

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

For

**The Proposed Expansion of
the East Manganese Mine on
a Portion Intersecting Portion
1 of the Farm East 207 and
Portion 1 of the Farm Gloria
266, Hotazel, Northern Cape**

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May 2021

A Phase 1 Archaeological Impact Assessment the Proposed Expansion of the East Manganese Mine on a Portion Intersecting Portion 1 of the Farm East 207 and Portion 1 of the Farm Gloria 266, Hotazel, Northern Cape

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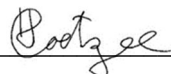
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I, Tobias Coetzee, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed East Manganese Expansion Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.



Date: 06 May 2021

List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

EIA – Environmental Impact Assessment

ESA – Early Stone Age

GPS – Global Positioning System

ha – Hectare

HIA – Heritage Impact Assessment

km – Kilometre

LIA – Late Iron Age

LSA – Later Stone Age

m – Metre

MASL – Metre Above Sea Level

MEC – Member of the Executive Council

MSA – Middle Stone Age

NHRA – National Heritage Resources Act

SAHRA – South African Heritage Resources Agency

Executive Summary

The author was appointed by Sitatunga Manganese (Pty) Ltd to undertake a Phase 1 Archaeological Impact Assessment (AIA) for the proposed expansion of the East Manganese mining operation on a portion intersecting Portion 1 of the Farm Gloria 266 and Portion 1 of the Farm East 270 near Hotazel in the Northern Cape Province. The proposed expansion project is located approximately 7 km northwest of Hotazel. Surrounding towns include Kathu 62 km to the south-southeast and Kuruman 65 km to the southeast. The aim of the study is to determine the scope of archaeological resources that could be impacted by the proposed expansion of the East Manganese mining operation. It should be noted that this report builds on the initial Heritage Impact Assessment conducted by African Heritage Consultants cc (Küsel 2018) and should therefore be read together with this report as the proposed expansion area borders and slightly overlaps the area covered in the initial study.

One potential archaeological site (B01) was observed during the pedestrian survey of the area demarcated for expansion. Site B01 consists of a windpump, circular reservoir and small angular structure near the eastern boundary of the study area. The earliest date associated with these structures is 1972 when a windpump is indicated on the topographical map. Although these features are not visible on any of the historical aerial images, the farmhouse to the south of the study area is shown on the 1959 aerial image. The possibility, therefore, exists that the structures associated with Site B01 date to the same period and are likely to exceed 60 years of age. A destruction permit from the relevant heritage authority will therefore be required should the proposed development impact the structures.

A few stone tools similar to the Middle Stone Age (MSA) artefacts recorded by African Heritage Consultants cc (Küsel 2018) were observed within the demarcated study area as well. Like the artefacts observed by African Heritage Consultants cc (Küsel 2018), these stone tools occurred in a dispersed context and are regarded to be of low significance. No further action is therefore required as the recording done during this study is regarded as sufficient.

Subject to adherence to the recommendations and approval by the South African Heritage Resources Agency (SAHRA), the proposed expansion of the East Manganese mining operation as per the indicated demarcation may continue. Should skeletal remains be exposed during rehabilitation, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

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1. Project Background

1.1 Introduction

The author was appointed by Sitatunga Manganese (Pty) Ltd to undertake a Phase 1 Archaeological Impact Assessment for the proposed expansion of the East Manganese mining operation near Hotazel in the Northern Cape Province. The proposed expansion project is located approximately 7 km northwest of Hotazel. Surrounding towns include Kathu 62 km to the south-southeast and Kuruman 65 km to the southeast. The proposed expansion area intersects Portion 1 of the Farm Gloria 266 and Portion 1 of the Farm East 270. For the East Manganese Mine to be able to reach a portion of their resources, mining will have to take place on the property of the neighbouring Gloria Mine that is owned by Assmang (**Table 1 & Figures 1 & 2**). The purpose of this study is to examine the demarcated portion in order to determine if any archaeological resources of heritage value will be impacted by the proposed expansion. It should also be noted that a Phase 1 Heritage Impact Assessment (HIA) was done for the East Manganese mining operation on Portion 1 and the Remaining Extent of the Farm East 270. The proposed expansion borders the original East Manganese mining operation and forms part of the same mining development. Therefore, this Phase 1 AIA should be read together with the previous heritage study conducted by African Heritage Consultants cc (Küsel 2018) as this report builds on the initial findings. The aim of this report is to provide the developer with information regarding the location of heritage resources on the demarcated portion.

The following report discusses the implication for the expansion of the East Manganese mining operation on the demarcated portion intersecting Portion 1 of the Farm Gloria 266 and Portion 1 of the Farm East 270 with regard to heritage resources. The demarcated portion is roughly rectangular in shape and is split into two by the Farms Gloria 266 and East 270. The legislation section included serves as a guide towards the effective identification and protection of heritage resources and will apply to any such material unearthed during the project within the demarcated study area.

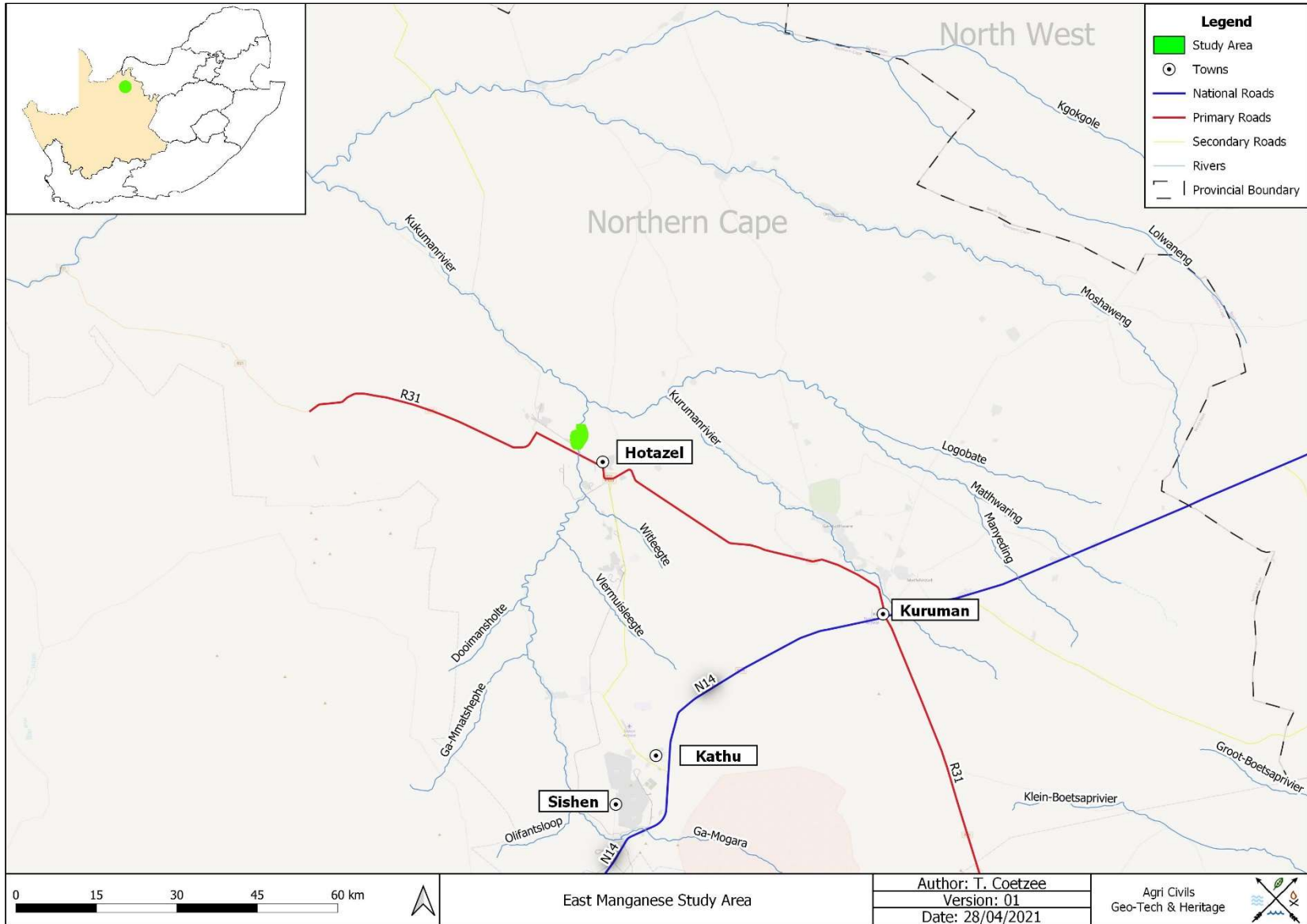


Figure 1: Regional and Provincial location of the study area.

1.2 Legislation

The South African Heritage Resources Agency aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an AIA if triggered.

AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact of the sites.

1.2.1 The EIA (Environmental Impact Assessment) and AIA processes

Phase 1 Archaeological Impact Assessments generally involve the identification of sites during a field survey with assessment of their significance, the possible impact that the development might have, and relevant recommendations.

All Archaeological Impact Assessment reports should include:

- a. Location of the sites that are found;
- b. Short descriptions of the characteristics of each site;
- c. Short assessments of how important each site is, indicating which should be conserved and which mitigated;
- d. Assessments of the potential impact of the development on the site(s);
- e. In some cases a shovel test, to establish the extent of a site, or collection of material, to identify the associations of the site, may be necessary (a pre-arranged SAHRA permit is required); and
- f. Recommendations for conservation or mitigation.

This AIA report is intended to inform the client about the legislative protection of heritage resources and their significance and make appropriate recommendations. It is essential to also provide the heritage authority with sufficient information about the sites to enable the authority to assess with confidence:

- a. Whether or not it has objections to a development;
- b. What the conditions are upon which such development might proceed;
- c. Which sites require permits for mitigation or destruction;

- d. Which sites require mitigation and what this should comprise;
- e. Whether sites must be conserved and what alternatives can be proposed to relocate the development in such a way as to conserve other sites; and
- f. What measures should or could be put in place to protect the sites which should be conserved.

When a Phase 1 AIA is part of an EIA, wider issues such as public consultation and assessment of the spatial and visual impacts of the development may be undertaken as part of the general study and may not be required from the archaeologist. If, however, the Phase 1 project forms a major component of an AIA it will be necessary to ensure that the study addresses such issues and complies with Section 38 of the National Heritage Resources Act (NHRA).

1.2.2 Legislation regarding archaeology and heritage sites

National Heritage Resource Act No.25 of April 1999

Buildings are among the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Farming Community settlements. The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives;
- any other prescribed category.

With regards to activities and work on archaeological and heritage sites this Act 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.”(34. [1] 1999:58)

and

“No person may, without a permit issued by the responsible heritage resources authority:

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”(35. [4] 1999:58)*

and

“No person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals.”(36. [3] 1999:60)*

On the development of any area the gazette states that:

“...any person who intends to undertake a development categorised as:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of a site-*

- i. *exceeding 5000m² in extent; or*
 - ii. *involving three or more existing erven or subdivisions thereof; or*
 - iii. *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - iv. *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10000m² in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.”(38. [1] 1999:62-64)*

and

“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- (a) *The identification and mapping of all heritage resources in the area affected;*
- (b) *an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) *an assessment of the impact of the development on such heritage resources;*
- (d) *an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) *the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) *plans for mitigation of any adverse effects during and after the completion of the proposed development.”*
(38. [3] 1999:64)

Human Tissue Act and Ordinance 7 of 1925

The Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC (Member of the Executive Council) as well as the relevant Local Authorities. Graves 60 years or older fall under the jurisdiction of the National Heritage Resources Act as well as the Human Tissues Act, 1983.

2. Study Area and Project Description

2.1 Location & Physical Environment

The East Manganese mining operation is situated roughly 7 km northwest of Hotazel across the land parcels listed in **Table 1**.

Table 1: Property name & coordinates

Property	Portion	Map Reference (1:50 000)	Lat	Lon	Parcel Size (ha)	Proposed expansion (ha)
Gloria 266	1	2722 BB	-27.158535	22.915576	1726.2	± 7
East 270	1	2722 BB	-27.158638	22.916818	45.7	

Kathu is located roughly 62 km to the south-southeast and Kuruman 65 km to the southeast of the East Manganese project area (**Figures 1 & 2**). The study area falls within the John Taolo Gaetsewe District Municipality and the Joe Morolong Local Municipality in the Northern Cape Province. In terms of vegetation, the study area falls within the Savanna Biome, Kalahari Duneveld Bioregion and the Gordonia Duneveld vegetation unit (Mucina & Rutherford 2006). Gordonia Duneveld is found in the Northern Cape Province and consists of areas with dunes comprising the largest part of the South African side of the Kgalagadi Transfrontier Park. Gordonia Duneveld is also found south of the Molopo River where it interleaves with Kalahari Karroid Shrubland in the west and south. Areas include a number of loose dune cordons south of the Orange River near Keimoes and between Upington and Putsonderwater. The eastern boundary is found at the longitude of Pearson's Hunt, but with outliers near Niekerkshoop in the southeast and Floradora the northeast. This vegetation unit's conservation status is considered to be least threatened with a conservation target of 16%. About 14% is protected within the Kgalagadi Transfrontier Park, while very little has been transformed. Erosion associated with this vegetation unit is regarded as very low (Mucina & Rutherford 2006).

According to Mucina & Rutherford (2006), the average elevation for Gordonia Duneveld ranges from 800 to 1200 MASL (Metre Above Sea Level). The average elevation of the project area is 1020 MASL and slopes from the slightly more elevated northern section towards the lower southern area.

The study area falls within the summer rainfall region with an average annual rainfall of roughly 379 mm. The average summer temperature is approximately 26.1 °C and the average winter temperature 11.5 °C (Climate-data.org accessed 29/04/2021).

The study area falls within the D41K Quaternary Catchment of the Vaal Water Management Area. The closest perennial river to the study area is the Molopo River that flows 112 km to the northwest of the study area. On a local level the Ga-Mogara non-perennial river intersects the area demarcated for mining expansion.

When the surrounding environment is considered, the areas to the southwest and west-northwest of the study area are associated with mining development. Access to the study area is via a local road turning from the R31 primary road to the south (**Figure 2**).

On a local scale, the study areas is situated directly west of an opencast pit and falls within a dry riverbed. At present, no mining activity is taking place within the demarcated expansion area.

2.2 Project Description

East Manganese requires the expansion of the mining footprint for their mining operations near Hotazel. The initial Phase 1 HIA was done on Portion 1 and the Remaining Extent of the Farm East 270 where the majority of the mine workings are located (Küsel 2018). However, in order for East Manganese to access a portion of their resources, benching and stripping will have to take place on a small portion falling on the adjacent mine's property. The proposed expansion measures approximately 7 ha, half of which is located on the neighbouring Gloria Mine's property that belongs to Assmang (**Figurers 2 & 3**).

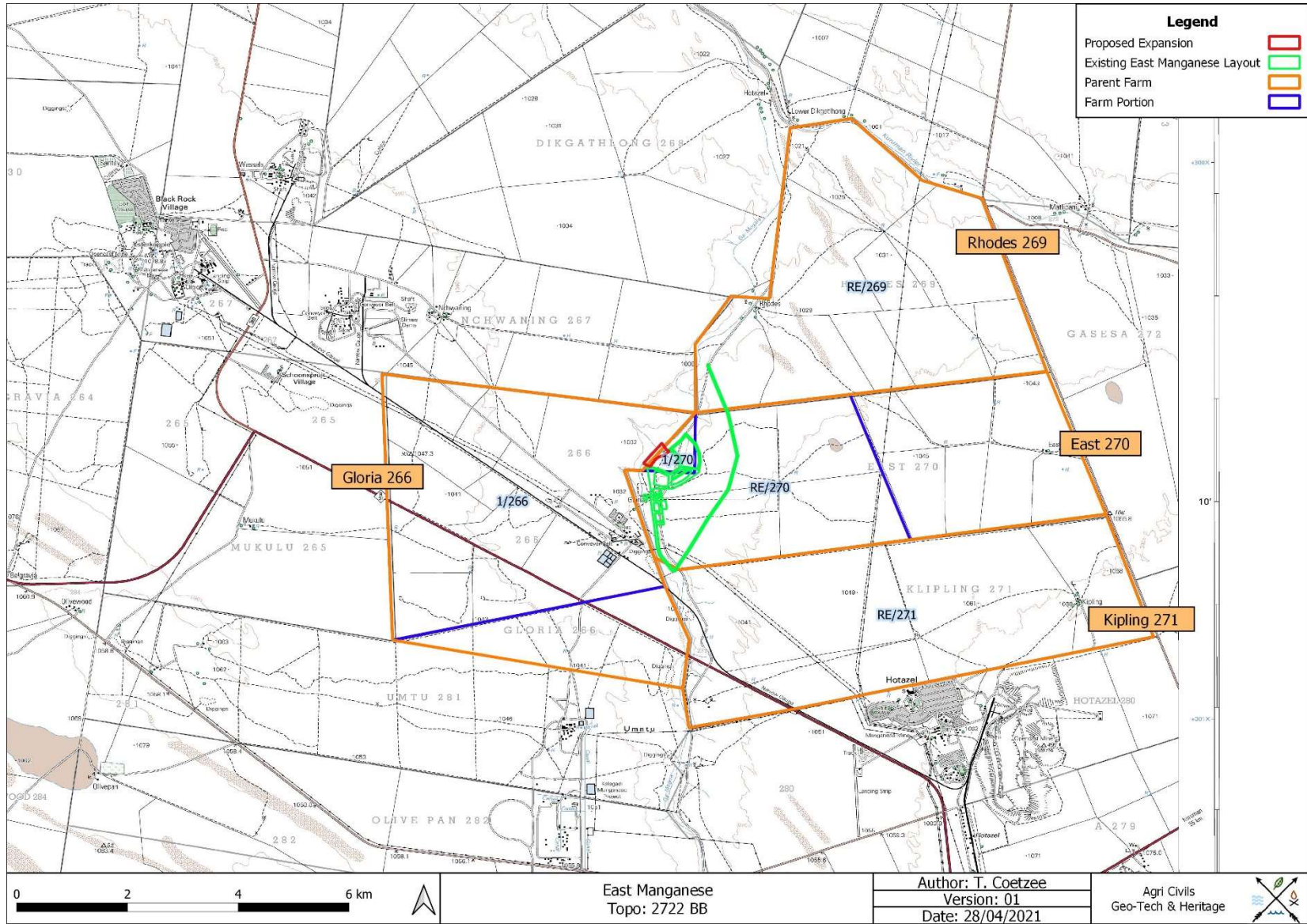


Figure 2: Segment of SA 1: 50 000 2722 BB indicating the study area.

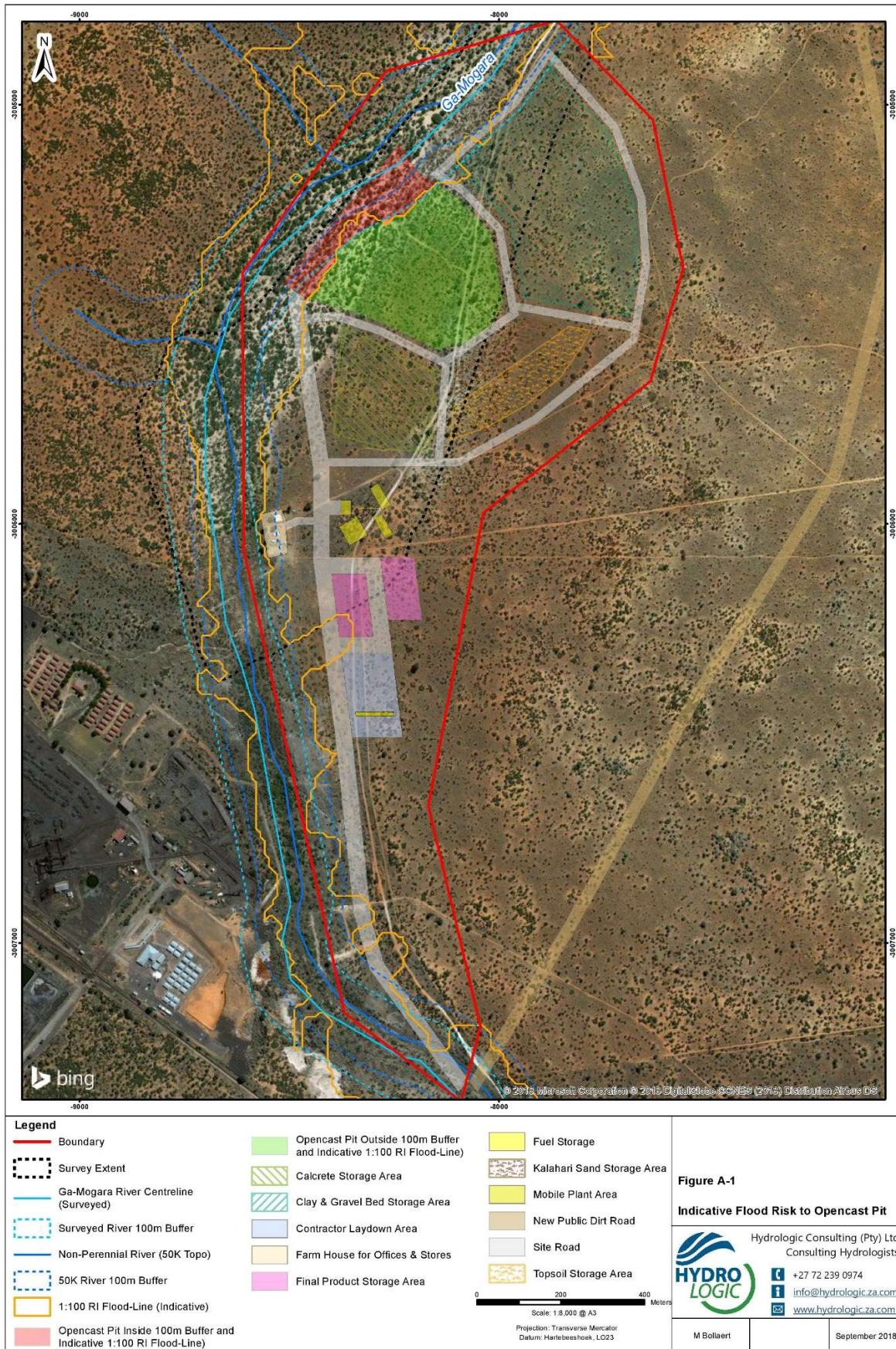


Figure 3: Mining Infrastructure & Proposed Expansion shaded in red (Provided by East Manganese 2021).

3. Methodology

Archaeological reconnaissance of the area demarcated for expansion was conducted during April 2021 (Autumn) through a systematic pedestrian site survey that lasted one day (**Figure 4**). The survey consisted of transects that varied between 25 m and 50 m. General site conditions were recorded via photographic record (**Figures 5 – 9**). Also, the site was inspected beforehand on Google Earth, historical aerial imagery and topographical maps in order to identify potential heritage remains (**Appendix A**). One potential site (B01) was identified on historical topographical maps, but could not clearly be identified on historical aerial imagery. It should be noted that the prefix '2722BB' is not used in the description due to the length of the name, but is recorded as such in **Tables 2 & 4**. The total area surveyed was approximately 7 ha.

The reconnaissance of the area under investigation served a twofold purpose:

- To obtain an indication of heritage material found in the general area as well as to identify or locate archaeological sites on the area demarcated for development. This was done in order to establish a heritage context and to supplement background information that would benefit developers through identifying areas that are sensitive from a heritage perspective.
- All archaeological and historical events have spatial definitions in addition to their cultural and chronological context. Where applicable, spatial recording of these definitions were done by means of a handheld GPS (Global Positioning System) during the site visit.

Table 2: Site coordinates & description

Abbreviated name	Site / Survey Point Name	Latitude	Longitude	Description	Current Status	Identification Source
B01	2722BB-B01	-27.159012	22.916550	Windpump, reservoir, structure	Dilapidated	Topo & Survey

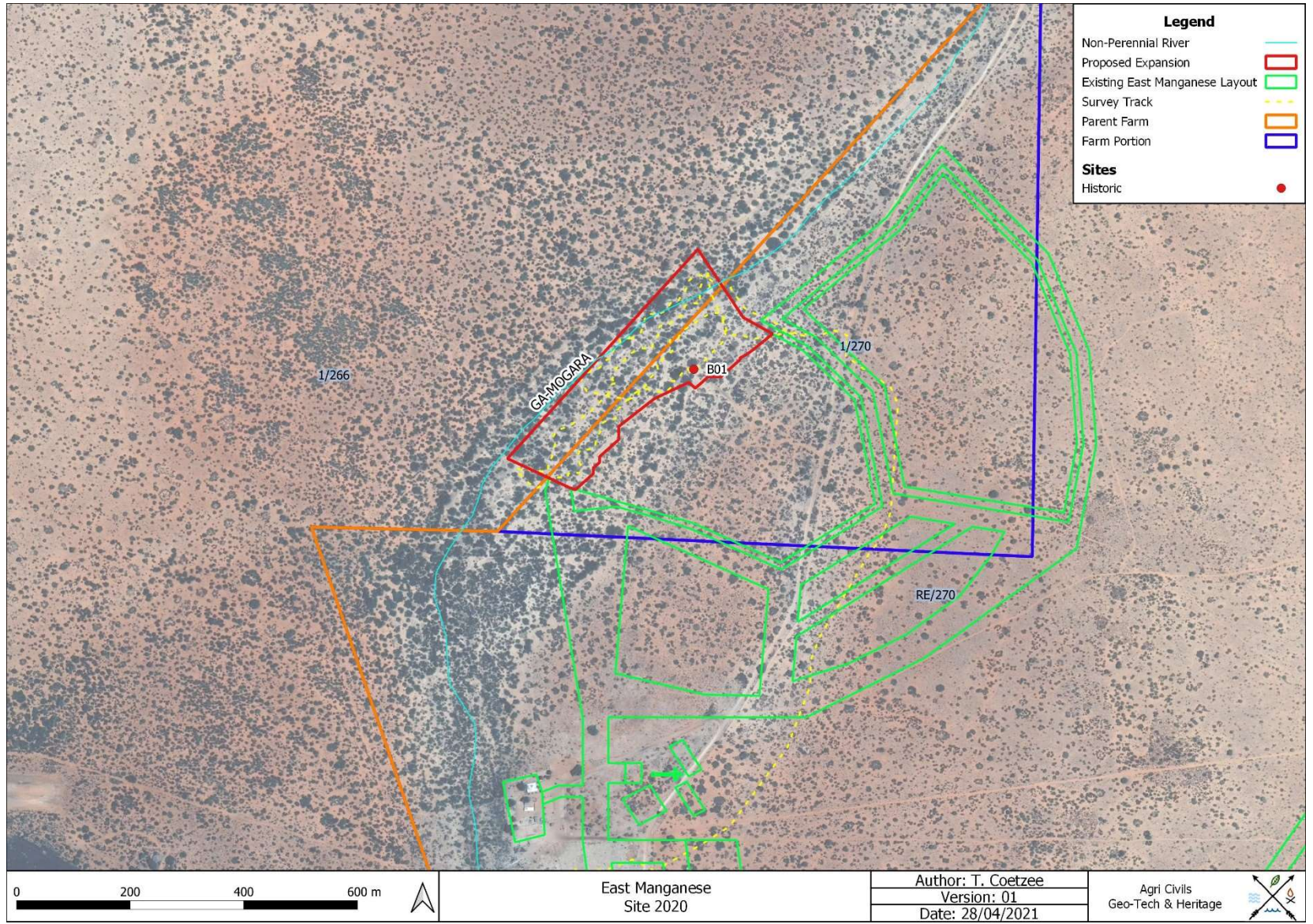


Figure 4: Study area with survey track on a 2020 aerial backdrop.



Figure 5: Proposed expansion as seen from the northeast.



Figure 6: Proposed expansion as seen from the northwest.



Figure 7: Proposed expansion as seen from the southeast.



Figure 8: Proposed expansion as seen from the southwest.



Figure 9: Current mining activity to the east of the proposed expansion.

3.1 Sources of information

At all times during the survey, standard archaeological procedures for the observation of heritage resources were followed. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was paid to disturbances; both man-made such as roads and clearings, and those made by natural agents such as burrowing animals and erosion. Locations of archaeological material remains were recorded by means of a Garmin Oregon 750 GPS. These sites, as well as the general conditions of the terrain, were photographed with a Samsung S7 mobile phone.

Since the study area is considered an extension of the initial area covered during the Phase 1 HIA conducted by African Heritage Consultants cc (Küsel 2018), this report should be read together with the initial heritage study. The literature and background information as described in the initial Phase 1 HIA is therefore still considered current and applicable and contextualises the study area from a heritage perspective.

3.1.1 Historical aerial and topographical maps

Historical aerial images dating to 1959, 1965 and 1972 (**Appendix A: Figures 17 – 19**) indicate no obvious building, structure or disturbance within the demarcated study area. Cultivated fields, however, are shown to the east and south, while a road is visible to east. The cultivated fields have since fell into disuse while the road is still visible.

When the 1972 topographical map (**Appendix A: Figure 20**) is inspected, a windpump is indicated near the eastern boundary of the demarcated study area, as well as the cultivated field further to the east. The 2001 topographical map (**Appendix A: Figure 21**) marks the windpump as a reservoir while the 2013 topographical map (**Appendix A: Figure 22**) again indicates a windpump. It can therefore be assumed that the windpump currently associated with Site B01 is the same as initially indicated on the 1972 topographical map, but was labelled differently in different map versions. Both the 2001 and 2013 topographical maps also show three footpaths leading to the windpump. The cultivated field indicated on the 1972 topographical map is omitted from all subsequent versions.

3.1.2 Previous Heritage Studies

East Manganese mining development on Portion 1 and the Remaining Extent of the Farm East 270

African Heritage Consultants cc (Küsel 2018) conducted a Phase 1 HIA for the East Manganese Mining Development on Portion 1 and the Remaining Extent of the Farm East 270, Hotazel. The study noted a low level of heritage resources in the vicinity of Hotazel and that settlements were mostly focussed around water sources. On a local scale, stone tools were located in the vicinity of the Ga-Mogara River, but were mostly isolated specimens and scatters of stone tools. The majority of the samples belonged to the MSA (Middle Stone Age), while a few ESA (Early Stone Age) and LSA (Later Stone Age) stone tools were located as well. The identified scatters of stone tools were regarded to be of low significance as they occurred in low densities and in dispersed contexts. Two informal cemeteries located outside of the development footprint, but within the East Manganese Mining Right boundary were noted as well.

3.2 Limitations

The study area appears to be undisturbed and mainly consists of a riverbed. The general visibility was considered to be good as a few trees and sparse ground cover characterised the majority of the study area. The relatively small area along the eastern boundary of the proposed study area, however, is associated with dense grass cover that hampered visibility (**Figure 10**). No other access constraints were encountered.



Figure 10: Dense vegetation associated with the eastern boundary of the proposed expansion.

4. Archaeological Background

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Later Iron Ages; and Historical or Colonial Periods. This section of the report provides a general background to archaeology in South Africa. For a detailed description of the archaeological context of the study area, refer to the initial Phase 1 HIA conducted by African Heritage Consultants cc (Küsel 2018).

4.1 The Stone Ages

The earliest stone tool industry, the Oldowan, was developed by early human ancestors which were the earliest members of the genus *Homo*, such as *Homo habilis*, around 2.6 million years ago. It comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). Archaeologists suggest these stone tools are the earliest direct evidence for culture in southern Africa (Clarke & Kuman 2000). The advent of culture indicates the advent of more cognitively modern hominins (Mitchell 2002: 56, 57)

The Acheulean industry completely replaced the Oldowan industry. The Acheulian industry was first developed by *Homo ergaster* between 1.8 to 1.65 million years ago and lasted until around 300 000 years ago. Archaeological evidence from this period is also found at Swartkrans, Kromdraai and Sterkfontein. The most typical tools of the ESA are handaxes, cleavers, choppers and spheroids. Although hominins seemingly used handaxes often, scholars disagree about their use. There are no indications of hafting, and some artefacts are far too large for it. Hominins likely used choppers and scrapers for skinning and butchering scavenged animals and often obtained sharp ended sticks for digging up edible roots. Presumably, early humans used wooden spears as early as 5 million years ago to hunt small animals.

Middle Stone Age (MSA) artefacts started appearing about 250 000 years ago and replaced the larger Early Stone Age bifaces, handaxes and cleavers with smaller flake industries consisting of scrapers, points and blades. These artefacts roughly fall in the 40-100 mm size range and were, in some cases, attached to handles, indicating a significant technical advance. The first *Homo sapiens* species also emerged during this period. Associated sites are Klasies River Mouth, Blombos Cave and Border Cave (Deacon & Deacon 1999).

Although the transition from the Middle Stone Age to the Later Stone Age did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999).

4.2 The Iron Age & Later History

The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). These groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Archaeological evidence from Early Iron Age sites is mostly artefacts in the form of ceramic assemblages. The origins and archaeological identities of this period are largely based upon ceramic typologies. Some scholars classify Early Iron Age ceramic traditions into different “streams” or “trends” in pot types and decoration, which emerged over time in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). Early Iron Age ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. This period continued until the end of the first millennium AD (Mitchell 2002; Huffman 2007). Some well-known Early Iron Age sites include the Lydenburg Heads in Mpumalanga, Happy Rest in the Limpopo Province and Mzonjani in Kwa-Zulu Natal.

The Middle Iron Age roughly stretches from AD 900 to 1300 and marks the origins of the Zimbabwe culture. During this period cattle herding appeared to play an increasingly important role in society. However, it was proved that cattle remained an important source of wealth throughout the Iron Age. An important shift in the Iron Age of southern Africa took place in the Shashe-Limpopo basin during this period, namely the development of class distinction and sacred leadership. The Zimbabwe culture can be divided into three periods based on certain capitals. Mapungubwe, the first period, dates from AD 1220 to 1300, Great Zimbabwe from AD 1300 to 1450, and Khami from AD 1450 to 1820 (Huffman 2007: 361, 362).

The Late Iron Age roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, as can be seen from the distribution of iron slag which tend to occur only in certain localities compared to a wide distribution during earlier

times. It was also during the Late Iron Age that different areas of South Africa were populated, such as the interior of KwaZulu Natal, the Free State, the Gauteng Highveld and the Transkei. Another characteristic is the increased use of stone as building material. Some artefacts associated with this period are knife-blades, hoes, adzes, awls, other metal objects as well as bone tools and grinding stones.

The Historic Period mainly deals with Europe's discovery, settlement and impact on southern Africa. Some topics covered by the Historical period include Dutch settlement in the Western Cape, early mission stations, Voortrekker routes and the Anglo Boer War. This time period also saw the compilation of early maps by missionaries, explorers, military personnel, etc.

5. Archaeological and Historical Remains

5.1 Stone Age Remains

A few isolated Stone Age artefacts were observed within the demarcated expansion boundary (**Figure 11**). The artefacts were located within the riverbed, roughly measure 4 X 5 cm and are weathered. The observed stone tools appear to be similar to the MSA artefacts observed by Küsel (2018). No stone tool concentrations were noted.

Stone Age artefacts are often associated with rocky outcrops or water sources. **Figures 12 – 14** are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa.



Figure 11: MSA stone tools associated with the demarcated expansion area.

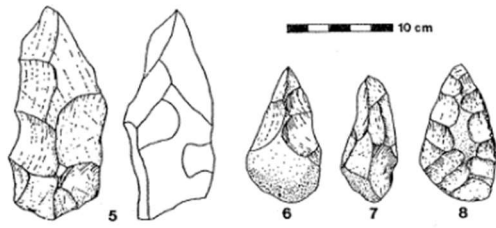


Figure 12: ESA artefacts from Sterkfontein (Volman 1984).

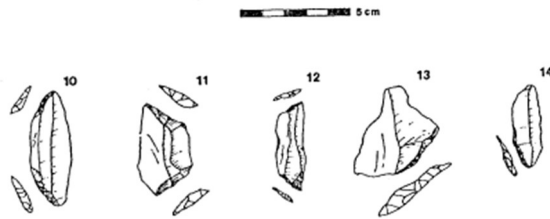


Figure 13: MSA artefacts from Howiesons Poort (Volman 1984).



Figure 14: LSA scrapers (Klein 1984).

5.2 Iron Age Remains

No Iron Age remains were observed within the demarcated study area.

The HIA conducted by African Heritage Consultants cc also did not observe Iron Age sites (Küsel 2018).

5.3 Historical

One site (B01), consisting of a windpump, circular cement water reservoir and a small angular structure measuring approximately 1.5 m X 1.5 m, was observed near the eastern boundary of the study area (Figures 15 & 16). The windpump is first indicated on the 1972 topographical map (Appendix A: Figure 20). Unfortunately the resolution of the historical aerial images dating to 1959, 1965 and 1972 (Appendix A: Figures 17 –19) are too low to identify any structures or features.

Küsel (2018) noted that the farm house to the south of the study area dates to the late 1960s, has significantly been altered over the years and is therefore not representative of the local vernacular architecture or of a specific style. The 1959 aerial image, however, indicates the farm house and it can therefore be assumed that the

windpump, reservoir and structure are likely to date to the same period. It should be noted the farm house might have been demolished and rebuilt during the late 1960s as mentioned by Küsel (2018).



Figure 15: Windpump and reservoir at Site B01.



Figure 16: Structure at Site B01.

5.4 Contemporary Remains

No contemporary remains were observed within the demarcated study area.

The heritage study done by African Heritage Consultants cc (Küsel 2018) stated that the farm house to the south is of recent origin.

5.5 Graves

No grave or burial site was observed within the demarcated study area.

The heritage study done by African Heritage Consultants cc (Küsel 2018) recorded two informal cemeteries falling outside of the current study area.

6. Evaluation

The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

A fundamental aspect in the conservation of a heritage resource relates to whether the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. There are many aspects that must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and if appropriate mitigated in order to gain data / information which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed.

6.1 Field Ratings

All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The field rating and classification in this report are prescribed by SAHRA.

Table 3: Field Ratings

Rating	Field Rating/Grade	Significance	Recommendation
National	Grade 1		National site
Provincial	Grade 2		Provincial site
Local	Grade 3 A	High	Mitigation not advised
Local	Grade 3 B	High	Part of site should be retained
General protection A	4 A	High/Medium	Mitigate site
General Protection B	4 B	Medium	Record site
General Protection C	4 C	Low	No recording necessary

Table 4: Individual site ratings

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2722BB-B01	Windpump, reservoir, structure	General Protection B	4 B	Medium	Record site

7. Statement of Significance & Recommendations

7.1 Statement of significance

The study area: The Proposed Expansion of the East Manganese Mine on Portion 1 of the Farm Gloria 266 and Portion 1 of the Farm East 270

As can be seen from the initial heritage study done by African Heritage Consultants cc (Küsel 2018), as well as the findings made in this study, the greater study area is considered to be significant from a heritage perspective.

The observed stone tools are similar to the MSA artefacts recorded by African Heritage Consultants cc (Küsel 2018), and occurred in low densities and in a dispersed context. These stone tools are therefore of low significance.

A clear construction date for Site B01, that consists of a windpump, circular cement reservoir and small angular structure, could not be obtained. The earliest reference was found on the 1972 topographical map as poor historical aerial image resolution hampered the identification of potential structures or features within the project boundary. However, the earliest aerial image that dates to 1959, shows the presence of the farm house to the south of the proposed study area. A possibility, therefore, exists that the structures associated with Site B01 date to the same period, exceed 60 years of age, and would therefore be protected under the NHRA (25 of 1999).

7.2 Recommendations

The following recommendations are made in terms with the National Heritage Resources Act (25 of 1999) in order to avoid the destruction of heritage remains associated with the area demarcated for development:

- The stone tools observed within the study area are associated with a dispersed context and are considered to be of low significance. The recording done during this study is therefore regarded as sufficient and no further action is required.
- Although Site B01 appears not to be unique or significant from a heritage perspective, a strong possibility exists that the windpump, reservoir and angular structure exceed 60 years of age. It is therefore recommended that this site be avoided by the proposed expansion. Should this not be possible, a destruction permit from the relevant heritage authority will be required.
- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during the course of the project, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
- Should the need arise to expand the proposed project beyond the surveyed area outlined in this study, the following applies: A qualified archaeologist must conduct a full Phase 1 Archaeological Impact Assessment on the sections beyond the demarcated area that will be affected by the development, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.
- From a heritage point of view, the proposed expansion of the East Manganese mining operation as per the demarcated boundary may proceed, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency.

8. Addendum: Terminology

Archaeology:

The study of the human past through its material remains.

Artefact:

Any portable object used, modified, or made by humans; e.g. pottery and metal objects.

Assemblage:

A group of artefacts occurring together at a particular time and place, and representing the sum of human activities.

Context:

An artefact's context usually consist of its immediate *matrix* (the material surrounding it e.g. gravel, clay or sand), its *provenience* (horizontal and vertical position within the matrix), and its *association* with other artefacts (occurrence together with other archaeological remains, usually in the same matrix).

Cultural Resource Management (CRM):

The safeguarding of the archaeological heritage through the protection of sites and through salvage archaeology (rescue archaeology), generally within the framework of legislation designed to safeguard the past.

Excavation:

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and other material covering and accompanying it.

Feature:

An irremovable artefact; e.g. hearths or architectural elements.

Ground Reconnaissance:

A collective name for a wide variety of methods for identifying individual archaeological sites, including consultation of documentary sources, place-name evidence, local folklore, and legend, but primarily actual fieldwork.

Matrix:

The physical material within which artefacts is embedded or supported, i.e. the material surrounding it e.g. gravel, clay or sand.

Phase 1 Assessments:

Scoping surveys to establish the presence of and to evaluate heritage resources in a given area.

Phase 2 Assessments:

In-depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required.

Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

Site:

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity.

Surface survey:

There are two kinds: (1) unsystematic and (2) systematic. The former involves field walking, i.e. scanning the ground along one's path and recording the location of artefacts and surface features. Systematic survey by comparison is less subjective and involves a grid system, such that the survey area is divided into sectors and these are walked ally, thus making the recording of finds more accurate.

9. References

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Human Tissue Act No. 65 of 1983, Government Gazette, Cape Town

National Heritage Resource Act No.25 of 1999, Government Gazette, Cape Town

Removal of Graves and Dead Bodies Ordinance No. 7 of 1925, Government Gazette, Cape Town

Appendix A: Historical Aerial Photographs and Topographical Maps

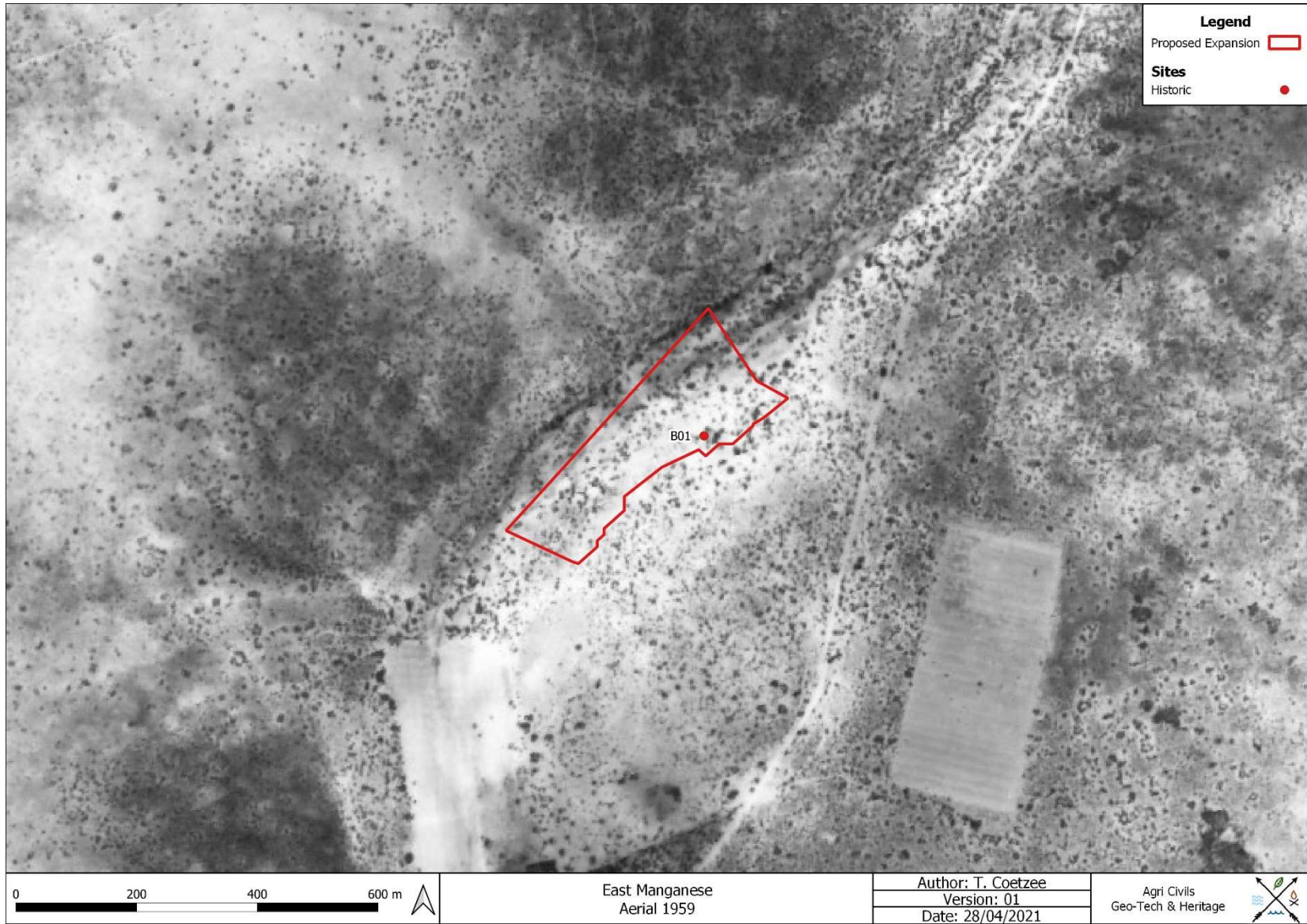


Figure 17: Proposed expansion superimposed on a 1959 aerial image.

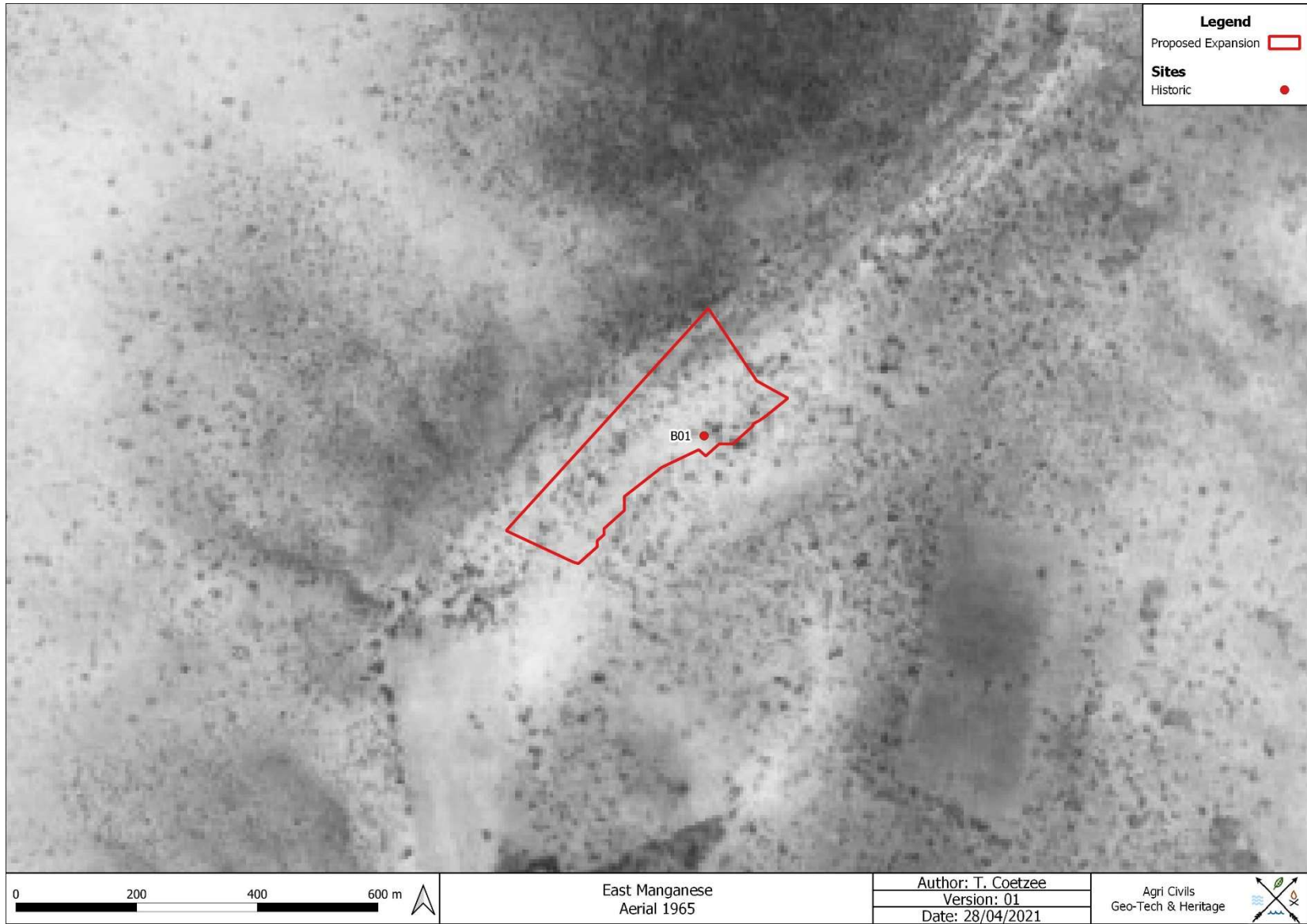


Figure 18: Proposed expansion superimposed on a 1965 aerial image.

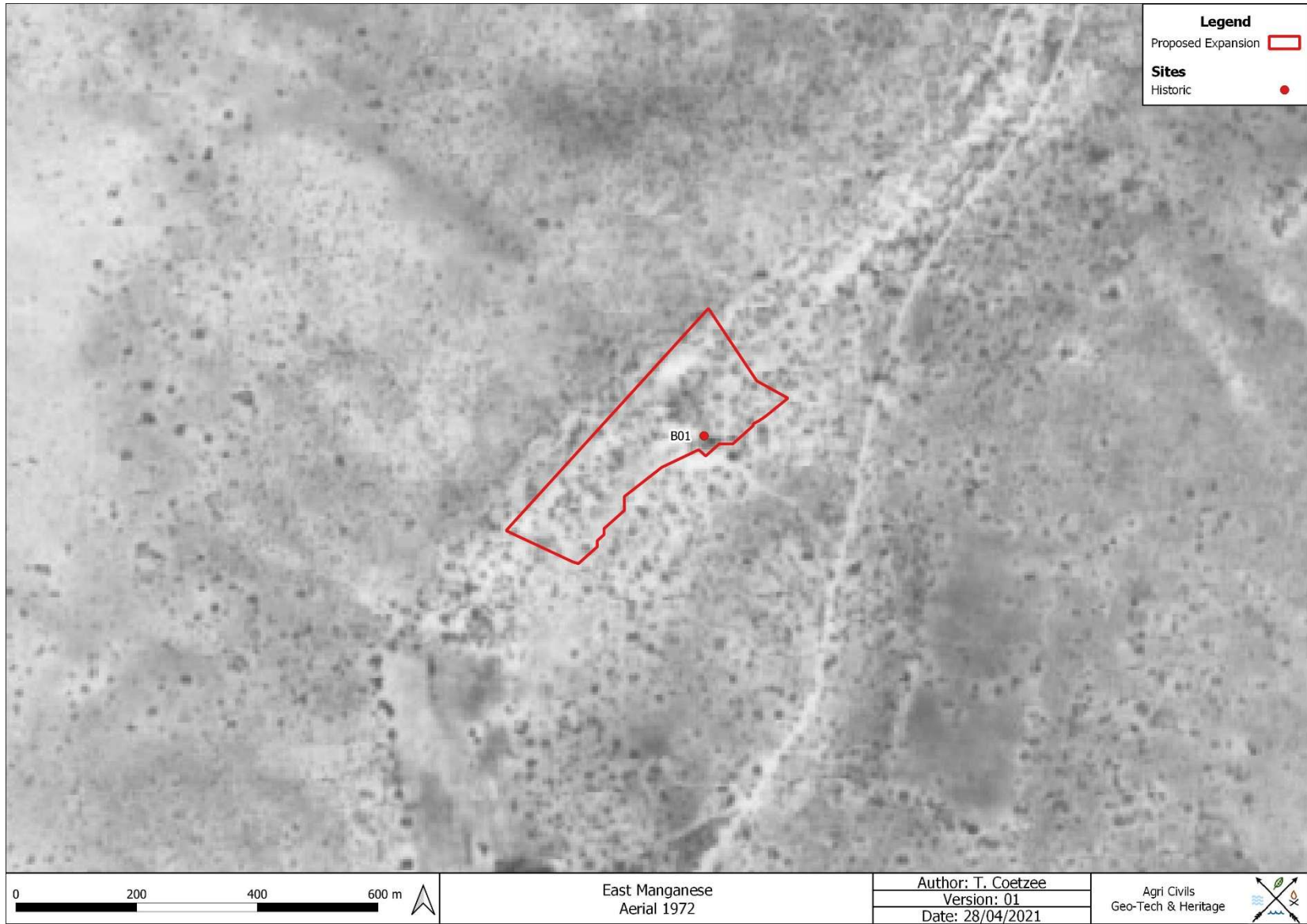


Figure 19: Proposed expansion superimposed on a 1972 aerial image.



Figure 20: Proposed expansion superimposed on a 1972 topographical map.

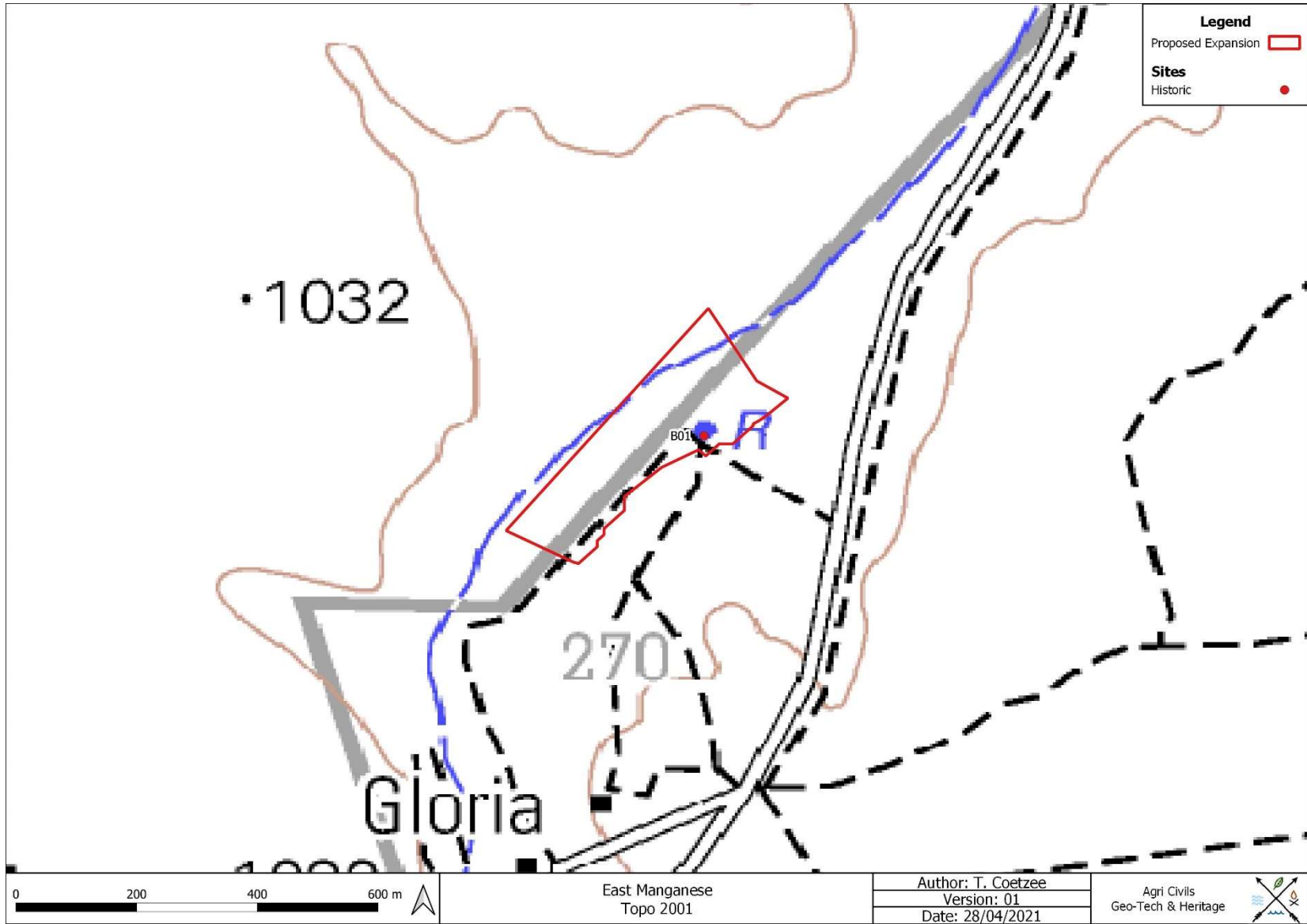


Figure 21: Proposed expansion superimposed on a 2001 topographical map.

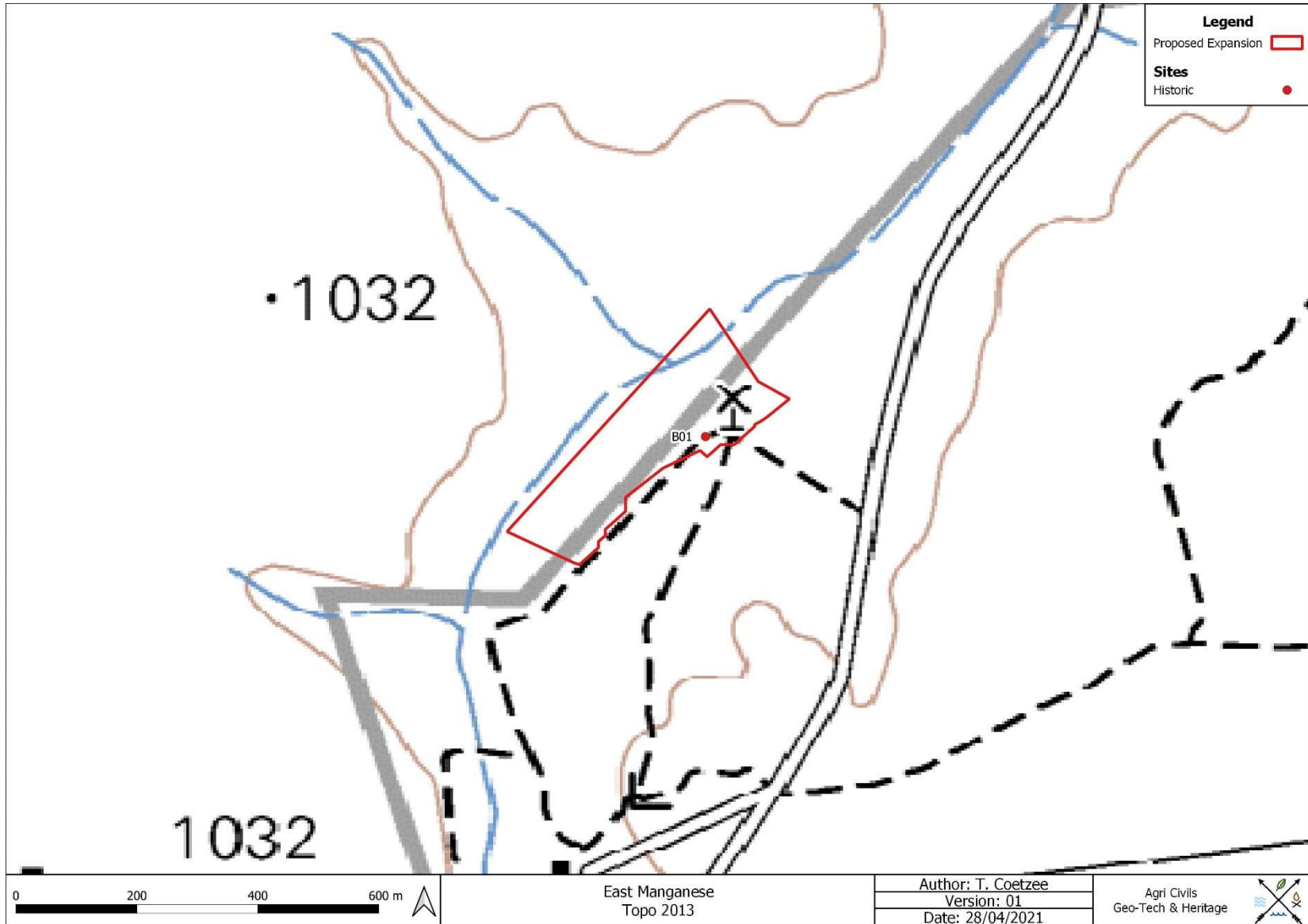


Figure 22: Proposed expansion superimposed on a 2013 topographical map.