



ARCHAEOLOGICAL DESKTOP STUDY

for the Proposed Elengabadi Construction & Projects Prospecting
Right Application on Portion 1 and the Remaining Extent of the Farm
Lymington 423,
Kathu, Northern Cape

For:

Archean Resources (Pty) Ltd

Project Ref:

Elengabadi Lymington PR

Date:

11/01/2023

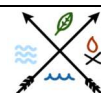
**Archaeological Desktop Study for the Proposed Elengabadi Construction & Projects Prospecting
Right Application on Portion 1 and the Remaining Extent of the Farm Lymington 423, Kathu, Northern Cape,
Bethal, Mpumalanga**

Project Ref: Elengabadi Lymington PR
 Report No: AR_1101231
 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 Elengabadi Lymington Prospecting 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	11/01/2023	



Executive Summary

Agri Civils Geo-Tech & Heritage was appointed by Archean Resources (Pty) Ltd to undertake an Archaeological Desktop study for Elengabadi Construction & Projects (Pty) Ltd on Portion 1 and the Remaining Extent of the Farm Lymington 423 (**Table 1**) within the Joe Morolong Local Municipality in the Northern Cape Province. The study area is located roughly 34 km northwest of Kathu. The aim of this report is to contextualise the general study area in terms of heritage resources and will provide the developers with general information regarding potentially sensitive areas. This will also shed light on what is to be expected during a Phase 1 Archaeological Impact Assessment and aid in interpreting finds.

A total of five sites consisting of intact/demolished buildings were noted on historical topographical maps and aerial imagery (**Table 2**). The analysis indicated that two sites consisting of buildings/structures (B01 & B02) potentially exceed 60 years of age. One of these sites (B02), however, appears to have been demolished, while surface infrastructure is present at the remaining site (B01). Three sites (B03 – B05) were identified as buildings on the 2001 topographical map and 2017 Google Earth satellite image and appear still to be associated with intact surface infrastructure. Sites B03 – B05 appear to date to contemporary times and are unlikely to exceed 60 years of age.

Due to the sites potentially exceeding 60 years of age, the demarcated areas associated with Sites B01 & B02 are considered to be sensitive from a heritage perspective. Should building remains dating to the Historic Period be present, such buildings might be protected by the National Heritage Resources Act (Act No. 25 of 1999). These sites should therefore be avoided by the proposed prospecting activities. Should this not be possible, the sites should first be inspected by a qualified archaeologist.

The demarcated areas associated with contemporary Sites B03 – B05 are unlikely to be significant from a heritage perspective. However, should impact to the sites be unavoidable, it is recommended that a qualified archaeologist first inspect the sites.

Since archaeological sites are often associated with water sources, the 500 m river buffer is considered to be potentially sensitive from a heritage perspective and should be avoided by the proposed prospecting activities. Should impact to the river buffer zone be unavoidable, it is recommended that a qualified archaeologist first inspect the area.

Apart from the identified potential sites, previous heritage studies conducted in the greater area recorded Stone Age sites, historical buildings and graves. Since such sites are likely to be encountered, care should be exercised when prospecting on the demarcated farm portions. Should uncertainty regarding heritage remains exist, or of 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.



A full Phase 1 Archaeological Impact Assessment must be conducted should any development that triggers an Archaeological Impact Assessment result from the prospecting project, including if the cumulative impact of the proposed prospecting exceeds 0.5 ha.

List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

DMR – Department of Mineral Resources

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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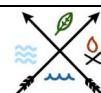


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1. Project Background

1.1 Introduction

Archean Resources (Pty) Ltd appointed Agri Civils Geo-Tech & Heritage to undertake an Archaeological Desktop Study for the proposed Elengabadi Construction & Projects (Pty) Ltd prospecting right application on Portion 1 and the Remaining Extent of the Farm Lymington 423 within the Joe Morolong Local Municipality in the Northern Cape Province. The study area is located roughly 34 km northwest of Kathu (**Figure 1 & Table 1**). The purpose of this study is to contextualise the demarcated study area in order to determine the scope of heritage resources that might be encountered during the prospecting phase and subsequent heritage studies, as well as to provide recommendations for the safeguarding of archaeological resources during prospecting. The aim of this report is to provide the developer with information regarding heritage resources in the vicinity of the study area based on results from previous studies, written historical information and historical topographical maps and aerial photographs.

In the following report, a broad overview of the proposed prospecting application for manganese and iron ore is provided and the study area is contextualised in terms of heritage resources. The legislation section included serves as a guide towards the effective identification and protection of heritage resources and will apply to any such material unearthed during the prospecting phase.



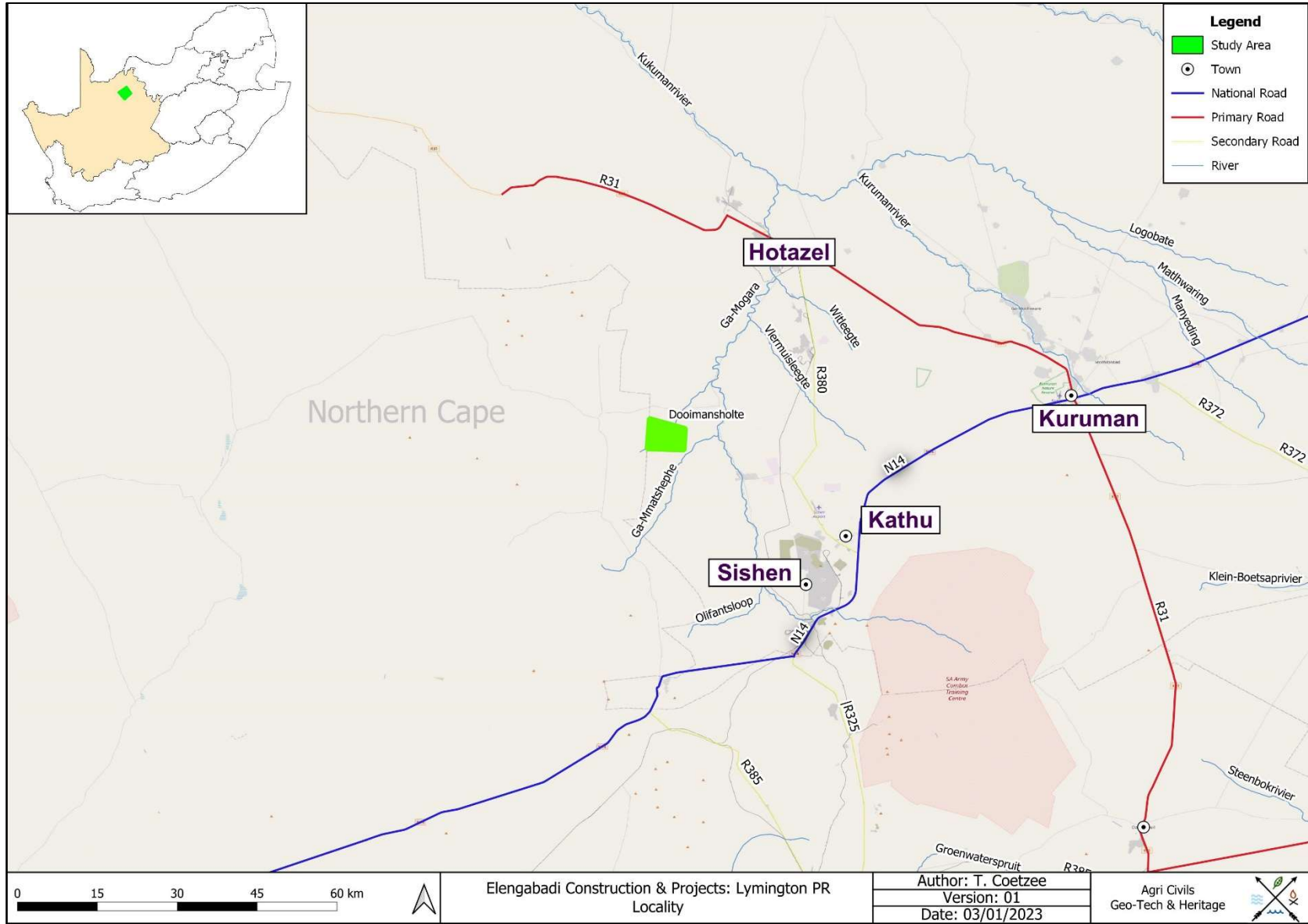


Figure 1: Regional and provincial location of the study area.



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 EIA (Environmental Impact Assessment) and AIA processes

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

All Archaeological Impact Assessment reports should include:

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

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

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



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

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

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 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 Elengabadi Construction & Projects (Pty) Ltd prospecting project is situated on the land parcels listed in **Table 1** and is illustrated in **Figure 2**.

Table 1: Land parcels & coordinates.

Property	Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Total Extent (ha)
Lymington 423	RE/423	2722 BC & DA	-27.526550	22.730697	± 1719.4
Lymington 423	1/423	2722 DB	-27.531014	22.763762	± 1361.3
Total					± 3080.7



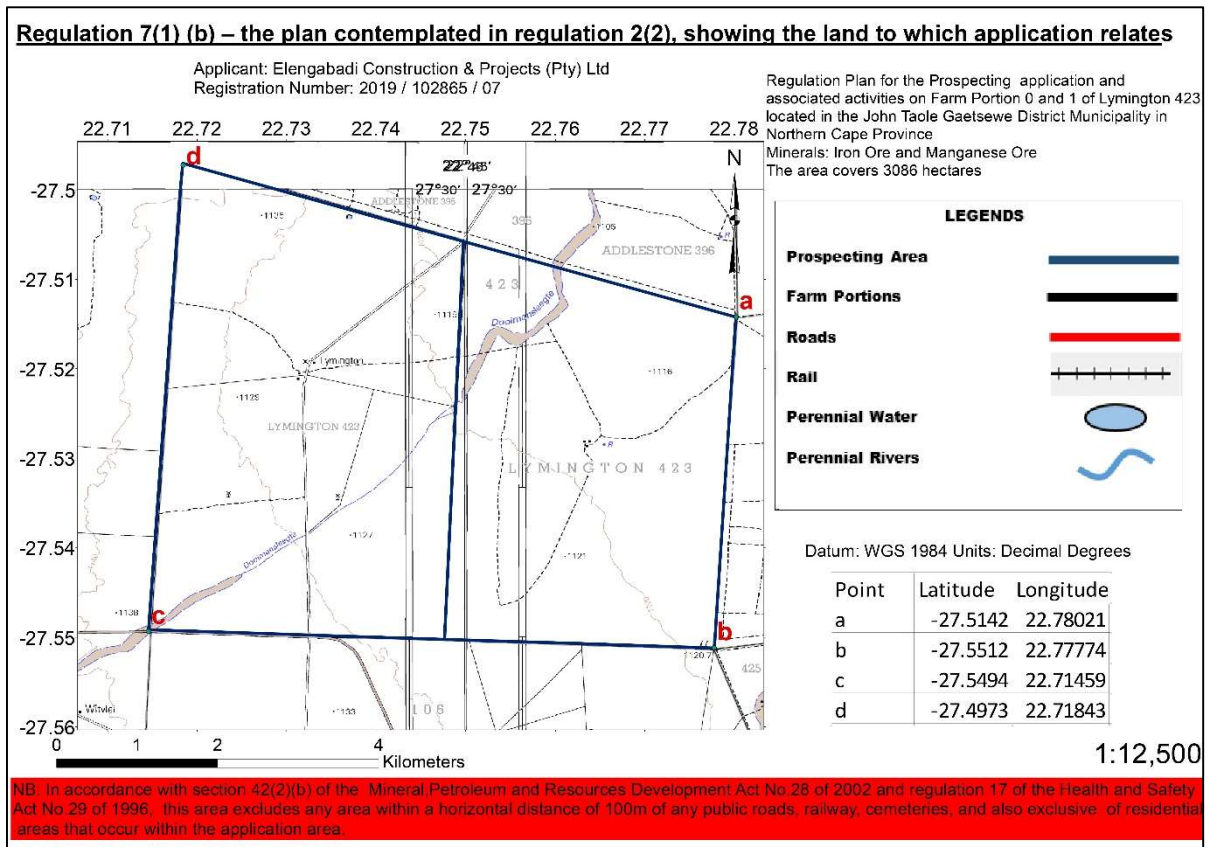


Figure 2: Proposed layout map (Provided by Archean Resources 2022).

Kathu is located roughly 34 km to the southeast of the proposed prospecting area, while Hotazel is located 38 km to the northeast and Kuruman 72 km to the east. The demarcated farm portions fall within the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province. The R380 secondary road runs in a north-south direction approximately 23 km to the east, while a power line intersects the south-western corner of the Remaining Extent of the Farm Lymington 423.

In terms of vegetation, the study area falls within the Savanna Biome and Eastern Kalahari Bioregion. On a local scale, the study area falls within Kathu Bushveld. According to Mucina & Rutherford (2006), Kathu Bushveld is associated with the plains from Kathu and Dibeng in the south, through Hotazel, covering the area between Van Zylsrus and McCarthysrus to the Botswana border in the north. This vegetation unit is considered least threatened with a conservation status of 16%. More than 1% has been transformed and erosion is considered to be low.

According to Mucina & Rutherford (2006), the average elevation for Kathu Bushveld ranges from 960 to 1300 MASL (metres above sea level). The average elevation of the study area is 1130 MASL and slopes from the slightly more elevated eastern side to the lower western side.



The study area falls within the summer rainfall region and the average annual rainfall is roughly 374 mm per year. The average annual temperature is 18.8 °C. The average summer temperature is 25 °C, while the winter temperature averages 10.5 °C (Climate-data.org accessed 04/01/2023).

The study area falls within in the D41K quaternary catchment of the Vaal Water Management Area. The closest perennial river to the study area is the Molopo River 120 km to the northwest. A non-perennial stream, known as Dooimansleegte, also intersects the demarcated farm portions and divides the study area into a north-western and a south-eastern half. The Spitskop Dam is located approximately 200 km to the east-southeast of the study area.

Access to the demarcated study area appears to be through local roads turning from the R380 secondary road. The majority of the study area appears to consist of open bushveld of which the use is unknown. Buildings are evident on the Remaining Extent and Portion 1 of the Farm Lymington 423.

2.2 Project description

The prospecting right application for manganese and iron ore covers approximately 3080.7 ha (**Figures 3 & 4**). For the prospecting phase, however, several sites will be selected for geotechnical drilling. The following project description was adapted from the application supplied by Archean Resources (2022: 3 & 4):

“Mineral Applied for: Iron Ore and Manganese Ore.

Field Mapping- *This method includes the identification of exposed geological structures and lithological outcrops, through aerial photo interpretation, satellite image interpretation and also by walking the farms/folios.*

F.1 Drilling

A proposed drilling programme of 10 boreholes will be used to further define the ore body. The drilling program will determine the exact outline, shape and size of the ore body. The core drilling is generally done in this target. The different rock sample intersecting the deposit will be sent for assay at one of the accredited laboratories.

RC-drilling- *Drilling is done in phases, as outlined elsewhere, over anomalous target areas, using reconnaissance lines or a grid of 100m or 400m x 400m holes will be approximately >50m deep depending on the local depth. The drill holes will be sent to the laboratory for assay.*



F.2 Geophysical Survey

Ground gravity surveys are applied in order to outline ore deposit positions and size accurately. Ground gravity surveys are carried out on a grid layout. The grid is placed in the field through the use of total station or real time GPS system. Gravity readings and accurate elevations are recorded at each station on the grid. The grid that is used is a 200m x 200m and if there are anomalies in the data the grid is tightened to 100m x 100m. The smaller grid increases the resolution and smaller features then become visible. 1000 gravity points will be needed to delineate the ore bearing lithologies. The gravity data will be evaluated by means of RC Diamond drilling.

Geophysical Survey- *Ground geophysical surveys will be conducted over selected target areas on a 200m x 200m grid. Ground gravity surveys is used to outline the ore hosting lithology.*

A phased prospecting programme will be applied:

Phase 1- Desktop Studies

It will comprise of gathering geological information about the project area. This will also include visiting organizations like the council of geosciences in order to research on what has been done in the region. This will take about the whole month to complete.

Phase 2- Field Mapping

It mainly consist of a comprehensive field mapping, geologist will complete properly selected transverse while recording their geological observations.

Geophysical Survey

Mainly consist of a comprehensive ground gravity survey to delineate magnetic anomalies and potential target areas.

Preliminary Drilling and assaying

It consists of reconnaissance drilling of \pm 5 Boreholes. The proposed drilling program in its entirety consists of 10 holes.

Detailed drilling and assaying



It consists of the remainder of the 10 boreholes minus the preliminary boreholes for detailed drilling within the determined target areas, to delineate the ore body accurately, and to determine depth to bedrock and internal stratigraphic composition of the ore body.

Geological Modelling

This will be comprised by detailed geological modelling.”



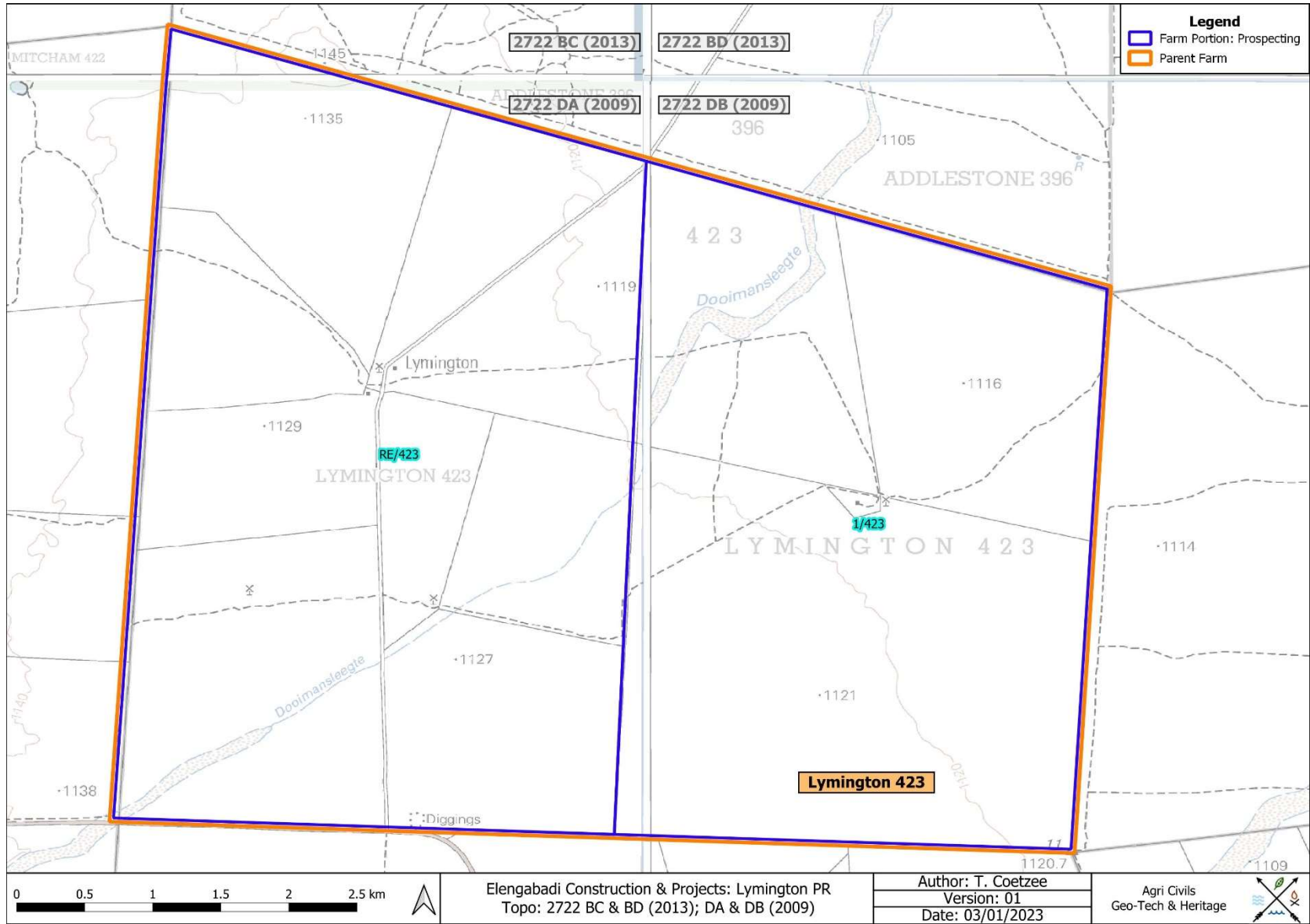


Figure 3: Segment of SA 1:50 000 2722 BC, BD, DA & DB indicating the area demarcated for prospecting.



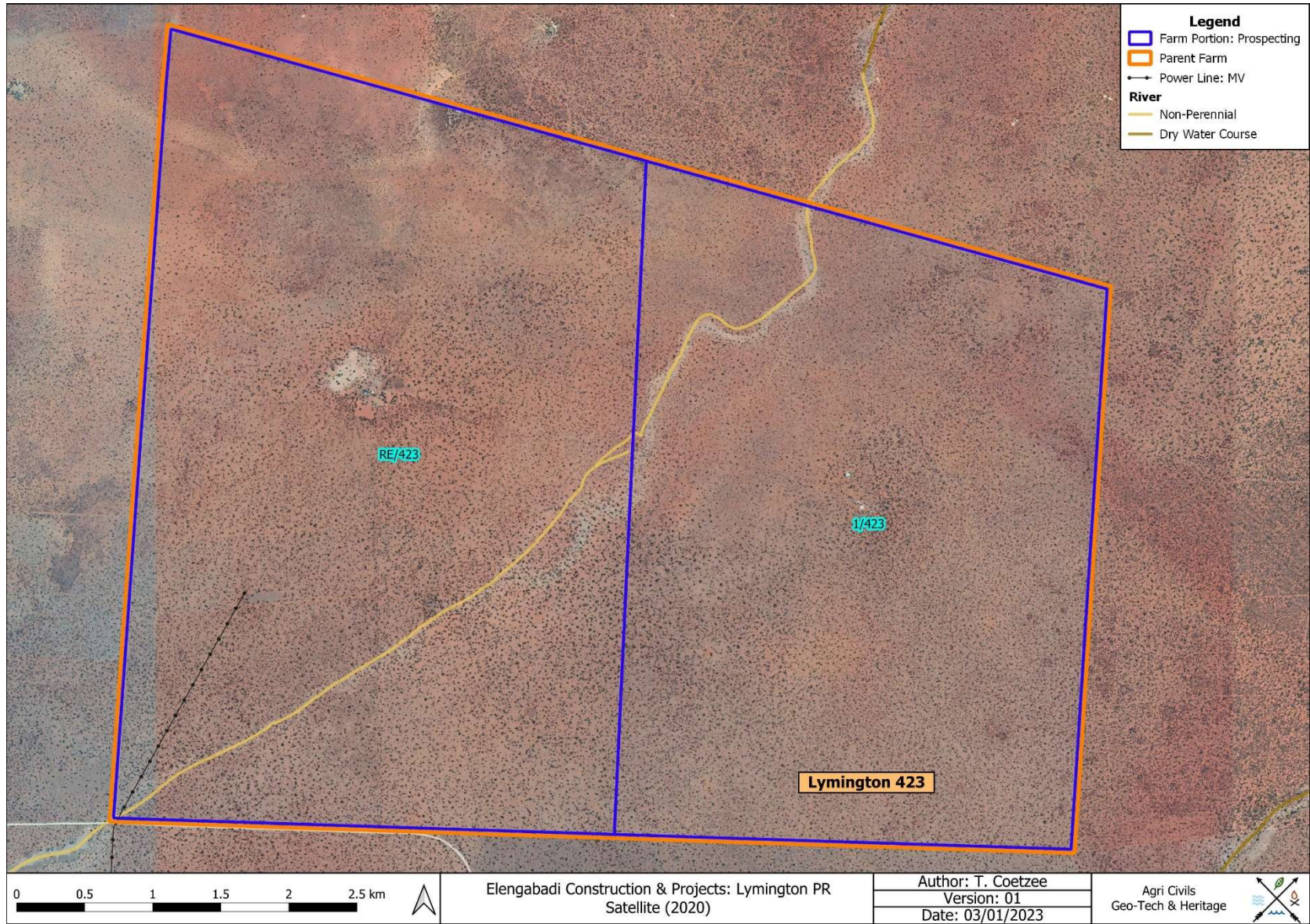


Figure 4: Proposed prospecting area portrayed on a 2020 satellite image.



3. Methodology

Archaeological reconnaissance of the study area was conducted by means of inspecting historical aerial imagery and topographical maps in order to identify potential heritage remains (**Appendix A**). The historical topographical datasets dating to 1973/1974, 2001, and 2009/2013, as well as the historical aerial images dating to 1957, 1965, 1972, and 1988, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Five potential sites were observed within the demarcated boundary (**Table 2 & Figure 5**). It should be noted that the prefixes '2722DA' and '2722DB' are not used when referring to the site names due to the length of the name, but are recorded as such in **Table 2**. Based on contemporary satellite imagery, one of the sites (B02) appears to have been demolished since no surface remains could be detected (**Figure 6**). The remaining sites appear to consist of intact surface infrastructure (B01, B03 – B05). The total area inspected was 3080.7 ha. Because heritage resources are often associated with water sources such as perennial and non-perennial rivers/streams, as well as perennial and non-perennial pans, these water sources were buffered by a distance of 500 m, indicating a potentially sensitive area (**Figure 19**).



Table 2: Potential site location.

Site No	Type	Identification Source	Parent Farm	Farm Portion	Current Status	Estimated Extent (ha)	Lat (y)	Lon (x)
2722DA-B01	Building	1957 Aerial	Lymington 423	RE	Surface Remains	9.3	-27.5205	22.73105
2722DB-B02	Building	1974 Topo	Lymington 423	1	Demolished	4.4	-27.5281	22.76574
2722DA-B03	Building	2001 Topo	Lymington 423	RE	Surface Remains	1.2	-27.5193	22.73303
2722DB-B04	Building	2001 Topo	Lymington 423	1	Surface Remains	2.1	-27.5285	22.76372
2722DB-B05	Building	2017 Satellite	Lymington 423	1	Surface Remains	0.8	-27.5265	22.76298

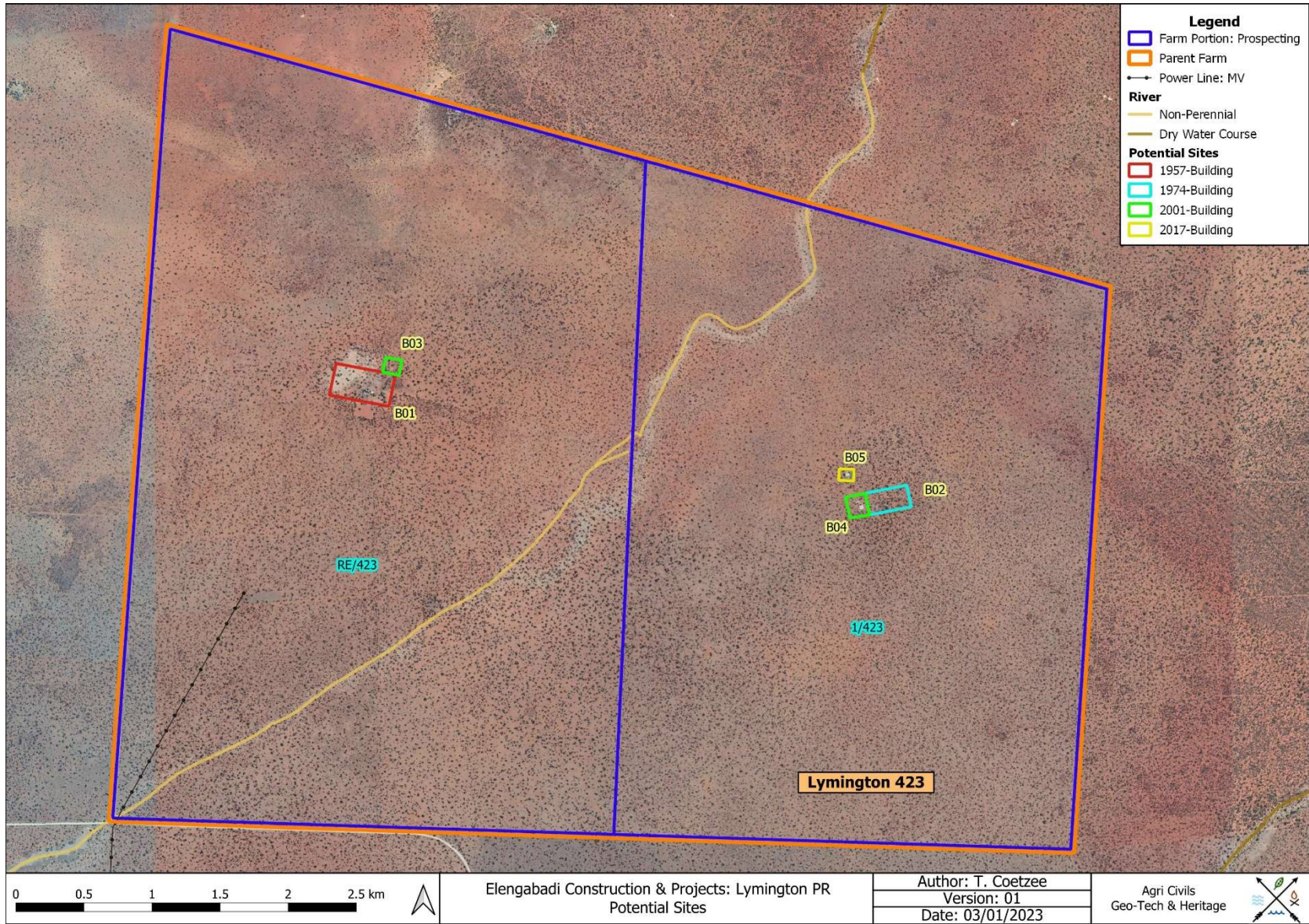


Figure 5: Potential Sites.



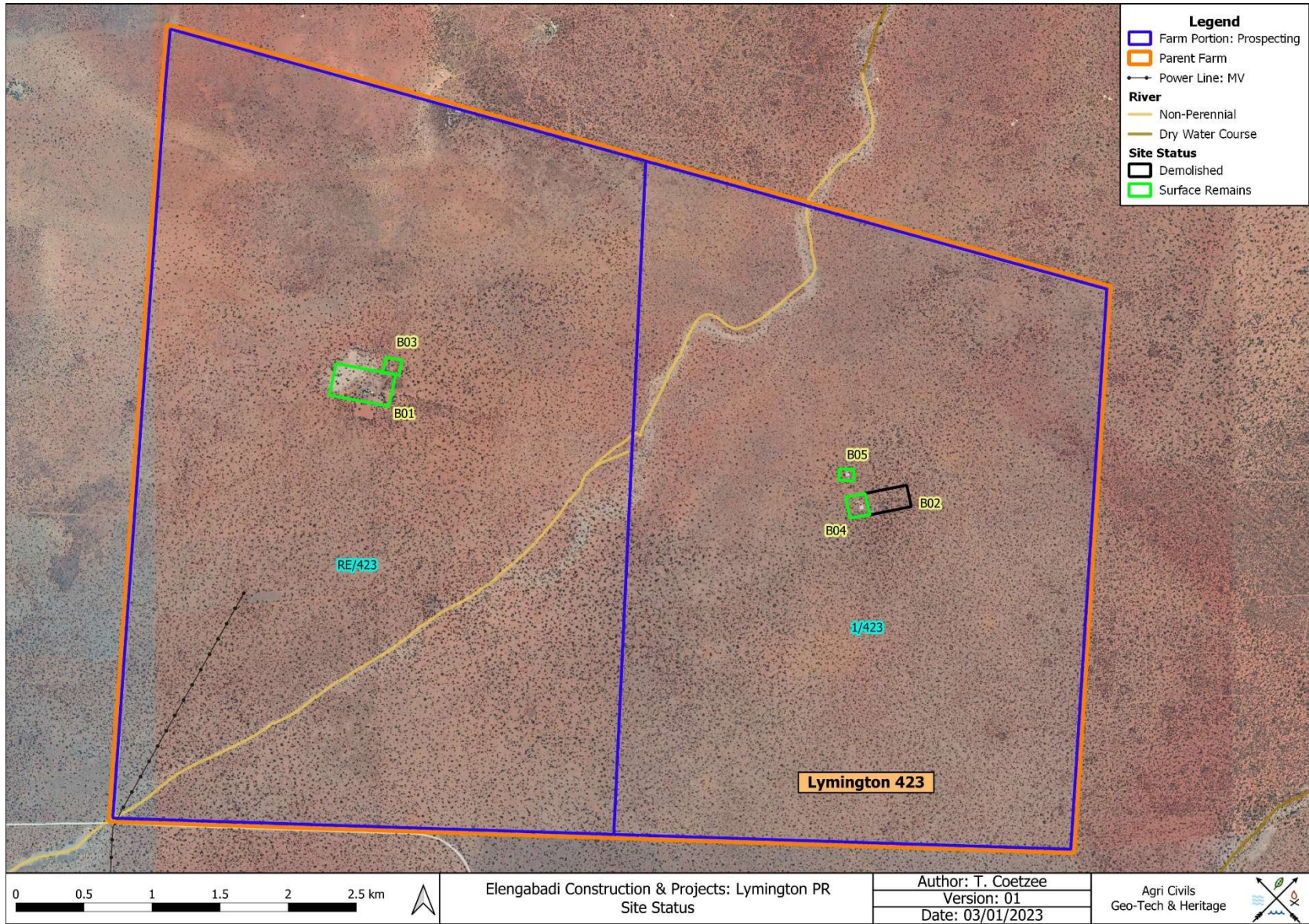


Figure 6: Site Status.



3.1 Limitations

Using historical topographical maps and historical aerial images for locating heritage resources have several shortcomings. Potential heritage remains, such as buildings, structures and graves/cemeteries, are not always indicated on topographical maps and are often omitted between different publications. Historical aerial imagery, on the other hand, might have a poor image resolution that renders potential heritage sites invisible. Inaccuracies during the georeferencing process may also lead to some heritage sites not being plotted, as well as dense vegetation obscuring heritage sites. Due to the small size of some heritage sites, such as Stone Age sites, small Iron Age features, rock art sites and burials, such sites are rarely visible on aerial imagery and are generally only detected during pedestrian surveys.

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 Archaeo-History

Worth mentioning is the fact that Wonderwerk Cave, a provincial heritage site, is located in the Kuruman-Postmasburg district. The cave bears evidence of continued human activity from 10 000 years ago (Snyman 1992: 13). Also, the remains of the extinct Cape horse and giant hartebeest were discovered (Mitchell 2002: 140). Wonderwerk Cave is also known for the abundant material culture and include unusual finds such as stone rings, chert pendants and engraved stones (Mitchell 2002: 184).

The Kuruman/Postmasburg area has a rich history spanning from the Early Stone Age to the Historical times. Below is a brief account of earlier events in the general area.

Hunter gatherer activities in the Kuruman area were present until the 1880's and even after that in the area west of the town. Several rock engravings in the Kuruman valley bear testimony to their presence in the area. Due to increased population hunter gatherer communities moved in a western and north-western direction in order to be able to continue exploiting game. Contact with early Batswana communities also resulted in the integration of the two groups. It was only during the last 500 years that the Batswana entered the northern regions of the Northern Cape. Possible factors affecting this might have been unfavourable environmental conditions such as heat, drought and poor soils in terms of agriculture. However, it appears that the Tlharo were the first Batswana group to arrive in the general area. Accordingly, the Batswana under Notwane clashed with Kudumane's hunter gatherer community near the area where the town is today. After Notwane defeated Kudumane they explored in the direction of present day Postmasburg, Danielskuil and Campbell, where he clashed with the Batlhaping (Snyman 1992: 15-16).

During the mid-18th Century, the Batlhaping moved from the Taung area first in a southern direction and later in a western direction and settled at Nokaneng, south of Olifantshoek. Towards the end of the 18th Century the Batlhaping under Molehabangwe established a loose confederation. Around 1770 the Korana crossed the Orange River and made contact with the Batlhaping. Initial interaction was peaceful and both groups benefitted from trade activities. Accusations of cattle theft, however, ended peaceful relations. Due to additional conflict with Korana groups, the Batlhaping first moved to Kathu and from there to Ga-Mopedi near the Kuruman River.



With the first colonial contact in 1801 the area was in a rather fragile state as Korana and Griqua groups exerted additional pressure on existing communities (Snyman 1992: 16).

A few European explorers ventured to these areas as well. Two expeditions worth mentioning are that of Lichtenstein in 1805 and that of Andrew Smith in 1835. After Lichtenstein reached the Kuruman River where they met Tswana speaking people, they turned in a southern direction towards the Orange River. It is noted that Lichtenstein's party made contact with Muliawang's capital consisting of about 600 houses near the Kuruman River (PGS 2010).

Following the first colonial contact with the area, colonials in the Cape thrived to establish a cattle trade with the Batlhaping. The Batswana also caught the attention of missionaries such as Jan Matthys Kok and William Edwards who accompanied the expedition led by P.J. Truter and William Somerville to the Batlhaping. This first mission expedition was unsuccessful, but follow-up expeditions around 1817 succeeded. Robert Moffat succeeded James Read at the mission station in 1821 and moved the mission station to its present location in 1824 (Snyman 1992: 17-25).

During the mid-19th Century, Kuruman served as the gate to the interior of South Africa and was regarded as a hub for hunting expeditions, trade, missionary work and exploration. With the discovery of diamonds in 1867 near Hopetown and gold in 1868 in Matabeleland, however, political instability in the general area increased (Snyman 1992: 42-43).

Evidence regarding white settlement in the study area suggests brief occupation during the latter part of the 19th Century. Permanent settlement, however, only followed around 1907 and 1908 when a period of drought in the then Cape Colony encouraged relocation (Smith 1966 cited in PGS 2010: 25).

4.2.4 Historical aerial imagery and topographical maps

Historical images and topographical maps dating to 1957, 1965, 1972, 1973/1974, 1988, 2001, and 2009/2013 (**Appendix A**) were used to determine the location and relative age of the structures and buildings associated with the demarcated farm portions (**Table 2**), as well as to establish historical land uses associated with the land parcels.

1957 Aerial Image

The aerial image dating to 1957 (**Appendix A: Figure 20**) indicates the presence of one area associated with buildings or structures (Site B01), while the remaining area seems to consist of open bushveld.



1965 & 1972 Aerial Images

The 1965 and 1972 aerial images (**Appendix A: Figures 21 & 22**) show no additional buildings, structures or activities.

1973/1974 Topographical Map

The 1973/1974 topographical map indicates one additional site (B02) consisting of two buildings near the centre of Portion 1, while no additional activities appear to be associated with the surrounding environment (**Appendix A: Figure 23**). It should also be noted that two buildings and two kraals are noted at Site B01.

1988 Aerial Image

The 1988 aerial image (**Appendix A: Figure 24**) shows no additional buildings, structures or activities. However, Site B02 identified on the 1973/1974 topographical map, is not visible (**Appendix A: Figure 23**).

2001 Topographical Map

Two building sites (B03 & B04) were identified within the study area: Site B03 consisting of one building bordering Site B01 on the Remaining Extent and Site B04 consisting of three buildings bordering Site B02 on Portion 1 (**Appendix A: Figure 25**). Also, two buildings are noted at Site B01, and none at Site B02.

2009/2013 Topographical Map

No additional sites were identified on the topographical map dating to 2009/2013 (**Appendix A: Figure 26**), while only one building is indicated at Sites B01 and B04.

Satellite Imagery (Google Earth 2017)

Site B05 was identified as a building to the north of Site B04 on Portion 1 and is still visible on the most recent satellite imagery dating to 2020 (**Figure 6**).

4.3 Examples of Heritage Sites

Figures 7 – 18 are examples of heritage sites often encountered. Iron Age and Stone Age sites are often associated with water sources, rocky outcrops and hills and should be avoided by the proposed prospecting activities.



Figure 7: ESA artefacts from Sterkfontein (Volman 1984).



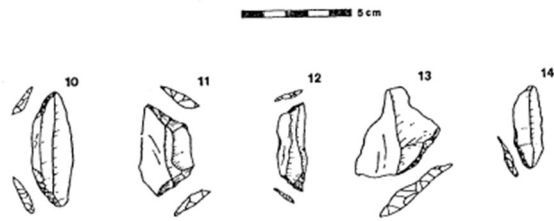


Figure 8: MSA artefacts from Howiesons Poort (Volman 1984).



Figure 9: LSA scrapers (Klein 1984).



Figure 10: Example of undecorated Iron Age potsherds.



Figure 11: Example of a decorated Iron Age potsherd.





Figure 12: Example of a potential Iron Age granary base.



Figure 13: Example of a stone-walled Iron Age site.



Figure 14 : Example of a broken lower grinding stone dating to the LIA.





Figure 15: Example of a dilapidated stone-walled site dating to the LIA.



Figure 16: Example of a historical building.



Figure 17: Example of a dilapidated historical kraal.





Figure 18: Example of a potential informal grave.

4.4 Previous Heritage Studies

Khumani Iron Ore Mine: Return Water Dam, Pipelines and Water Containment Facility

A Heritage Impact Assessment was conducted for the construction of a new Return Water Dam, Pipelines and Containment Facility for the Khumani Iron Ore Mine near Sishen in the Northern Cape Province. The Khumani Iron Ore HIA project area is located approximately 40 km southeast the proposed Elengabadi Lymington project area. The HIA noted that the study area is located within areas transformed by mining activities. A few undiagnostic stone flakes were observed, but according to the author the flakes occurred out of context and the possibility exists that it might have been pseudo tools created by heavy duty machinery (Van der Walt 2019).

AIA for the Photo-Voltaic Solar Power Generation Plant on the Farm Adams 328

A Heritage Impact Assessment was conducted by Archaetnos & Cultural for the construction of a photo-voltaic solar power generation plant on a portion of the remaining extent of the farm Adams 328 near Hotazel. The study, located approximately 27 km northeast of the proposed Elengabadi Lymington prospecting area, recorded one stone tool that possibly dates to the MSA, as well as building ruins dating to contemporary or possibly historical times. Both sites were assigned a low significance (Pelser 2012).

Lomoteng heritage study, Postmasburg

Peter Beaumont (2011) conducted a baseline archaeological study on the 6404 ha Lomoteng 669 farm 30 km north of Postmasburg and approximately 63 km southeast of the proposed Elengabadi Lymington project area. The purpose of the study was to evaluate the area to determine the level of impact 18 prospecting boreholes would have on heritage resources. During the survey, four Stone Age sites of heritage importance were recorded. These included: a core from which four flakes had been detached; a weathered andesite flake, an irregular red jasper flake, and blade distal portion of foreign jaspilite. A possible explanation offered for the low artefact densities suggests that the lack of surface water in the area played a determining role in site settlement



selection. Other heritage material noted during the survey include a storeroom older than 60 years, as well as six cobble-covered graves.

Desktop Heritage survey of the Proposed Mamatwan Manganese Mine

A desktop heritage survey was conducted for the construction of a slimes handling and bulk water storage facility at the Mamatwan Mine. The area demarcated for the slimes handling and bulk water storage facility is located directly west of R380 secondary road and roughly 24 km northeast of the proposed Elengabadi Lymington project area. According to the desktop study, no national monuments, battlefields or historical cemeteries are known to exist in the immediate area. It is also mentioned that Stone Age scatters and historical buildings are associated with the general area, while Iron Age settlements tend to occur near riverbanks (Anderson 2016).

5. Archaeological and Historical Remains

This section serves as an indication of heritage material associated with the study area based on previous research, as well as historical aerial images and topographical maps.

5.1 Stone Age Remains

Several of the heritage studies conducted in the vicinity of the study area located Stone Age remains (see Van Der Walt 2019, Pelsler 2012, Beaumont 2011), while the study conducted by Anderson notes the presence of Stone Age sites in the general area. None of the studies, however, recorded high artefact densities. 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.

5.2 Iron Age Farmer Remains

Although stone-walled sites are often detectable on satellite and aerial imagery, none were observed within the demarcated prospecting area. Although not visible on satellite imagery, the presence of such sites might be obscured by dense vegetation and poor preservation. Also, the heritage study conducted by Anderson (2016) notes the potential presence of Iron Age sites near river banks. None of the conducted studies, however, recorded such sites.

5.3 Historical Remains

Site B01 was identified as an area associated with buildings on the 1957 aerial image (**Appendix A: Figure 20**). Buildings/infrastructure are also evident on all remaining datasets. Although the number of buildings could not be determined from the aerial images, the 1973/1974 topographical map shows the presence of two buildings and two kraals (**Appendix A: Figure 23**), while the 2001 topographical map also shows two buildings, but at different locations within the site boundary. The 2009/2013 topographical map (**Appendix A: Figure 25**), however, shows only one building (**Appendix A: Figure 26**). Since the buildings are shown at different



locations, the possibility exists that the buildings were demolished and replaced by modern buildings. However, it is also possible that inaccuracies occurred during the creation of the topographical maps.

Site B02 could not be detected on any of the aerial/satellite images, but was identified on the 1973/1974 topographical map as two buildings (**Appendix A: Figure 23**). The buildings are also omitted from the remaining topographical maps. The possibility therefore exists that the site might date to an earlier age, but might not be visible on aerial imagery. Since the site is not shown on subsequent topographical maps, it is assumed that the buildings were demolished between 1974 and 2001 (**Appendix A: Figures 23 & 25**).

The heritage study conducted by Pelser (2012) recorded ruins that could date to historical times, while Beaumont (2011) noted a storeroom older than 60 years.

5.4 Contemporary Remains

Evidence from satellite and aerial imagery, as well as topographical maps, indicate the presence of three sites (B03 – B05) that appear to date to contemporary times. These sites do not exceed 60 years of age. Only one of the sites (B03) is located on the Remaining Extent of the Farm Lymington 423, while the remaining sites are located on Portion 1 of the Farm Lymington 423.

Sites B03 and B04 appear to have been constructed between 1988 and 2001 (**Appendix A: Figures 24 & 25**). Both sites still appear to be associated with surface infrastructure. It should also be noted that based on the 2009/2013 topographical map (**Appendix A: Figure 26**), two of the buildings at Site B04 were demolished.

One site was identified on Google Earth satellite imagery dating to 2017 and appears still to be associated with surfaced infrastructure.

The heritage study conducted by Pelser (2012) noted building ruins that might date to contemporary times.

5.5 Graves

No graves, cemeteries or burial grounds were observed on historical aerial imagery and topographical maps. However, such sites are rarely visible on aerial imagery and are not always indicated on topographical maps. Such sites are also often associated with historical buildings and the possibility therefore exists that graves may be associated with the identified sites.

The heritage study conducted by Beaumont (2011) recorded six cobble-covered 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 (Act No. 25 of 1999), while other historical and cultural significant sites, places and features, are generally determined by community preferences.

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

6.1 Field Ratings

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

Table 3: 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

*These site ratings can only be assigned following a Phase 1 AIA.

7. Statement of Significance & Recommendations

7.1 Statement of Significance

The study area: Portion 1 and the Remaining Extent of the Farm Lymington 423.

As can be seen from previous research conducted in the area, the general region is significant from a heritage perspective. Heritage sites are likely to include Stone Age sites, cemeteries/burial sites and historical



structures. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.

Figure 19 indicates demolished sites and sites associated with surface remains that potentially date to the Historic Period, as well as a 500 m buffer area around water sources. The 500 m buffer area is considered to be potentially sensitive from a heritage perspective since archaeological sites are often located within this zone.

Site B01 is likely to be associated with intact historical infrastructure, while Site B02 is associated with demolished historical infrastructure. These sites are likely to exceed 60 years of age. The associated demarcated areas are therefore considered to be sensitive from a heritage perspective and should building remains dating to the Historic Period be present, such buildings might be protected by the NHRA (Act No. 25 of 1999). The remaining sites, whether intact or demolished, are of contemporary origin and are unlikely to be sensitive from a heritage perspective.



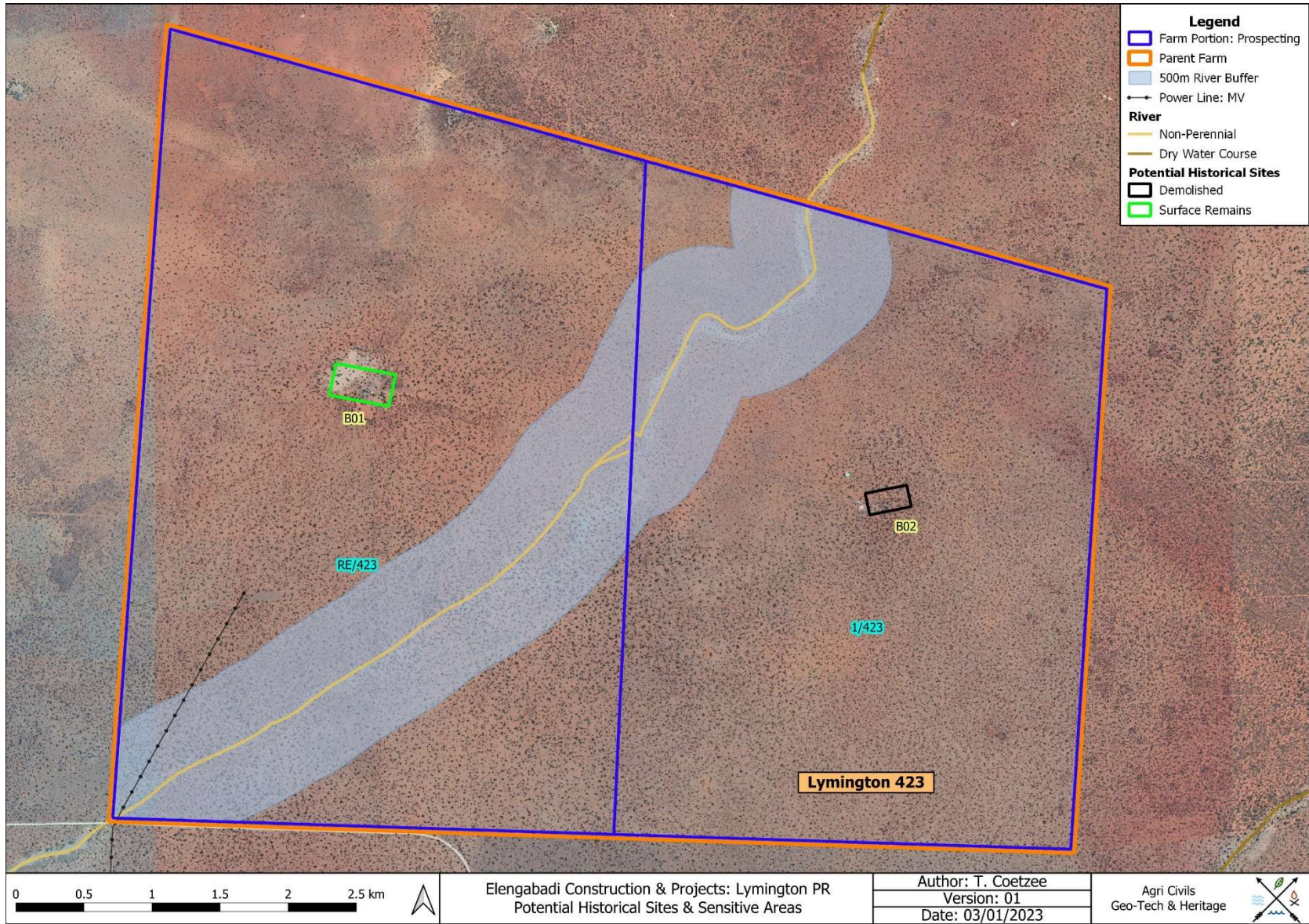


Figure 19: Potential Sites & Sensitive Areas.



7.2 Recommendations

The following recommendations are made in order to avoid the destruction of heritage remains within the area demarcated for prospecting:

- Although Site B02 appears not to be associated with historical surface remains, subsurface culturally significant material might be present. The possibility also exists that historical surface remains exceeding 60 years of age are present, but are not detectable on aerial imagery. Therefore, it is recommended that the demarcated area be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should first inspect the site in order to determine the potential presence of surface remains.
- The buildings associated with Site B01 might exceed 60 years of age. These sites are likely to be significant from a heritage perspective and should be avoided by the proposed prospecting activities.
- The remaining sites (B03 – B05) do not exceed 60 years of age and are unlikely to be significant from a heritage perspective. However, should impact to the sites be unavoidable, it is recommended that a qualified archaeologist first inspect the sites.
- The 500 m buffer zone surrounding the non-perennial river is potentially sensitive from a heritage perspective and it is therefore recommended that this area be avoided by the proposed prospecting activities. Should impact to the river buffer zone be unavoidable, it is recommended that a qualified archaeologist first inspect the area.
- 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.
- Should it be required, a qualified archaeologist may inspect the proposed prospecting localities once available, and provide recommendations that will aid the protection of heritage resources.
- Prospecting should not take place in the vicinity of stone cairns, potential burial sites, stone-walling, building ruins or any other heritage sites, material or structures.
- Should the prospecting outcome result in further development or construction, a full Phase 1 Archaeological Impact Assessment must be conducted on the affected area if triggered. Also, a full Phase 1 AIA must be conducted should the cumulative impact of the proposed prospecting exceed 0.5 ha.



- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the prospecting phase, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed, 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, prospecting may proceed on the demarcated portions, subject to the abovementioned conditions and recommendations.

8. Conclusion

The proposed Elengabadi Lymington project that consists of the prospecting of manganese and iron ore on Portion 1 and the Remaining Extent of the Farm Lymington 423 covers approximately 3080.7 ha. The general area is characterised by open bushveld of which the use is unknown. The Archaeological Desktop Study examined the area using a combination of historical aerial imagery, historical topographical maps, contemporary satellite imagery, as well as written sources and previous heritage studies conducted in the area. Two potentially historical intact/demolished building sites and three areas consisting of intact contemporary buildings were noted. These areas, as well as the 500 m buffer zone, should be avoided by the proposed prospecting activities. Since Stone Age, potentially historical sites and graves have been recorded by previous heritage studies in the greater area, the study area is potentially significant from a heritage perspective.

Should the recommendations made in this study be adhered to, the proposed Elengabadi Lymington prospecting 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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Appendix A: Historical Aerial Imagery & Topographical Maps



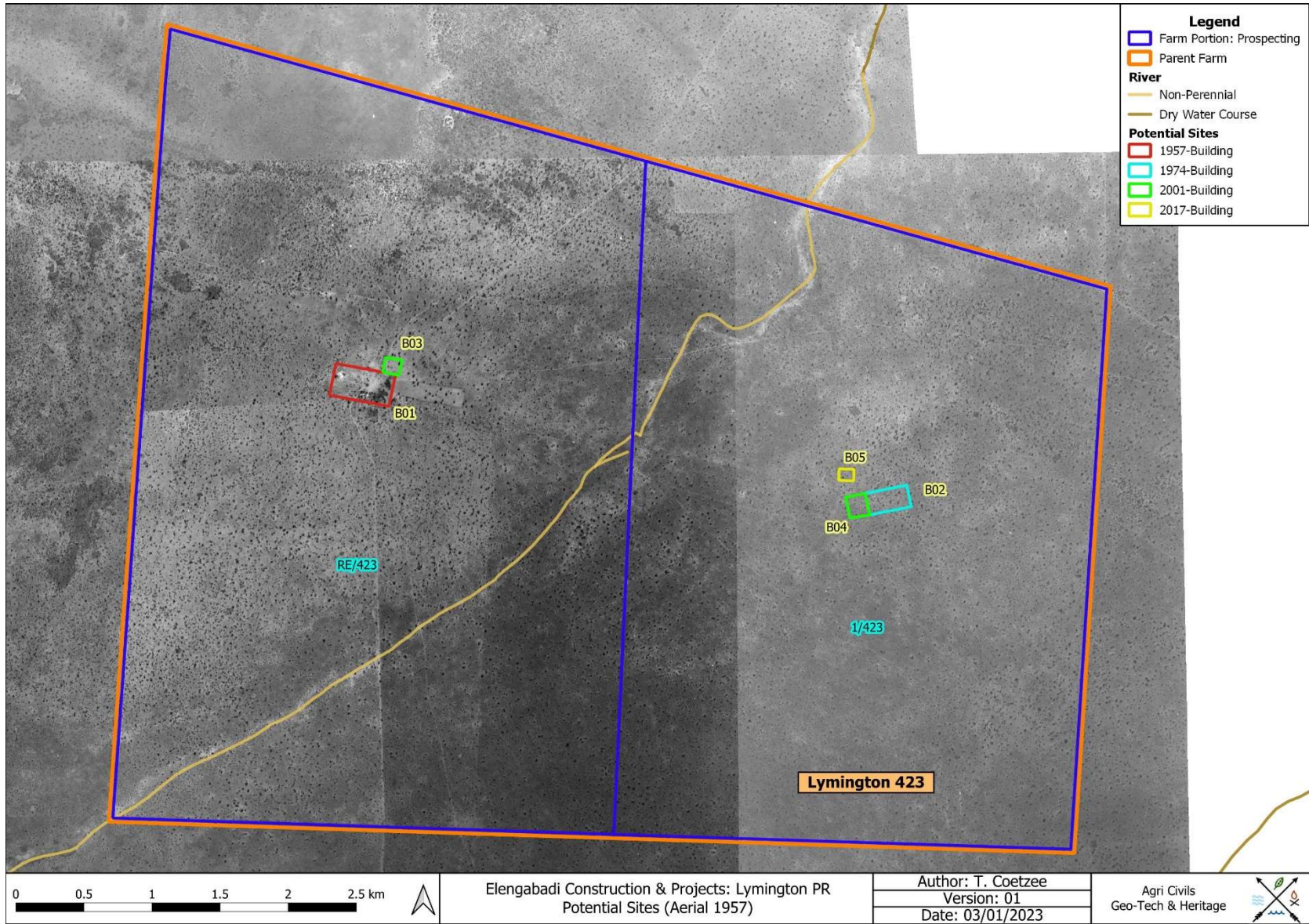


Figure 20: 1957 Aerial image of the study area.



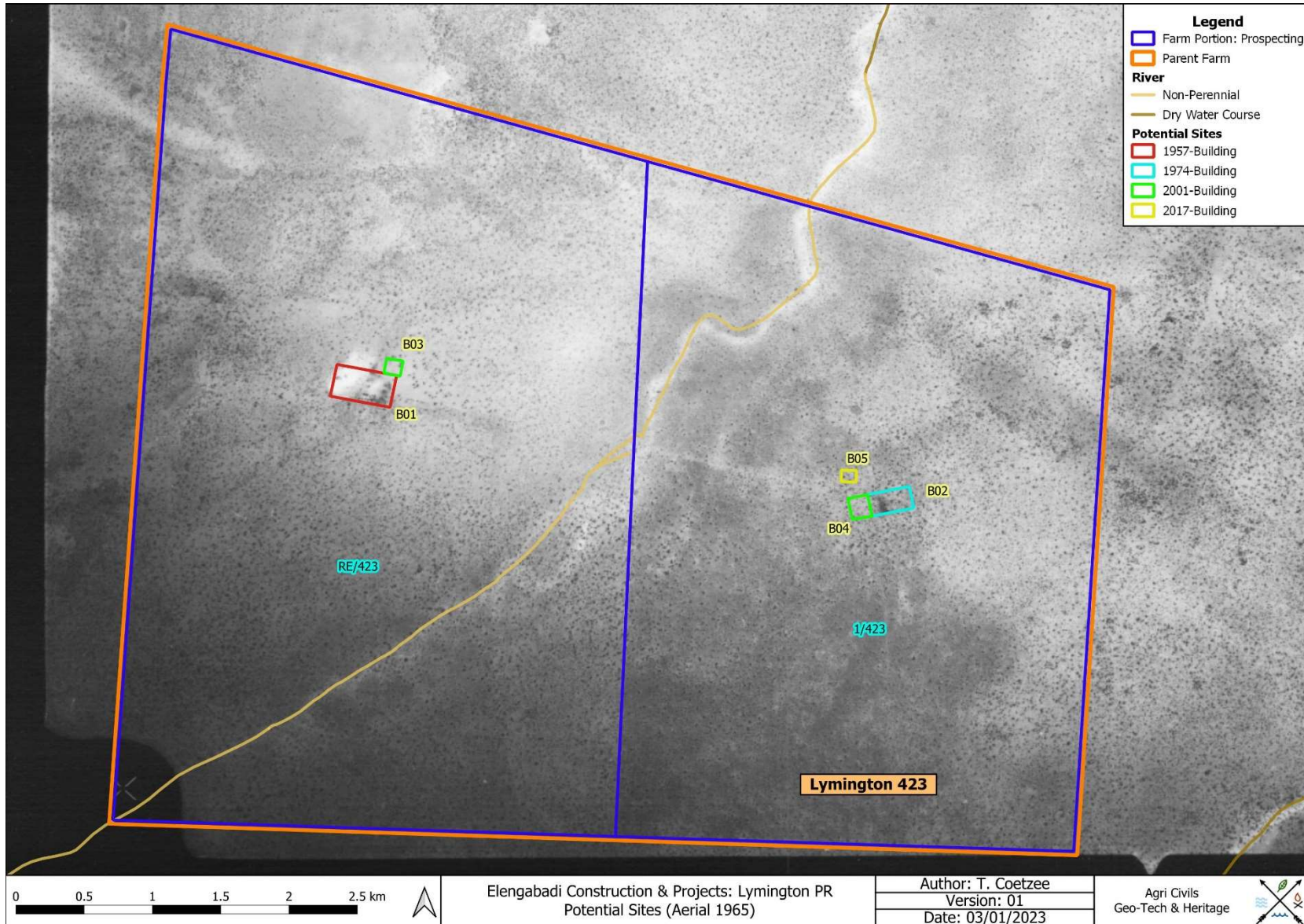


Figure 21: 1965 Aerial image of the study area.



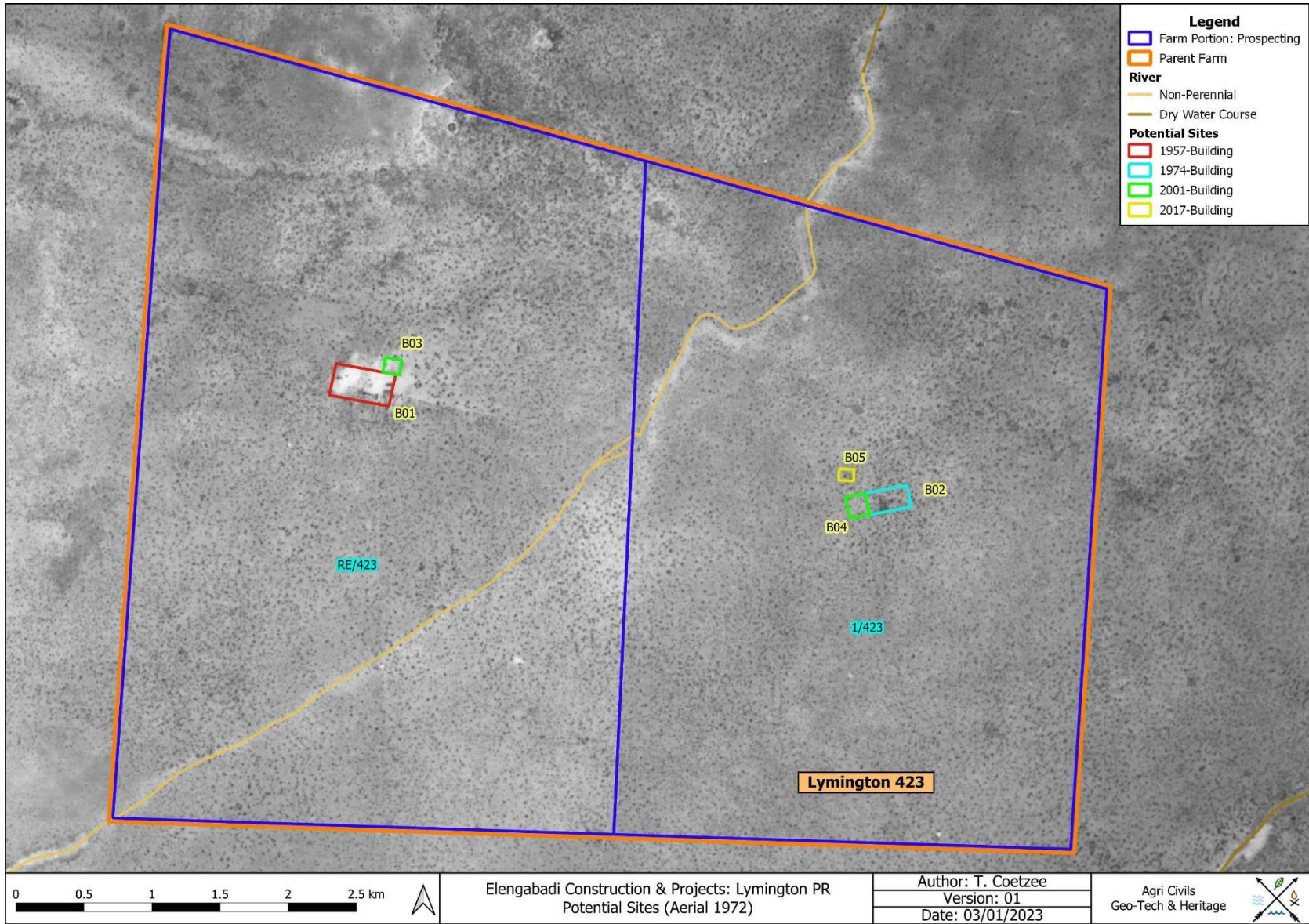


Figure 22: 1972 Aerial image of the study area.



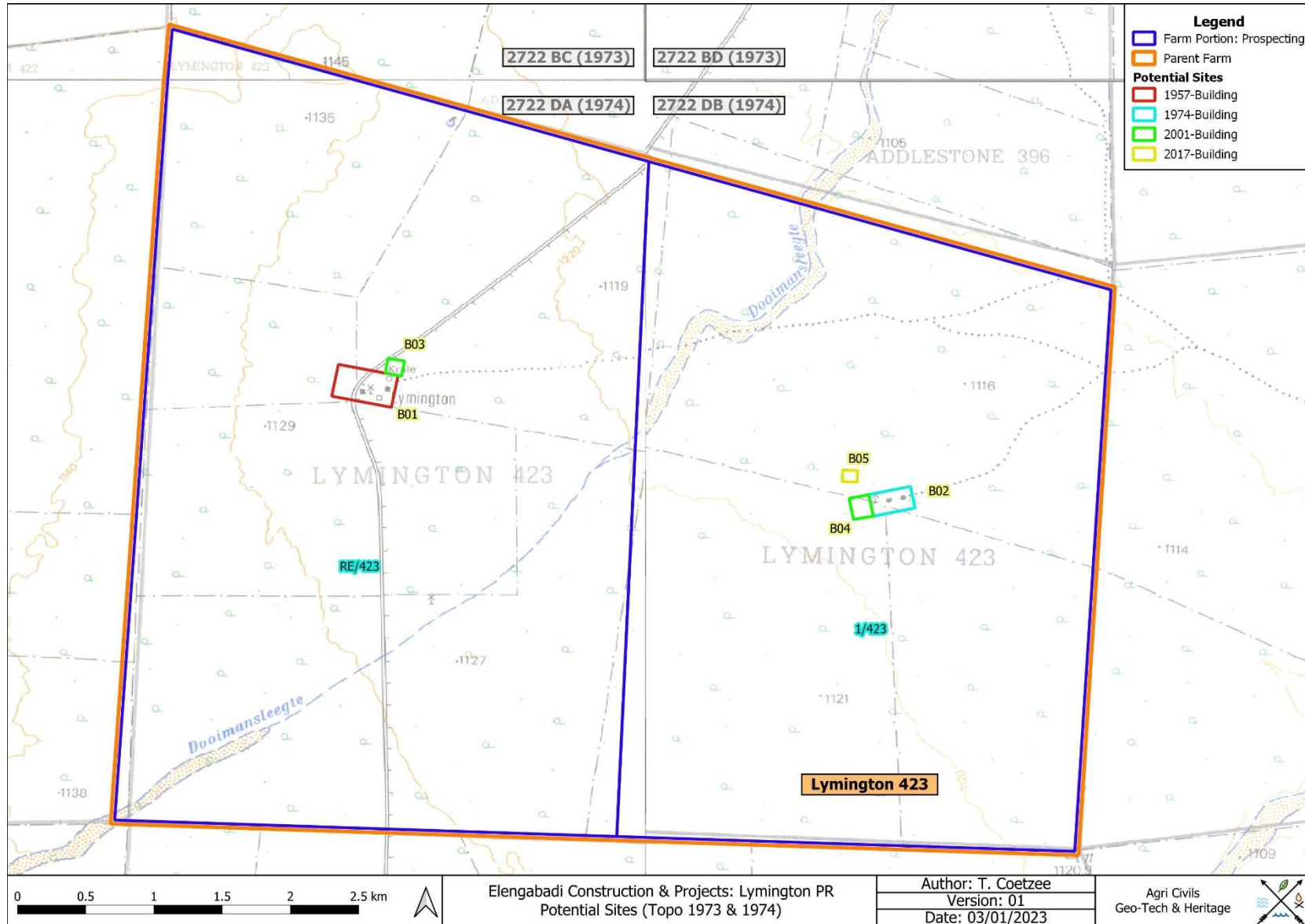


Figure 23: Segments of 1973 and 1974 1:50 000 2722 BC, BD, DA and DB indicating the study area.



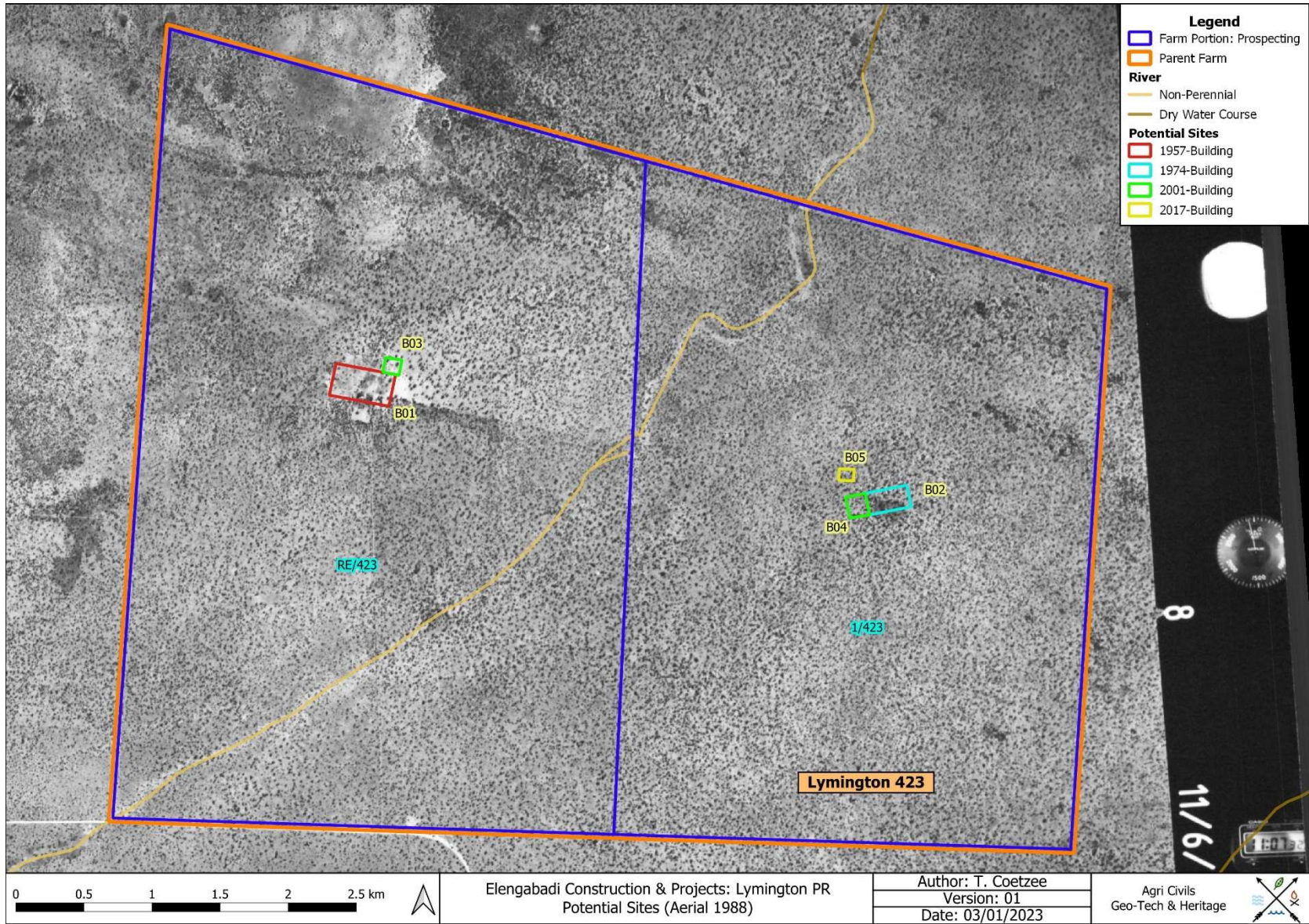


Figure 24: 1988 Aerial image of the study area.



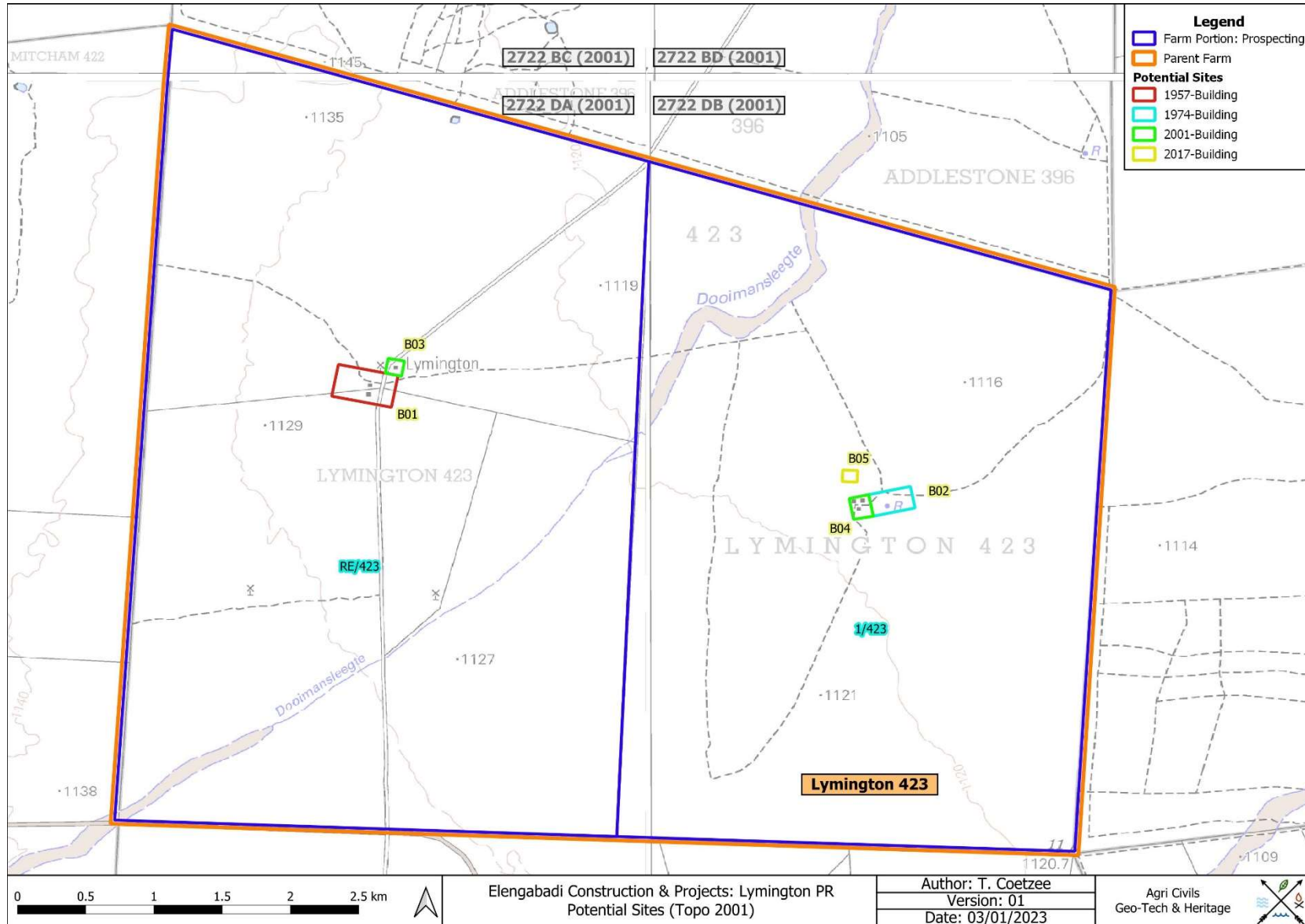


Figure 25: Segments of 2001 1:50 000 2722 BC, BD, DA and DB indicating the study area.



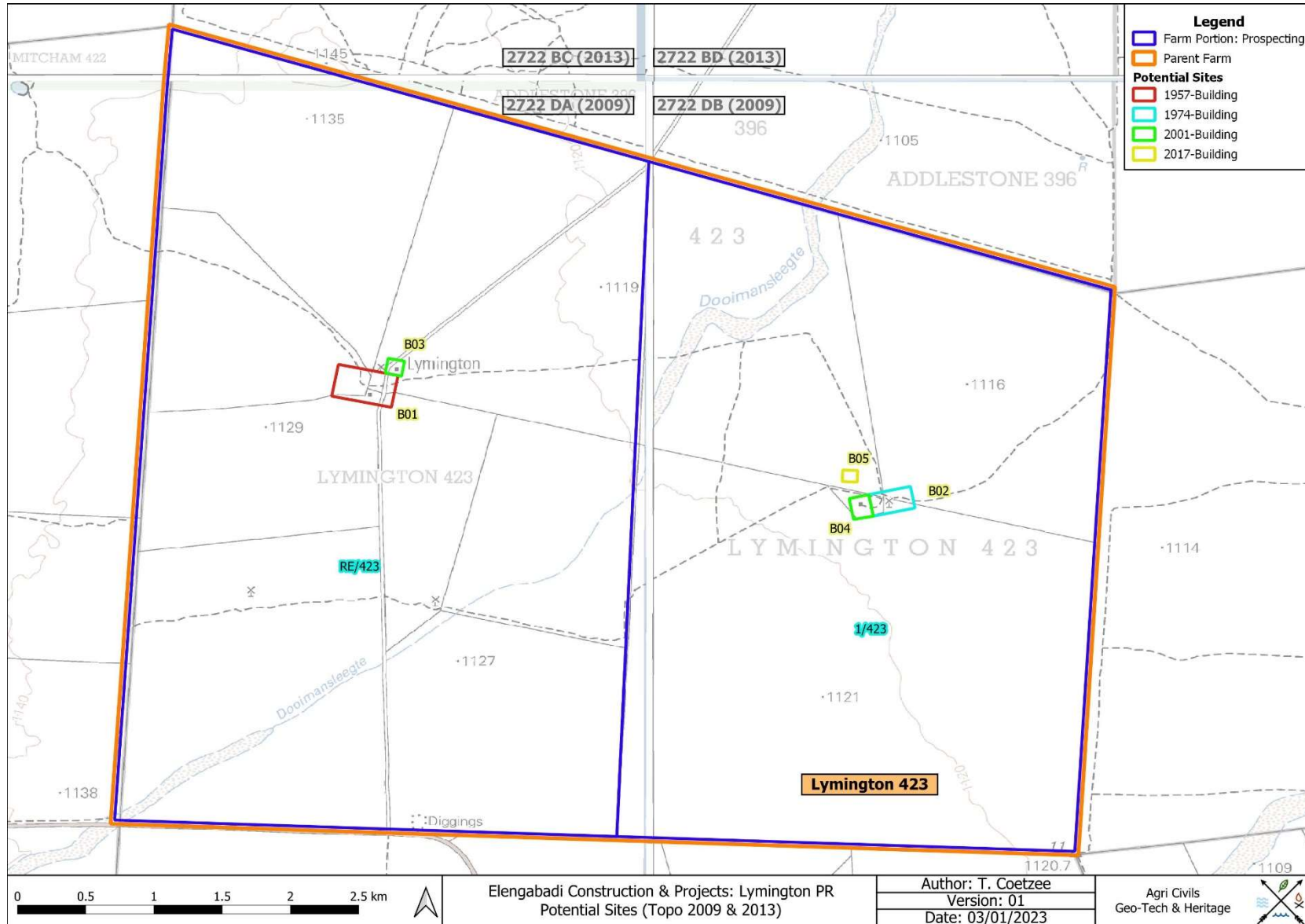


Figure 26: Segments of 2009 and 2013 1:50 000 2722 BC, BD, DA and DB indicating the study area.

