



PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

**for the Proposed Casteel Dam Safety Rehabilitation Project on a Portion
of the Remaining Extent of the Farm Kasteel 231 KU, Acornhoek,
Mpumalanga**

For:

Naledzi Environmental Consultants (Pty) Ltd

Project Ref:

Casteel Dam Safety Rehabilitation Project

Date:

04/04/2023

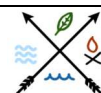
Phase 1 Archaeological Impact Assessment for the Proposed Casteel Dam Safety Rehabilitation Project on a Portion of the Remaining Extent of the Farm Kasteel 231 KU, Acornhoek, Mpumalanga

Project Ref: Casteel Dam Safety Rehabilitation Project
Report No: NEC-2402231
Report Version: 2

I, Tobias Coetzee, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Casteel Dam Safety Rehabilitation 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.

Author	Qualification	Email	Date	Signature
Tobias Coetzee	MA (Archaeology – UP)	tcoetzee.heritage@gmail.com	04/04/2023	



Executive Summary

Agri Civils Geo-Tech & Heritage was appointed by Naledzi Environmental Consultants (Pty) Ltd to undertake a Phase 1 Archaeological Impact Assessment for the proposed Casteel Dam Safety Rehabilitation Project on a portion of the Remaining Extent of the Farm Kasteel 231 KU near Acornhoek in the Mpumalanga Province. The aim of the study is to determine the scope of archaeological resources that could be impacted by the proposed Safety Rehabilitation Project.

The area demarcated for the Casteel Dam Safety Rehabilitation Project is associated with open veldt, a river and the existing Casteel dam. Also, the entire project area has previously been disturbed by a combination of cultivated fields and the construction of the dam, indicating a lower sensitivity and potential impact to cultural resources. One historical enclosure and an associated clearing (Site B01) falling outside of the demarcated project area was noted on the 1954 aerial image. The enclosure was completely demolished and is not associated with surface remains. The site is therefore not considered to be sensitive from a heritage perspective and is not at risk of being impacted by the proposed project. An inspection of historical aerial imagery and historical topographical maps revealed the absence of buildings and structures within the demarcated project area and no potential heritage sites were observed during the pedestrian survey. The demarcated project area is therefore not considered to be sensitive from a heritage perspective. However, the local community noted that some rituals take place at the dam and that the dam is associated with a watersnake. It is therefore advised to liaise with the local community regarding the impact the proposed project might have on these cultural aspects. It should also be noted that no objections were raised by the Moreipuso Traditional Authority and that to their knowledge, only crocodiles and hippopotamuses are found in the dam. Although the Sethlare Traditional Authority could not be reached at the time of the site visit, they are aware of the project.

Subject to adherence to the recommendations and approval by SAHRA, the proposed Casteel Dam Safety Rehabilitation Project as per the indicated boundary 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, No. 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

BID – Background Information Document

CRM – Cultural Resource Management

DSE – Dam Safety Evaluations

DSRP – Dam Safety Rehabilitation Programme

DWS – Department of Water and Sanitation

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

SIAM – Strategic Infrastructure Asset Management

NHRA – National Heritage Resources Act

SAHRA – South African Heritage Resources Agency



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1. Project Background

1.1 Introduction

Naledzi Environmental Consultants (Pty) Ltd appointed Agri Civils Geo-Tech & Heritage to undertake a Phase 1 Archaeological Impact Assessment (AIA) for the proposed Casteel Dam Safety Rehabilitation Project on a portion of the Remaining Extent of the Farm Kasteel 231 KU near Acornhoek in the Mpumalanga Province (**Table 1 & Figure 1**). The proposed rehabilitation project falls within the Bushbuckridge Local Municipality and is located approximately 11 km south-southwest of Acornhoek. The purpose of this study is to examine the demarcated study area in order to determine if any archaeological resources of heritage value will be impacted by the proposed development, as well as to archaeologically contextualise the general study area.

In the following report, the implications for the proposed Casteel Dam Safety Rehabilitation Project on the demarcated portion regarding heritage resources are discussed: A Portion of the Remaining Extent of the Farm Kasteel 231 KU. 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.

It should be noted that the 2009 topographical map (**Figure 2**) labels the dam as the 'Josepa Dam', while the handwriting on the board at the dam refers to the 'Ga Josepha' Dam (**Figure 7**). In order to ensure a consistent naming convention throughout the project, the name 'Casteel Dam' is used.



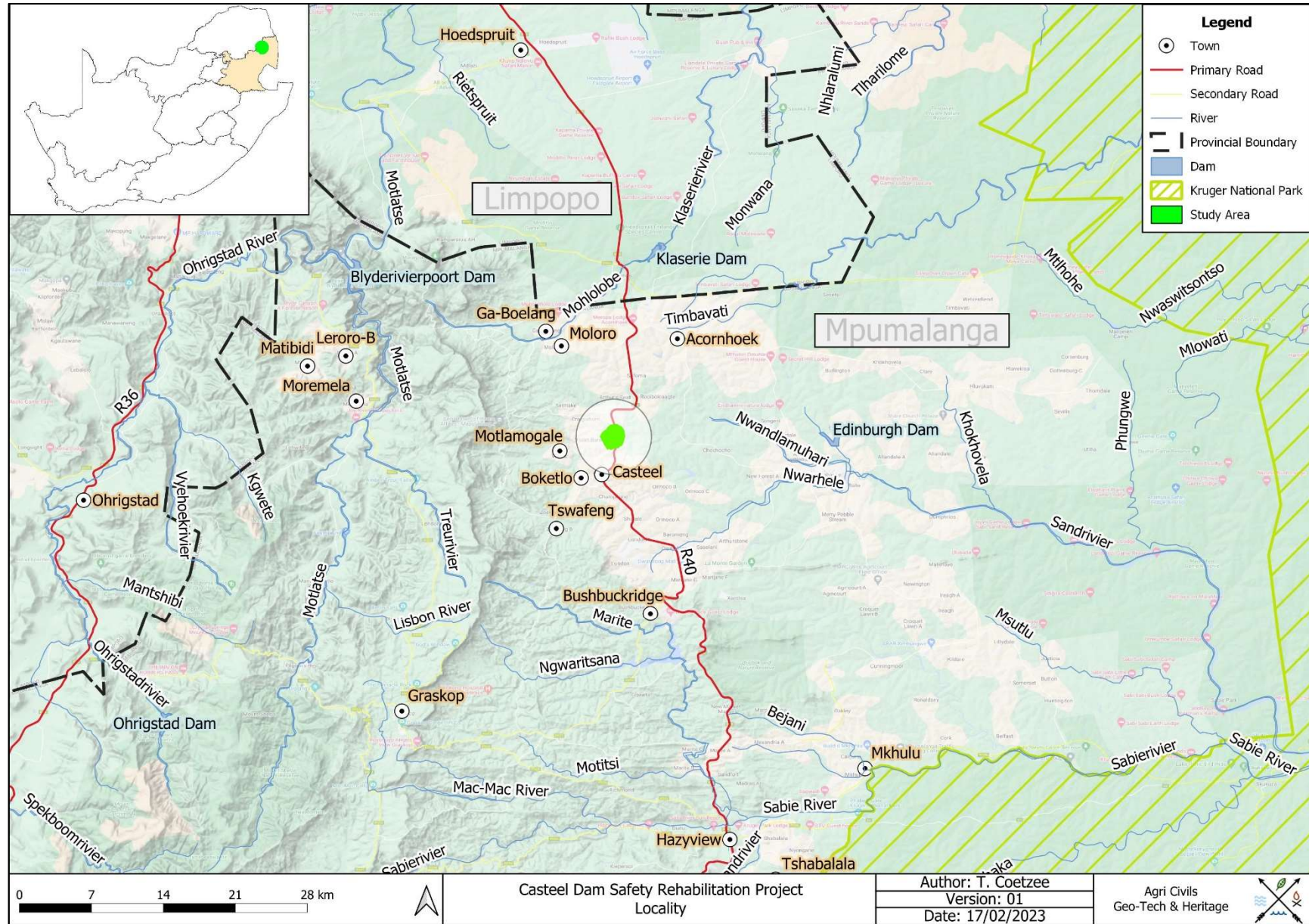


Figure 1: Regional and Provincial location of the study area.



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 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 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)*



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 Member of the Executive Council (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 Casteel Dam Safety Rehabilitation Project is situated to the south-southwest of Acornhoek. 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)
Kasteel 231 KU	RE	2431 CA	-24.692503	31.026261	1779.8	±4.5

The study area is located 3 km north-northeast of Casteel, 11 km south-southwest of Acornhoek and 16 km north-northwest of Bushbuckridge (**Figure 1**). The study area falls within the Ehlanzeni District Municipality and the Bushbuckridge Local Municipality in the Mpumalanga Province. In terms of vegetation, the study area falls within the Savanna Biome and Lowveld Bioregion. According to the vegetation classification by Mucina & Rutherford (2006), the study area falls within the Granite Lowveld vegetation unit.

Granite Lowveld's conservation status is considered to be vulnerable with a conservation target of 19%. About 17% is statutorily conserved in the Kruger National Park and another 17% in other private nature reserves. This vegetation unit is found in the Limpopo and Mpumalanga Provinces, as well as in Swaziland and marginally in Kwa-Zulu Natal. According to Mucina and Rutherford (2006), Granite Lowveld occurs on the following areas:

"A north-south belt on the plains east of the escarpment from Thohoyandou in the north, interrupted in the Bolobedu area, continued in the Bitavi area, with an eastward extension on the plains around the Murchison Range and southwards to Abel Erasmus Pass, Mica and Hoedspruit areas to the area east of Bushbuckridge. Substantial parts are found in the Kruger National Park spanning areas east of Orpen Camp southwards through Skukuza and Mkuhlu, including undulating terrain west of Skukuza to the basin of the Mbyamiti River. It continues further southward to the Hectorspruit area with a narrow westward extension up the Crocodile River Valley past Malelane, Kaapmuiden and the Kaap River Valley, entering Swaziland between Jeppe's Reef in the west and the



Komati River in the east, through to the area between Manzini and Siphofaneni, including the Grand Valley, narrowing irregularly and marginally entering KwaZulu-Natal near Pongola”

More than 20% of this vegetation unit has been transformed by cultivation and settlement development. Erosion associated with this vegetation unit is considered to vary between very low and moderate (Mucina & Rutherford 2006).

The average elevation of Granite Lowveld varies between 250 and 700 Metres Above Sea Level (MASL). The average elevation of the project area is 604 MASL and slopes from the elevated northern and southern areas to the lower mid-section.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 988 mm. The average annual temperature is 19.8 °C, while the average summer temperature is 22.9 °C and the average winter temperature 15.2 °C (Climate-data.org accessed 17/02/2023).

The study area falls within the X32A Quaternary Catchment of the Inkomati Usuthu Water Management Area (WMA). The closest perennial river to the study area is the Tlulandziteka River in which the Casteel Dam was built. Another perennial river, the Sand River, flows roughly 1.3 km to the south, while several non-perennial rivers and streams are found in the general area. The Orinoco Dam is located approximately 7 km to the southeast.

When the surrounding environment is considered, the region is associated with densely populated areas and a few cultivated fields. Access to the study area is via the R40 primary road running on a north-south direction to the east of the project area (**Figures 2 & 3**). In terms of the project area, the proposed site establishment area, a section of the access road and the entire extent of the alternative access road consist of open veldt, while the rehabilitation works area consists of the dam embankment and spillway.



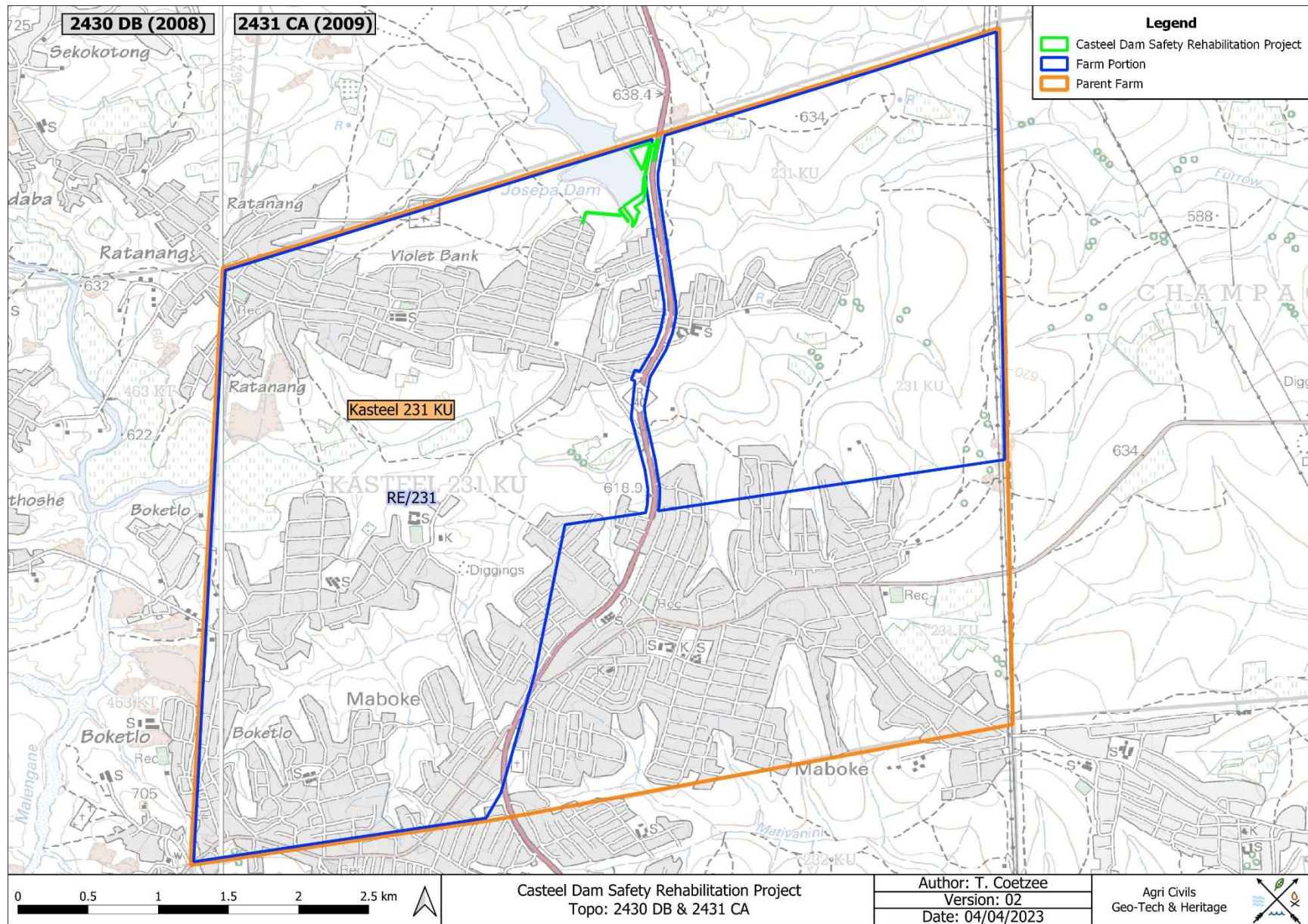


Figure 2: Segments of SA 1: 50 000 2430 DB and 2431 CA indicating the study area.



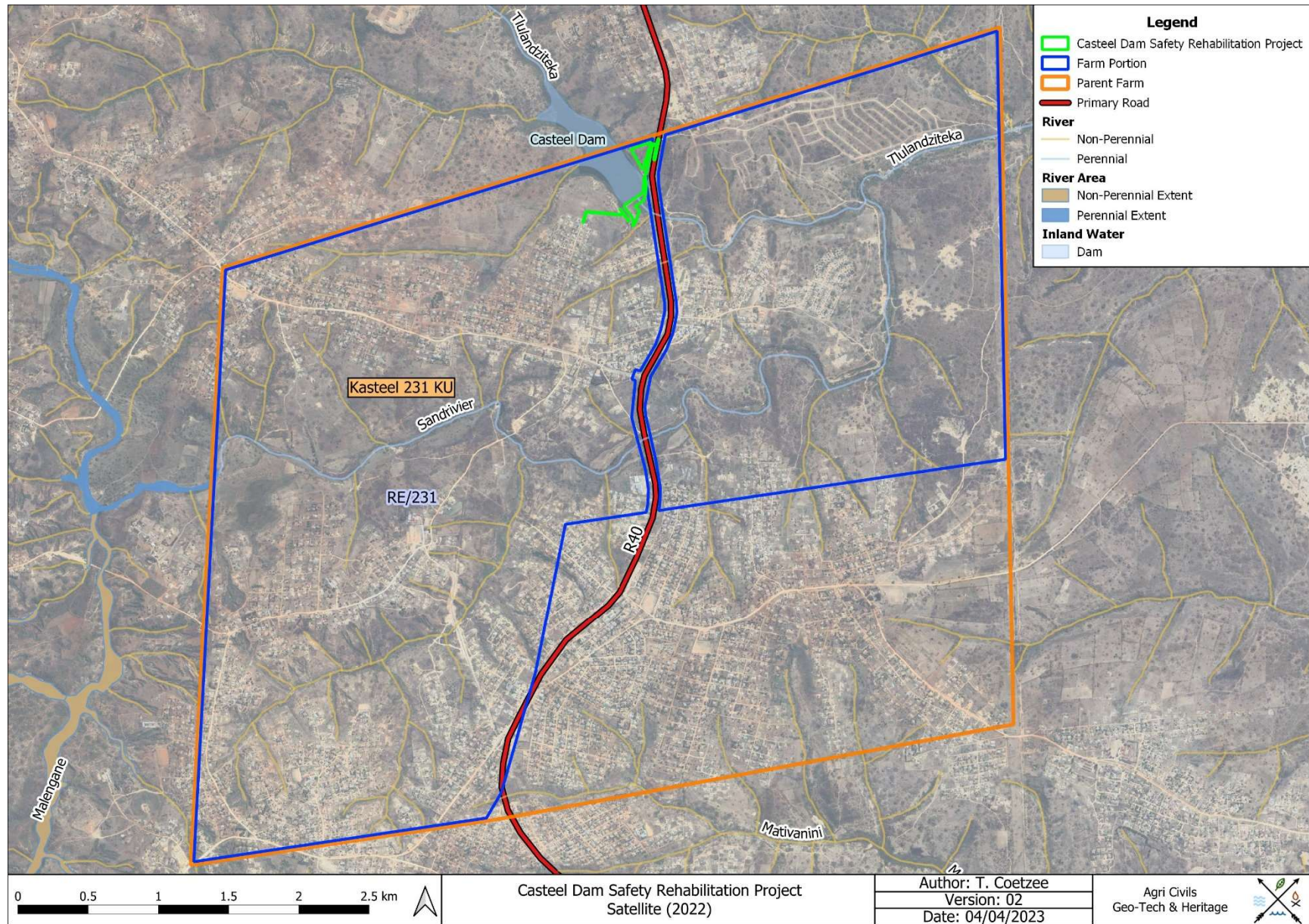


Figure 3: Study area portrayed on a 2022 satellite image.



2.2 Project Description

The following description was adapted from the Background Information Document (BID) that was supplied by Naledzi Environmental Consultants (2022).

The Department of Water and Sanitation (DWS), Directorate: Strategic Infrastructure Asset Management (SIAM) proposes to conduct scheduled rehabilitation works at Casteel Dam. Casteel Dam was completed in 1965 and is a medium-sized earth fill-embankment dam (L-Shaped) located within the Sand River Catchment. The dam's main purpose is to supply water for domestic use and irrigation schemes for the former Lebowa government rural community.

The DWS, Directorate: SIAM conducts Dam Safety Evaluations (DSE) every five (5) years in terms of the Dam Safety Regulation (GN R 139, 24 February 2012) at all departmental dams. Any safety risks identified at these dams are placed on the Dam Safety Rehabilitation Programme (DSRP) for repair. The latest DSE conducted at the dam identified several safety risks and have been placed on the DSRP for scheduled rehabilitation i.e.

- The slope on the downstream embankment is unstable;
- There is an eroded gully downstream in the spillway channel;
- The outlet works are non-functional;
- The dam is freely discharging from the spillway to the river;
- The spillway capacity is inadequate and requires the dam embankment to be raised

The DWS Chief Directorate: Construction Management proposes to undertake the necessary rehabilitation works at the original dam embankment over a twenty-four (24) month construction period. No expansion of the dam or construction of a new facility is proposed.

The following rehabilitation work is proposed:

The project scope of works would include three components i.e.

- 1) 28 500m² (2.85 Ha) rehabilitation works at the main dam embankment, spillway section and outlet works.
- 2) 0.9 Ha Site establishment area north-east of the dam.
- 3) Upgrading and realignment of the existing gravel access road from the R40 to the dam embankment. An existing access road through Casteel will be used to access the spillway section during the rehabilitation works.

The DWS will remove all reeds and vegetation on the spill approach channel and upstream slope along the dam embankment as part of the rehabilitation works. It will promote the free flow of water, prevent spillway blockages and allow for the placement of slope protection material. The site establishment area comprises degraded shrubland that will also need to be cleared to accommodate the site offices.



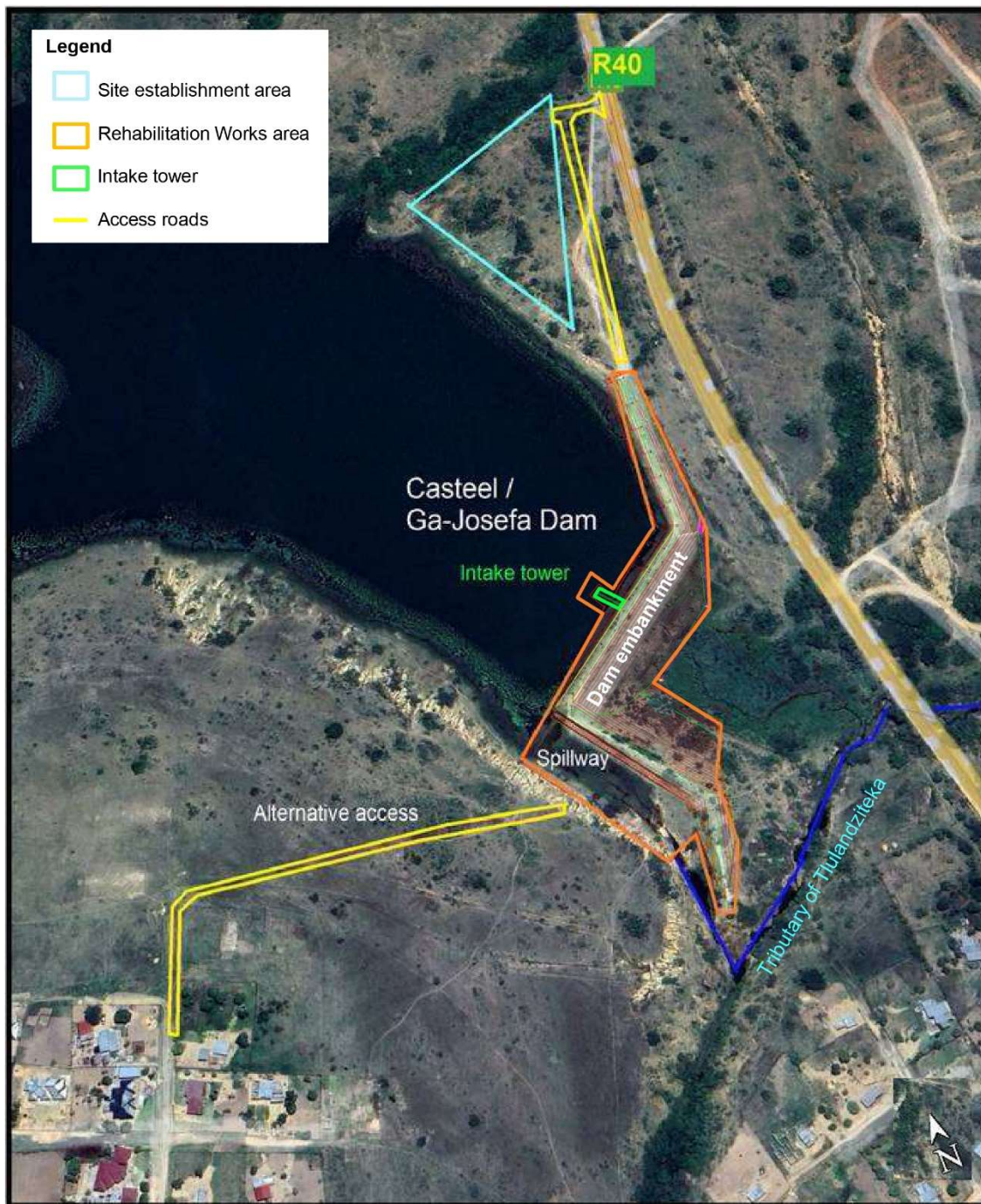


Figure 4: Proposed Casteel Dam Safety Rehabilitation project (adapted from Naledzi Environmental Consultants (2022)).

3. Methodology

Archaeological reconnaissance of the ±4.5 ha study area was conducted during February 2023 through an unsystematic pedestrian survey of the proposed Casteel Dam Safety Rehabilitation Project area (**Figure 5**). General site conditions were recorded via photographic record (**Figures 7 – 18**). 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 1970, 1986, and 2009, as well as the historical aerial images dating to 1944, 1954, 1965, 1970, 1974, 1981, 1983, 1984, 1986, and 2003 proved



useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. One (1) potential site falling outside of the demarcated study area was identified on historical aerial imagery and was inspected during the pedestrian survey (**Table 2 & Figure 5**). The site status of the recorded site is shown in **Figure 6**. No additional heritage sites were observed during the pedestrian survey. Since heritage resources are often associated with perennial and non-perennial rivers, these water sources located within close proximity of the study area were buffered by a distance of 500 m, indicating a potentially sensitive area. Since the study area is located directly next to a river, the entire study area falls within this zone. However, the majority of the study area appears to have been cultivated in the past as can be seen on the historical aerial images and topographical maps. These areas are disturbed and are less sensitive from a heritage perspective (**Figure 25**).

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 Global Positioning System (GPS) during the site visit, as well as by plotting the boundaries from aerial imagery and topographical maps.



Table 2: Site coordinates & descriptions.

Name	Off. Name	Latitude	Longitude	Description	Age	Current Status	Estimated Extent	ID Source	Farm Portion	Intersecting Development
B01	2431CA-B01	-24.689334	31.027901	Enclosure & clearing	Historical	Demolished – No surface remains	0.1 ha	Aerial 1954	RE/231	No



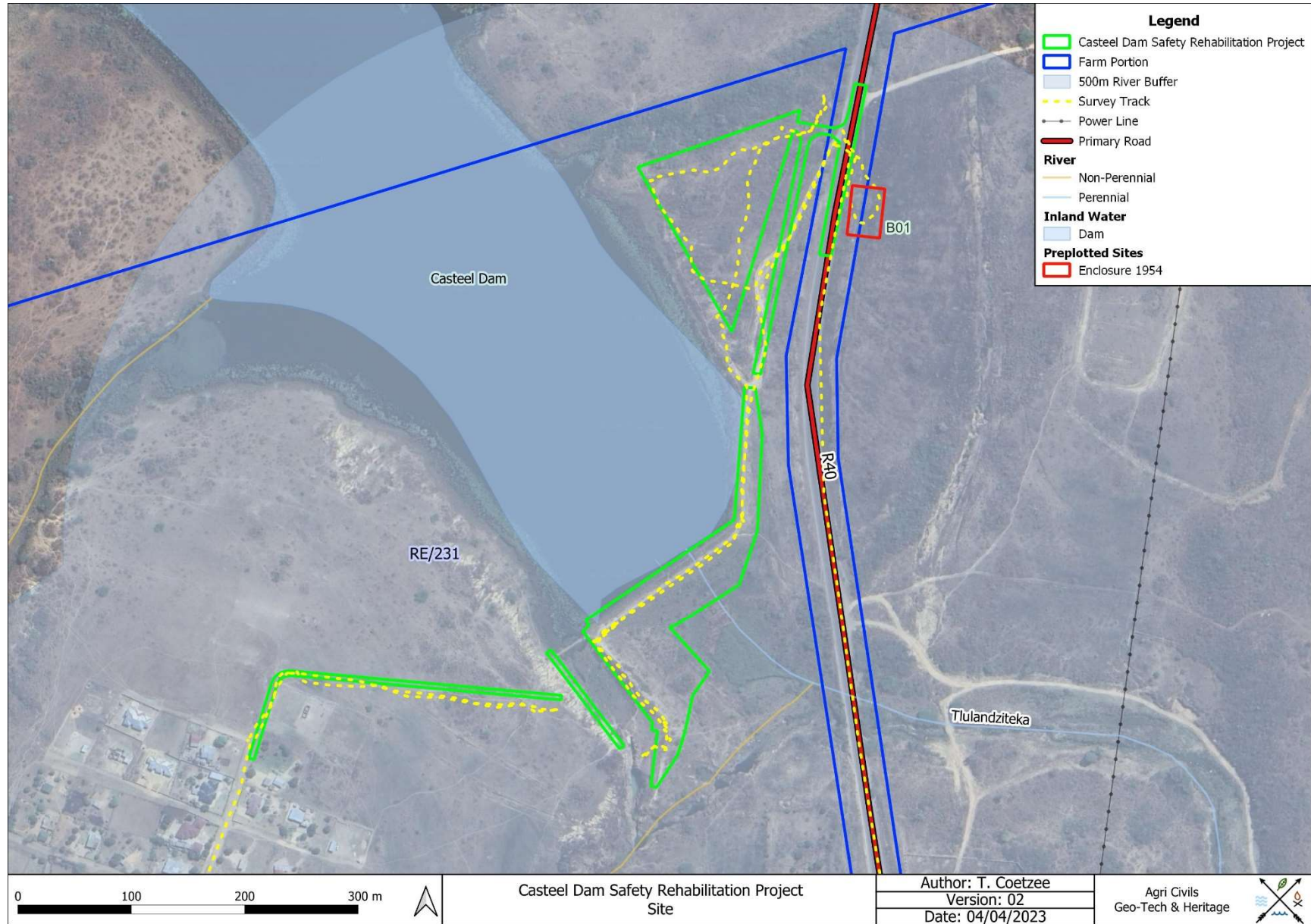


Figure 5: Study area with survey track portrayed on a 2022 satellite image.



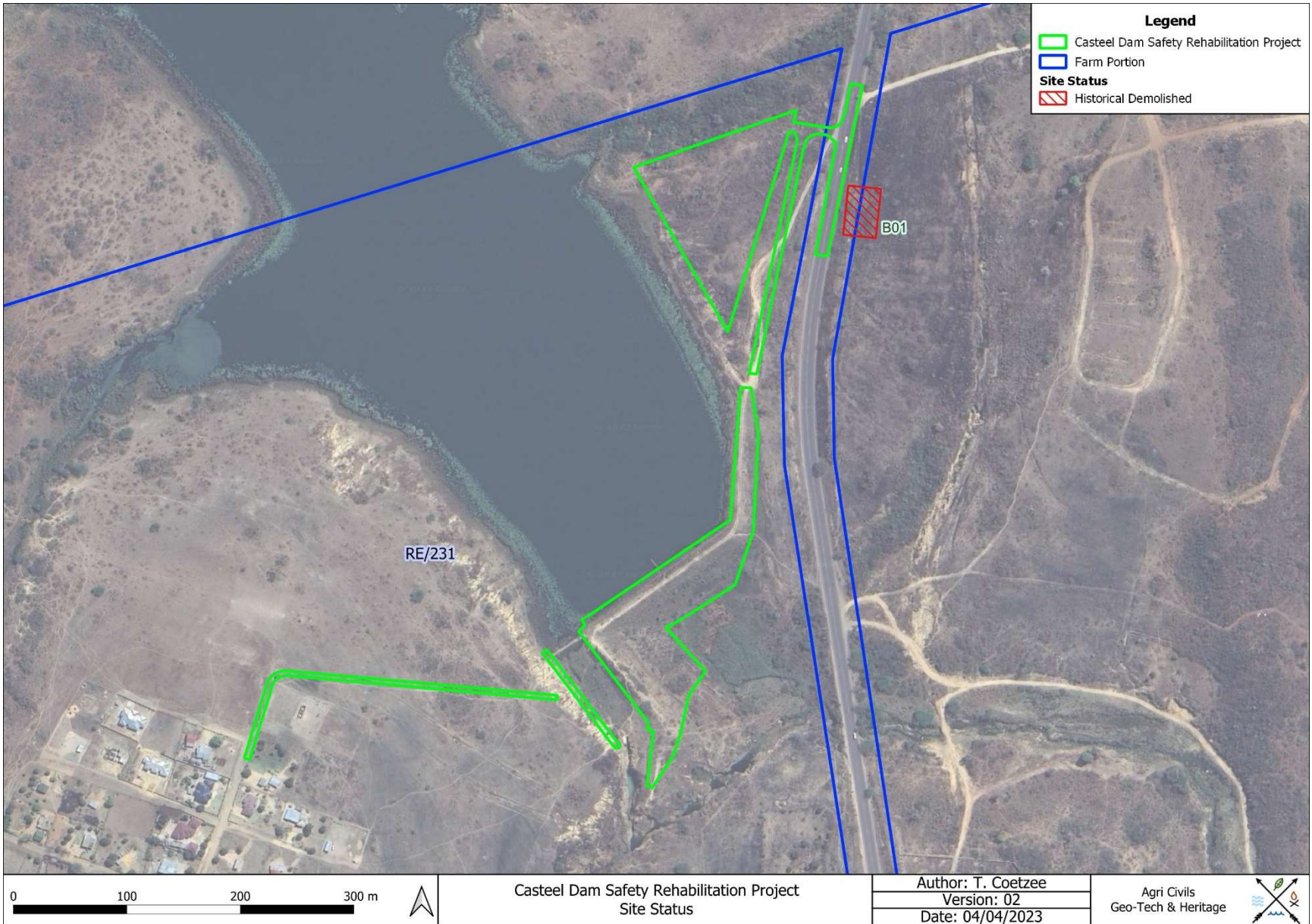


Figure 6: Site status portrayed on a 2022 satellite image.





Figure 7: Entrance to the study area.



Figure 8: Northern access road.



Figure 9: Proposed site establishment area seen from the northern corner.





Figure 10: Proposed site establishment area seen from the southern corner.



Figure 11: Proposed site establishment area seen from the western corner.



Figure 12: Proposed rehabilitation works area seen from the north (dam embankment).





Figure 13: Proposed rehabilitation works area seen from the south (dam embankment).



Figure 14: Area to the east of the proposed rehabilitation works area.



Figure 15: Southern tip of the proposed rehabilitation works area (spillway).





Figure 16: Proposed rehabilitation works area seen from the proposed southern access road.



Figure 17: Eastern section of the proposed southern access road.



Figure 18: Western section of the proposed southern access road.



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

Acorn to Oaks School

A Phase 1 AIA was conducted for the construction of a school on Portion 17 of the Farm Acornhoek 212 KU (Celliers 2012). The area demarcated for the construction of the school is located approximately 14.5 km northeast of the proposed Casteel Dam Rehabilitation Project. During the study, one upper grinding stone and two demolished dwellings were recorded. All three sites were considered to be of low significance.

Township development on the Farm Kasteel 231 KU

A Phase 1 archaeological survey was conducted by Kudzala Antiquity cc for a residential and township development on the same farm as the proposed Casteel Dam Rehabilitation Project (Celliers 2014): Kasteel 231 KU. The survey was conducted on an area of the farm directly to the east of the proposed Casteel Dam Rehabilitation Project. The archaeological and historic assessment aimed at identifying heritage resources on the demarcated project area via a desktop assessment as well as a field survey. The heritage study recorded three sites: two grave sites and one concrete dam. The graves were considered to be of high local social significance, while the concrete dam was considered to be of low historic value.

Borrow Pits on Greenvalley 213 KU and Casteel 231 KU

An archaeological investigation was conducted by Mr J van Schalkwyk for two borrow pit locations on the farms Greenvalley 213 KU and Casteel 231 KU. The borrow pit on the Farm Casteel 231 KU appears to be located approximately 200 m northeast of the proposed Casteel Dam Safety Rehabilitation Project, while the location of the borrow pit on the Farm Greenvalley 213 KU is unknown. The Farm Greenvalley 213 KU, however, is located approximately 6.5 km north of the proposed Casteel Dam Safety Rehabilitation Project. During the study, a clay pot on a termite mound was noted and it was recommended that the site be avoided. No additional potential heritage sites were noted (Van Schalkwyk 2001).

Acorn City mixed use township development

Beyond Heritage conducted a Heritage Impact Assessment for the proposed mixed-use township development consisting of agricultural, business, institutional, transportation, residential, and public open spaces and



associated infrastructure on Portion 276 of the Farm Arthursseat 214 KU. The inspected area measured 49.69 ha and is located approximately 5.7 km north of the proposed Casteel Dam Safety Rehabilitation Project. Twenty-one burial sites consisting of marked and unmarked graves were recorded, as well as one broken lower grinder (Van der Walt 2021).

Road development, Bushbuckridge

A Phase 1 HIA was conducted for the construction of a road between a clay mining area, a factory and the R40. The majority of the development was proposed on the Farms Craigieburn 462 KT and Authursseat 214 KU, directly to the north and northwest of the proposed Casteel Dam Safety Rehabilitation Project. During the study, two historic graves and two Early Iron Age sites consisting of pottery fragments and a hut floor were recorded (Roodt 2005).

3.1.2 Historical topographical maps & aerial images

1944 Aerial image

The aerial image dating to 1944 (**Appendix A: Figure 26**) shows the demarcated study area prior to the construction of the Casteel Dam. No structures are visible within the demarcated boundaries and the entire area appears to be cultivated. A road is also noted to the east of the study area while a few buildings are visible in the general area.

1954 Aerial image

The 1954 aerial image (**Appendix A: Figure 27**) shows a few additional buildings in the general area and what appears to be an enclosure within a clearing directly east of the proposed Casteel Dam Safety Rehabilitation Project (Site B01). Some areas also appear to be no longer cultivated.

1965 Aerial image

When the 1965 aerial image is inspected (**Appendix A: Figure 28**), the Casteel Dam is noted, as well as the road now known as the R40 running directly to the east of the dam. The entire demarcated study area also appears to be disturbed by a combination of cultivated fields and what appears to be activities relating to the construction of the dam. The enclosure at Site B01 is no longer visible, but the clearing appears to be present.

1970 Aerial image

The 1970 aerial image (**Appendix A: Figure 29**) shows the same detail noted on the 1965 aerial image. Additional buildings in the general area are noted as well.

1970 Topographical map

The first 1: 50 000 topographical map of the study area dates to 1970 (**Appendix A: Figure 30**). According to the map, the southern section of the demarcated study area is cultivated and no building or structure exists at Site B01. Several buildings are also noted in the greater area.



1974 Aerial image

The 1974 aerial image (**Appendix A: Figure 31**) reflects the same detail observed on the 1970 aerial image, while the clearing at Site B01 is still visible.

1981 Aerial image

The clearing previously noted at Site B01 is no longer visible on the 1981 aerial image (**Appendix A: Figure 32**), and the majority of the area appears to be no longer cultivated.

1983 Aerial image

The only difference noted on the 1983 aerial image (**Appendix A: Figure 33**) is that the road directly to the east of the proposed study area (R40) appears to have been tarred.

1984 Aerial image

Compared to the 1983 aerial image, the 1984 aerial image shows no additional detail (**Appendix A: Figure 34**).

1986 Aerial image

The only additional detail noted on the 1986 aerial image (**Appendix A: Figure 35**) is what appears to be vegetation clearing and construction activities directly to the south of the dam. An access road to the southeast is also noted. These activities might relate to earlier rehabilitation work conducted at the dam.

1986 Topographical map

The 1986 topographical map (**Appendix A: Figure 36**) indicates no activities, buildings or structures on the demarcated study area.

2003 Aerial image

The 2003 aerial image (**Appendix A: Figure 37**) shows a significant increase in residential development to the south of the study area, while no buildings or structures are noted within the demarcated project boundary.

2009 Topographical map

The most recent topographical map of the study area dates to 2009 (**Appendix A: Figure 38**). The name of the dam is shown for the first time and the residential development to the south of the dam is labelled as Violet Bank. No buildings or structures are shown on the demarcated project area.

3.1.3 Personal Communication

According to Mr Vincent, the secretary of the Moreipuso Traditional Authority, no graves or cemeteries are located within the project area, but noted the presence of crocodiles and hippopotamuses in the dam. Mr Vincent also stated that there are no objections from the Moreipuso Traditional Authority (Mr Vincent, pers. comm. 2023). The secretary of the Sethlare Traditional Authority, Me Myrah Machate, could unfortunately not be reached.



3.2 Limitations

The site visit (February 2023) confirmed the open veldt areas associated with the proposed alternative access road and site establishment area, as well as the disturbed area associated with the dam embankment and spillway. The area to the south of the dam is associated with relatively short grass that promoted visibility, but was relatively wet in some places that slightly hampered free movement (**Figure 19**). The area behind the dam wall, spillway and site establishment area are associated with extremely dense vegetation cover that hampered visibility and free movement (**Figure 20**). Also, the secretary of the Sethlare Traditional Authority, Me Myrah Machate, could not be reached. However, the Moreipuso Traditional Authority secretary, Mr Vincent, was consulted.



Figure 19: Sections of wet and marshy conditions to the south of the dam.



Figure 20: Sections of dense vegetation and trees at the proposed site establishment 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 Acornhoek and Bushbuckridge Archaeo-History

According to Bergh (1999), the Pai Pulana Pai and the Kutswe lived in the general Acornhoek and Bushbuckridge area by the start of the 19th Century, while Bornman (2017) notes that at some stage the Ba-Phalaborwa, Mapulana, Shangane and others settled in the area as well.

The name Acornhoek is possibly an adaptation of Eekhoornhoek (squirrel corner), which is derived from the German surname Eichhorn and named after the acorn-like fruits of the Mobola Plum/Cork Tree/Hissing Tree which in some respect resembles the oak tree. The name Bushbuckridge refers to the high number of bushbuck that once occurred in the area (Bornman 2017: 174, 185).

A block of land in the present-day Bushbuckridge area used to be known as 'Alexandria' and served as hunting farms for the McCorkingdale Settlement (New Scotland). This area was granted by the ZAR Government on 17 July 1869. McCorkingdale appointed Vaughan Kirby, a big-game hunter, as his representative and agent for the Lowveld farms. Kirby took up residence at the site of the present-day Bushbuckridge police station. The New Scotland settlement failed to flourish and with McCorkingdale's death in 1871, many settlers moved to the Kimberley diamond fields. Although 'Alexandria' was repossessed by the ZAR in 1886, Kirby remained at Bushbuckridge trading and hunting until 1893. Kirby sold out to a man named Wood, who sold to Capt. J. C. Ingle, who in turn sold to Sherwell. Sherwell was shot dead at the door of his store and is buried at Bushbuckridge (Bornman 2017: 185 – 186).

The initial accounts of Frederick Vaughan Kirby's exploits were published in the British sporting journal 'Land and Water' under the pseudonym "Maqaqamba" and later in the book *In Haunts of Wild Game*. His self-promoting accounts caught the public's attention and it is possible that he supplemented the income from his trading store at Bushbuckridge by acting as a guide to foreign sportsmen. Some of the names mentioned in his hunts include Henry Glynn and his sons, Henry and Fred Barber (after whom the town of Barberton was named) and Holden Bowker. According to Bornman (2017: 186 – 187), a general belief existed among people that Kirby was not truthful in his accounts of his hunts and that some regarded him as a game slaughterer. Kirby eventually retired as the chief conservator of Zululand Game Reserve in 1928 and was succeeded by Roden Symons.

During the South African War (1899 – 1902), Colonel Baron Ludwig Franz (Francis) Christian von Steinaecker, commander of the 'Steinaecker's Horse', erected several forts in the Lowveld. The only conflict that took place at a fort in the Lowveld was at Fort Mpisane on the farm New Forest 234 KU to the northeast of Bushbuckridge (approximately 11 km to the southeast of the project area). The confrontation was led by Commandant Piet Moll and during the conflict, the officer in charge of the fort, Capt. H. F. Francis, and many of the Shangane troops were killed and buried on the farm New Forest (Bornman 2017: 187).



When the war concluded, Von Steinaecker tried to obtain permanent commission in the British armed forces, but was unsuccessful. Von Steinaecker then attempted to farm tobacco on the farm London to the northwest of Bushbuckridge (approximately 9 km south of the project area) and when this failed, he moved in with the Native Commissioner at Bushbuckridge, John Griffiths. Thereafter he moved in with John Travers on the farm Champagne 230 KU (bordering the farm Kasteel 231 KU to the east) where he committed suicide by taking strychnine. Von Steinaecker died at the age of 63 and was buried at an unmarked grave at Bushbuckridge (Bormman 2017: 187).

5. Archaeological and Historical Remains

5.1 Stone Age Remains

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

These artefacts are often associated with rocky outcrops or water sources. **Figures 21 – 23** below are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa.

Archaeological studies conducted in the surrounding areas also did not locate Stone Age artefacts.

According to Bergh (1999: 4), no major Stone Age archaeological sites are located in the direct vicinity of the study area.



Figure 21: ESA artefacts from Sterkfontein (Volman 1984).

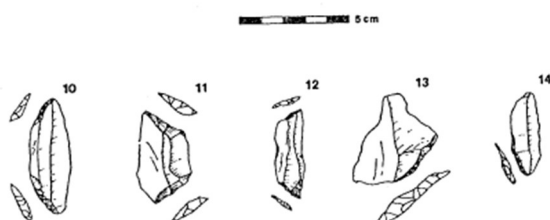


Figure 22: MSA artefacts from Howiesons Poort (Volman 1984).

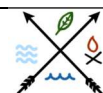




Figure 23: LSA scrapers (Klein 1984).

5.2 Iron Age Farmer Remains

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

The heritage study conducted for the road development between a clay mining area, a factory and the R40 located two Early Iron Age sites consisting of pottery fragments and a hut floor (Roodt 2005).

5.3 Historical Remains

One potential site dating to the Historic Period were noted on the historical aerial imagery dating to 1954 (**Appendix A: Figure 27 & Table 3**). The site (B01) is visible on the 1954 aerial image as an enclosure within what appears to be a clearing. The area measures approximately 0.1 ha. The enclosure is no longer visible on the 1965 aerial image (**Appendix A: Figure 28**), while the clearing remains visible until 1974. This suggests that the enclosure was constructed between 1944 and 1954 (**Appendix A: Figures 26 & 27**), but were demolished by 1965 (**Appendix A: Figure 28**).

Site B01 is located directly east of the R40 primary road, does not intersect the proposed development area and is not associated with any surface remains (**Figure 24**).

The heritage study conducted by Celliers (2012) recorded one upper grinding stone and two demolished dwellings that might date to the Historic Period, while Celliers (2014) recorded a circular concrete dam that was considered to be of low historic value. The heritage study conducted by Van der Walt (2021) recorded one broken lower grinder that might date to the Historic Period.

Table 3: Historical Sites.

Name	Type	Source	Year	Current Status	Surface Indications
B01	Enclosure	Aerial	1954	Demolished	None





Figure 24: Environment associated with Site B01.

5.4 Contemporary/Natural Remains

No sites dating to contemporary times were noted during the site inspection.

It should be noted that the client, Naledzi Environmental Consultants (Pty) Ltd, mentioned that during their engagement with the local community, it was noted that some rituals are conducted at the dam and that some believe that a watersnake lives in the dam. According to the Moreipuso Traditional Authority's secretary, Mr Vincent, only crocodiles and hippopotamuses are present in the dam.

The heritage study conducted by Van Schalkwyk (2001) recorded a clay pot on a termite mound that might indicate cultural significance. The rest of the heritage studies did not record significant contemporary cultural remains (see Celliers 2012, Celliers 2014, Van der Walt 2021, Roodt 2005).

5.5 Graves/Burial Sites

No burial sites were observed during the pedestrian survey and according to Mr Vincent, no graves or burial sites are found within the project area.

The heritage studies conducted by Celliers (2014), Van der Walt (2021) and Rood (2005), recorded the presence of several graves.



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.

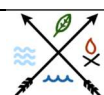
Table 4: Prescribed Field Ratings.

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 5: Individual site ratings.

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2431CA-B01	Demolished enclosure & clearing	General Protection B	4 B	Medium	Record site

* Ratings are dependent on specific project boundaries and activities.



7. Statement of Significance & Recommendations

7.1 Statement of Significance

The study area: The Proposed Casteel Dam Safety Rehabilitation Project

The general study area is associated with open veldt, a river and the Casteel dam. One historical site consisting of an enclosure within a clearing was noted on the 1954 aerial image (Site B01). The site, however, falls outside of the project area, has completely been demolished and is not associated with surface remains. The site is therefore not considered to be sensitive or significant from a heritage perspective and is not at risk of being impacted by the proposed development.

Although the demarcated project area is completely located within 500 m of a river, a zone that is generally associated with a higher heritage site probability, the demarcated project area has been disturbed by past cultivation and by the construction of the dam between 1954 and 1965. The river buffer area is therefore not considered to be particularly sensitive from a heritage perspective (**Figure 25**). Also, historical aerial images and historical topographical maps indicate the absence of potential heritage sites within the demarcated project boundaries and no sites were observed within the demarcated boundary during the pedestrian survey. The demarcated area is therefore not considered to be sensitive from a heritage perspective. However, mention was made by the local community that rituals are conducted at the dam and that some believe that a watersnake is present in the dam. According to the Moreipuso Traditional Authority, only crocodiles and hippopotamuses live in the dam and that they do not object to the proposed project.



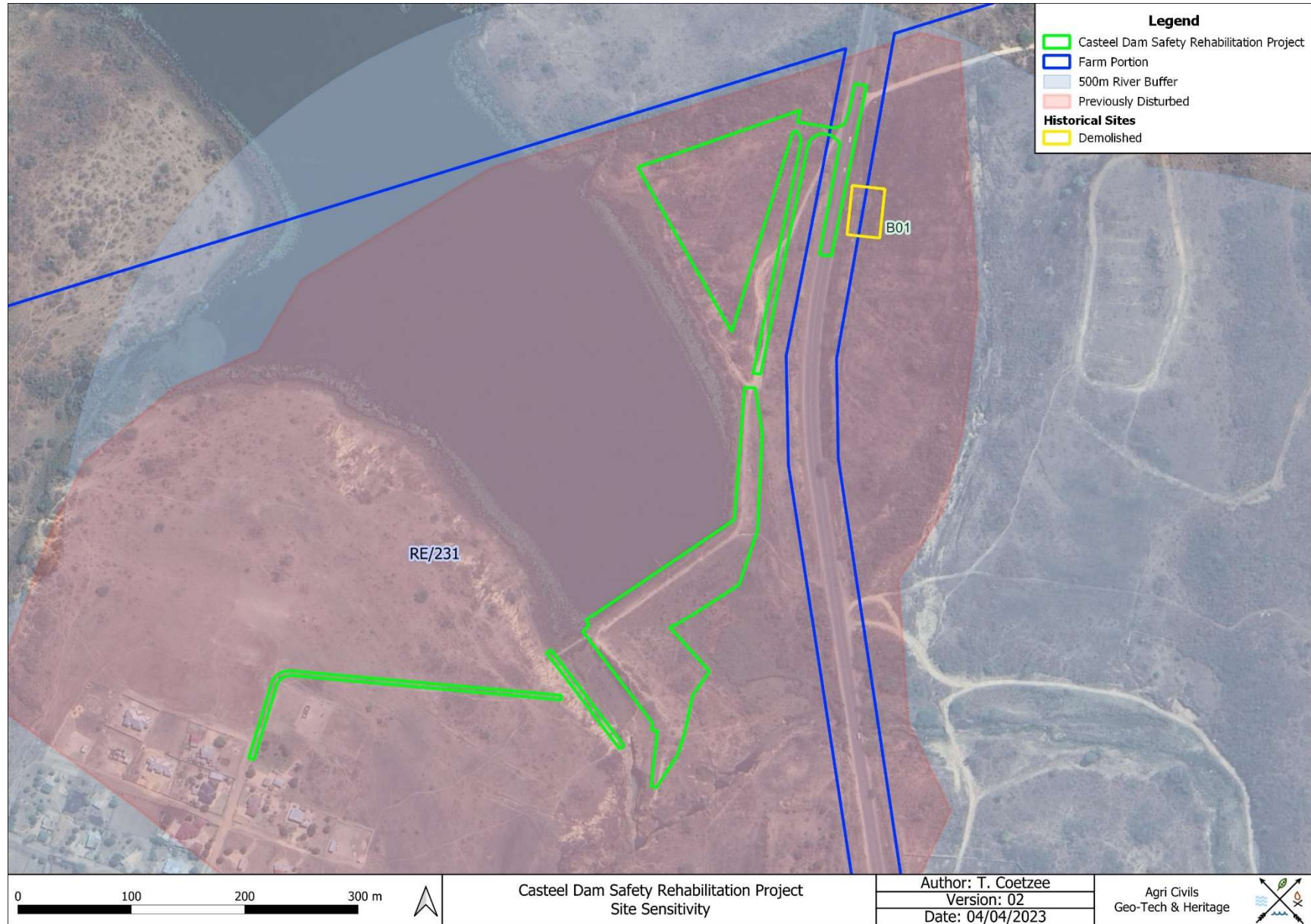


Figure 25: Study area and potentially sensitive areas portrayed on a 2022 satellite image.



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 area demarcated for the proposed Casteel Dam Safety Rehabilitation Project:

- Historical Site B01 used to be associated with an enclosure and a clearing exceeding 60 years of age. However, the enclosure was demolished and the site was sufficiently recorded. Also, the site does not intersect the demarcated project area and is therefore not at risk of being impacted by the proposed development. No further action is required.
- The local community noted that some rituals take place at the dam and that a watersnake is present in the dam. It is therefore recommended to liaise with the local community regarding the impact the proposed project might have on these cultural aspects.
- 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, the proposed Casteel Dam Safety Rehabilitation Project 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 Casteel Dam Safety Rehabilitation Project consists of rehabilitation work that will impact roughly 4.5 ha of previously disturbed land. The identified site (B01) is located outside of the project area, has been demolished and is not at risk of being impact by the proposed project. Due to cultural aspects that include certain rituals taking place at the dam, as well as the belief that a watersnake is present in the dam, liaising with the local community regarding the potential impact of the project on these activities and beliefs is advised.

Should the recommendations made in this study be adhered to and with the approval of the South African Heritage Resources Agency, the proposed Casteel Dam Safety Rehabilitation 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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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 Imagery & Topographical Maps



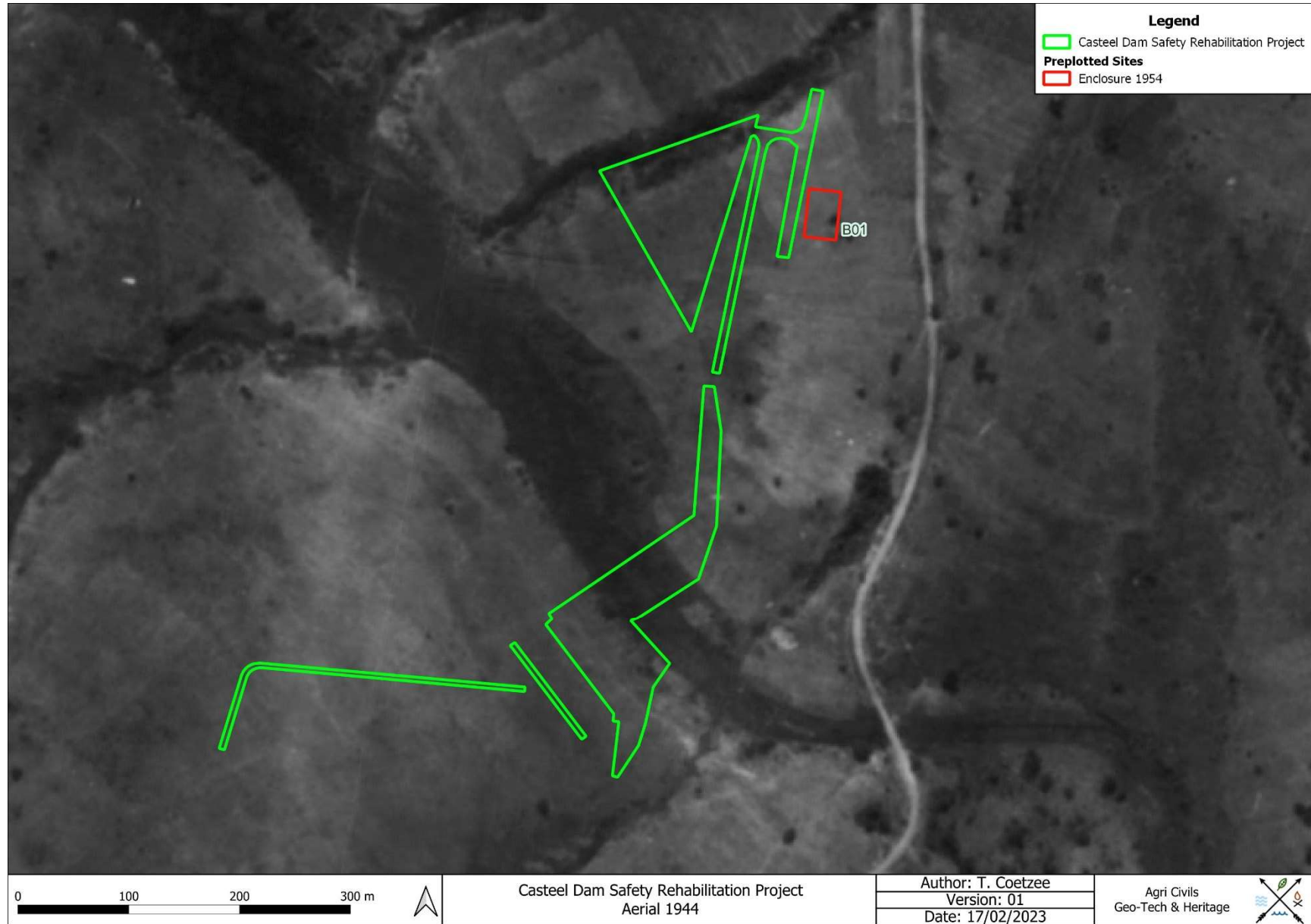


Figure 26: Study area superimposed on a 1944 aerial image.



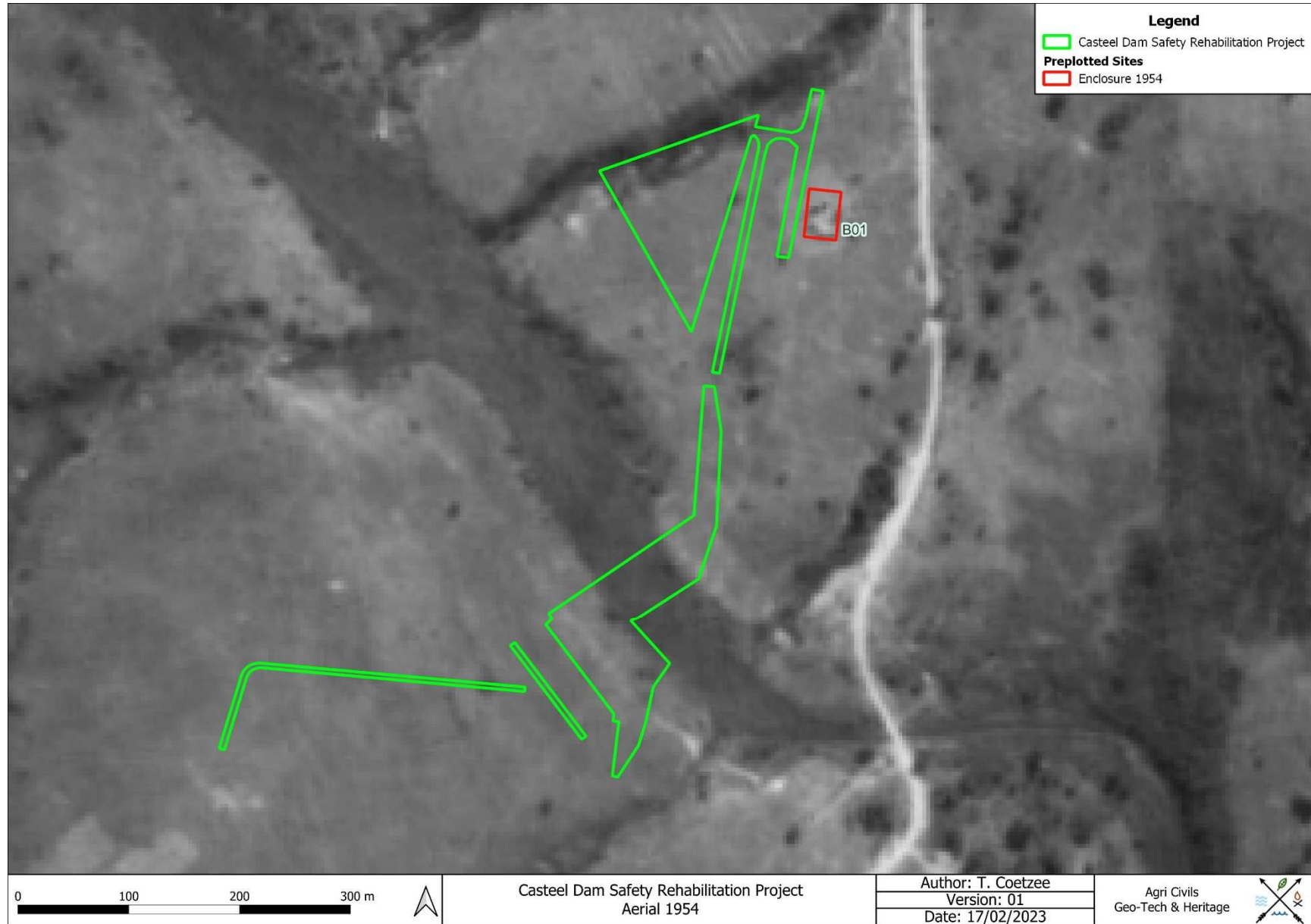


Figure 27: Study area superimposed on a 1954 aerial image.



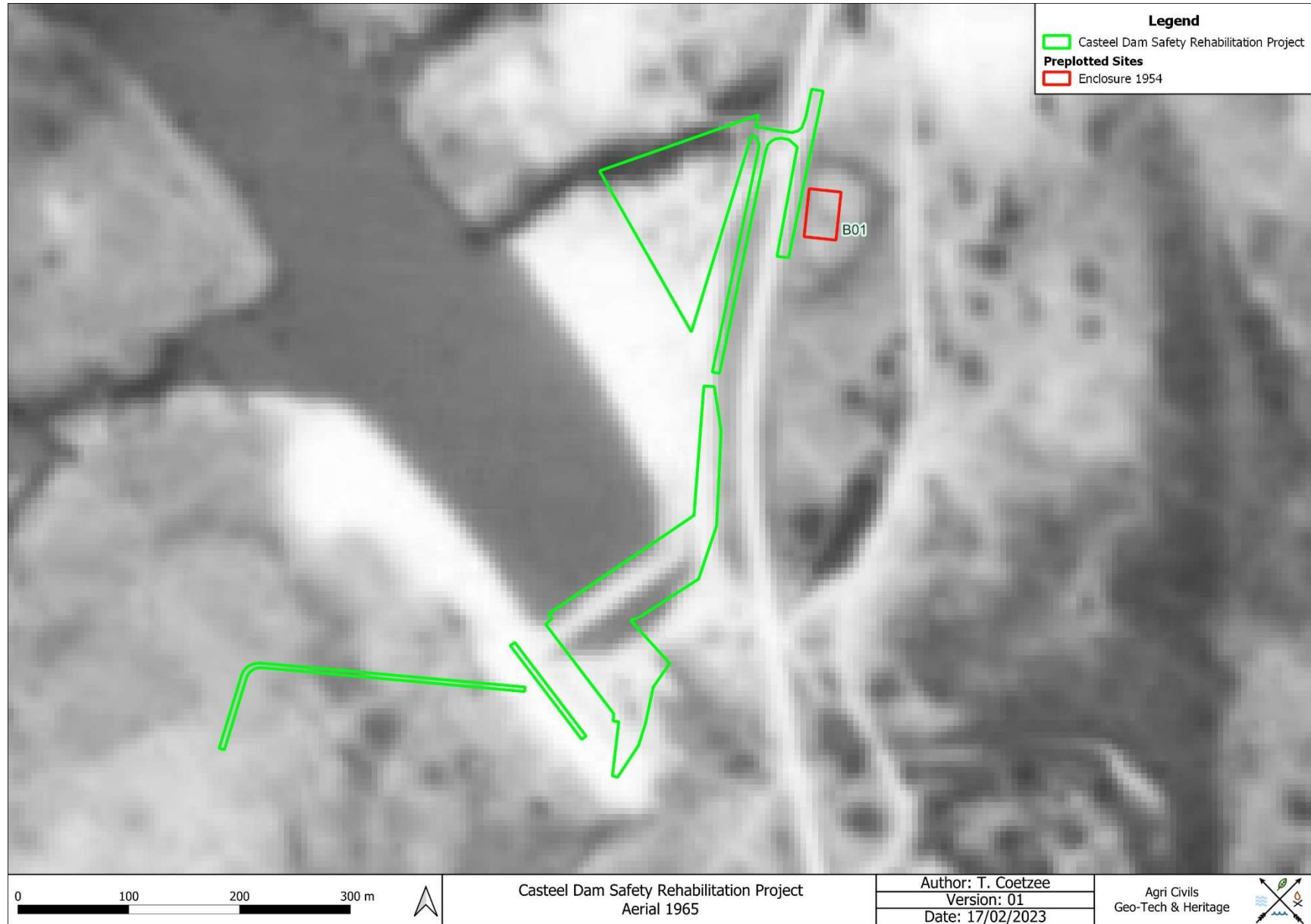


Figure 28: Study area superimposed on a 1965 aerial image.



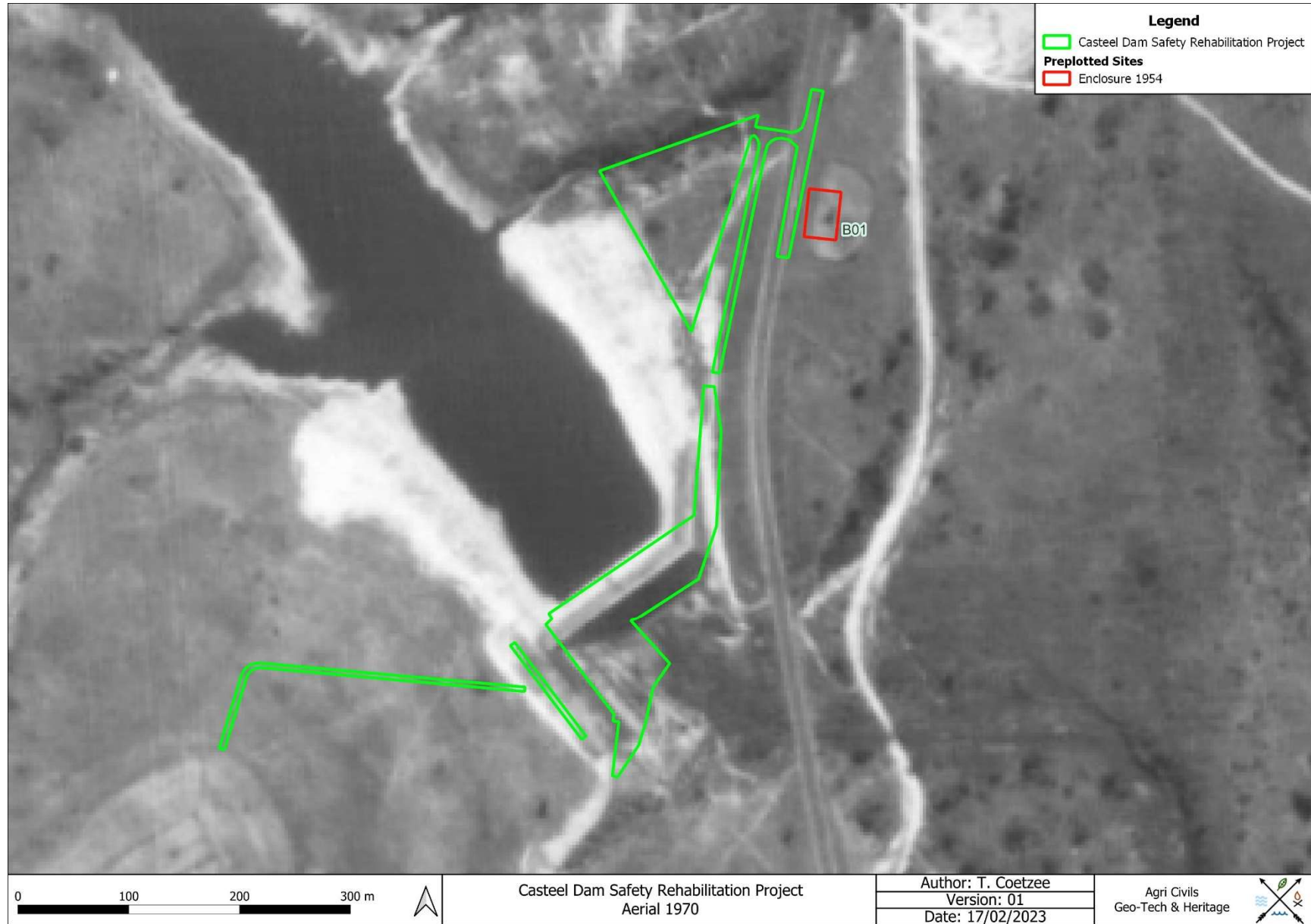


Figure 29: Study area superimposed on a 1970 aerial image.



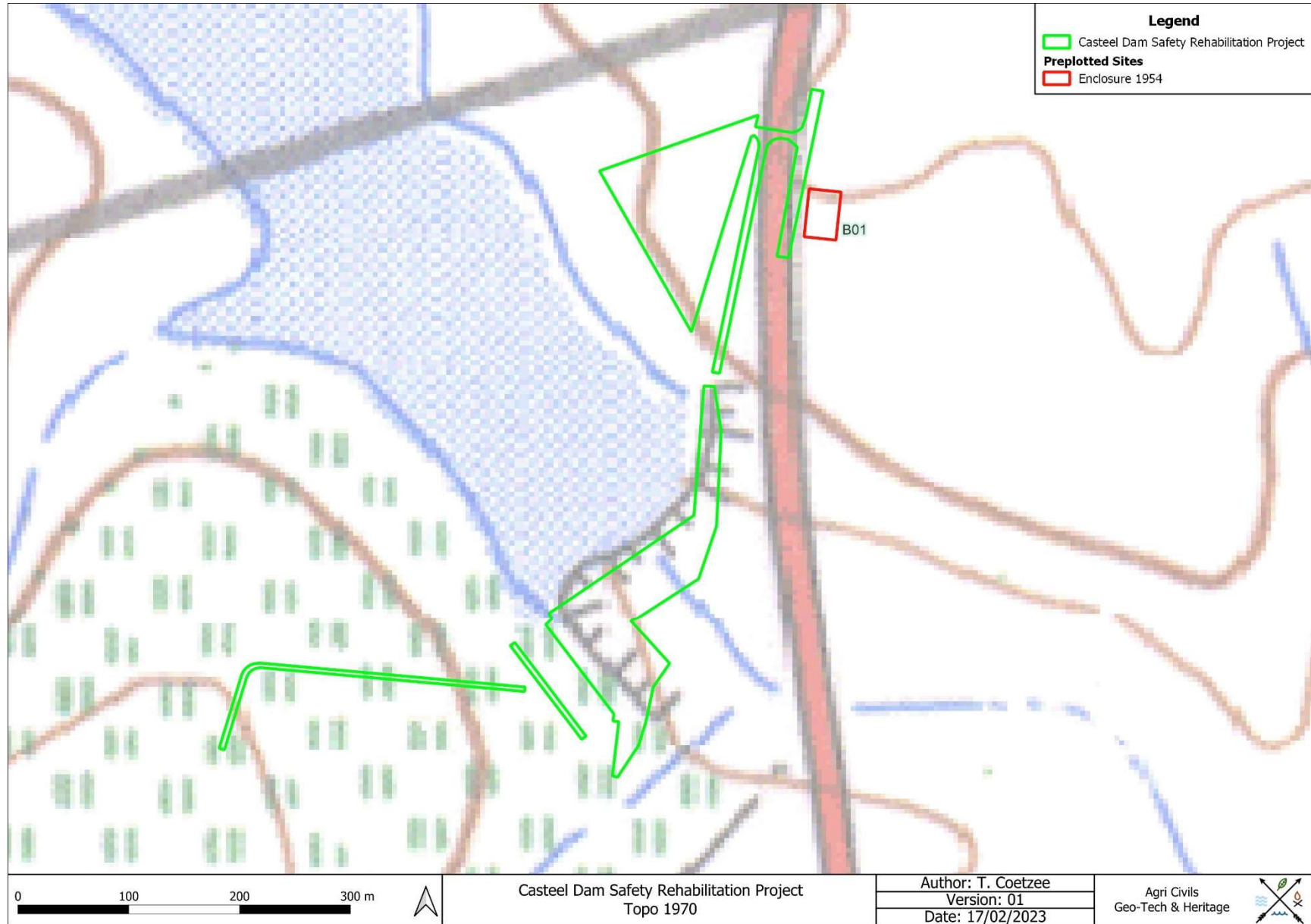


Figure 30: Study area superimposed on a 1970 topographical map.



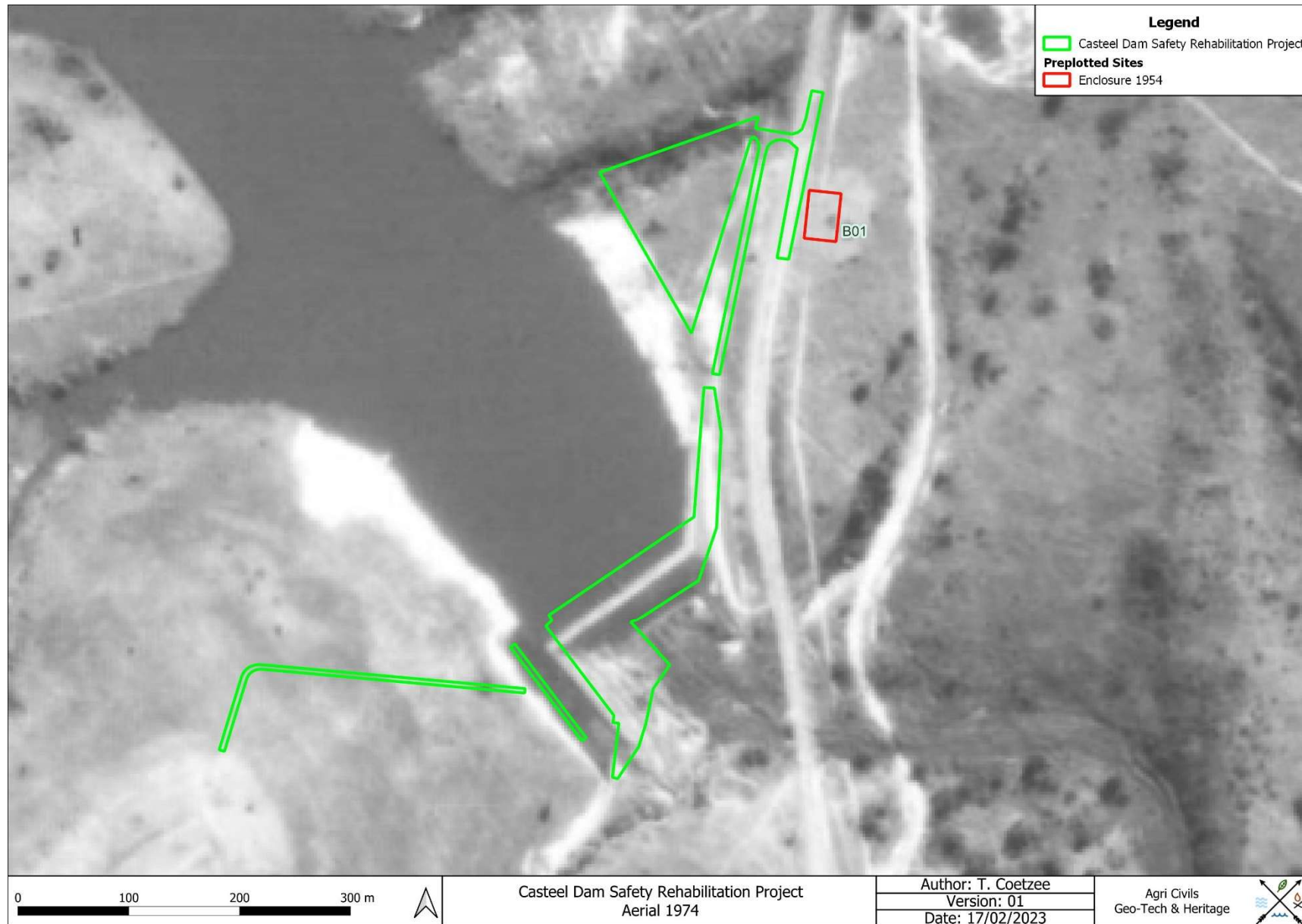


Figure 31: Study area superimposed on a 1974 aerial image.



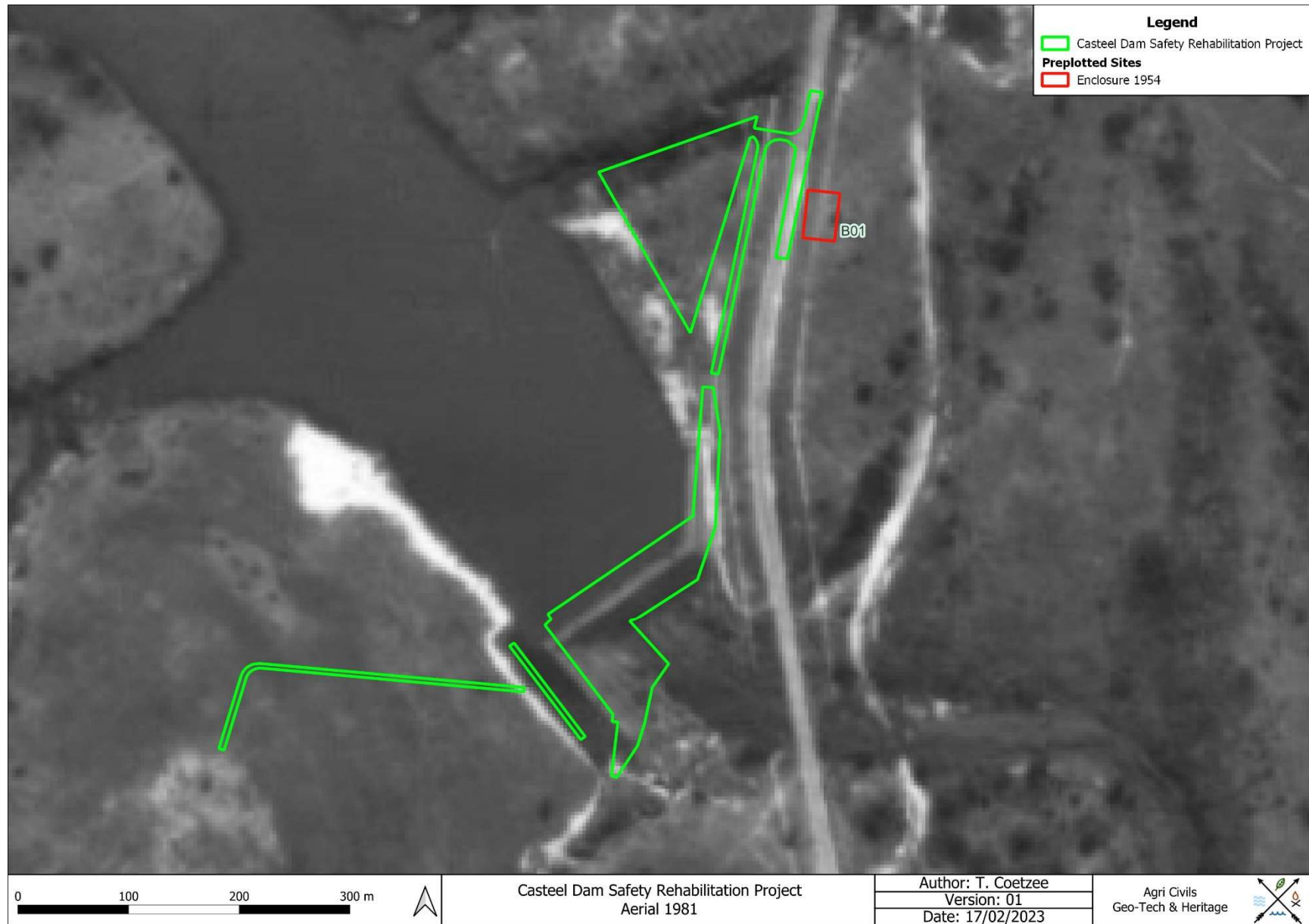


Figure 32: Study area superimposed on a 1981 aerial image.



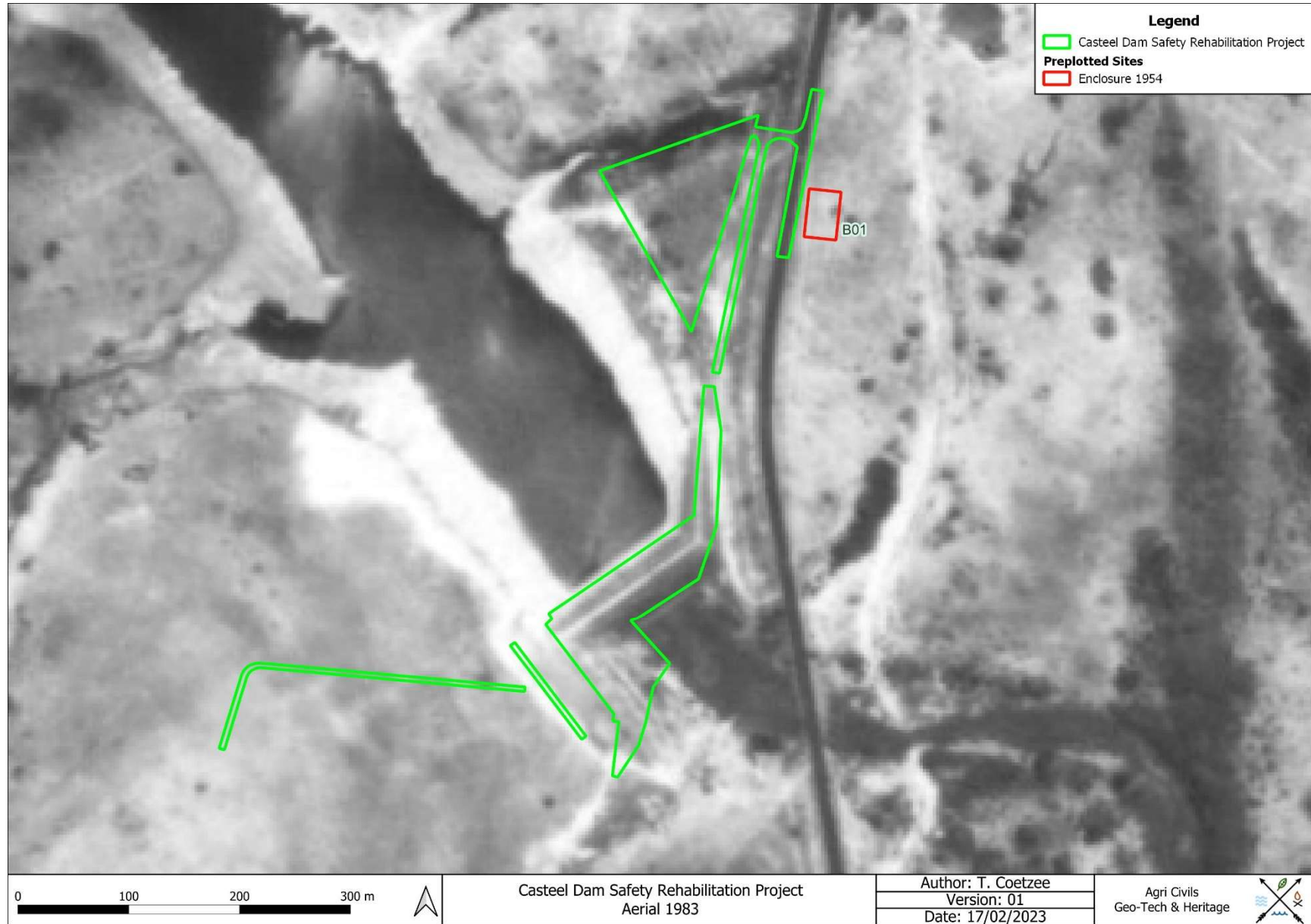


Figure 33: Study area superimposed on a 1983 aerial image.



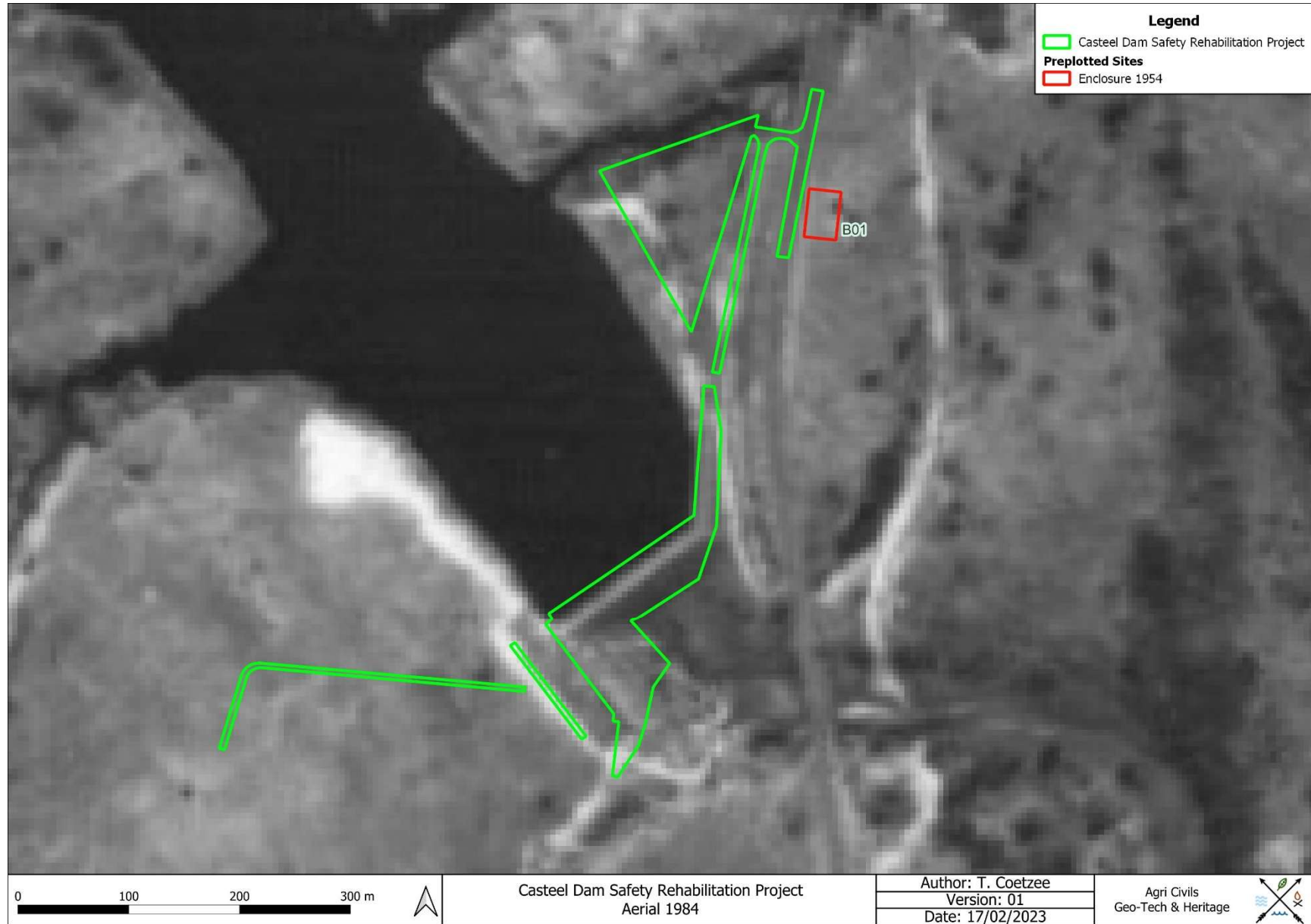


Figure 34: Study area superimposed on a 1984 aerial image.



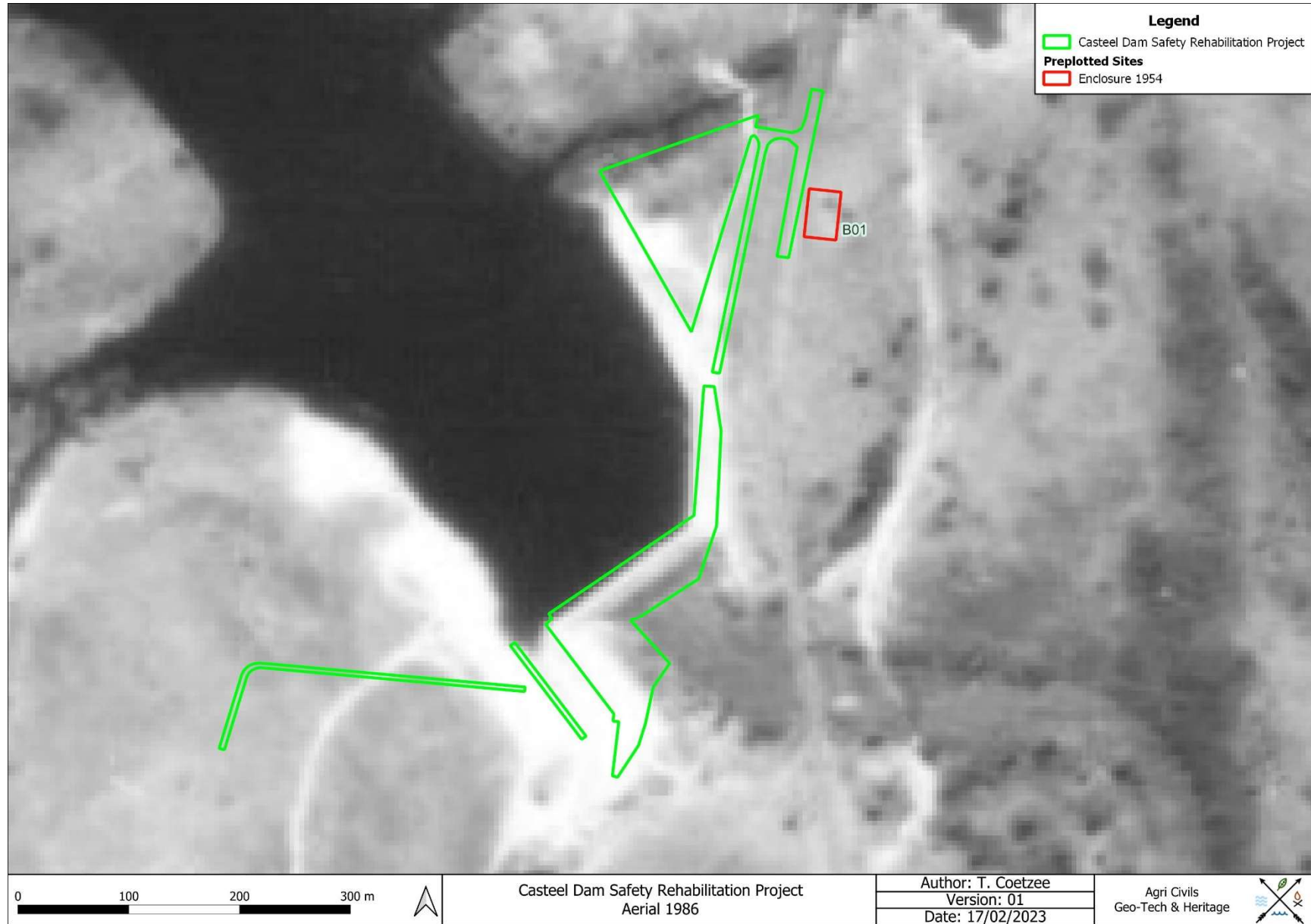


Figure 35: Study area superimposed on a 1986 aerial image.



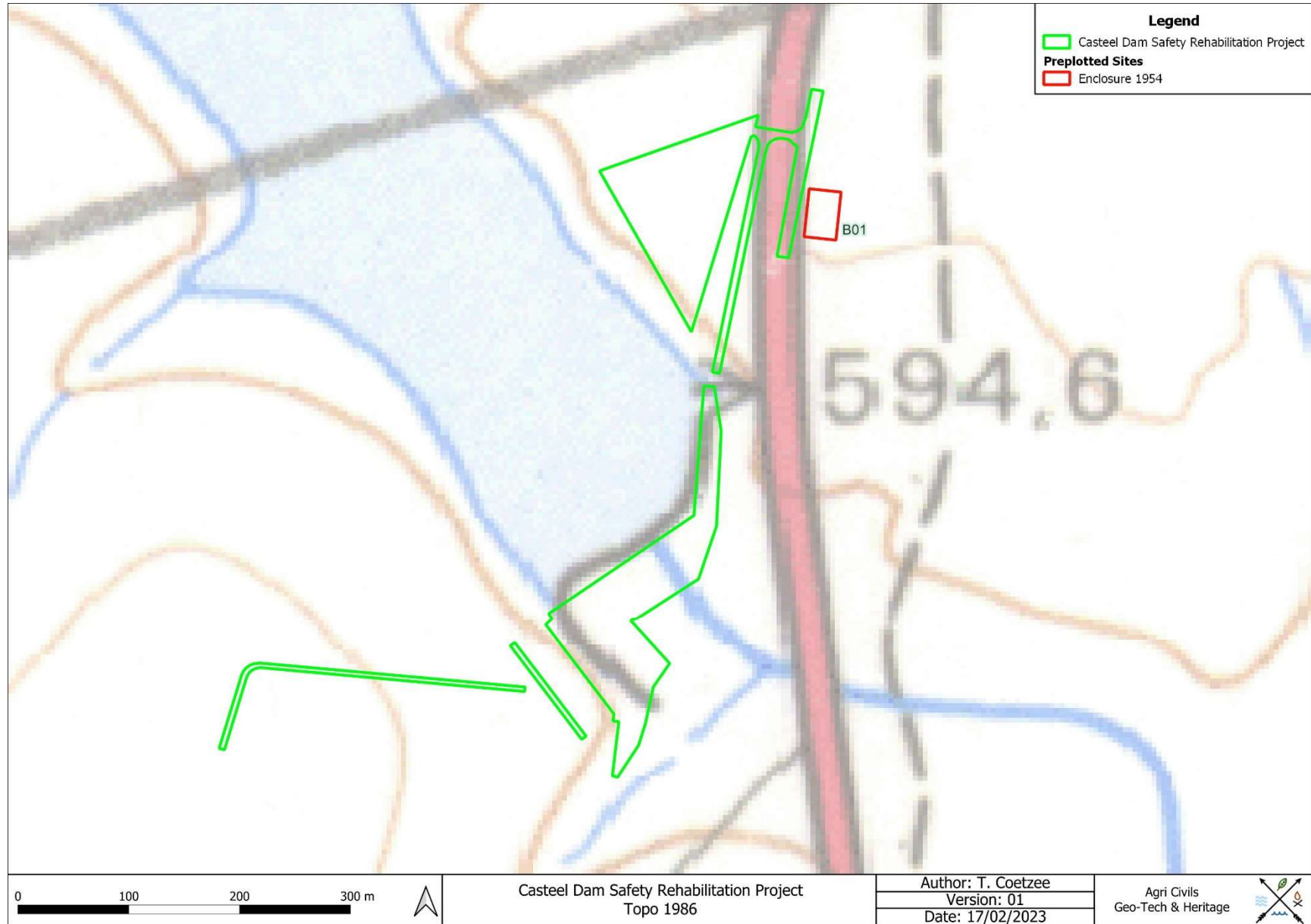


Figure 36: Study area superimposed on a 1986 topographical map.



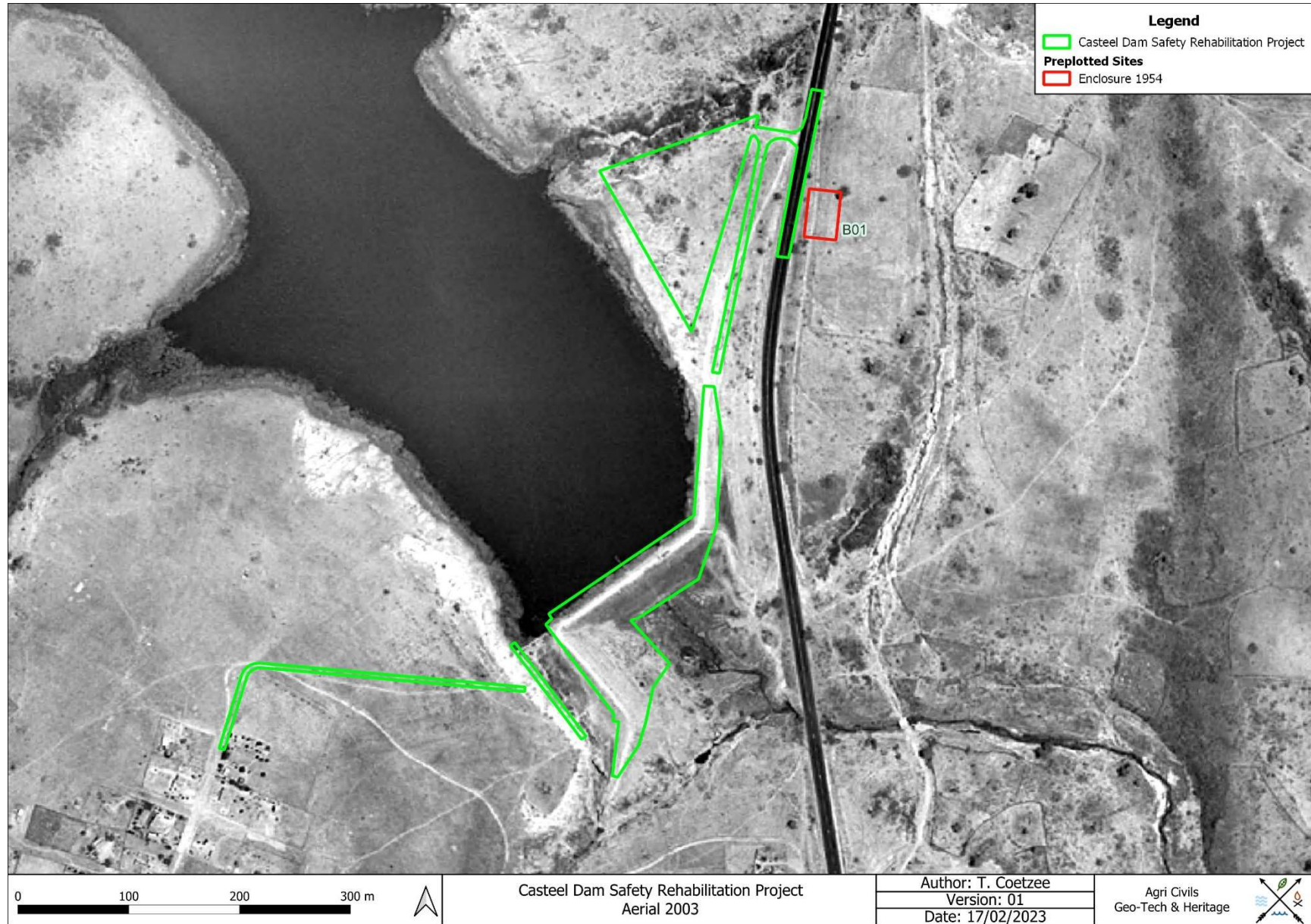


Figure 37: Study area superimposed on a 2003 aerial image.



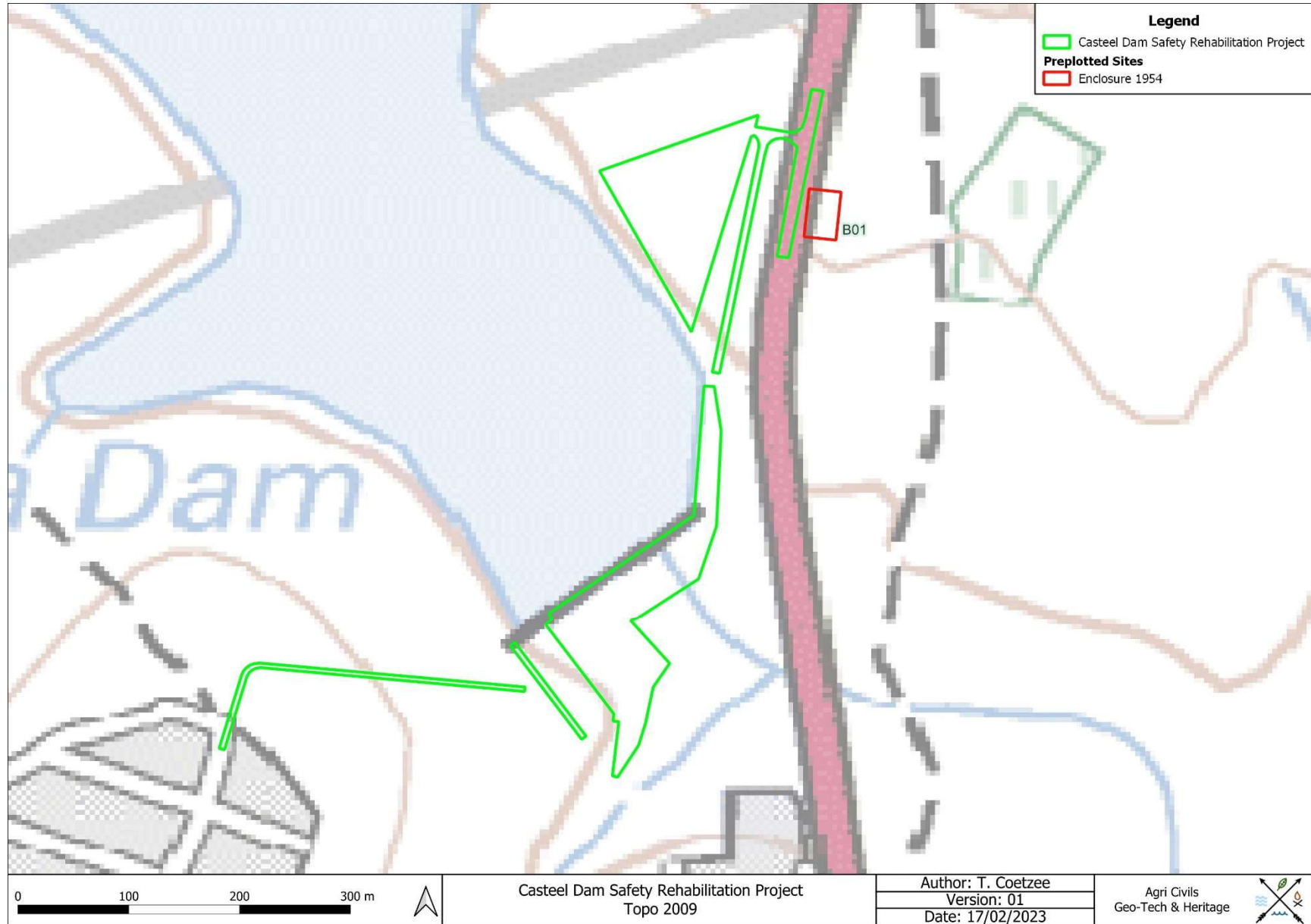


Figure 38: Study area superimposed on a 2009 topographical map.

