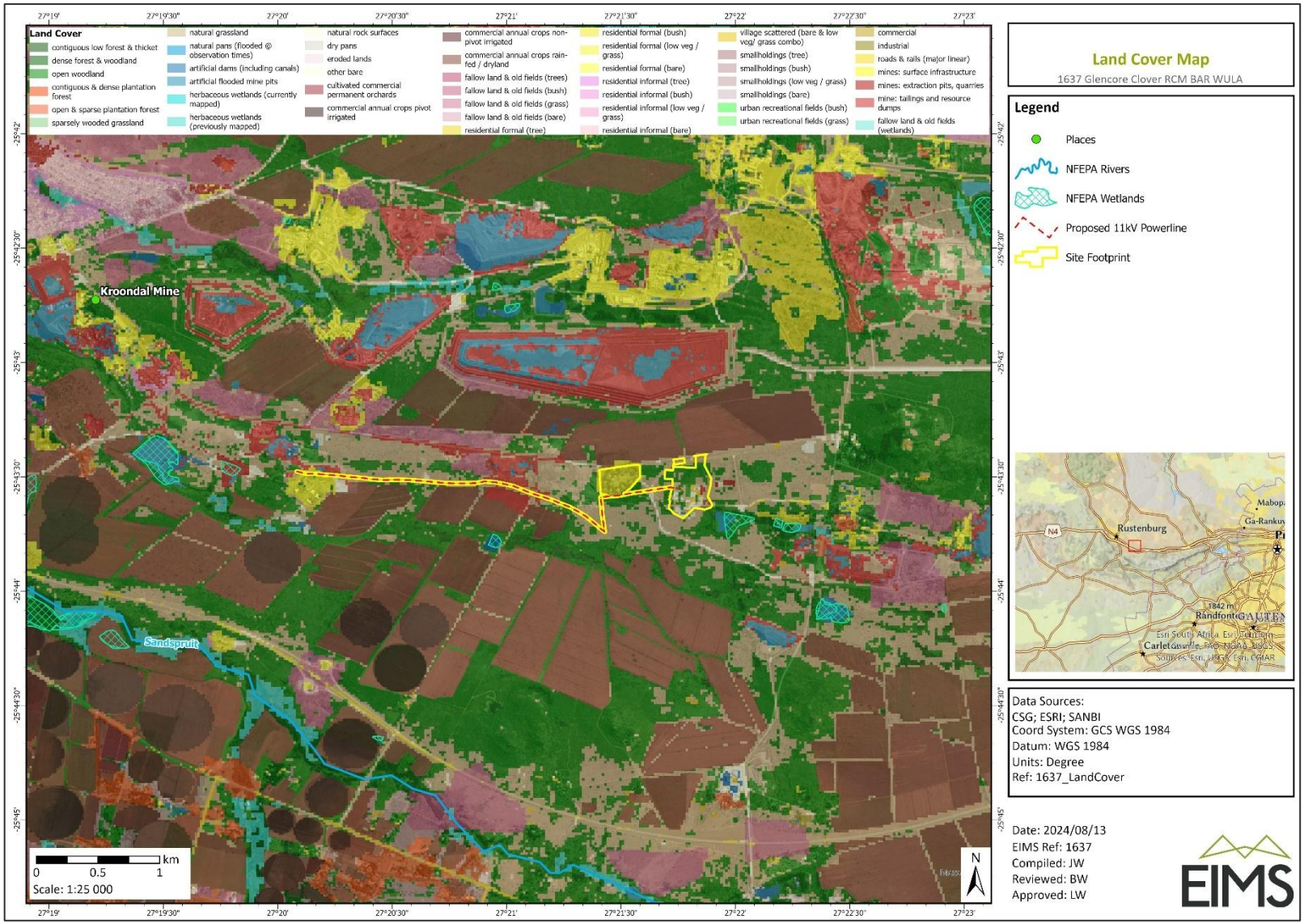

Figure 26: Land use and land cover of the proposed site and surrounding areas.

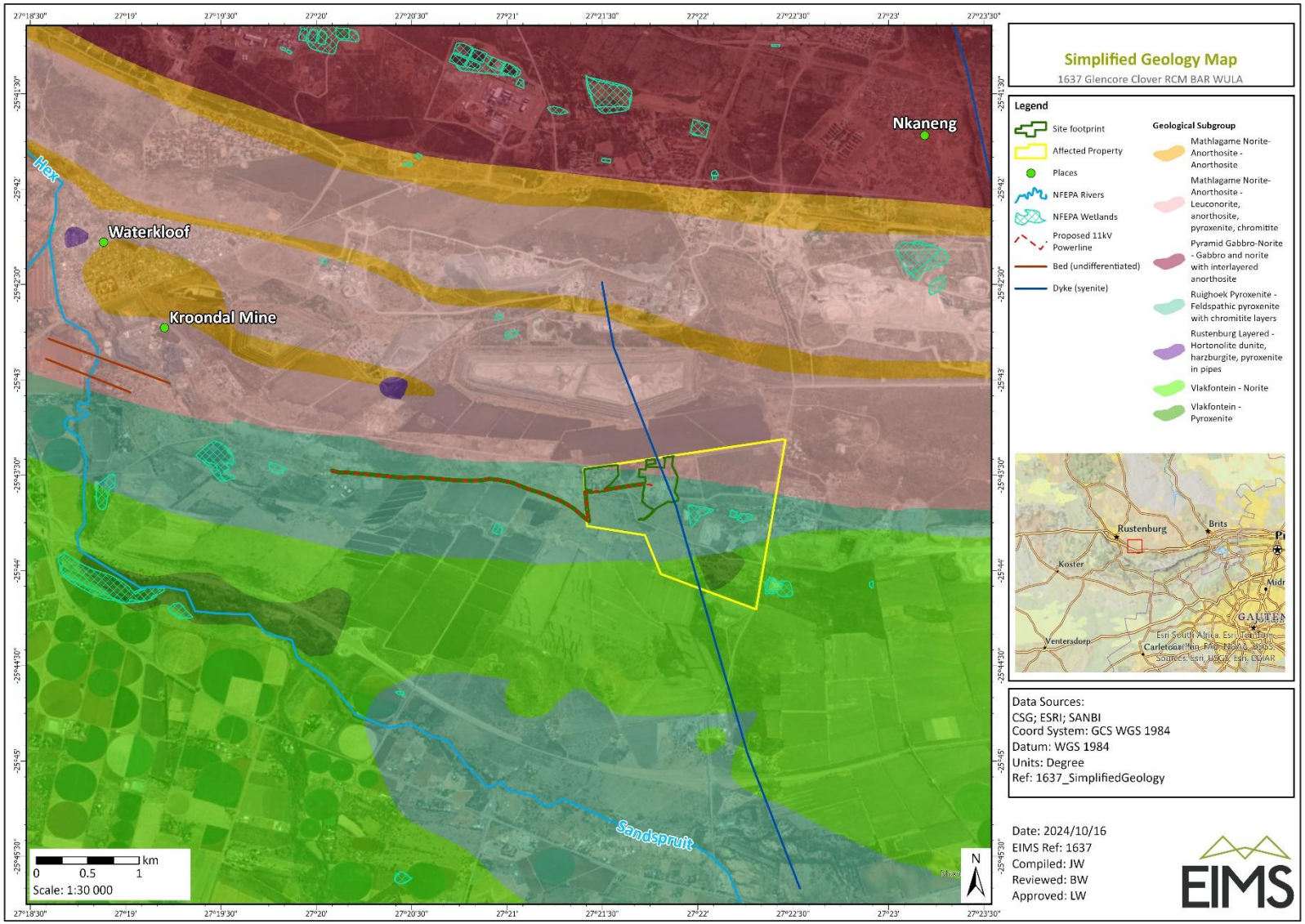

Figure 27: Simplified Geology Map

5 METHODOLOGY

The following section describes the methodology used to gather information on potential heritage resources and impacts in this report. Firstly, an initial desktop assessment was conducted to identify key areas of heritage sensitivity and potential features identified in the past. A field survey was then conducted to verify the significance of any identified features as well as identify any additional features.

5.1 INITIAL DESKTOP ASSESSMENT

To evaluate the overall sensitivity and extent of Archaeological and Heritage features within and around the development footprint, a desktop assessment of the area was conducted. The desktop assessment involved making use of existing information related to heritage resources of the area.

As an initial step, the Screening Tool of the Department of Forestry, Fisheries and the Environment was consulted. The Screening Tool includes a geospatial database of recorded and identified sensitivities relating to Archaeological and Cultural Heritage sites or finds. The information available through the Screening Tool provided a basis which informed further desktop assessments and the extent to which the field survey would be conducted. This information was then corroborated with information available through the South African Heritage Resources Information System (SAHRIS), Chief Directorate: National Geospatial Information (CD:NGI), as well as Google Earth Imagery. Various aerial photographs and 1st edition topographic maps were consulted to verify the extent of heritage and archaeological sensitivity in and around the development footprint. Altogether, the data consulted included geospatial records dating as far back as 1955.

5.2 FIELD SURVEY

To verify and add to the observations made through the desktop assessment, a field survey was conducted over two separate days, on 2 August 2024 and on 11 November 2024. The field survey involved traversing the proposed development footprint, with a focus on assessing areas which appear to be undisturbed. The survey also included consulting personnel on site at the existing Clover Rustenburg Chrome Mines, to gather more insight on any known archaeological sites and finds. While most of the area is disturbed by different land uses including agriculture and mining activities, a site survey was necessary to evaluate the overall sensitivity of the area, as well as identify archaeological sites and objects which may not have been identified since.

A team, including an Archaeologist and two EAPs surveyed key areas of the development footprint, as well as key areas immediately outside of the development footprint. A Garmin eTrex 10 was used to record track logs of the extent of the survey itself.

5.3 DOCUMENTATION AND ANALYSIS

All observations gathered through the desktop assessment as well as the field survey were documented and analysed in terms of their significance. Through the desktop assessment, any sites noted through the Screening Tool and SAHRIS were documented in relation to the proposed development. During the field survey, the location of larger Archaeological and Heritage finds was recorded. Smaller Archaeological and Heritage finds were recorded *in situ*. A 30-meter buffer was placed around finds which constituted a site.

Geotagged photographs were taken throughout the survey. This included the photographing of finds, as well as the surrounding environment. Physical scales were included in all photographs which require an understanding of dimensions, sizes and the colour of finds. For larger finds, a 1,5-meter scale divided into 10cm segments was used. For smaller finds, an IFRAO Standard Scale (Figure 28) was used.

Figure 28: IFRAO Standard Scale used for photography of Archaeological finds.

The appointed Archaeologist also kept written notes about the different findings as well as their context. These were recorded in the Archaeologist's personal field journal.

Sites and finds were subsequently analysed in terms of their significance. Several criteria were used to assess the significance of finds and their bearing on the overall heritage significance and sensitivity of the affected area. Table 2 provides a list of the different criteria considered when assessing the significance of finds and or site. In relation to each criterion, different questions were embedded in the analysis of sites and finds.

Table 2: Different criteria and questions which guided the analysis of Archaeological and Heritage finds or sites.

Criterion	Questions which guided analysis
Overall Integrity or condition	1. Is the find or site recognisable beyond initial identification? 2. Is the find or site well or poorly preserved? 3. Has the find or site been disturbed or removed from their original context? 4. Has the find been exposed to severe post-depositional damage or disturbance? 5. What types of meteorological and geomorphological events may have disturbed or compromised the integrity of the find or site?
Context	1. Has the surrounding area been highly disturbed? 2. Is it likely that the find has been removed from its original context? 3. Have other individual finds been located within 15 meters of the find, meriting the description of the find as part of a site? 4. Does the find form part of a collection of more than 3 finds located within 15 meters of each other? 5. Could the find form part of a larger, chronologically or contextually related collection of finds in the area?
Spatial relation to other sites	1. Are there any identified sites located near the find or site? 2. To what extent can the find or site be related to all other sites identified? 3. How close are the other sites to the site or find? 4. Does the occurrence of this site or find change the regional heritage or archaeological narrative?

Prehistoric and historical provenance	1. Can the find or site be identified in terms of which period it relates to, i.e. Stone Age, Iron Age, or Historical? 2. Does the find corroborate or correlate with general understandings of the period it relates to? 3. Does the find or site fit into the heritage narrative of the region or province? 4. Does this find or site add new insight to contemporary understandings of the period it relates to? 5. Does this find or site add new insight to contemporary understandings of Archaeology in South Africa?

5.4 CLASSIFICATION OF SITES

Considering the above-described documentation and analysis methods, heritage finds and sites were classified or graded according to the SAHRA Minimum Standards (2007) recommendations. The grading system adopted in this report is captured in Table 3.

Table 3: Classification of heritage sites as per the SAHRA Minimum Standards (2007) and adopted in this report

Level	Grade	Significance	Action
National	I	High	Nominate for Field Rating/Grade I
Provincial	II	High	Nominate for Field Rating/Grade II
Local	IIIA	High	Retain as heritage register site, no mitigation advised
Local	IIIB	High	Mitigate and retain as heritage register site
General Protection A	IV A	High/Medium	Mitigate before destruction
General Protection B	IV B	Medium	Record before destruction
General Protection C	IV C	Low	No further recording required

The different criteria considered when analysing finds and sites allowed for subsequent grading and classification. In this regard, prehistoric and historic provenance, spatial relations to other sites, and context allowed for the identification of the level of importance of the site or find. In this regard, finds and sites were graded according to if they were of National, Provincial, Local or General significance. Overall Integrity or condition and context guided the advised mitigation action.

5.5 LIMITATIONS

This section details the different limitations associated with the implemented methodology of this assessment. Approaches to mitigate these limitations are therefore presented.

5.5.1 GENERAL LIMITATIONS

Several limitations were expected and encountered while implementing the above-described methodology. Some of these limitations relate to the project itself, while some are more general, relating to the implementation of the methodology itself.

Firstly, such investigations are limited to desktop and field surveys from which findings are drawn. In this regard, the findings presented here are limited to surface observations. Below-ground archaeological contexts would

only apply in cases where the methodology includes components involving excavations and test pits. To mitigate this limitation, this report advises the application of heritage procedures adopted by the developer in cases where construction activities lead to the identification of unexpected finds.

The field survey conducted for this report does not account for any finds on surrounding areas which are not affected by the proposed development. To mitigate this, the initial desktop assessment considers surrounding pre-identified heritage resources and prior heritage studies done in the area.

5.5.2 PROJECT-SPECIFIC LIMITATIONS

As a key limitation noted during the field survey, some areas surveyed were densely vegetated. These areas were circumvented and assessed from other vantage points.

6 FINDINGS

The following section presents the findings of both the desktop assessment as well as the field survey. The desktop assessment revealed that the development area had been extensively disturbed through other developments and activities. A single historical site, as well as 4 singular finds were identified through the field survey which are within or in proximity to the development footprint.

6.1 DESKTOP ASSESSMENT RESULTS

An initial desktop assessment was undertaken to ascertain the overall sensitivity of the area in terms of heritage features. The DFFE Screening Tool was used as an initial point of reference in this regard. The Screening Tool suggested that the area to be developed is of Low Sensitivity as captured in Figure 29.

The DFFE Screening Tool highlighted an area to the West of the affected area indicating that the spot is of Very High Sensitivity. Although the area is further than 1 km away from the proposed development, further research was carried out to ascertain the constitution of its heritage significance. It was ascertained that the heritage feature highlighted by the Screening Tool was an identified Stone Wall Structure. The site itself is heavily vegetated, located on the nearby hill. An analysis of aerial photographs and Google Earth Imagery provides a visual understanding of the extent of the structure, with some of the wall visible from above (Figure 30).

Figure 29: Map of Relative Archaeological and Cultural Heritage Sensitivity (DFFE Screening Tool)

Figure 30: Stone Wall Structure located on the hill about 1 km from affected area. Note the remaining wall of the central cattle kraal or court (After Google Earth, 2018).

Apart from this observation, the affected area was assessed using Google Earth as well as available surveys and mapping resources via the CDNGI Geospatial Portal (http://www.cdngiportal.co.za/cdngiportal/). A 1st Edition Topographic map (2527CB) of the area was analysed. As the map was drawn in 1968, it would include information on observations within the footprint of the development. As observed in Figure 31, the topographic map in question highlighted no nearby features worth noting or verifying.

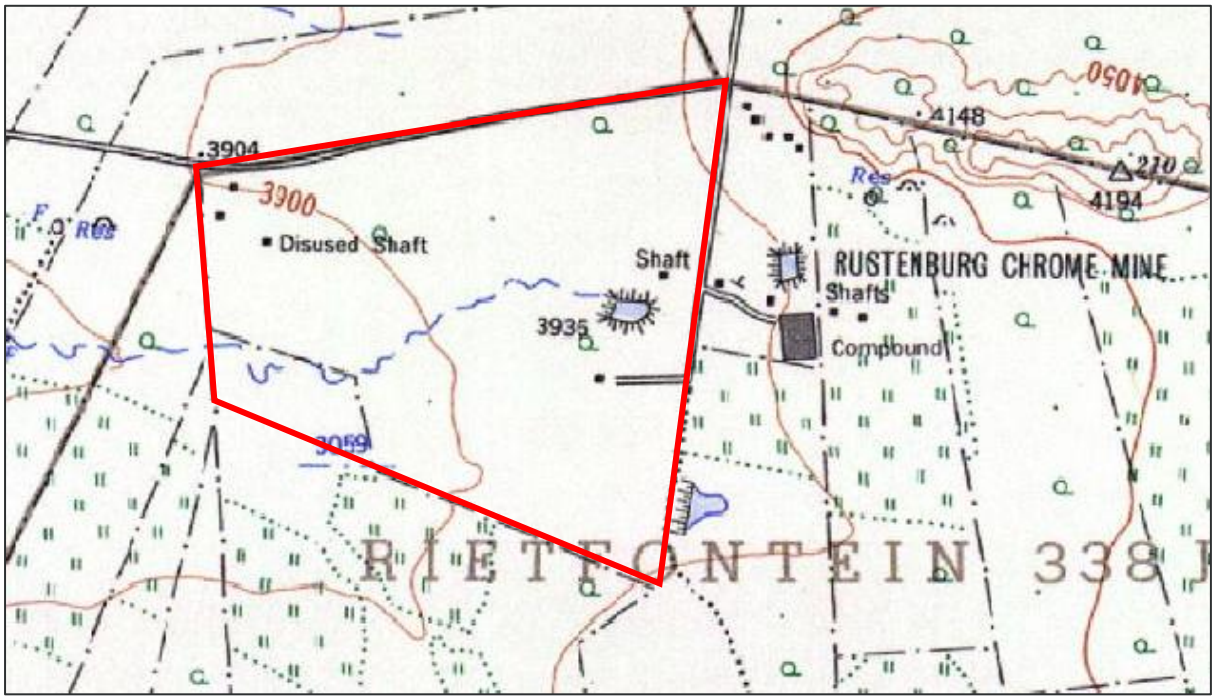

Figure 31: Extract of a 1st edition (1968) topographic map of the affected area (Map reference 2527CB) (after CDNGI Website (http://www.cdngiportal.co.za/cdngiportal/)). Affected area within red border.

Aerial photographs were also consulted to verify the absence of heritage features within and around the affected area. Aerial photographs consulted include imagery from 1955 and 2004. The 1955 aerial photograph was taken prior to the significant development of the area. As photographed, the area was disturbed only by farming activities from as far back as 1955 (Figure 32). This differs from 2004, where the area has been largely developed, and the current infrastructure is identifiable to some degree (Figure 33). As observable, no key surface features, or heritage sites have been recorded through past mapping and surveys.

These observations were further corroborated through a field survey, as well as through discussions with personnel on site. Although the proposed development site was considered to be of Low Sensitivity in terms of Archaeology and Cultural Heritage, more detail on these themes and their relationship to the development was necessary. This was particularly important considering the presence of Iron Age Stone Wall Structures further away from the development footprint.

Figure 32: The full extent of the 1955 Aerial Photograph (after CDNGI Website (http://www.cdngiportal.co.za/cdngiportal/)). Affected area within red border.

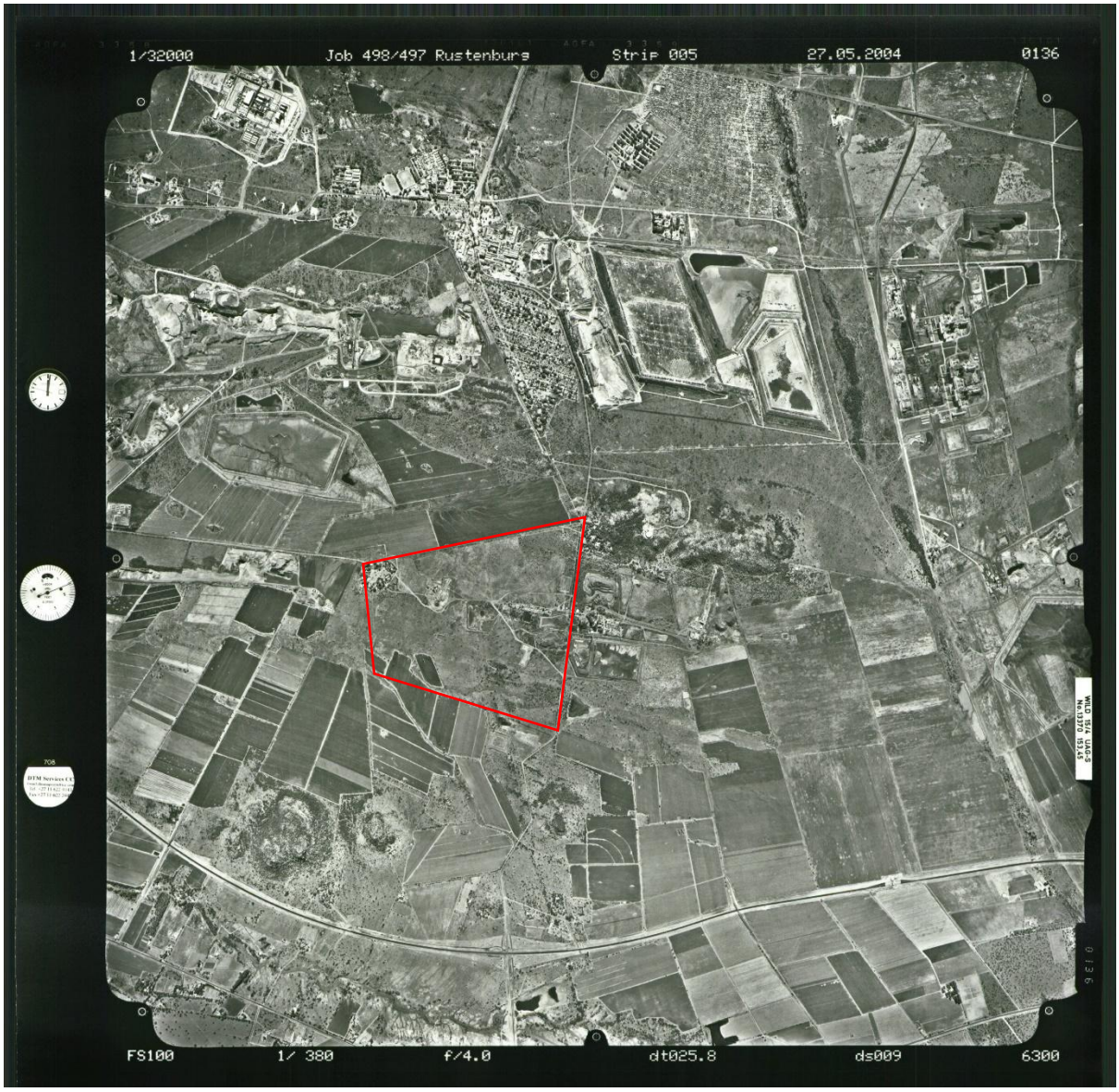

Figure 33: The full extent of the 2004 Aerial photograph (after CDNGI Website (http://www.cdngiportal.co.za/cdngiportal/)). Affected area in within red border.

It was therefore anticipated that any heritage finds and sites would relate to mainly LSA and Iron Age periods. Further, given the extent of development and disturbance, it was anticipated that the integrity and context of any heritage finds and sites would have been compromised.

6.2 FIELD ASSESSMENT RESULTS

The appointed Archaeologist surveyed the various areas which fall within the proposed development footprint. The survey covered areas to be potentially disturbed by construction activities, as well as the intended laydown area. Figure 34 is a map of all the areas surveyed, specifically including the paths tracked out by the Archaeologist. The field survey was conducted on two separate days during Winter and Spring.

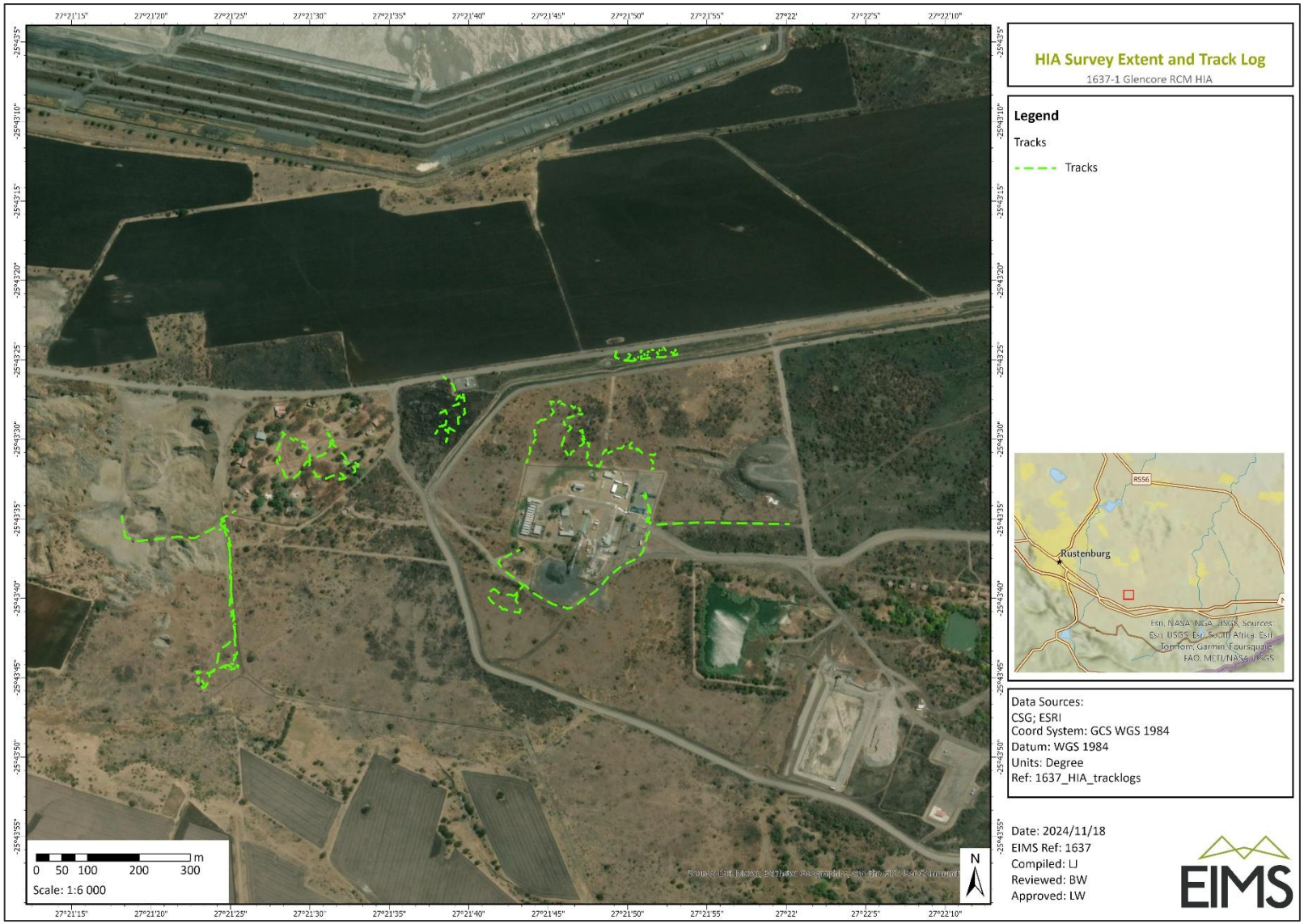

Figure 34: Field survey track log

6.2.1 GENERAL OBSERVATIONS

As previously highlighted and captured in the appraisal of environmental attributes and baseline environment, the area proposed for development is highly disturbed. In this regard, it was noted that most of the area surrounding the current infrastructure includes paths and roads, with much of the area being regularly cleared (Figure 35). Further, evidence suggests that the area has also been used for the deposition of rocks and stones originating from the mine workings (Figure 36). As for most of the development footprint, the proposed infrastructure lies either in proximity to disturbed areas, in areas that have been disturbed in the recent past by the activities of Rustenburg Chrome Mines.

In relation to the laydown area, the site and all associated buildings such as existing houses have since been abandoned. Evidence was gathered suggesting that the area has been utilised for different purposes until as recently as 2019 (Figure 37). After consulting with representatives on site, it was stated that the area was previously used by the operations. In the recent past, all the existing houses and buildings have been stripped of all asbestos, leaving only the skeletal structures of most of the buildings still on site (Figure 38). These buildings are of no heritage significance.

Figure 35: Photograph taken of the area proposed for the construction of the main access route and roundabout.

Figure 36: A rock and stone deposit near the proposed parking lot area.

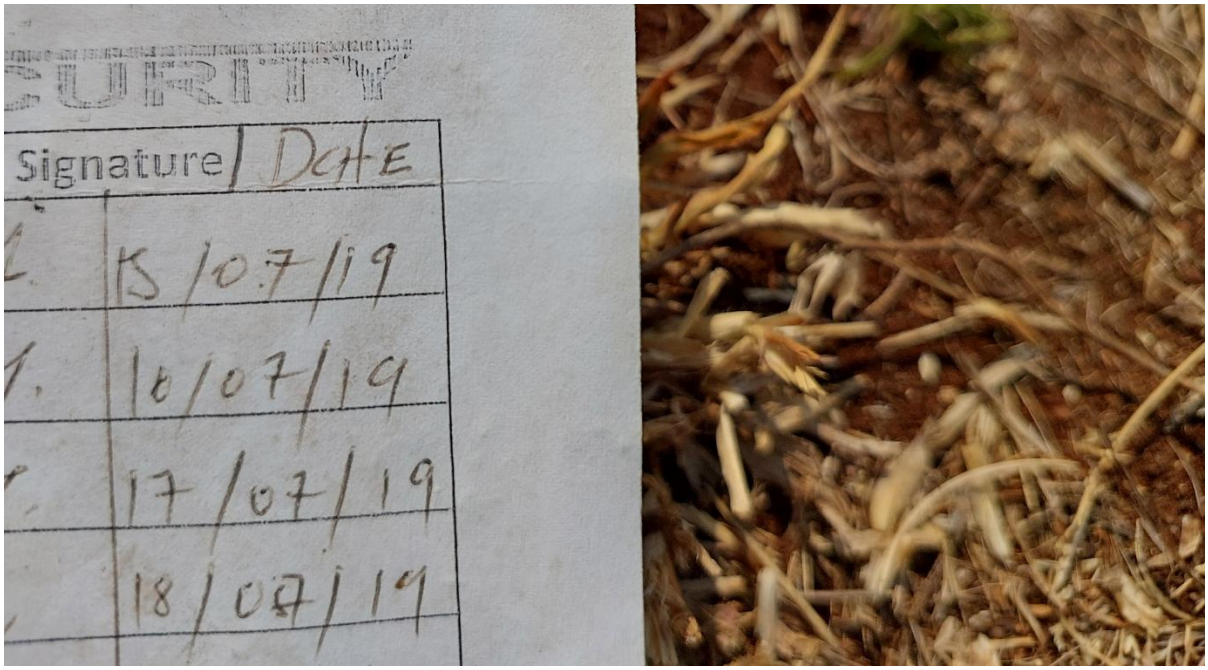

Figure 37: Security Guard sheet found near the guard house of the laydown area signed and dated 2019.

Figure 38: The remains of a house in the laydown area having been stripped of asbestos walls and ceilings.

6.2.2 ARCHAEOLOGICAL FINDS

Although the site has been highly disturbed by the activities of the operations in the area, some archaeological finds were made during the field survey. These included the identification of historical structures, LSA lithic pieces, as well as a fragment of Iron Age pottery.

A) STONE AGE FINDS

Three individual LSA lithic pieces were identified during the field survey. This included a core, a shaped flake, and one formal tool. The below described single finds have been rated as Grade IV C. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the finds were rated as Low, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. This is mainly because the finds have already been displaced and affected by agricultural and mining activities of the area.

The LSA core included evidence of at least two flake removals as photographed in Figure 39. The core itself measured no more than 5 cm.

Figure 39: LSA Core identified. One of the flake removals can be seen to the bottom right side of the core.

A shaped flake including evidence of at least two removals on the dorsal surface was identified during the survey. As photographed in Figure 40, the flake had been exposed to dust from the operations and surrounding waste rock. Although the piece includes evidence of shaping, its condition has been heavily affected.

Figure 40: A shaped flake identified during the field survey. The flake had been exposed to dust of the surrounding activities and deposited waste rock.

Figure 41: A large LSA scraper identified during the field survey.

Figure 42: Photograph taken of the left edge of the scraper including evidence of retouch.

The final LSA piece identified was a large LSA scraper (Figure 41). The piece was between 4-5 cm in size, with the distal end including removals and retouch defining the scraping edge. Most of the retouch was noted on the left edge of the tool (Figure 42).

B) IRON AGE FINDS

An Iron Age potsherd was identified during the survey. The potsherd was a piece of the lip of a vessel. The piece was a fragment of the lip exclusively, with no sign of decoration. The piece was very small, less than 2 cm in size (Figure 43). The piece was about 9 mm thick, indicating the overall thickness of the lip of the vessel itself. While the piece provided little information as to the decoration of the vessel it came from, it had signs of interior colouring. The piece also suggested that the vessel itself had a rounded lip (Figure 44). This single Iron Age find has been rated as Grade IV C. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the find was rated as Low, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. This is mainly because the find has already been displaced and affected by agricultural and mining activities of the area. Further, because the piece did not include any identifiable details such as motifs or decoration, it would not have been possible to associate it with any specific ceramic style or categorisation.

Figure 43: Photograph of the potsherd identified during the field survey. Photograph taken of the interior section of the potsherd including signs of a red colouring.

Figure 44: Photograph of the profile of the potsherd. Note the rounded lip highlighted.

C) HISTORICAL STRUCTURES

Historical structures forming one historical site were identified to the south of the proposed activities, mainly in proximity to the proposed powerline tie-in location. The structures included an enclosed farm dam with connected storage buildings (Figure 45), and a two-roomed building (Figure 46). Upon inspection on site, these buildings have been highly disturbed and damaged. Items such as stripped wiring of nearby power cables indicate that the buildings are presently frequently used or visited. Some signs also suggest that the buildings were only abandoned recently, for example, the inner walls of the two-roomed building have multiple layers of paint on them.

Figure 45: The enclosed farm dam and associated storage rooms of the historical structure complex.

Figure 46: Two-roomed building part of the historical structure complex.

Background research was done on these structures, and it was concluded that the buildings are older than 60 years as they appear on the 1955 aerial photographs. It is suggested that the structure is of heritage significance. The site itself is approximately 70m from the proposed activities in relation to the powerline tie-in. Therefore, it is expected that the project and associated activities will not have any impact on this site. The site has been rated as Grade III A and has been allocated the identifier GCK001 for the sake of this report. This suggests that the developer must be cognisant of the site, however, should the activities take place as proposed, the site will not be impacted, and no mitigation will be necessary. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the site itself was rated as Least Concern, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. It is important to note that this rating was allocated on the basis that the site is not to be affected by the activities proposed. Should activities proposed intersect with the site and or the 30-meter buffer, the site will be rated as Medium.

D) HISTORICAL PERIOD FINDS

Although no historical finds were noted during the survey, a fragment of what appeared to be a broken ceramic plate was found (Figure 47), as well as a metal plate which appeared to be a borehole cap or cover (Figure 48). Upon further analysis, the ceramic fragment was associated with broken powerline insulators spread around the site as part of waste in the area. These finds indicated activity in the area in the recent past, potentially related to the operations of Rustenburg Chrome Mines. These finds have no heritage significance.

Figure 47: A fragment of a broken ceramic powerline insulator.

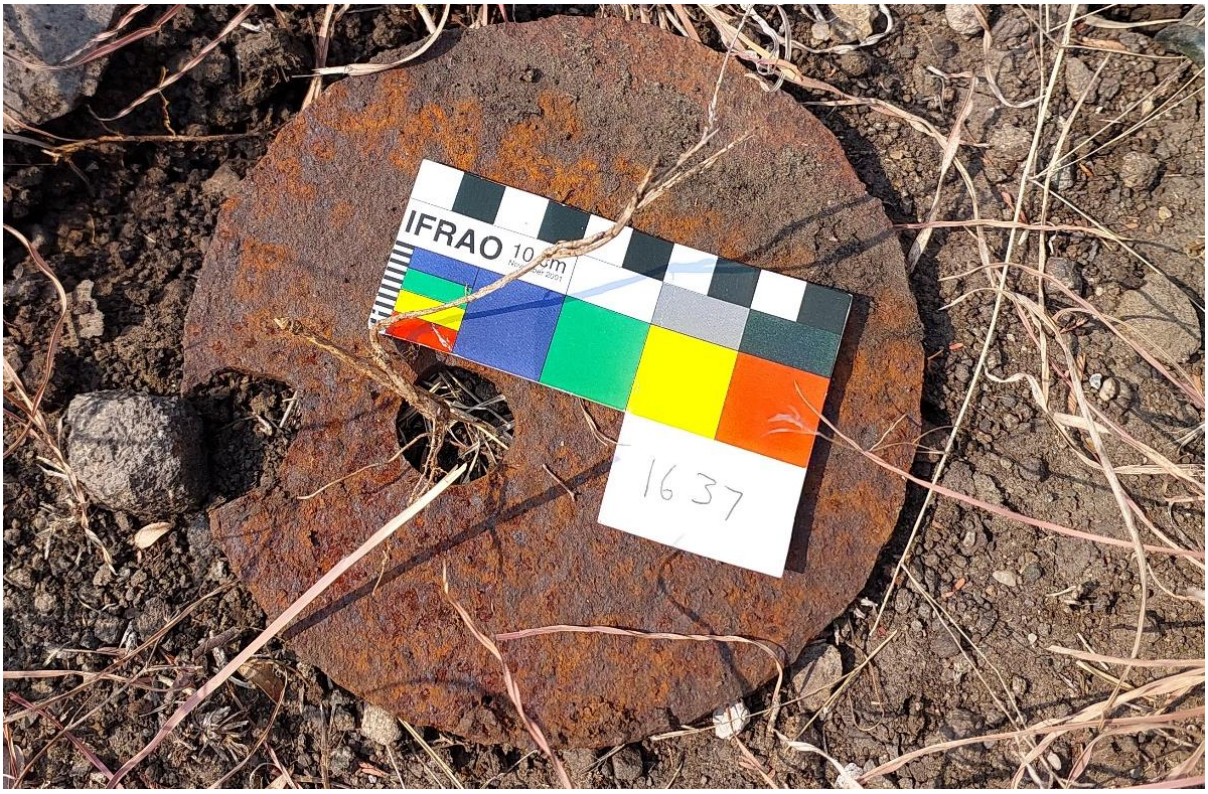

Figure 48: Borehole cap or over identified during the field survey.

6.2.3 SUMMARY OF FINDINGS

Altogether, four individual finds and one key site were identified during the field survey. A 30-meter buffer as prescribed by SAHRA was drawn around the site (GCK001). Although not affected by the proposed activities, GCK001 and the associated buffer was included in the mapping of the various finds. Figure 49 presents a visual summary of the different findings and their location.

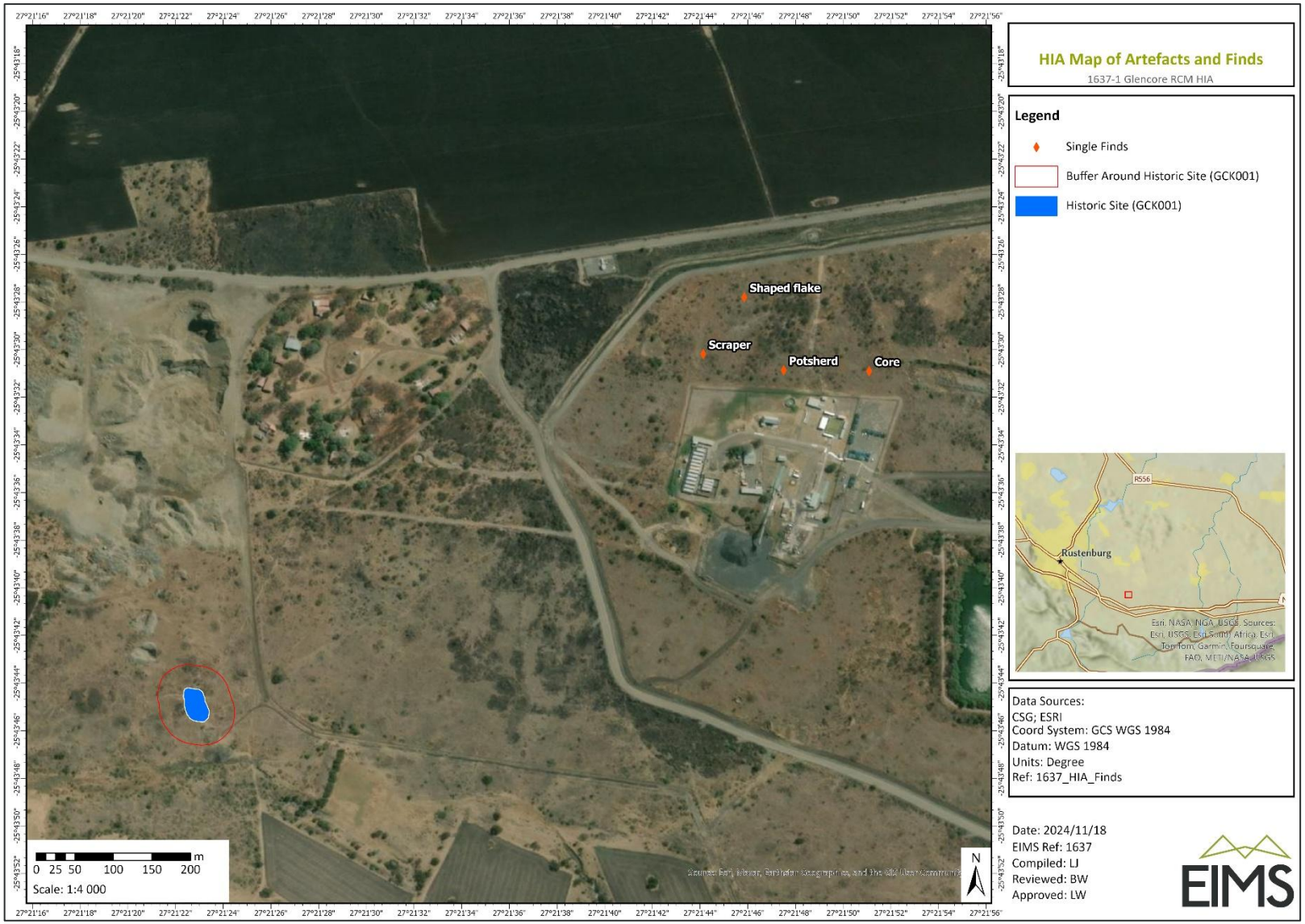

Figure 49: Map of heritage finds across the study site

7 IMPACT ASSESSMENT

This section describes the impact assessment methodology adopted, and the impacts identified during the Heritage Impact Assessment.

7.1 IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the risk (R) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the Risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the R to determine the overall significance (S). The impact assessment will be applied to all identified alternatives. Where possible, mitigation measures will be recommended for impacts identified.

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the risk (R). The risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact. For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C = \frac{(E + D + M + R) * N}{4}}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 4 below.

Table 4: Criteria for Determining Impact Consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)

Aspect	Score	Definition
	5	Permanent (>65 years, no mitigation measure will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost
	4	Impact is reversible only by incurring prohibitively high time and cost
	5	Irreversible Impact

Once the C has been determined the R is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 5.

Table 5: Probability Scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25 %),
	2	Low probability (there is a possibility that the impact will occur; >25 % and <50 %),
	3	Medium probability (the impact may occur; >50 % and <75 %),
	4	High probability (it is most likely that the impact will occur- > 75 % probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative R associated with the impact. R is therefore calculated as follows:

R= C x P

Table 6: Determination of Risk.

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20

	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the risk assessment will result in a range of scores, ranging from 1 through to 25. These R scores are then grouped into respective classes as described in Table 7.

Table 7: Significance Classes.

Risk Score	
Value	Description
< 9	Low (i.e. where this impact is unlikely to be a significant risk/ reward).
≥9 - <17	Medium (i.e. where the impact could have a significant risk/ reward),
≥17	High (i.e. where the impact will have a significant risk/ reward).

The impact R will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact R (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the R score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 8: Criteria for Determining Prioritisation.

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.

Irreplaceable Loss of Resources (LR)	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 8. The impact priority is therefore determined as follows:

Priority = CI + LR

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (refer to Table 9).

Table 9: Determination of Prioritisation Factor.

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance, the PF is multiplied by the R of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 10: Final Significance Rating.

Significance Rating	
Value	Description
≤ -17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
> -17 ≤ -9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
> -9 < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0 < 9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).

Significance Rating	
Value	Description
≥ 9 < 17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists (in this case, the Archaeologist) and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

7.2 IDENTIFIED HERITAGE IMPACTS

Table 11 provides a breakdown of the potential impacts identified through this assessment, considering the above-cited and adopted methodology.

As a description, the proposed activities will have impacts on listed include the LSA single finds (see 6.2.2 (A)) as well as Iron Age single find (see A)6.2.2 (B)). As indicated, none of these finds constitute a site as they were scattered across far distances around the development area.

Given that these finds are located in the area of the proposed parking lot, these finds will be affected by construction activities. If not found or collected, these finds may be permanently displaced or damaged. Bearing in mind the nature of the finds which have been documented and analysed, their heritage value is not critically significant. It is the understanding of the Archaeologist that these finds represent pieces from sites further away from the development area or finds which have been removed from context due to the extensive mining activities which take place in the surrounding area. Given that these finds were identified together with modern debris, this would indicate that the proposed site for development has been extensively disturbed and does not carry intrinsic heritage value. It is possible that the finds were initially displaced and deposited at the locations they were found through alluvial, erosional, and anthropogenic processes associated with development.

While these individual finds do not represent markers of heritage significance, they may be indicators of below-ground heritage finds and sights. For this reason, as a mitigation measure proposed, a Heritage Finds or Chance Find Procedure for addressing heritage finds must be adopted as part of construction processes. Should finds of an alarming significance, for example, a grave or high density of small finds be discovered during construction, this procedure will inform the next steps taken to ensure the documentation of these finds, and further action to be taken should a heritage professional deem necessary.

It is on this premise that post-mitigation of the identified heritage impacts is rated a Low Negative, given the potential for a heritage procedure to allow for the documentation, recording, and further assessment of undiscovered finds and sites. A heritage procedure can present opportunity to limit the impact of development on heritage finds to construction activities, with the potential to document and further assess finds should they be related to broader sites. This ultimately presents opportunity to reverse the adverse effects of development of heritage finds, given that their value can be evaluated through documentation. This also presents opportunity to better understand the heritage significance of the area to be developed.

Table 11: Archaeological Impact Assessment

Impact Description				Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Identifier	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final Score
5.2.2 (A)	Destruction or displacement of identified LSA single finds	Alternative 1	Construction	-1	1	5	1	5	5	-15	-1	1	1	1	1	5	-5	High	1	2	1,13	-5,625
5.2.2 (B)	Destruction or displacement of identified Iron Age single find	Alternative 1	Construction	-1	1	5	1	5	5	-15	-1	1	1	1	1	5	-5	High	1	2	1,13	-5,625

8 RECOMMENDATIONS AND MITIGATIONS

Considering the Impact Assessment above, the following presents a list of mitigations proposed in light of the identified impacts.

8.1 SITE-SPECIFIC RECOMMENDATIONS AND MITIGATIONS

Table 12 provides a breakdown of recommendations and mitigations to be considered for inclusion in the EMPr related to this project. These mitigations are associated with construction phase which may involve clearing of vegetation and removal of topsoil for development. Although identified above-ground finds will be affected by these activities regardless of mitigation, the mitigation measures recommended serves to address the potential of further discoveries.

Table 12: List of site-specific mitigations and recommendations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures / Management Actions	Compliance with Standards	Time Period for Implementation
Construction which may involve clearing of vegetation and removal of topsoil	Construction	Destruction or displacement of identified LSA single finds. Destruction or displacement of identified Iron Age single find.	No further mitigation or action is recommended. However, a Heritage Procedure is advised to be followed should additional heritage finds or sites be encountered.	NHRA	During construction activities

8.1 OVERALL RECOMMENDATIONS

As a key overall recommendation, the developer is reminded to remain cognizant of the potential to discover unidentified above-ground and below-ground finds and sites. Upon discovery of any additional heritage finds of an alarming significance, example, grave or high density of small finds, a Heritage Finds or Chance Find Procedure should be followed.

8.2 HERITAGE FINDS PROCEDURE AND CHANCE FINDS

A heritage procedure is applicable where finds are identified during the proposed activities. This procedure is guided by the NHRA but should correspond with the overall EMPr drafted for the development. The following is a guideline on how a Heritage or Chance Find Procedure can be structured:

- In the event of a chance find which appears of significant value to the lay person, all development activities must be temporarily halted.
- Finds should not be displaced. Instead, their location should be recorded, and a short description prepared for further evaluation to follow.
- A qualified Archaeologist must be consulted to, firstly, record the find and evaluate its heritage significance. The Archaeologist should provide recommendations on how to approach the finds moving

forward. This may include recommendations for the mitigation of impacts on the heritage resources in question.

- Should the Archaeologist recommend, development can resume following the application of recommendations and mitigation measures.

The above should act as a brief guideline which should form an intrinsic element of current or future Heritage Procedures or Protocols adopted by the developer of the project in question.

9 CONCLUSION

This report was prepared as part of a Phase 1 Heritage Impact Assessment for the proposed Glencore WCM Kroondal Mine Infrastructure Project. As part of this assessment, a desktop as well as on-site evaluation of Heritage impacts was conducted.

Through the methodology adopted as part of this assessment, no significant heritage impacts were identified. While some archaeological finds will be impacted, mitigation measures proposed accounts for any further discoveries and the potential to impact undiscovered heritage finds. Therefore, from an Archaeological perspective, the development will not have significant foreseeable impacts.

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Appendix 1: Archaeologist's CV

Appendix 2: Archaeologist's Declaration

CURRICULUM VITAE

Name:	Lucien Nicolas James
Nationality:	South African
Date of Birth:	4 May 1993
Profession:	Environmental Consultant and Archaeologist
Professional Qualification/ Training:	BA (Archaeology and Geography); Wits University, 2017
	BSc (Hons) Geography, Archaeology and Environmental Studies; Wits University, 2018
	MSc (Geography); Wits University, 2021
	Ph. D. (Geography); Wits University, 2024
Professional Membership/ Registrations:	Registered Candidate Environmental Assessment Practitioner (EAPASA reg. no. 2023/6772)
	Accredited Professional Archaeologist (ASAPA member no. 0619)
Publications:	James, L. & Simatele, M.D. 2024. Bystanders or active participants? Mobilising meaningful participation in River Basin Management: Lessons from the Gauteng Province, South Africa. *International Journal of River Basin Management.* https://doi.org/10.1080/15715124.2024.2417405.
Current Employer:	Environmental Impact Management Services (Pty) Ltd.

KEY EXPERIENCE

Lucien James is an environmental consultant and archaeologist with experience in different fields across the Arts, Social Science, Natural Science, and academia in general. He has been employed by EIMS as an environmental consultant since March 2023 working on several projects under various roles. He is registered with EAPASA as a Candidate EAP. Lucien has obtained a BSc (Hons) in Geography, Archaeology and Environmental Studies (Archaeology-focused) and is accredited as a Professional Archaeologist with Association of South African Professional Archaeologists (ASAPA). He holds a MSc in Geography having done research on phytoremediation and the mining industry. In 2024, he completed his Ph.D. through research with a focus on collaborative River Basin Management in South Africa. He has worked as a Teaching Assistant (TA) and researcher since 2018 and engages in academic work through publications and conferences. He has taught 1st year, 2nd year, 3rd year and Honour's Archaeology and Geography courses. His research has been funded by the National Research Foundation (NRF) and the Water Research Commission (WRC). He has also published his research in an international academic journal. He has presented his research at a national level through various conferences in South Africa and has participated in other conferences and workshops on Climate Change and Climate Change Adaptation.

CAREER SUMMARY

Period: Current	Organisation: EIMS	Position: Environmental Consultant and Archaeologist
Key Projects/Assignments	Project experience: • AEMFC Herbert Prospecting Basic Assessment – Public Participation • Aries-Kronos 400kV Powerline Upgrade – Project Assistance, on-site specialist oversight, Water Use License • Block 3B/4B Oil and Gas Offshore Exploration EIA – Public Participation • ENEL Solar PV – External Audit • Harmony Freddies to Target Pipeline Part 1 EA Amendment and WUL Amendment – Project Management • Harmony FSN Pipeline Basic Assessment – Public Participation • Harmony Kusasalethu Pipeline Basic Assessment – Public Participation • Harmony Mispah Pipeline Basic Assessment – Public Participation • Harmony Nooitgedacht TSF EIA – Public Participation • Harmony Valley TSF EIA – Public Participation • Kusile Power Station Temporary Stacks MES Postponement and AEL Variation Application • Mine Waste Solutions Kareerand Pipeline Basic Assessment – Public Participation • Mooiplaats WUL Amendment – Project Management • Mulilo Struisbult PV2 EMPr Amendment – Public Participation • Mulilo Struisbult PV2 Grid Connection Basic Assessment – Public Participation • Selkirk Avenue Development Pipeline Basic Assessment and EMPr – Project Assistance • Sibanye KDT1 Remining EIA – Public Participation and Heritage Impact Assessment (Exemption) • Sibanye Western Limb Tailings Re-treatment Facility Retrofitting Basic Assessment – Public Participation • Tetra4 Cluster 2 Gas Production EIA – Public Participation • Tetra4 Powerline Basic Assessment – Public Participation • Thungela Lephalale CBM EIA – Public Participation and Water Use License	
Heritage Project/ Assignments	• Motouane RBD12 Pre-drill Survey Heritage Reporting	

	• Glencore RCM Phase 1 HIA • BMM Sandgat Prospecting Desktop HIA • BMM Oubip Prospecting Desktop HIA • Aqua Farming Droogfontein Pivot Agriculture HIA

LANGUAGE CAPABILITY

Language	Speak	Read	Write
English	Excellent	Excellent	Excellent
Afrikaans	Basic	Intermediate	Intermediate
French	Excellent	Excellent	Excellent
Spanish	Basic	Intermediate	Intermediate
Latin	N/A	Basic	Basic

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications at the time of signature.

Signature of Staff Member

24/01/2025

Date

EIMS ENVIRONMENTAL IMPACT MANAGEMENT SERVICES		SPECIALIST DECLARATION	
EIMS Ref	1681	Project Name	Motuoane ER386 EIA

Project Details

Project Name	Motuoane ER386 EIA
Applicant	Motuoane Energy (Pty) Ltd
Competent Authority	Department of Mineral Resources (DMR)

Specialist Details

Specialist Company	Environmental Impact Management Services (Pty) Ltd			
Specialist Name	Lucien James			
Contact details	Tel	0117897170	Cell	0812376735
	E-mail	lucien@eims.co.za		
	Postal Address	PO Box 2083, Pinegowrie 2123, South Africa		
	Physical Address	8 Dalmeny Road, Pine Park, Randburg		

General Declaration

By signing this form, I hereby declare that:

- I act as an independent specialist 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 undertaking the specialist work as required, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations, and all other applicable legislation.
- I have not, and will not engage in, conflicting interest in the undertaking of the activity.
- I understand to disclose to the applicant and 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 have taken into account, to the extent possible, the matters referred to in Regulation 18 when preparing the report, plan or document.
- 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 this form are true and correct.

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- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations.
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B 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 remunerative for work performed in terms of the Regulations.

Undertaking Under Oath/Affirmation

By signing this form, I swear under oath/affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signatures

Specialist					
Name	Lucien James	Signature		Date	13/01/2025
Commissioner of Oaths					
Name		Signature		Date	
Commissioner of Oaths Official Stamp					

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