



# PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

for the Proposed Tala Bethal S102 Amendment on a Portion of Portion 1  
of the Farm K-Stad 195 IS, Hendrina, Mpumalanga

**For:**

Eco Elementum (Pty) Ltd

**Project Ref:**

Tala Bethal S102

**Date:**


08/11/2022

**Phase 1 Archaeological Impact Assessment for the Proposed Tala Bethal S102 Amendment on a Portion of Portion 1 of the Farm K-Stad 195 IS, Hendrina, Mpumalanga**

Project Ref: Tala Bethal S102  
Report No: EE-0811221  
Report Version: 1

I, Tobias Coetzee, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Tala Bethal S102 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.

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## Executive Summary

Agri Civils Geo-Tech & Heritage was appointed by Eco Elementum (Pty) Ltd to undertake a Phase 1 Archaeological Impact Assessment for the proposed Tala Bethal S102 Project on a portion of Portion 1 of the Farm K-Stad 195 IS near Hendrina in the Mpumalanga Province. The proposed mining expansion is located approximately 11 km southwest of Hendrina and falls within the Steve Tshwete Local Municipality. The aim of the study is to determine the scope of archaeological resources that could be impacted by the proposed mining development. The proposed development footprint measures approximately 35 ha, while the remaining mine boundary measures approximately 110.2 ha.

The demarcated development footprint area is characterised by a combination of previously/currently cultivated land, open veldt utilised as pasture, and sections already disturbed by mining development. According to historical aerial imagery and topographical maps, parts of the study area were cultivated as early as 1955. During later years, the majority of the area was cultivated, suggesting a general lower significance and potential impact to cultural resources.

One building was noted on historical aerial imagery within the demarcated development footprint (Site B01). The building, however, was demolished and the site is not associated with surface remains, but potentially sensitive subsurface cultural material might be located within the site boundary. Should such material be discovered, a qualified archaeologist must be contacted.

Sites located outside of the development footprint include: One demolished historical building (B02), an intact historical building (B03) and two cemeteries (F01 & F02).

Demolished historical building B02 is located approximately 100 m northeast of the nearest surface development, is not associated with material culture and is not at risk of being impacted by the proposed development. The intact historical building at Site B03 is located approximately 100 m southeast of the proposed opencast area, is protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and might be impacted by the proposed mining development. It is therefore recommended that the Environmental Control Officer monitor the site on a quarterly basis, as well as pre and post blasting. Should damage to the site be observed, a qualified archaeologist must be contacted. Should impact to the site be unavoidable, a destruction permit may be applied for from the Mpumalanga Provincial Heritage Resources Authority.

Cemetery F01, located on the northern boundary of the study area and approximately 266 m northeast of the proposed opencast area, will be impacted by a berm that is planned through the cemetery. The cemetery consists of approximately eight graves and although no dates were observed, the possibility exists that the graves exceed 60 years of age. The cemetery is therefore protected by the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Since the cemetery appears not to be in use anymore, it is recommended that a 20 m fenced-off conservation buffer be erected around the cemetery in order to avoid accidental damage, and that no mining/construction activities take place within



100 m of the cemetery. Access to the cemetery should also not be refused. Should impact to the cemetery be unavoidable, a grave relocation process may be initiated.

Cemetery F02 consists of approximately nine unfenced graves within an agricultural field on the southern border of the mining area. No dates were observed on the surface dressings, but the possibility exists that the graves exceed 60 years of age. The cemetery is therefore protected by the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The nearest surface development is proposed 700 m to the northeast and no impact to the cemetery is foreseen.

Subject to adherence to the recommendations and approval by the South African Heritage Resources Agency, the proposed Tala Bethal S102 Project as per the indicated boundaries may continue. Should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority must be 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.



## List of Abbreviations

**AIA** – Archaeological Impact Assessment

**CRM** – Cultural Resource Management

**DMR** – Department of Mineral Resources

**ECO** – Environmental Control Officer

**EIA** – Environmental Impact Assessment

**ESA** – Early Stone Age

**ha** – Hectare

**HIA** – Heritage Impact Assessment

**km** – Kilometre

**LIA** – Late Iron Age

**LSA** – Later Stone Age

**m** – Metre

**MASL** – Metres Above Sea Level

**MEC** – Member of the Executive Council

**MSA** – Middle Stone Age

**NHRA** – National Heritage Resources Act

**SAHRA** – South African Heritage Resources Agency



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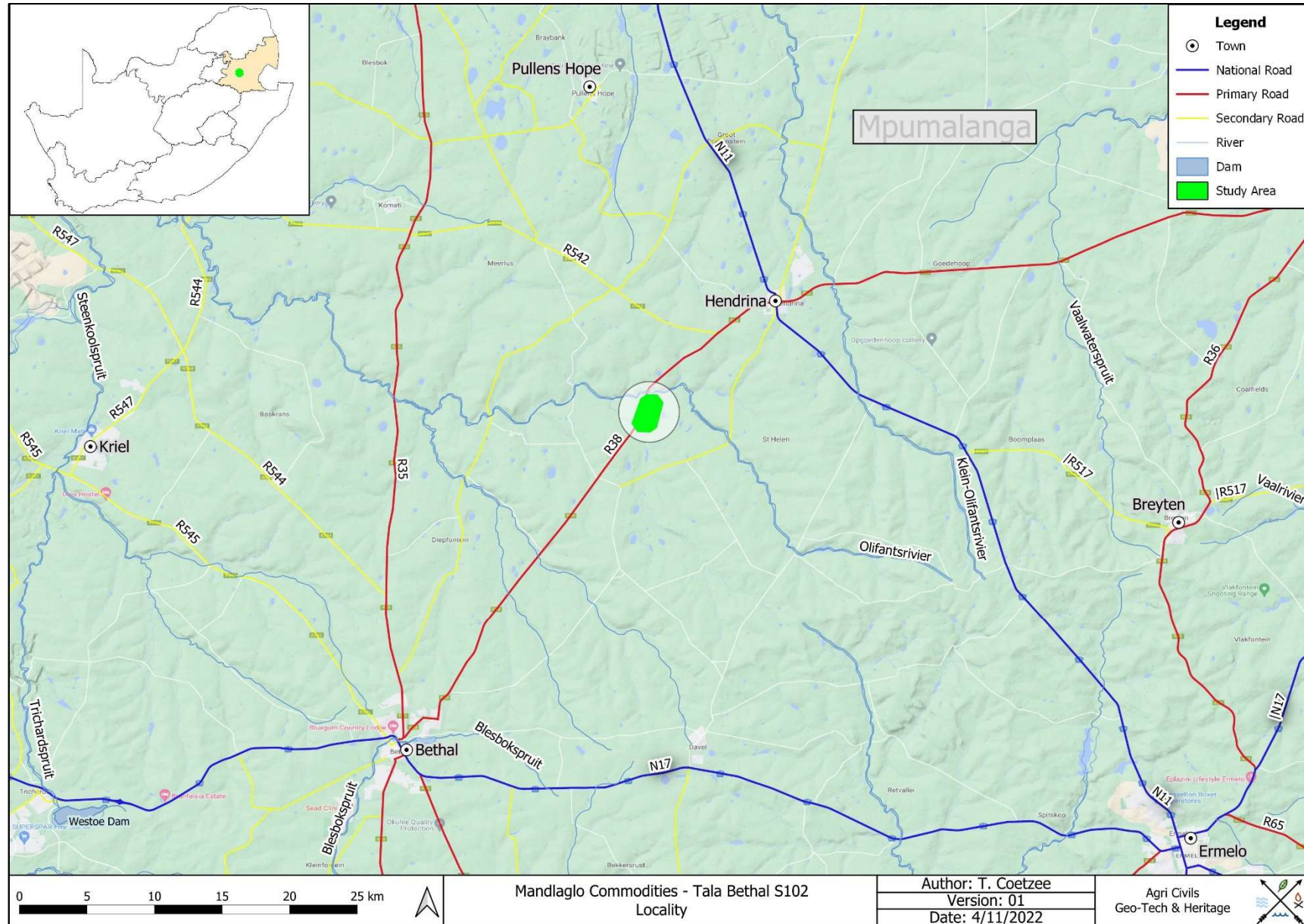
# 1. Project Background

## 1.1 Introduction

Eco Elementum (Pty) Ltd appointed Agri Civils Geo-Tech & Heritage to undertake a Phase 1 Archaeological Impact Assessment (AIA) for the proposed Tala Bethal S102 Project on a portion of Portion 1 of the Farm K-Stad 195 IS (**Table 1**) near Hendrina in the Mpumalanga Province (**Figure 1**). The purpose of this study is to examine the area demarcated for the proposed coal mining development in order to determine if any archaeological resources of heritage value will be impacted, as well as to archaeologically contextualise the general study area.

In the following report, the implications for the proposed Tala Bethal S102 Project on the demarcated portion regarding heritage resources are discussed: A Portion of Portion 1 of the Farm K-Stad 195 IS. The development will consist of an opencast pit and associated infrastructure. 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 development and construction phases of the project.





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



## 1.2 Legislation

The South African Heritage Resources Agency (SAHRA) 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.

Archaeological Impact Assessments (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 Environmental Impact Assessment (EIA) 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.

### 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 5000m<sup>2</sup> 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 10000m<sup>2</sup> 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)



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 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 proposed Tala Bethal S102 Project is situated to the southwest of Hendrina. The identified land parcel is listed below (**Table 1**):

**Table 1:** Farm Portions & Coordinates.

Farm Name	Farm Portion	Map Reference (1:50 000)	Lat	Lon	Land Parcel Extent (ha)	Intersecting Development Extent (ha)
K-Stad 195 IS	1	2629 BA	-26.232168	29.631469	145.2	±35

The study area is located 11 km southwest of Hendrina, while Pullens Hope is located 24 km to the north-northwest, Bethal 29 km to the southwest and Ermelo 50 km to the southeast (**Figure 1**). The study area falls within the Nkangala District Municipality and the Steve Tshwete Local Municipality in the Mpumalanga Province. In terms of vegetation, the study area falls within the Grassland Biome, which is typically associated with summer rainfall regions. This Biome covers approximately 28% of South Africa. According to the vegetation classification by Mucina & Rutherford (2006), the study area falls within the Eastern Highveld Grassland vegetation unit.

Eastern Highveld Grassland's conservation status is considered to be endangered with a conservation target of 24%. Only a small portion is conserved in statutory and private reserves. This vegetation unit consists of the plains between Belfast / eMakhazeni in the east and the eastern side of Johannesburg in the west and also extends towards Bethal, Ermelo and to the west of Piet Retief / eMkhondo. This vegetation type is associated with slightly to moderately undulating plains and includes low hills and pan depressions. The general vegetation is short dense grassland with small, scattered rocky outcrops and some woody species. About 44% of this vegetation unit has been transformed by cultivation, plantations, mines, urbanisation and the building of dams. Although no serious alien invasions are reported, *Acacia mearnsii* may become dominant in disturbed areas. Erosion associated with this vegetation unit is considered to be low (Mucina & Rutherford 2006).



The average elevation for Eastern Highveld Grassland varies between 1520 and 1780 MASL (metres above sea level), while the average elevation of the project area is 1625 MASL. The general area is associated with a relatively even gradient.

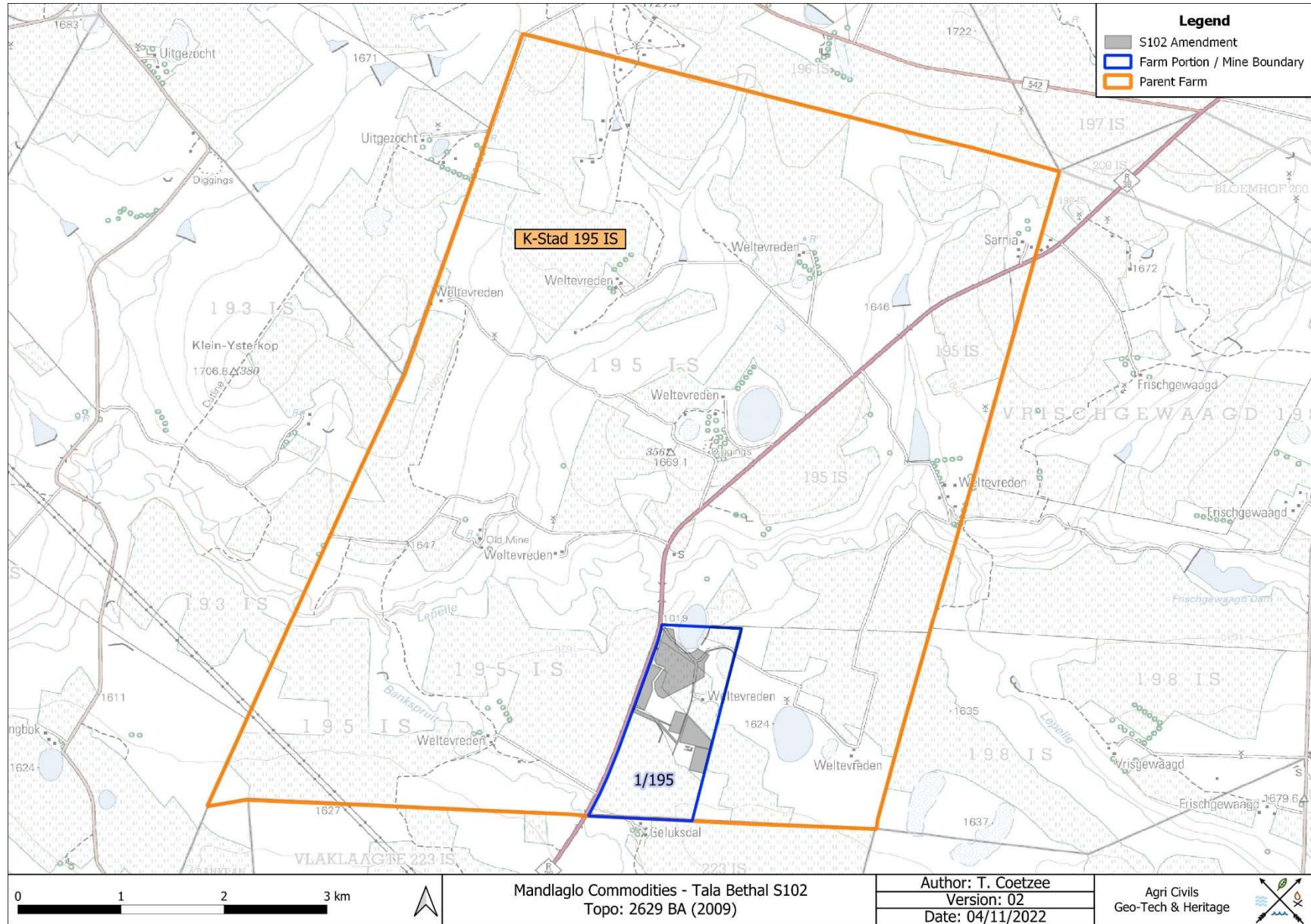
The study area falls within the summer rainfall region and has an average annual rainfall of roughly 794 mm. The average annual temperature is 15.1 °C, while the average summer temperature is 18.5 °C and the average winter temperature 9 °C (Climate-data.org accessed 01/11/2022).

The study area falls within the B11A Quaternary Catchment of the Olifants Water Management Area (WMA). The closest perennial rivers to the study area are the Olifants River that flows approximately 332 m to the north and the Bankspruit that flows 1 km to the south. A non-perennial pan is located near the north-eastern corner of the study area, while a perennial pan intersects the northern boundary of the study area. The Willem Brummer Dam is located 40 km to the southeast and the Trichardtsfontein Dam 48 km to the southwest.

When the surrounding environment is considered, the region is associated with extensive crop cultivation and some mining development. Access to the study area is via the R38 primary road along the western border of the demarcated land parcel (**Figures 2 & 3**). In terms of the proposed S102 area, several sections of the area have already been disturbed by mining activities, while the remaining areas are used for the cultivation of crops and pasture. Most of the proposed development is located on previously/currently cultivated land.

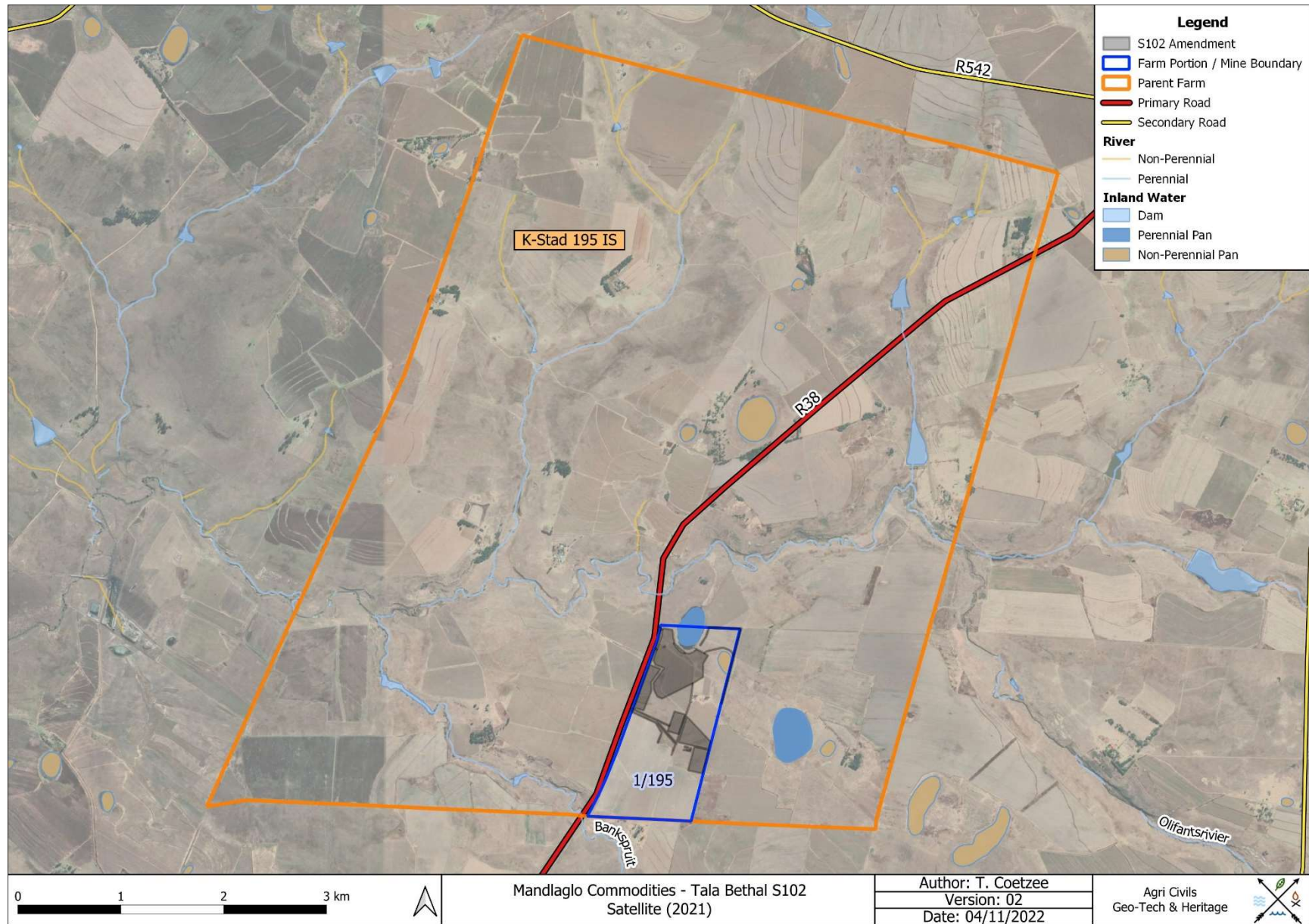






**Figure 2:** Segment of SA 1: 50 000 2629 BA indicating the study area.





**Figure 3:** Study area portrayed on a 2021 satellite image.



## 2.2 Project Description

The Tala Bethal coal mine is planning a small section of opencast and infrastructure on one portion of their existing mining right area. As a result, a Section 102 amendment to include the proposed development in the Environmental Management Programme and Mine Works Programme must be applied for. The proposed mining development consists of approximately 35 ha and will include of the following infrastructure/areas (**Figure 4**):

- Opencast pit
- Overburden Dump
- ROM Pad
- Plant
- Weighbridge
- Berms
- Roads
- Parking
- Offices
- Hardpark
- Workshop





Figure 4: Proposed Tala Resources mining development (supplied by Eco Elementum 2022).



### 3. Methodology

Archaeological reconnaissance of the study area was conducted during October 2022 through a combination of a systematic and unsystematic pedestrian survey of the proposed 35 ha infrastructure area, as well as the remaining 110.2 ha mine boundary (**Figures 5 & 6**). Where applicable, the transects were spaced between 60 m and 70 m apart. General site conditions were recorded via photographic record (**Figures 7 – 14**). Also, the study area was inspected on Google Earth, historical topographical maps, and historical aerial imagery in order to identify potential heritage remains (**Appendix A**). The historical topographical maps dating to 1965, 1984, 1996, and 2009, as well as the historical aerial images dating to 1955, 1968, 1978, 1984, 1991, and 2005, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Three (3) potential sites were identified on historical aerial imagery and topographical maps and were inspected during the pedestrian survey (**Table 2 & Figure 5**). An additional two (2) sites were identified and recorded during the site visit. The site status of all recorded sites is shown in **Figure 6**. It should be noted that the official site names in **Tables 2 & 6** include the prefix '2629BA', but due to the length of the name, the prefix is omitted in the rest of the report. Since heritage resources are often associated with perennial and non-perennial rivers/streams/pans, these water sources located within close proximity of the study area were buffered by a distance of 500 m, indicating a potentially sensitive area. The areas previously/currently associated with cultivated land intersecting the study area were traced and plotted as shown on topographical maps, indicating disturbed areas that are less sensitive from a heritage perspective (**Figure 5**).

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, as well as by plotting the boundaries from aerial imagery and topographical maps.



**Table 2:** Site coordinates & description.

Name	Off. Name	Latitude	Longitude	Description	Age	Current Status	Estimated Extent	ID Source	Farm Portion	Intersecting Development
B01	2629BA-B01	-26.226129	29.631088	Building	Historical	Demolished – No surface remains	0.7 ha	Aerial 1955	1/195	Yes
B02	2629BA-B02	-26.232519	29.635109	Building	Historical	Demolished - Foundation mound	1.0 ha	Aerial 1955	1/195	No
B03	2629BA-B03	-26.230985	29.633966	Building	Historical	Intact	1.1 ha	Aerial 1955	1/195	No
F01	2629BA-F01	-26.224791	29.635512	Cemetery	Potentially Historical	Intact – Dilapidated	759 m <sup>2</sup>	Field	1/195; 7/195; 9/195	Yes
F02	2629BA-F02	-26.241409	29.628146	Cemetery	Potentially Historical	Intact – Dilapidated	192 m <sup>2</sup>	Field	1/195; RE/5/2 23	No



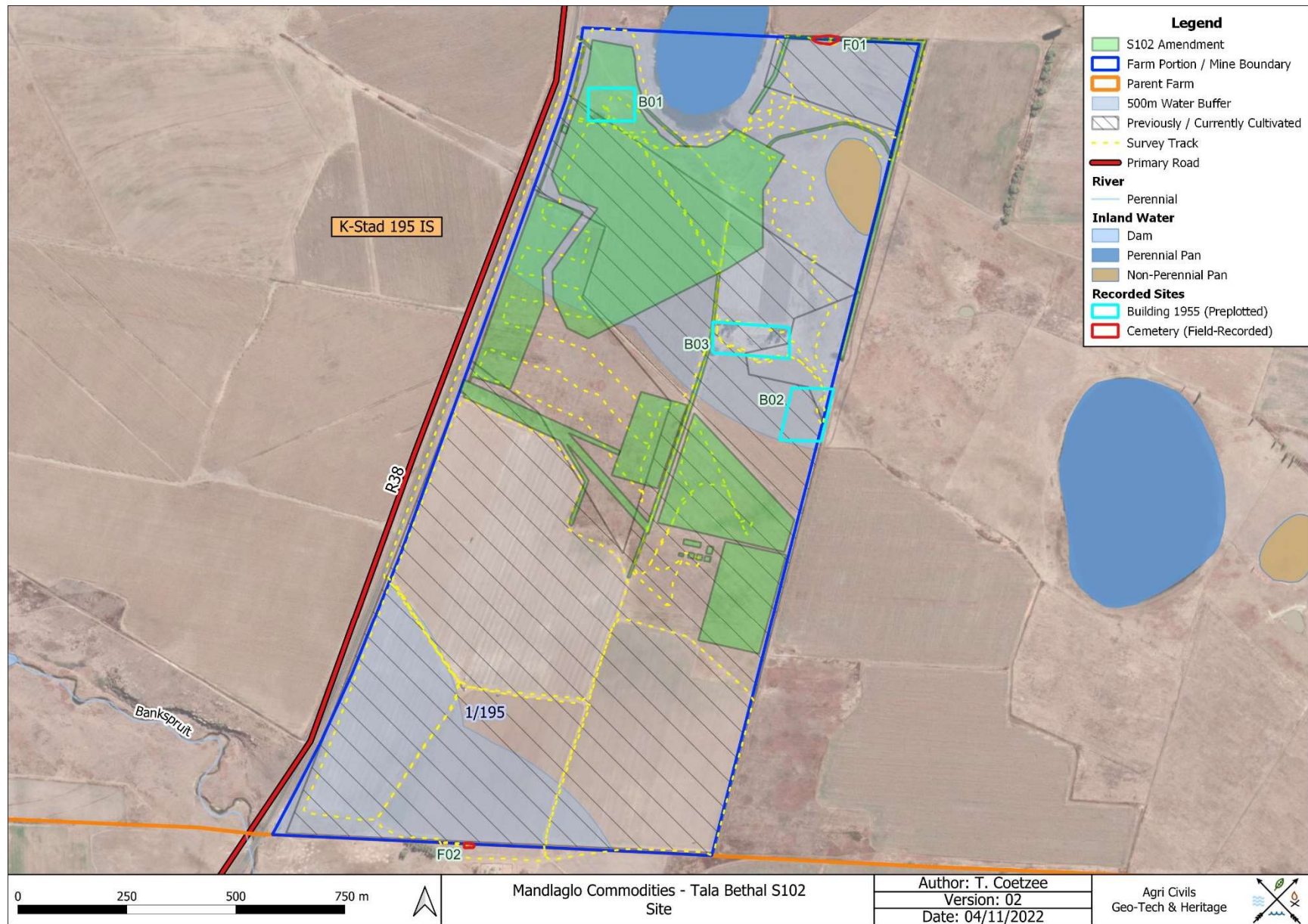


Figure 5: Study area with survey track portrayed on a 2021 satellite image.



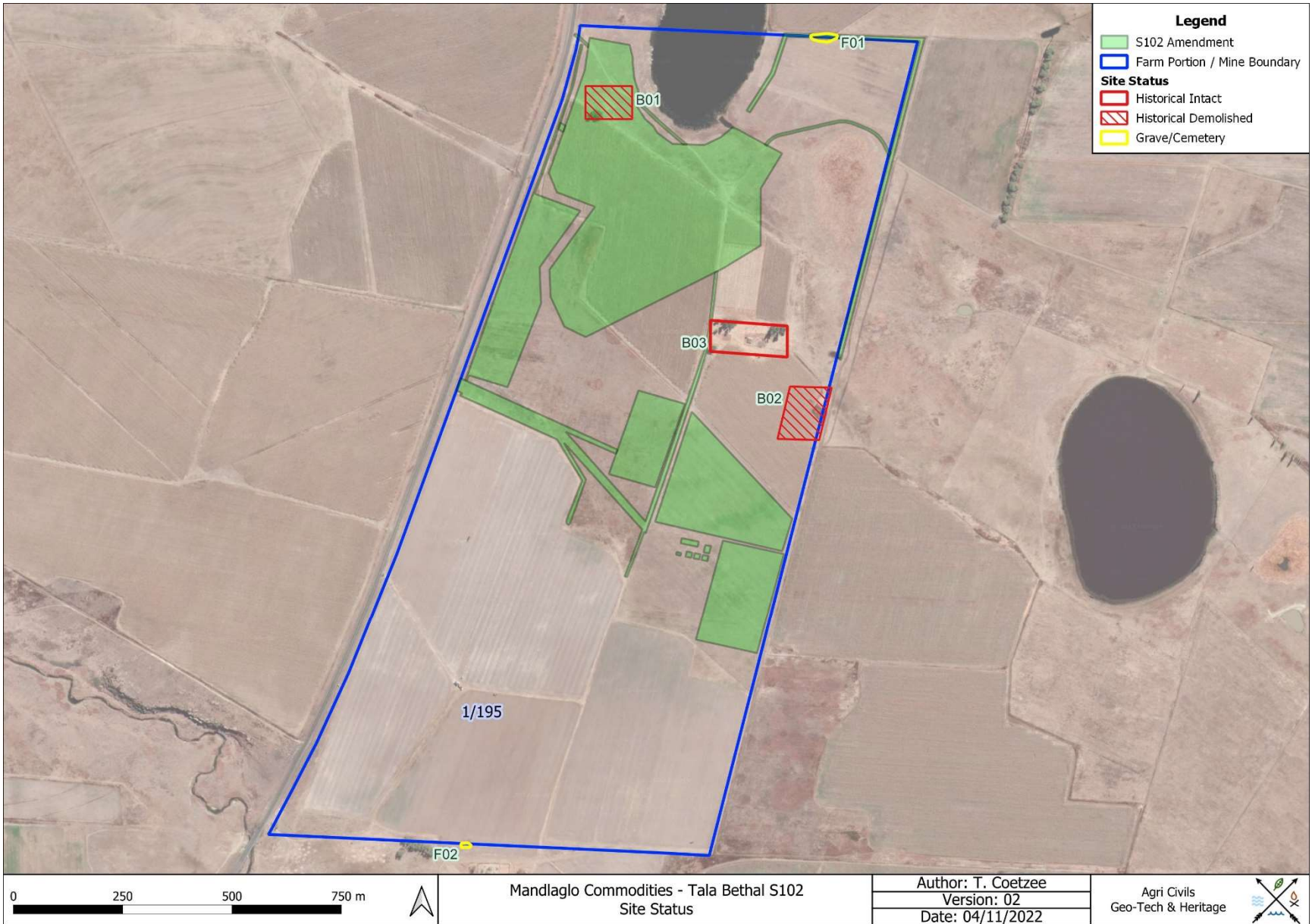


Figure 6: Site status portrayed on a 2021 satellite image.







**Figure 7:** Study area seen from the north-eastern corner.



**Figure 8:** South-eastern corner of the S102 Amendment area.



**Figure 9:** Cultivated southern section of Portion 1.





**Figure 10:** South-western section of the study area.



**Figure 11:** Study area seen from the north-western corner.



**Figure 12:** Current development in the north-western corner of the study area with a pan in the background.





**Figure 13:** Previously cultivated section in the north-eastern corner.



**Figure 14:** Open area near the western border of the S102 Amendment area.

### 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 associated with archaeological material remains, as well as general environmental conditions, were recorded by means of a Garmin Oregon 750 GPS and were photographed with a Samsung A71 mobile phone. A literature study, which incorporated previous work done in the region, was conducted in order to place the study area into context from a heritage perspective.



### 3.1.1 Previous Heritage Studies

#### **Forzando Coal Holdings on the Farms Weltevreden 193 IS and Halfgewonnen 190 IS**

An archaeological survey was conducted for a coal mine on the Farms Weltevreden 193 IS and Halfgewonnen 190 IS. The demarcated impact area was 600 X 600 m and is located roughly 3.5 km west of the proposed Tala Bethal S102 Project. Archaeological Resources Management (ARM) surveyed the study area and the remains of two circular homesteads that possibly date to the Late Iron Age were observed. Both homesteads consist of between 3 and 6 structures and are located close to a stream. More recent angular settlement remains, as well as 2 graveyards associated with the settlements were observed. The graves consisted of mounds made with ferricrete. One of the graveyards consisted of 8 graves, and the other of 5 graves (Huffman & Steel 1995).

#### **Goedehoop Coal Mine, Mpumalanga**

An Archaeological and Cultural Historical survey and impact assessment was conducted by the National Cultural History Museum (2003) for the development of the Goedehoop opencast coal mine near Hendrina in the Mpumalanga Province. The Goedehoop site is located roughly 11.7 km southwest of the proposed Tala Bethal S102 Project. Opencast areas that were surveyed included portions of the Farms Schurvekop 227 IS, Vlakkuielen 76 IS, Middelkraal 50 IS, and Halfgewonnen 190 IS. It was noted that a few graveyards located outside of the study areas were observed and would therefore not be impacted.

#### **Halfgewonnen Colliery, Mpumalanga**

Van Vollenhoven (2013) conducted a Cultural Heritage Impact Assessment for a mining right application at the Halfgewonnen Colliery between Hendrina and Bethal. The Halfgewonnen Colliery is located on the Farm Halfgewonnen 190 IS about 8.5 km west of the proposed Tala Bethal S102 Project. The project entailed the extraction of pillars from the underground mining area that was previously mined through bord-and-pillar methods. Van Vollenhoven (2013) located no sites of cultural heritage significance during the survey.

### 3.1.2 Historical topographical maps & aerial images

Historical images and topographical maps dating to 1955, 1965, 1968, 1978, 1984, 1991, 1996, 2005 and 2009 (**Appendix A**) were used to determine the location and relative age of the structures and buildings associated with the demarcated study area (**Table 2**), as well as to establish historical land uses.

#### **1955 Aerial Image**

The aerial image dating to 1955 (**Appendix A: Figure 34**) indicates the presence of three areas associated with buildings or structures (Sites B01 – B03), as well as several cultivated fields and the road that would later become the R38.



### **1965 Topographical Map**

The 1965 topographical map (**Appendix A: Figure 35**) shows the absence of the building at Site B01, while a hut is shown at Site B02 and a building at Site B03. The cultivated sections also appear to have largely remained unchanged.

### **1968 & 1978 Aerial Images**

When the 1968 and 1978 aerial images (**Appendix A: Figure 36 & 37**) are inspected, buildings are visible at sites B02 and B03 only, while the open area along the western border of the study area appears to be possibly cultivated.

### **1984, 1991, 2005 Aerial Images; 1984, 1996, 2009 Topographical Maps**

The remaining aerial images and topographical maps show no buildings or structures at Sites B01 and B02, while a building is still visible at Site B03 (**Appendix A: Figure 38 – 43**). A small section of cultivated land is also shown in the north-eastern corner on the 2009 topographical map (**Appendix A: Figure 43**).

### **3.1.3 Personal Communication**

According to the developer, no graves or cemeteries are located within the project area. The developer, however, did note that the building at Site B03 is old and that one of the Hendrina residents lived in the house for a while. Personal communication with the farm owner, who was busy planting on the southern section of the project area, revealed the location of two cemeteries: Site F01 along the northern border of the study area, and Site F02 along the southern border of the study area. According to his knowledge, no additional heritage sites are located within the demarcated study area.

## **3.2 Limitations**

The site visit (October 2022) confirmed that the majority of the study area consists of cultivated land and a few sections of open veldt. Except for a few wet and marshy areas near the perennial and non-perennial pans that hampered free movement, no other constraints were encountered and the general visibility was considered to be good (**Figure 15**).





Figure 15: Wet conditions associated with the study area.

## 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.

### 4.1 The Stone Age

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 (Early Stone Age) 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 (LSA) 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). These artefacts are often associated with rocky outcrops or water sources.

## 4.2 The Iron Age & Historical Period

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 (LIA) 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 Historical 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.

#### 4.2.1 The South African War

Several small skirmishes took place in the general area. The phase in the South African War that is significant in terms of the study area relates to the period after the British occupied Pretoria on 5 June 1900. During this time, the republican forces retreated towards the eastern boundary of the *Zuid-Afrikaansche Republiek* under General Louis Botha and started employing guerrilla tactics (Matakoma Heritage Consultants 2007).

One of the more important and well-known South African War sites in the vicinity of the study area is the Battle of Bakenlaagte, located approximately 43 km west of the study area. The battle took place on 30 October 1901 between Lieutenant Colonel George Benson's Flying Column and the joint forces of General Louis Botha and General Sarel Grobler. Benson's Flying Column continuously threatened Boer commandos that caused the commandos to move camp every two days. Grobler had been following Benson's trail and harassed his rearguard, but it was only after Botha and his commando joined Grobler's commando that an attack could be launched. Benson's column was enroute from Syferfontein to Balmoral to resupply his men and horses. The column, consisting of more than 300 wagons, 800 horses and 600 infantry, aimed to camp at Bakenlaagte farmstead (Von der Heyde 2013: 208-209).

During the march, the column stretched out over a distance of approximately 2 km. The advance guard reached the Bakenlaagte farmstead at 09:00, but one of the rearguard wagons got stuck in mud when crossing a drift. Because the Boers were close by and visibility was poor, Benson rode back towards the rearguard and ordered two field guns be placed on a stony ridge between the camp and the rearguard. Benson was on his way to rescue the wagon when Botha with 800 men launched his attack. Upon seeing the attack, Benson ordered a retreat to Gun Hill, where the field guns were positioned. Two companies were also on their way from the camp to Gun Hill. At this stage Benson ordered some of the rearguard toward the northeast to protect the camp, creating a gap through which the Boers attacked. The position was overrun and of the 280 soldiers, the British suffered 231 casualties. Before Benson succumbed to his wounds, he ordered the camp to fire their guns at the hill, despite the danger to him and his men. The shelling drove the Boers back, but ambulance wagons provided cover and they managed to capture the two field guns. The Boers lost almost 100 men and decided not to follow up with an attack. The 73 British soldiers, including Benson, who were killed in the Battle were buried on Gun Hill, but were later exhumed and reburied in Germiston's Primrose Cemetery (Von der Heyde 2013: 208-209).





#### 4.2.2 Coal mining general history near eMalahleni, Middelburg, Bethal, Hendrina, Ermelo and Carolina

Mpumalanga, especially the area between eMalahleni, Middelburg, Bethal, Hendrina, Ermelo and Carolina, is associated with vast coal fields. These coal fields formed between 200 and 300 million years ago from rotten forests in swamps. During this period, Africa was still attached to South America, India and Antarctica as part of the Gondwana supercontinent. By 250 million years ago, the climate changed to dry warm conditions and the swamps in Mpumalanga were replaced by desert-like conditions around 200 million years ago. By 180 million years ago, when the Gondwana supercontinent started to split up, volcanic lava fields covered areas in Mpumalanga (De Wit 2007: 37).

With the rich coal deposits in Mpumalanga, it was only a matter of time before its value was realised and the coal extracted. Coal mining is Mpumalanga's most important industrial activity and produces about 80% of South Africa's coal. The earliest coal mining in the area dates to 1868 when farmers extracted coal for personal use in the Middelburg district. Large-scale coal mining around eMalahleni, however, only started after the discovery of gold on the Witwatersrand in 1886. Due to the discovery of coal in the Brakpan and Springs surroundings in 1887 and no railway linking eMalahleni with the Rand, these early eMalahleni coal mines closed down. It was more cost effective to exploit the closer Brakpan and Springs coal deposits than the coal found at eMalahleni (Schirmer 2007: 316).

After the construction of the railway line between the Rand and eMalahleni the deposits were exploited on large scale again. The coal fields, which are about 40 km wide, are concentrated around eMalahleni and run towards Belfast in the east. The first collieries around eMalahleni were Douglas, Transvaal and Delagoa Bay, Witbank and Landau and are of a higher quality compared to the coal found at Brakpan and Springs. During the 1890s some of the coal was exported via Delagoa Bay. In addition, the coal was readily accessible as the deposits occurred at a depth of 100 m or less (Schirmer 2007: 316-317). It should also be noted that the railway line between Pretoria and Lorenzo Marques (Maputo) was completed on 2 November 1894 and the connection between eMalahleni and Johannesburg during the 1910s (Heydenrych 1999).

Between 1900 and 1920 many new collieries were established and the coal price dropped. This led to the establishment of the Transvaal Coal Owners' Association with the main aim to regulate output coal prices. This also acted to counter possible competition. It should also be noted that not all collieries joined this association. The establishment of the Transvaal Coal Owners' Association had positive as well as negative influences. On the one hand eliminating the competition might have impacted negatively on efficiency and the workers. On the other hand, it is possible that the capacity of coal mines was enhanced and facilitated further development in the industry. One positive point was that the association eased interaction with international buyers. During the 1930s, however, the coal price continued to drop and resulted in mechanisation. This introduced electric coal cutters and eliminated the need for high number of unskilled workers. By 1946 eMalahleni and Middelburg saw



the emergence of a modern coal industry. The Transvaal had 34 large collieries that were responsible for 99.7% of the province's coal (Schirmer 2007: 317-319).

Between 1940 and 1960 coal output in the Eastern Transvaal increased from 13 million to 25 million tons. Although industrialisation expanded throughout this time in South Africa and a demand existed for coal both locally and internationally, a steady shift to oil as the dominant form of energy was noted. In light of these developments Anglo American Corporation launched three research programmes in the 1960s. As a result of these programmes the region's coal mines became export orientated. This trend continued throughout the 1980s. During these times a series of coal-burning power stations around the eastern Highveld coal deposits were constructed (Schirmer 2007: 321).

#### 4.2.3 Hendrina general history

The town of Hendrina became a village in 1923 and was named after Hendrina Beukes, the wife of the owner of the farm on which it was established. The area is associated with maize production and coal mining, as well as Arnot and Hendrina power stations (Bulpin 1986: 637).

## 5. Archaeological and Historical Remains

### 5.1 Stone Age Remains

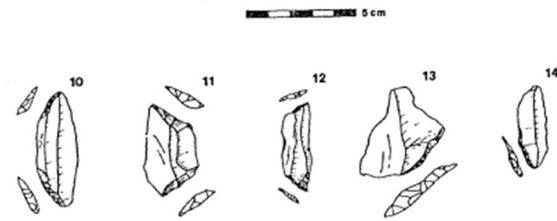
No Stone Age archaeological remains were located within the demarcated study area.

The heritage studies conducted in the vicinity of the study area also did not locate any Stone Age remains. According to Bergh (1999), the closest Stone Age site is Welgelegen Shelter, a LSA site located in the vicinity of Ermelo approximately 50 km to the southeast. Because such sites are often associated with water sources, Stone Age material is more likely to be encountered within the 500 m river buffer zone of the study area. **Figures 16 – 18** below are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa.



**Figure 16:** ESA artefacts from Sterkfontein (Volman 1984).





**Figure 17:** MSA artefacts from Howiesons Poort (Volman 1984).



**Figure 18:** LSA scrapers (Klein 1984).

## 5.2 Iron Age Farmer Remains

No Iron Age Farmer remains were located within the demarcated study area.

The heritage study conducted for Forzando Coal Holdings on the Farms Weltevreden 193 IS and Halfgewonnen 190 IS located two circular homesteads that possibly date to the LIA (Huffman & Steel 1995), indicating the potential existence of Iron Age sites in the greater area.

## 5.3 Historical Remains

Three sites dating to the Historic Period were noted on the historical aerial imagery dating to 1955 (**Appendix A: Figure 34 & Table 3**).

Building Site B01, located near the north-western corner of the study area and within the proposed infrastructure area, is visible on the 1955 aerial image only (**Appendix A: Figure 34**). The building, however, is not indicated on the 1965 topographical map and is not visible on the 1968 aerial image (**Appendix A: Figures 35 & 36**). The building, therefore, appears to have been demolished between 1955 and 1965. The site inspection also revealed that the entire area has been disturbed by modern construction activities and no material remains were observed (**Figure 19**).

Building Site B02 is located along the eastern border of the study area and approximately 100 m northeast of the nearest proposed infrastructure. The site is indicated as a hut on the 1965 topographical map and is also visible on the 1968 and 1978 aerial images (**Appendix A: Figures 35 – 37**). Since the building is not visible on any subsequent datasets, it can be deduced that the building was demolished between 1978 and 1984 (**Appendix A: Figures 37 – 39**). The site inspecting confirmed the presence of a foundation mound and the absence of material culture (**Figure 20**).



Building Site B03, located near the eastern border of the study area and outside of the proposed infrastructure area, is visible on all the historical aerial images and topographical maps. The site inspection also confirmed the existence of the building. This suggests that the building at Site B03 is the original building. The building measures approximately 11 m X 11 m and is constructed from stone and has a corrugated iron roof. The domestic area around the building measures approximately 1.1 ha and the border of the area is located approximately 100 m southeast of the proposed opencast area. Associated infrastructure include a windpump, cement dam and temporary corrugated iron structures possibly housing small stock (**Figures 21 – 23**). At present, the building is occupied.

The heritage study conducted by Huffman & Steel (1995) recorded angular settlement remains that might date to the Historic Period

**Table 3:** Historical Sites.

Name	Type	Source	Year	Current Status	Surface Indications
B01	Building	Aerial	1955	Demolished	None
B02	Building	Aerial	1955	Demolished	Foundation mound
B03	Building	Aerial	1955	Intact	Building



**Figure 19:** Environment associated with Site B01.





**Figure 20:** Foundation mound at Site B02.



**Figure 21:** Northern perspective of the building at Site B03.



**Figure 22:** Southern perspective of the building at Site B03.





**Figure 23:** General view of Site B03.

## 5.4 Contemporary/Natural Remains

No contemporary/natural sites were recorded within the study area.

The heritage study conducted by Huffman & Steel (1995) recorded contemporary angular settlement remains.

## 5.5 Graves/Burial Sites

Two cemeteries were identified during the site inspection (**Table 4**).

Cemetery F01 is located along the northern border of the study area and consists of approximately eight graves oriented in an east-west direction. Two graves are associated with formal surface dressings and six graves with informal surface dressings. Due to dense vegetation cover and small surface indications, additional graves might be located in the cemetery. One of the formal headstones, consisting of bricks and cement, is intact, while the other formal headstone is in a dilapidated state. The informal surface dressings consist of elongated stone cairns without headstones. The cemetery is not fenced-off and appears not to be in use anymore, but it is likely to be still visited, especially since a clay pot was observed at one of the informal graves. No dates were noted on the surface features and the only inscription noted was as follows:

“Meykie  
Mlotshwa”

The age of the cemetery is therefore unknown, but appear to exceed 60 years of age (**Figures 24 – 29**). Based on the current development layout, the cemetery will be impacted by a berm, while the opencast area will be located approximately 266 m to the southwest.



Cemetery F02 partially intersects the southern border of the study area and is located approximately 700 m southwest of the nearest proposed development. The cemetery is located within a cultivated field, appears to be no longer in use, is not fenced-off and consists of at least one formal and eight informal graves. The formal surface decoration consists of brick and cement and is in a dilapidated state, while the informal surface decorations consist of highly obscured elongated stone cairns without headstones. All the observed graves are oriented in an east-west direction and are not associated with grave goods. It is therefore unclear if the cemetery is still visited. Since no inscriptions were noted, the age of the cemetery is unknown, but is likely to exceed 60 years of age (Figures 30 – 32).

The heritage studies conducted by Huffman & Steel (1995) and the National Cultural History Museum (2003), recorded the presence of several graves and cemeteries.

**Table 4:** Graves/Cemeteries

Name	Type	Source	Year	Current Status	Age
F01	Cemetery	Field	Unknown	Intact – Dilapidated	Potentially Historical
F02	Cemetery	Field	Unknown	Intact – Dilapidated	Potentially Historical



**Figure 24:** General view of Cemetery F01.





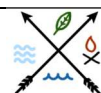
**Figure 25:** Formal surface dressing at Cemetery F01.



**Figure 26:** Close-up of the inscription on the formal surface dressing.



**Figure 27:** Informal surface dressings at Cemetery F01.







**Figure 28:** Dilapidated formal surface dressing at Cemetery F01.





**Figure 29:** Grave goods at an informal surface dressing at Cemetery F01.



**Figure 30:** General view of Cemetery F02.





**Figure 31:** Dilapidated formal surface dressing of a grave at Cemetery F02.





**Figure 32:** Informal grave at Cemetery F02.



## 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

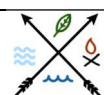
All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The field rating and classification in this report are prescribed by SAHRA.

**Table 5:** Prescribed 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 6:** Individual site ratings.

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2629BA-B01	Demolished Building	General Protection C	4 C	Low	No recording necessary
2629BA-B02	Demolished Building	General Protection B	4 B	Medium	Record site
2629BA-B03	Intact Building	General Protection B	4 B	Medium	Record site



Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2629BA-F01	Cemetery	Local	Grade 3 A	High	Mitigation not advised
2629BA-F02	Cemetery	Local	Grade 3 A	High	Mitigation not advised

\* Ratings are dependent on specific project boundaries and activities.

## 7. Statement of Significance & Recommendations

### 7.1 Statement of Significance

#### The study area: The Proposed Tala Bethal S102 Project

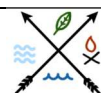
Some of the areas within the demarcated project area are considered to be significant from a heritage perspective. The significance of the proposed area and the observed sites are discussed here.

The general study area is associated with a combination of historical buildings, foundation mounds, and cemeteries. The demarcated S102 area is partially located within 500 m of a river/stream/pan, a zone that is generally associated with a higher heritage site probability. Although some LIA sites were recorded in the greater area, the immediate project area is not well known for Stone Age or Iron Age sites. Also, several areas have been disturbed by previous and current crop cultivation that significantly lowers the sensitivity in terms of heritage resources. These areas are illustrated on **Figure 33**.

Site B01 was identified as a building on the 1955 aerial image (**Appendix A: Figure 34**). Although the site intersects the demarcated development area, the building was completely demolished and is not associated with surface remains anymore. However, the possibility exists that significant cultural material might be unearthed within the boundary of the demarcated area. The demarcated area is therefore considered to be potentially sensitive (**Figure 33**).

Site B02 was identified as a building on the 1955 aerial image, but was demolished and currently consists of a foundation mound only (**Appendix A: Figure 34**). Also, the site does not intersect the area demarcated for development and no impact is therefore anticipated (**Figure 33**).

Site B03 consists of an intact historical building dating to at least 1955 (**Appendix A: Figure 34**), is considered to be sensitive from a heritage perspective and since the building exceeds 60 years of age, is protected by the NHRA (Act No. 25 of 1999). However, based on the current layout, Site B03 does not intersect the proposed development footprint, but the site might be impacted by the proposed mining development (**Figure 33**).

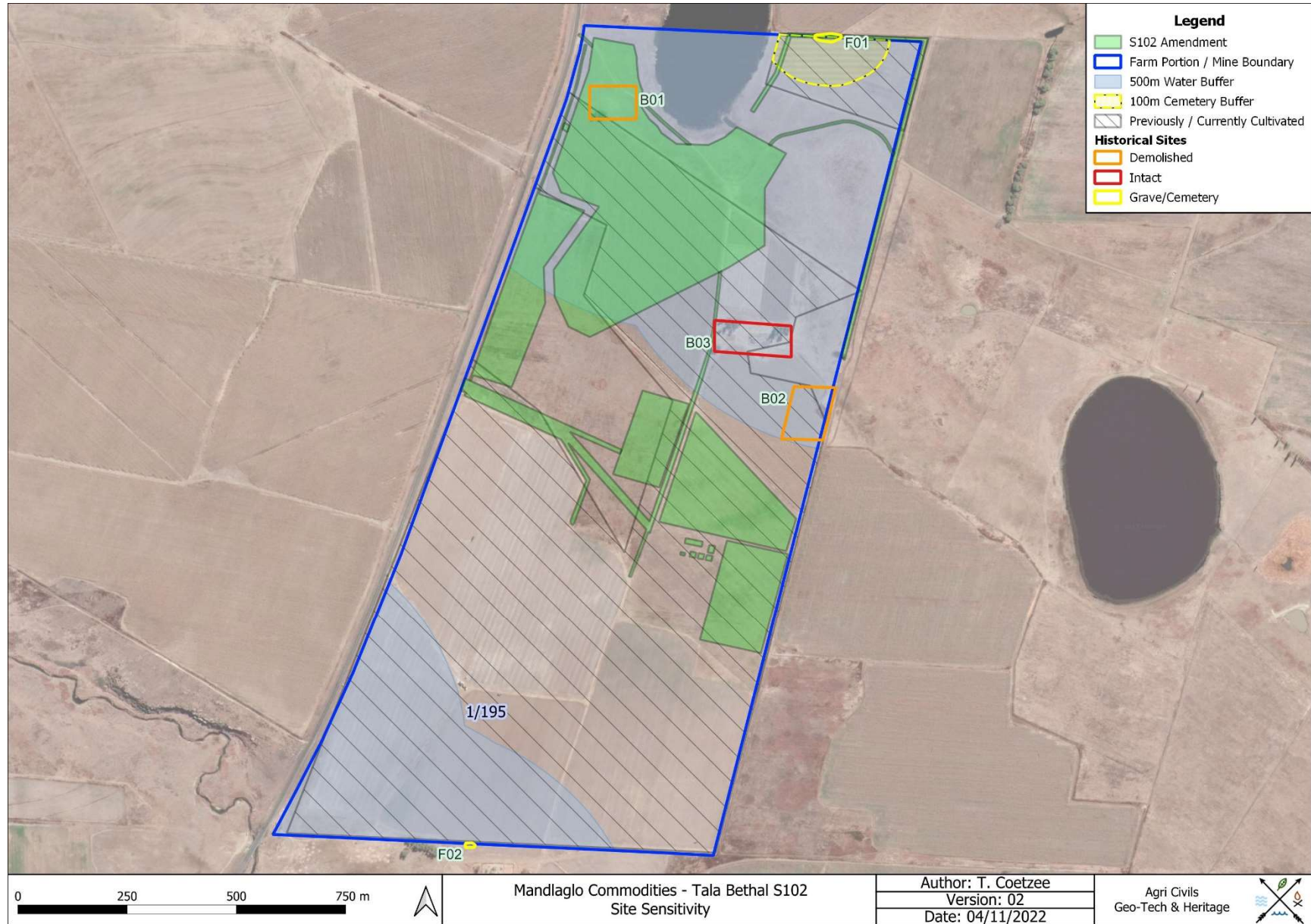


Site F01 was identified as a cemetery on the northern border of the study area and likely contains graves older than 60 years. The graves are significant from a heritage perspective as the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the NHRA (Act No. 25 of 1999) apply. Since a berm is proposed through the cemetery, the graves will be impacted.

Site F02, identified as a cemetery on the southern border of the project area, potentially contains graves older than 60 years. The graves are significant from a heritage perspective as the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the NHRA (Act No. 25 of 1999) apply. Due to the type of surface features and dilapidated state of the graves, it is unlikely that this site will be impacted by the proposed development as it is located a significant distance from the proposed development.

The 500 m water buffer, a zone generally associated with a higher heritage site probability, intersects the demarcated study area. However, the majority of the study area is associated with previously/currently cultivated land that is not considered to be sensitive from a heritage perspective (**Figure 33**).





**Figure 33:** Study area and potentially sensitive areas portrayed on a 2021 satellite image.





## 7.2 Recommendations

The following recommendations are made in terms with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) in order to avoid the destruction of heritage remains associated with the areas demarcated for the proposed mining development:

- Historical Site B01 intersects the proposed development footprint and used to be associated with a building exceeding 60 years of age. However, the building was demolished and the area disturbed. Since infrastructure existed at the site, the possibility of uncovering cultural material within the demarcated boundary is higher compared to other areas. Should such remains be discovered, it is recommended that the associated activity be suspended and that a qualified archaeologist be contacted. This site is therefore considered to be potentially sensitive.
- Historical Site B02 is located approximately 100 m from the nearest development footprint and used to be associated with a building exceeding 60 years of age. However, the building was demolished, and only a foundation mound remains. Since the site does not intersect the proposed development footprint, no impact is foreseen. The site was sufficiently recorded and no further action is required.
- Historical Site B03 is located approximately 100 m from the nearest development footprint, but might be impacted by the proposed development. Since the building exceeds 60 years of age, it is protected under the NHRA (Act No. 25 of 1999). It is therefore recommended that the site be monitored on a quarterly basis by the Environmental Control Officer, as well as before and after blasting. Should any damage be observed as a result of the proposed development, a qualified archaeologist must be contacted. Should damage to the building be unavoidable, a destruction permit may be applied for from the Mpumalanga Provincial Heritage Resources Authority.
- Site F01, a cemetery consisting of approximately eight graves, is located within an area demarcated for the location of a berm, while the nearest opencast activities will be roughly 266 m to the southwest. Although no dates were observed on the surface features, the possibility exists that the graves exceed 60 years of age. Therefore, the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the NHRA (Act No. 25 of 1999) apply. Due to the proposed location of the berm, the cemetery will be impacted by the proposed development. Since the cemetery appears not to be in use anymore and in order to prevent accidental damage to the graves, a fenced-off conservation buffer of 20 m is recommended and that no mining/construction activities take place within 100 m of the cemetery. Access to the cemetery should also not be refused. Alternatively, the graves may be relocated by a qualified graves relocation unit to a premises earmarked by the local municipality, but will set in motion a substantial process as new legislation will be triggered. These processes, however, must be performed in



accordance with the involvement of community leaders and the relatives of the deceased buried in the concerned cemetery.

- Site F02, a cemetery consisting of approximately nine graves, is located on the southern border of the project area and roughly 700 m southwest of the nearest proposed development. Although no dates were observed on the surface features, the possibility exists that the graves exceed 60 years of age. Therefore, the Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the NHRA (Act No. 25 of 1999) apply. Due to the type and dilapidated state of the surface features and proximity to the proposed development, it is unlikely that the site will be impacted. Access to the cemetery should also not be refused.
- The above recommendations are based on the specific project activities and extents as indicated by the figures in this report. Should the proposed surface impact areas be changed, the report must be amended accordingly.
- Should uncertainty regarding the presence of heritage remains exist, or if heritage resources are discovered by chance, it is advised that the potential site be avoided and that a qualified archaeologist be contacted as soon as possible.
- Since 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 development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
- From a heritage point of view, development may proceed on the demarcated area, subject to the abovementioned conditions, recommendations, and approval by the South African Heritage Resources Agency.



## 8. Conclusion

The proposed Tala Bethal S102 Project consists of an opencast pit and surface infrastructure impacting approximately 35 ha. During the site inspection, three sites associated with historical infrastructure and two cemeteries were recorded. It was also noted that the study area has to a large extent been disturbed by previous/current cultivation.

The two cemeteries (F01 & F02), a foundation mound (B02), as well as one intact historical building (B03) were identified on the outside of the demarcated development footprint, while one demolished historical building (B01) was recorded inside of the proposed development footprint. One of the cemeteries (F01) and the intact historical building (B03) might be impacted by the proposed development, while the demolished building within the development footprint (B01) might be associated with potentially sensitive subsurface cultural material. The cemetery should be fenced-off, and the intact historical building should be monitored. The remaining cemetery (F02) and demolished building (B02) are not at risk of being impacted by the proposed mining development.

Should the recommendations made in this study be adhered to and with the approval of the South African Heritage Resources Agency, the proposed Tala Bethal S102 Project may proceed.



## 9. 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.

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*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 Imagery & Topographical Maps

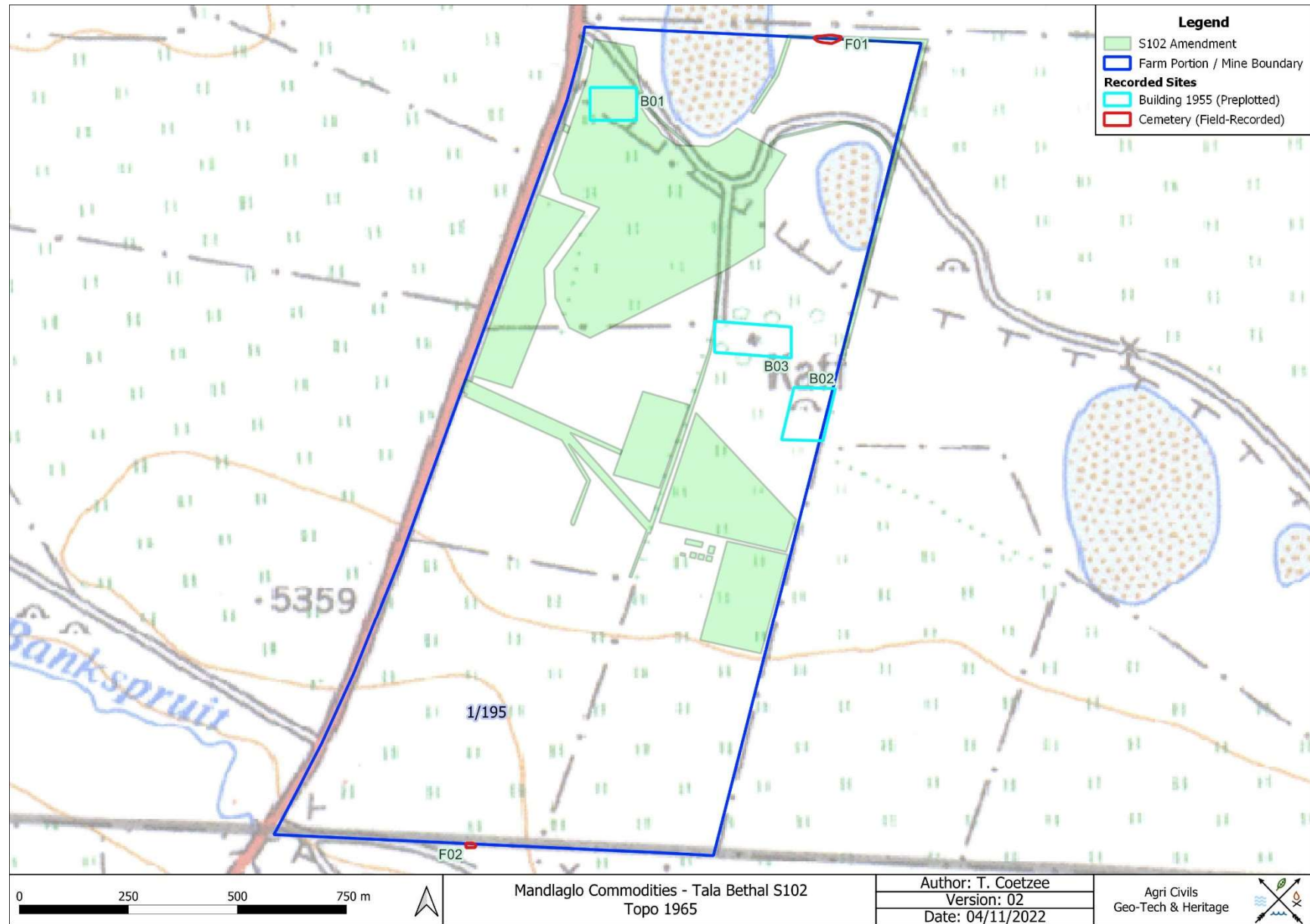




**Figure 34:** Study area superimposed on a 1955 aerial image.







**Figure 35:** Study area superimposed on a 1965 topographical map.





**Figure 36:** Study area superimposed on a 1968 aerial image.





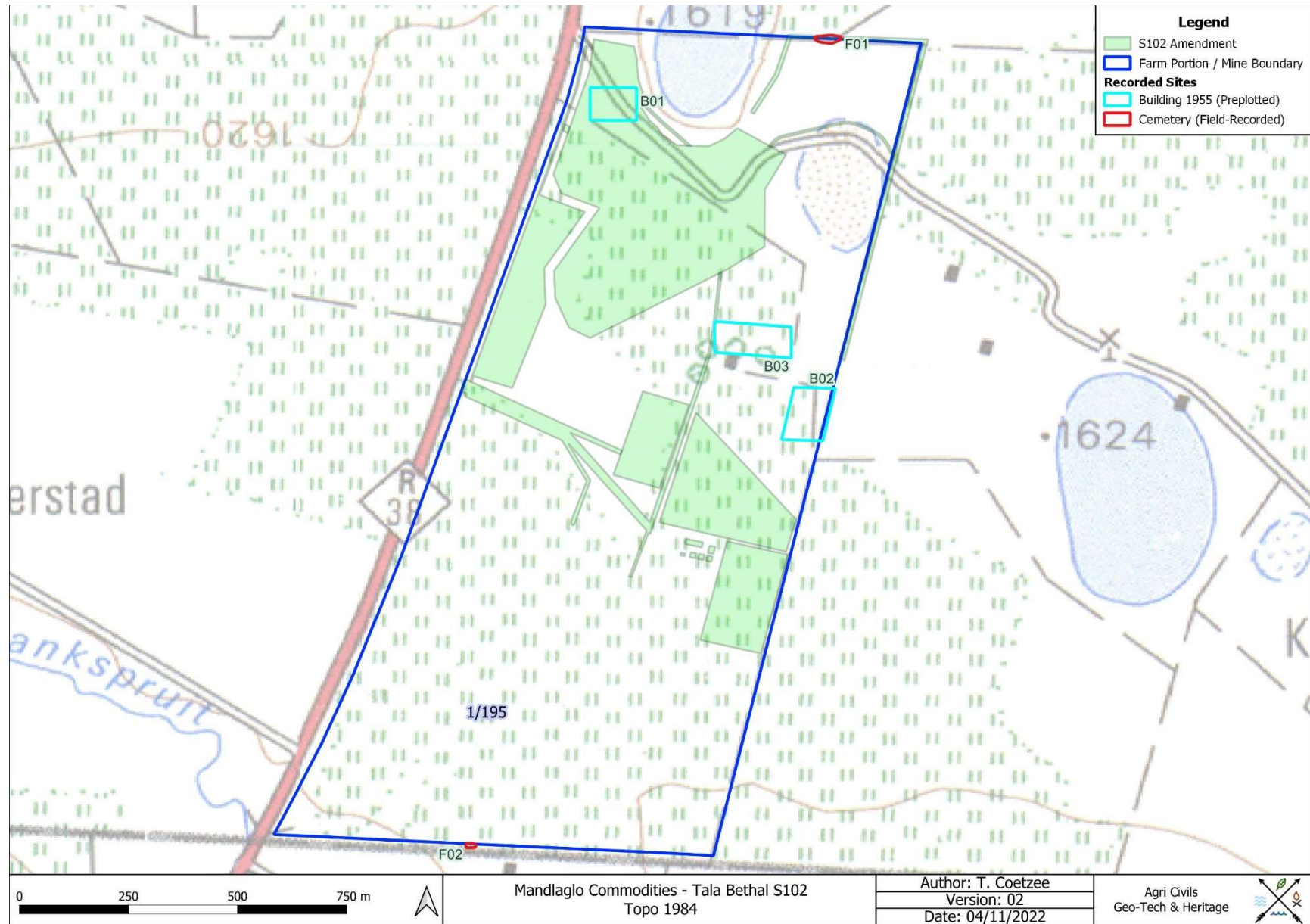
**Figure 37:** Study area superimposed on a 1978 aerial image.





**Figure 38:** Study area superimposed on a 1984 aerial image.





**Figure 39:** Study area superimposed on a 1984 topographical map.





**Figure 40:** Study area superimposed on a 1991 aerial image.



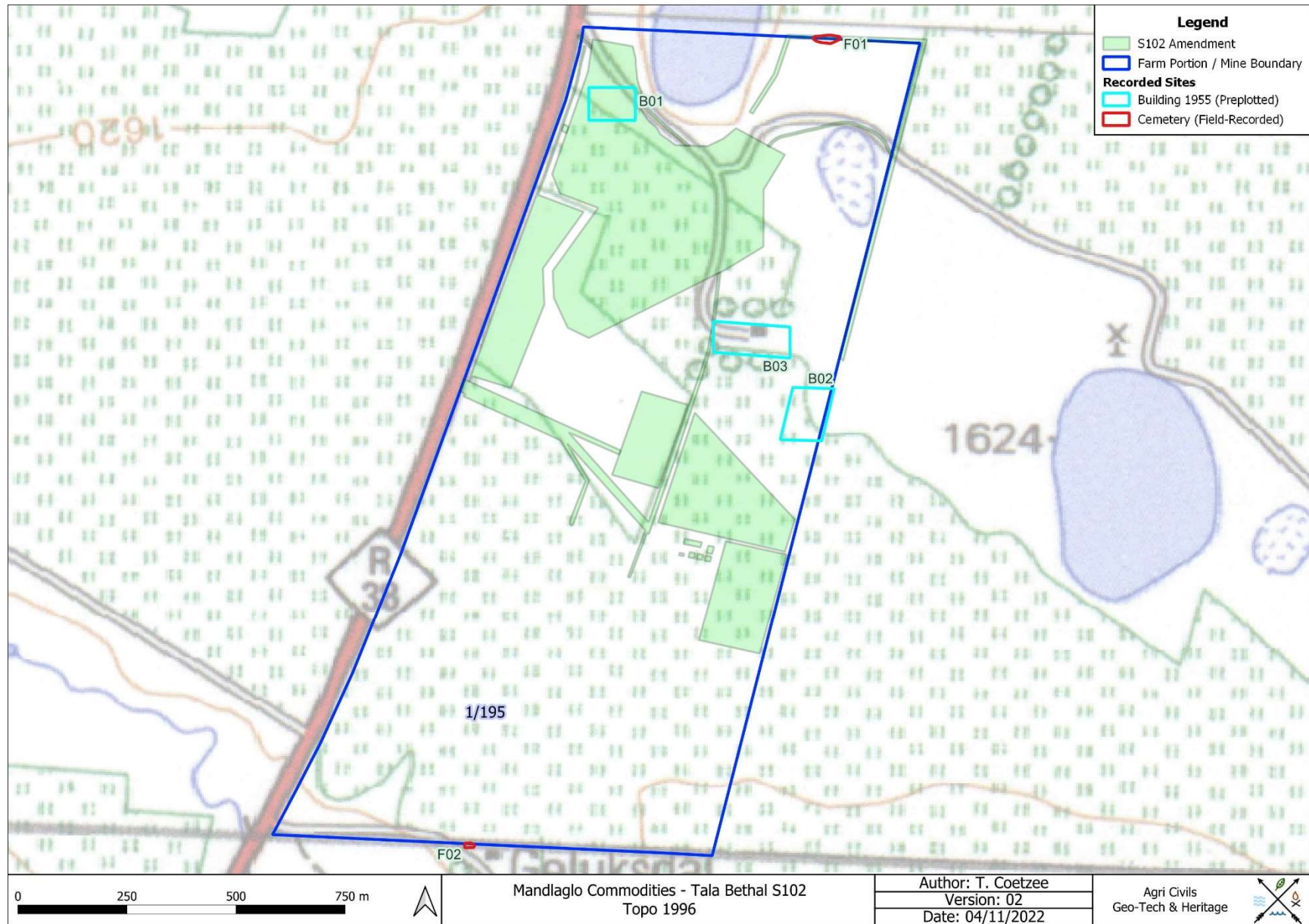


Figure 41: Study area superimposed on a 1996 topographical map.



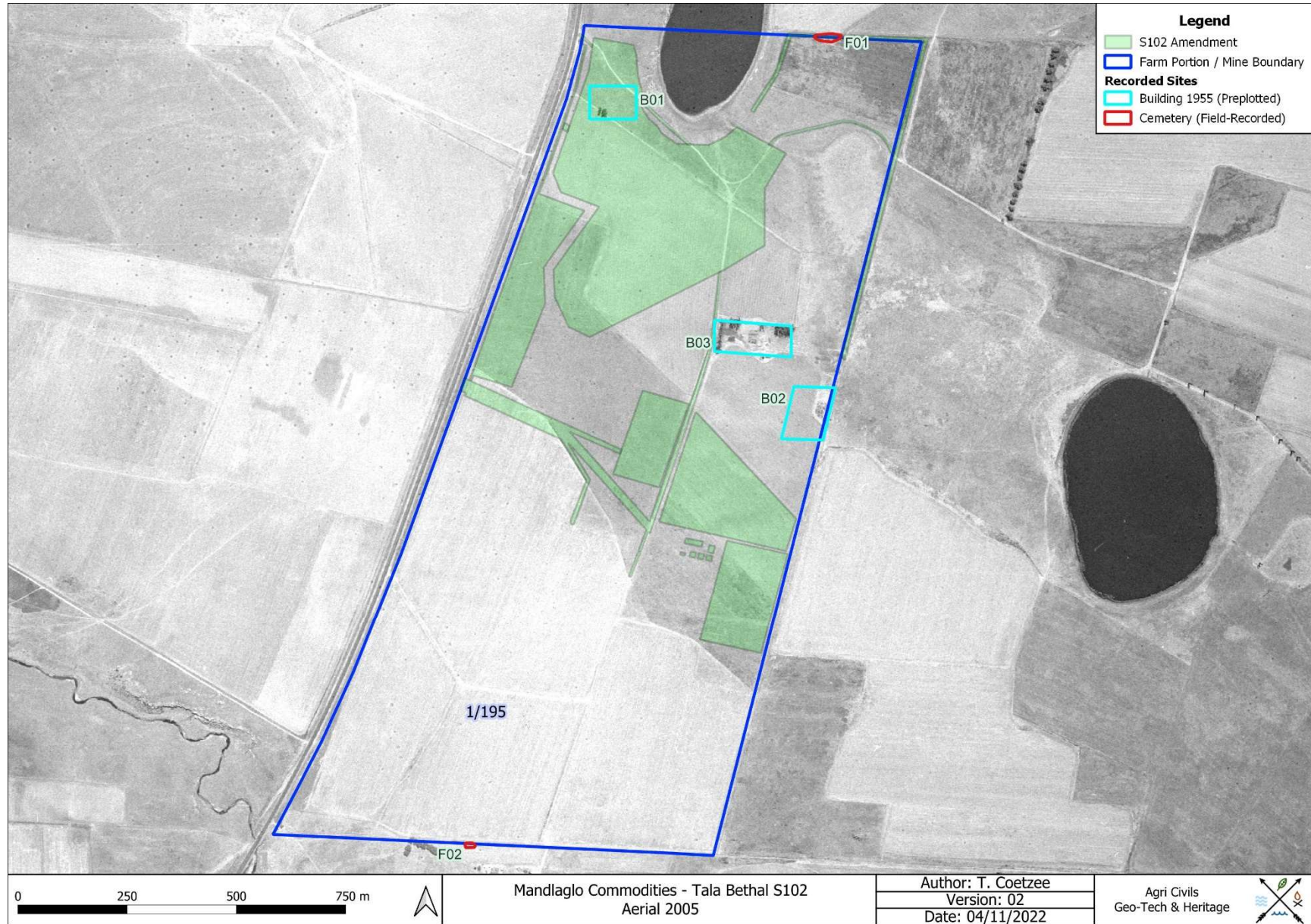


Figure 42: Study area superimposed on a 2005 aerial image.





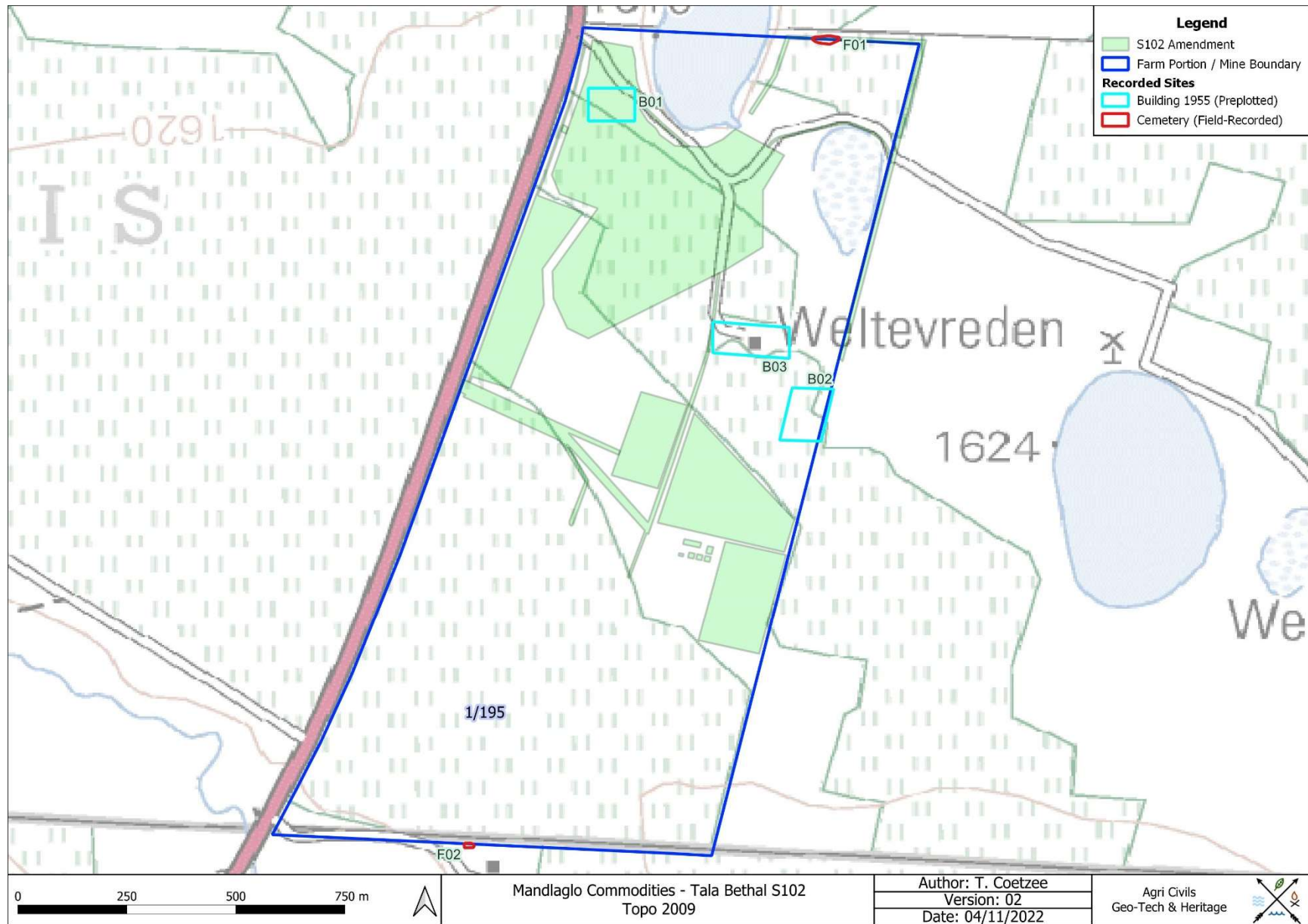


Figure 43: Study area superimposed on a 2009 topographical map.

