ARCHAEOLOGICAL DESKTOP STUDY

for the Application of a Prospecting Right on the Farm Standard Salt Pan 1959 and Portions 1 & 3 of the Farm Witkraal 878, Petrusburg, Free State

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

Date: 28 September 2021

Executive Summary

The author was appointed by Eco Elementum (Pty) Ltd to undertake an Archaeological Desktop study for Limestone Mining (Pty) Ltd on the listed Farm Portions (**Table 1)** within the Letsemeng Local Municipality in the Free State Province. The study area is located roughly 18 km northeast of Petrusburg and 57 km south-southeast of Boshof. 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 eight sites consisting of buildings and structures were noted on historical topographical maps and aerial imagery (**Table 2**). Based on contemporary satellite imagery, three of these sites are associated with surface remains, while five appear to have been demolished as no surface remains are visible on satellite imagery. Although no surface remains are evident, subsurface culturally significant material might still be present. The demarcated sites should be avoided by the proposed prospecting activities. No streams or steep gradients that might indicate a potentially sensitive archaeological environment were noted on the available data sources. A full Phase 1 AIA (Archaeological Impact Assessment) must be done should any development that triggers an AIA 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

NTM – National Treasure Minerals

SAHRA – South African Heritage Resources Agency

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1. Project Background

1.1 Introduction

Eco Elementum (Pty) Ltd appointed the author to undertake an Archaeological Desktop study for Limestone Mining (Pty) Ltd on the Farm Standard Salt Pan 1959 and portions 1 and 3 of the Farm Witkraal 878 within the Letsemeng Local Municipality in the Free State Province. The study area is located roughly 18 km northeast of Petrusburg (**Figure 1**) while the intersecting farm portions are listed in **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 is provided and the study area is contextualised in terms of heritage resources. The prospecting application is for limestone and salt. 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.

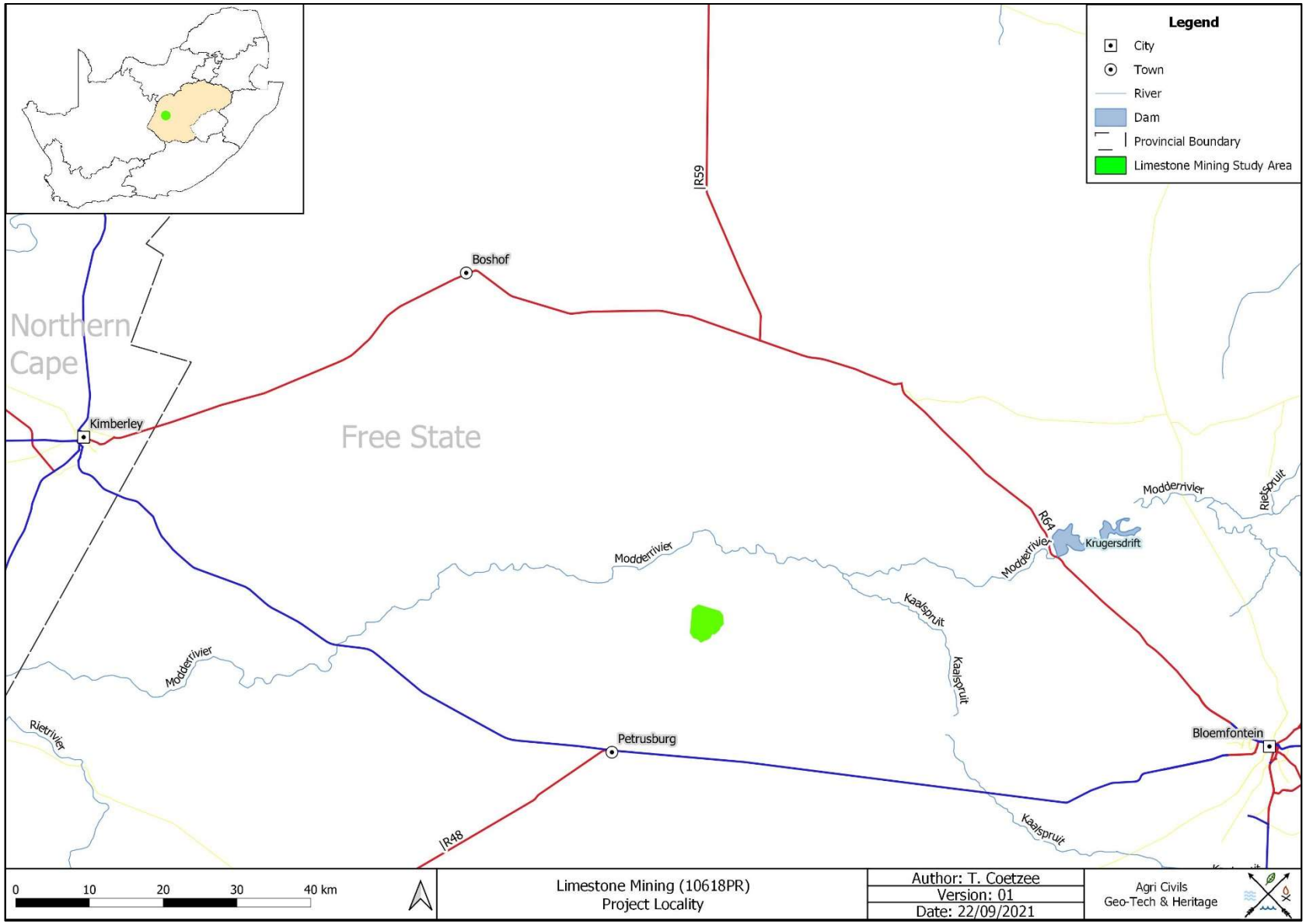

Figure 1: Regional and provincial location of the study area.

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)

Human Tissue Act and Ordinance 7 of 1925

The Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC 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 Limestone Mining (Pty) Ltd project is situated on the properties listed in **Table 1**.

Table 1: Property name & coordinates.

Property	Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Extent (ha)
Witkraal 878	1/878	282 5DC	-28.962128	25.530138	428.8
Witkraal 878	3/878	282 5DC	-28.952339	25.521920	0.6
Standard Salt Pan 1959	0/605	282 5DC	-28.973315	25.526006	266.2
Total					**695.6**

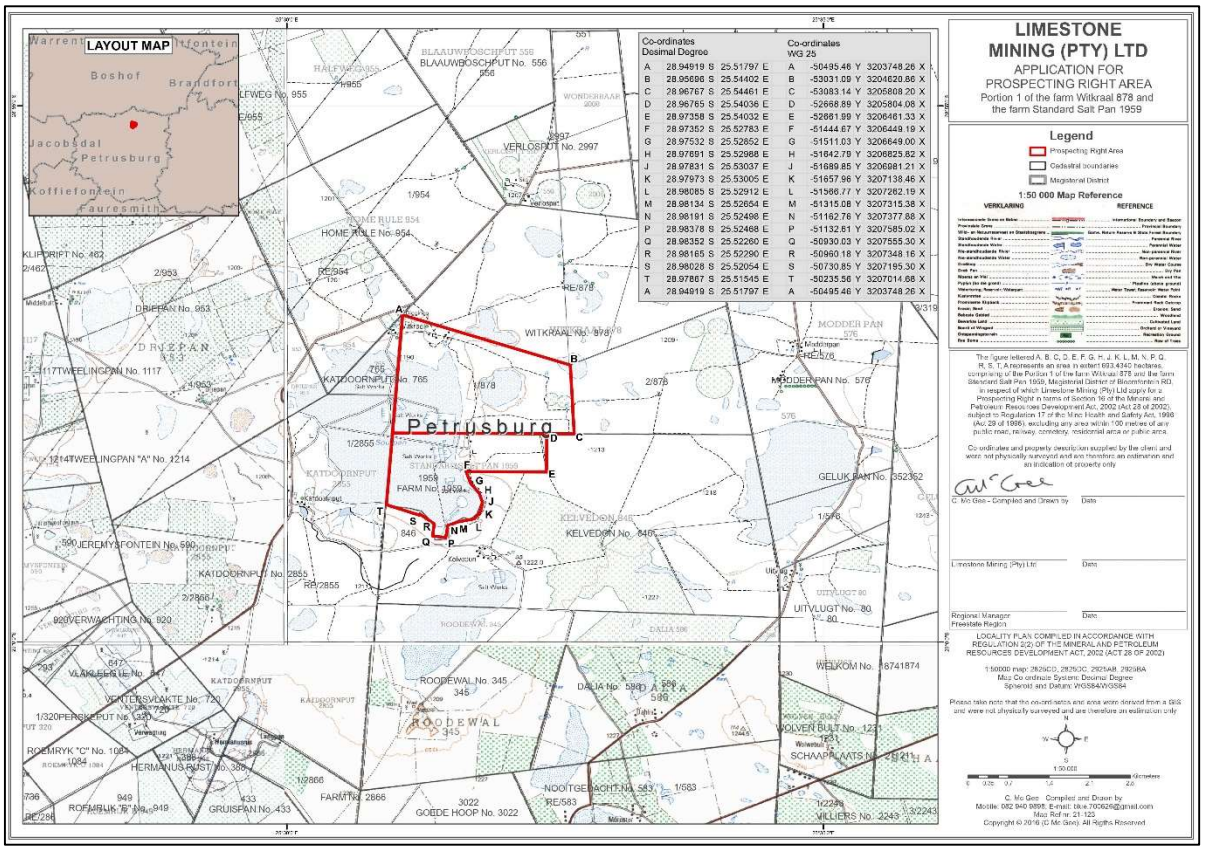

Figure 2: Proposed layout map (Provided by Eco Elementum 2021).

Petrusburg is located roughly 18 km to the southwest of the proposed prospecting area, while Boshof is located 57 km to the north-northwest and Bloemfontein 72 km to the east-southeast. The demarcated farm portions fall within the Letsemeng Local Municipality and the Xhariep District Municipality in the Free State Province. The N8 national road runs east-west approximately 16 km to the south, while the R64 primary road runs 32 km to the north.

In terms of vegetation, the study area falls within the Grassland Biome which is typically associated with summer rainfall regions. This Biome covers approximately 28% of South Africa. Locally, the study area falls within the Bloemfontein Dry Grassland vegetation unit, while two areas consist of salt pans. Bloemfontein Dry Grassland is found in the Free State Province and is associated with the south-central part of the province. The unit extends from Petrusburg in the west to the Rustfontein Dam in the east and from Reddersburg in the south to the Soetdoring Nature Reserve in the north. This vegetation type is considered endangered with a conservation target of 24%. Only a small portion is statutorily conserved in the Soetdoring Nature Reserve and more than 40% has already been transformed, mainly by crop cultivation and urban development. Erosion characteristics vary between very low, low and moderate (Mucina & Rutherfords 2006).

According to Mucina & Rutherfords (2006), the average elevation for Bloemfontein Dry Grassland varies between 1200 and 1480 MASL (metres above sea level). The average elevation for the study area is roughly 1200 MASL and slopes from the slightly more elevated eastern section to the lower western section.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 496 mm per year. The average maximum temperature for the study area is recorded during January when an average of 24.7 ºC is reached. On average, July is the coldest month with a temperature of 9.9 ºC (Climate-data.org 23/09/2021).

The study area falls within the C52K Quaternary Catchment of the Orange Water Management Area. The closest perennial river to the study area is the Modder River that flows approximately 9 km to the north. The Krugersdrift Dam is located 45 km to the east.

Access to the site appears to be through local roads turning from the N8 national road. The majority of the study area appears to consist of salt pans while smaller sections are cultivated. Buildings are evident on the Farm Standard Salt Pan 1959, as well as on Portions 1 and 3 of the Farm Witkraal 878 Portions. These buildings are likely to be associated with current salt mining activities on the demarcated study area.

2.2 Project description

The prospecting right application for limestone and salt covers about 695.6 ha (**Figures 3 & 4**). For the prospecting phase, however, several sites will be selected for geotechnical drilling. These boreholes and its associated activities will impact on a surface area of between 250 and 625 m². The full extent of the drill site will also be demarcated and no drilling will be done outside of the boundary.

Prospecting activities will include the following:

Current access roads will be used as far as possible, but in cases where access roads to drill sites do not exist, a single track will be selected based on the area where the least environmental impact will occur. The same tracks will be used should repeated access be required. Vegetation and topsoil excavated during the drilling process will be stockpiled next to sumps where it will serve as a storm water diversion berm. On completion of the drilling process, the rehabilitated sumps will be backfilled with the stockpiled material. Because a constant water supply is needed for the drilling process, 15 000l will be stored in tanks. The plastic-lined sumps will be used to recycle water through a filter process in order to maintain a constant clean water source for the purpose of drilling. In terms of potable water for employees and workers, a temporary 260l tank will be placed on-site. Additional facilities will include temporary portable toilets, berms, and a maximum of 60m³ of diesel fuel located on an impermeable surface with bunds.

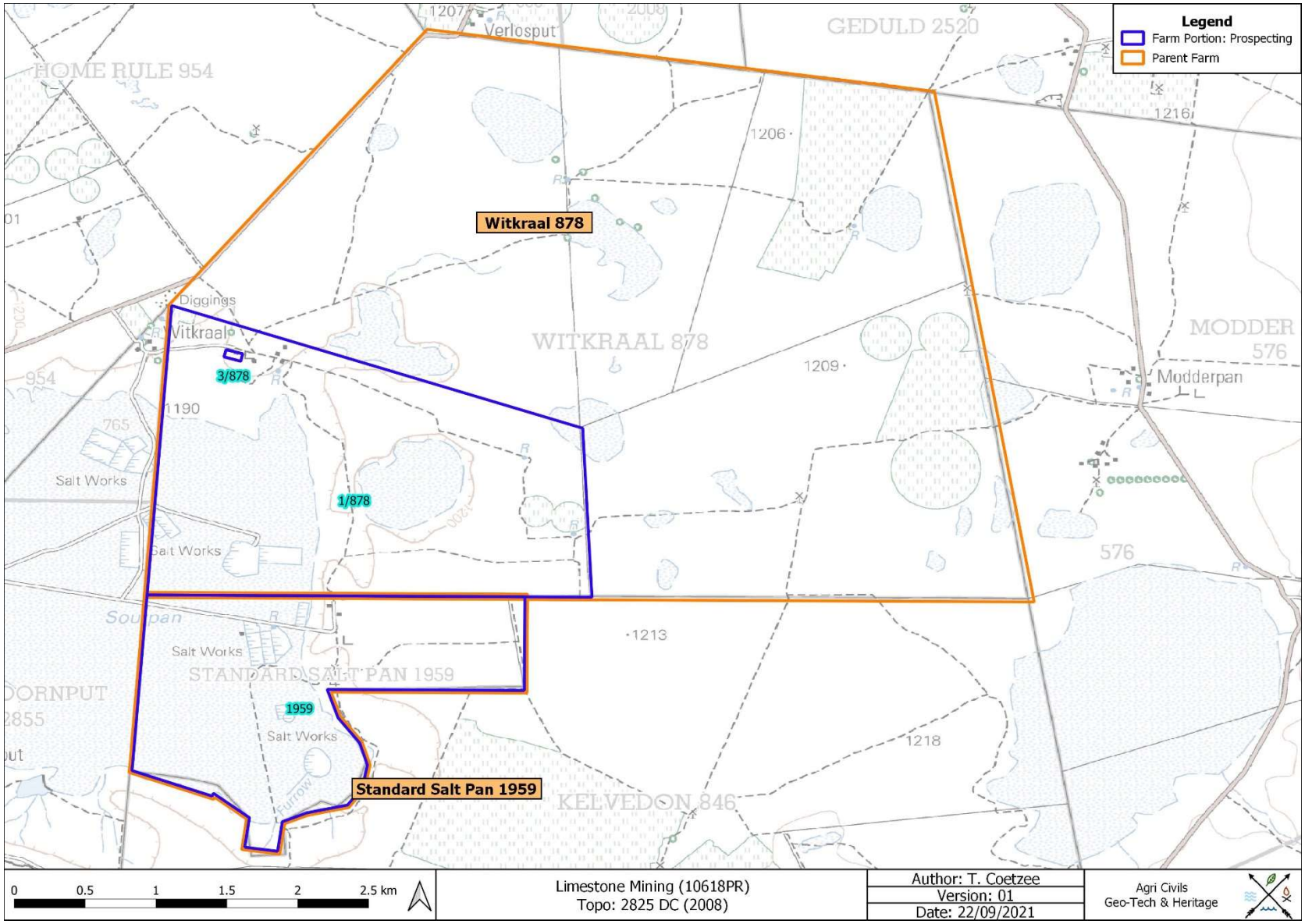

Figure 3: Segment of SA 1:50 000 2825 DC indicating the farm portions demarcated for prospecting.

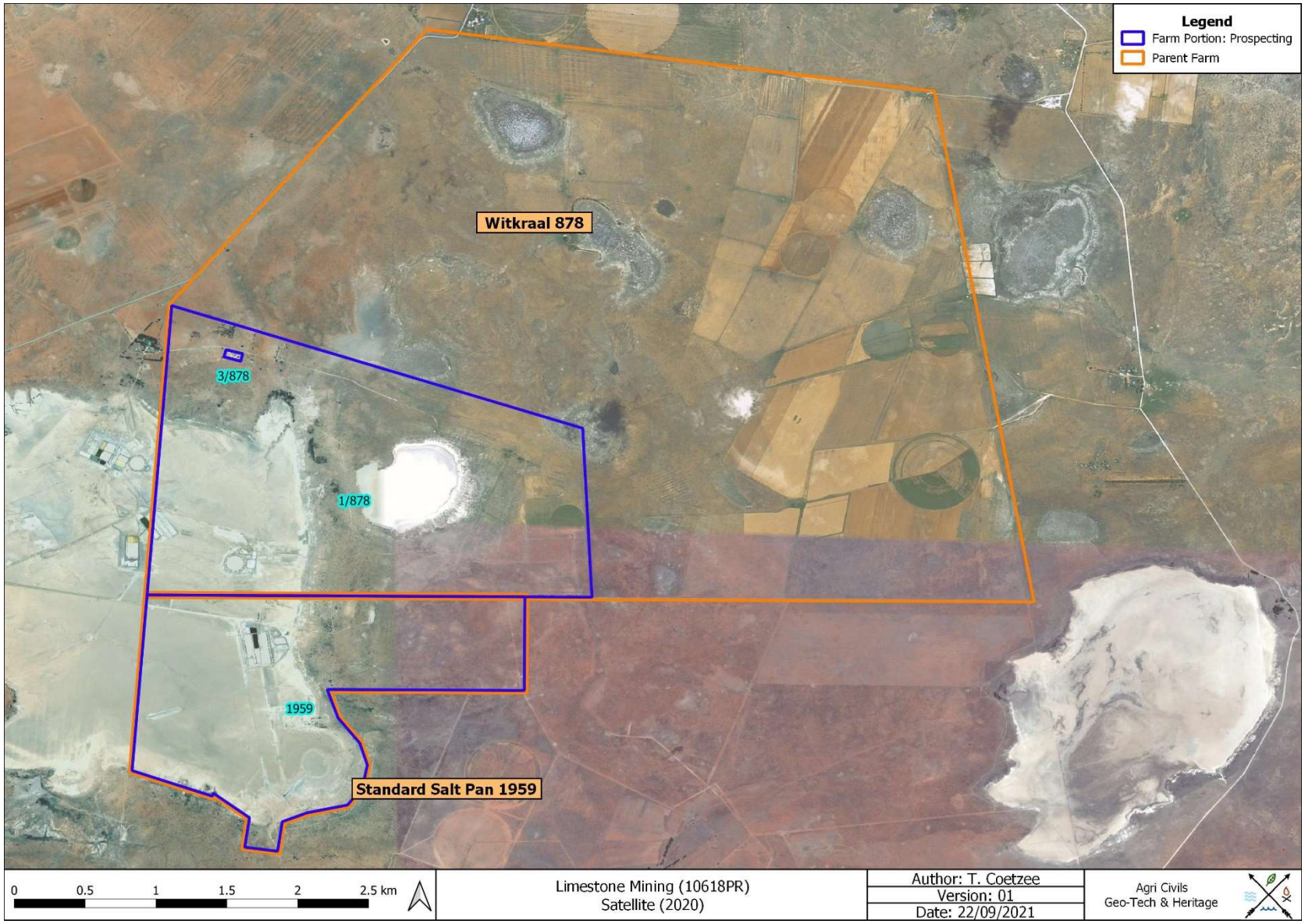

Figure 4: Proposed prospecting area portrayed on a 2020 satellite image.

3. 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.

3.1 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. **Figures 5 – 7** below shows examples of stone tools often associated with the ESA, MSA and LSA of southern Africa.

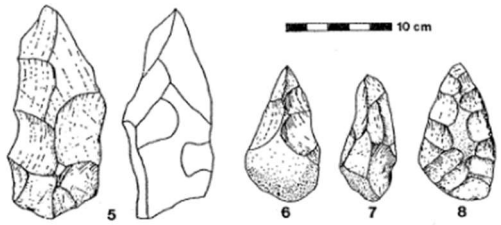

Figure 5: ESA artefacts from Sterkfontein (Volman 1984).

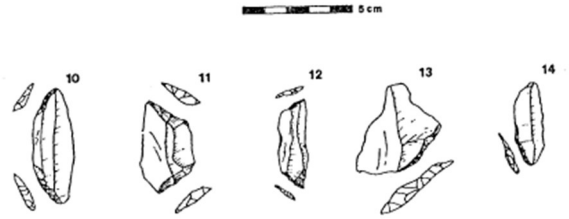

Figure 6: MSA artefacts from Howiesons Poort (Volman 1984).

Figure 7: LSA scrapers (Klein 1984).

3.2 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.

Figures 8 – 15 are examples of heritage sites sometimes encountered – such areas should be avoided.

Figure 8: Example of undecorated potsherds.

Figure 9: Example of a decorated potsherd.

Figure 10: Example of a potential granary base.

Figure 11: Example of a stone-walled site.

Figure 12 : Example of a broken lower grinding stone.

Figure 13: Example of a dilapidated stone-walled site.

Figure 14: Example of a historical building.

Figure 15: Example of a potential informal grave.

3.3 Previous Heritage Studies

Mercury – Perseus 400 kV Transmission Line

The heritage study conducted for the construction of a 400 kV transmission line along three potential routes between Orkney and Dealsville consisted of a scoping review of heritage resources that are likely to be encountered in the study area. Although all three route options were considered to be of low cultural significance, route option two was considered to be the least likely option to impact heritage resources. The report also mentions the likely presence of stone age sites, as well as early Tswana-speaking iron age sites, Anglo Boer War battlefields, farmsteads and cemeteries. One of the Mercury – Perseus transmission line routes passes the proposed prospecting area approximately 3 km to the east (Van Schalkwyk 2003).

Bolokanang Township Extension

The HIA done for the development of the Bolokanang Township extension directly south of Petrusburg, recorded no sites on the specific area. The Bolokanang Township extension is located approximately 20 km southwest of the proposed prospecting site (Dreyer 2006).

Drilling site at Treurhoek / Doorndam

A Heritage Impact Assessment for a drilling site at Treurhoek / Doorndam to the southeast of Boshof was conducted by Morris (2016). The inspected area measured approximately 80 m X 20 m. The study, done on an area located approximately 10 km northwest of the proposed Limestone Mining prospecting project, revealed two weathered flakes that possibly date to the MSA. It was noted that such surface finds lack archaeological integrity and are therefore of low significance. Two cemeteries were recorded as well. Mention is also made of the presence of ESA, MSA, LSA, as well as stone-walled settlements and rock engravings in greater study area.

4. 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.

5. Statement of Significance & Recommendations

5.1 Statement of significance

The study area: The Farm Standard Salt Pan 1959 and Portions 1 & 3 of the Farm Witkraal 878, Free State

As can be seen from previous research done in the area, the general region is significant from a heritage perspective. Heritage sites are likely to include ESA, MSA and LSA sites, rock engravings, as well as Tswana-speaking iron age sites, Anglo Boer War battlefields, farmsteads and cemeteries. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.

The **Appendix A** figures indicate the study area on 1969, 1986 and 2008 topographical maps, as well as on 1956, 1965, 1975 and 1986 aerial images, while **Table 2** lists the potential sites, type of site, location, estimated extent and current status as observed on contemporary satellite imagery. **Figure 16** indicates the identified potential sites.

The historical aerial images indicate activity at the salt pans and the presence of buildings to the northeast and east thereof since at least 1956 (**Appendix A: Figure 17**). Fewer buildings are noted by 1965 (**Appendix A Figure 18**) and by 1975 (**Appendix A: Figure 20**) cultivated fields are visible in the north-eastern corner, south-eastern corner and directly east of the salt large salt pan. Activities at the salt pan appear to have remained

largely the same during these times. These observations are also reflected by the historical topographical maps.

Eight potential sites were identified on the historical aerial images and topographical maps: Four on the Farm Standard Salt Pan 1959 and four on Portion 1 of the Farm Witkraal 878. All the observed sites are associated with buildings. Three sites are associated with surface remains as observed on contemporary satellite imagery. The remaining five sites appear to have been demolished as no surface features are noted on contemporary satellite imagery, but might be associated with subsurface culturally significant remains. It is also unknown whether the sites associated with intact buildings have been demolished and replaced by modern buildings.

Site B01 is indicated as a building in the salt pan on the 1969 topographical map (**Appendix A: Figure 19**). The site is located on Portion 1 of the Farm Witkraal 878. Due to poor resolution, no structures are visible on the historical aerial images. Contemporary satellite imagery, however, show the presence of buildings.

Site B02, located in the salt pan on the Farm Standard Salt Pan 1959, was identified as a building on the 1965 aerial image (**Appendix A: Figure 18**). The building is not visible on the 1956 aerial image (**Appendix A: Figure 17**), but is shown on the 1969 topographical map (**Appendix A: Figure 19**). Due to poor image resolution, the building is not visible on the 1975 aerial image (**Appendix A: Figure 20**). The building is also not visible on the 1986 aerial image and topographical map. This suggests that the building was constructed between 1956 and 1965, and was demolished by 1986. Contemporary satellite imagery shows the absence of buildings and structures.

Site B03 is located on Portion 1 of the Farm Witkraal 878 and was identified on the 1956 aerial image (**Appendix A: Figure 17**) as an area associated with several buildings. The majority of these buildings were demolished by 1965, while several additional buildings appear as well (**Appendix A: Figure 18**). Some buildings and structures are still visible on contemporary satellite imagery. Some of the buildings and structures associated with this area therefore predate 1956, while others were constructed between 1956 and 1965.

Site B04 is located directly south of Site B01 and is also located in the salt pan on Portion 1 of the Farm Witkraal 878. The site was identified as a building on the 1956 aerial image (**Appendix A: Figure 17**), but appears to have been demolished by 1965 (**Appendix A: Figure 18**). Contemporary satellite imagery shows the absence of buildings or structures.

Sites B05 and B07, identified as buildings on the 1956 aerial image (**Appendix A: Figure 17**), are located directly east of the salt pan on the Farm Standard Salt Pan 1959. Building is also visible on the 1965 and 1975 aerial images, as well as on the 1969 topographical map (**Appendix A: Figures 18 – 20**). By 1986 (**Appendix**

A: Figures 21 & 22), however, the buildings appear to have been demolished. Contemporary satellite imagery shows the absence of buildings and structures.

Site B06, identified as buildings on the 1956 aerial image (**Appendix A: Figure 17**), is located directly east of the salt pan on the Farm Standard Salt Pan 1959. Buildings are also visible on the 1965 and 1975 aerial images (**Appendix A: Figures 18 & 20**), but the 1969 topographical map (**Appendix A: Figure 19**) only shows one building on the northern boundary of the site. By 1986 (**Appendix A: Figures 21 & 22**), however, the buildings appear to have been demolished. Contemporary satellite imagery shows the absence of buildings and structures.

Site B08, located to the north of the salt pan on Portion 1 of the Farm Witkraal 878, was identified as an area associated with buildings on the 1965 aerial image (**Appendix A: Figure 18**). The buildings are not visible on the 1956 aerial image (**Appendix A: Figure 17**), but are shown on the 1975 and 1986 aerial images, as well as on the 1969 and 1986 topographical maps (**Appendix A: Figures 19 & 22**). Fewer buildings are shown on the 2008 topographical map (**Appendix A: Figure 23**). Contemporary satellite imagery, however, show the presence of buildings.

Should any parts of the four sites observed on the 1956 aerial image still exist, whether on the surface or at a subsurface level, it would be at least 65 years old and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999. Since the three sites identified on the 1965 aerial image might have been constructed between 1956 and 1965, the sites might exceed 60 years of age as well and would therefore also be protected by the NHRA 25 of 1999. The building identified on the 1969 topographical map is not visible on the historical aerial images. This might be attributed to poor image resolution and the possibility exists that the building exceeds 60 years of age and should therefore be considered potentially significant from a heritage perspective. It should also be noted that streams and steep gradients are often associated with heritage sites. No such areas, however, were noted on the available data sources.

Table 2: Potential site location.

Site No	Type	Parent Farm	Farm Portion	Current Status	Estimated Extent (ha)	Lat (y)	Lon (x)
B01	Building	Witkraal 878	1	Structures	0.6	-28.965075	25.523050
B02	Building	Standard Salt Pan 1959	0	Demolished	0.5	-28.969471	25.523910
B03	Building	Witkraal 878	1	Structures	28.5	-28.954593	25.527358
B04	Building	Witkraal 878	1	Demolished	0.4	-28.966255	25.523083
B05	Building	Standard Salt Pan 1959	0	Demolished	0.5	-28.971333	25.527968
B06	Building	Standard Salt Pan 1959	0	Demolished	2.3	-28.973025	25.529809
B07	Building	Standard Salt Pan 1959	0	Demolished	0.2	-28.972227	25.528792
B08	Building	Witkraal 878	1	Structures	4.3	-28.951753	25.524072

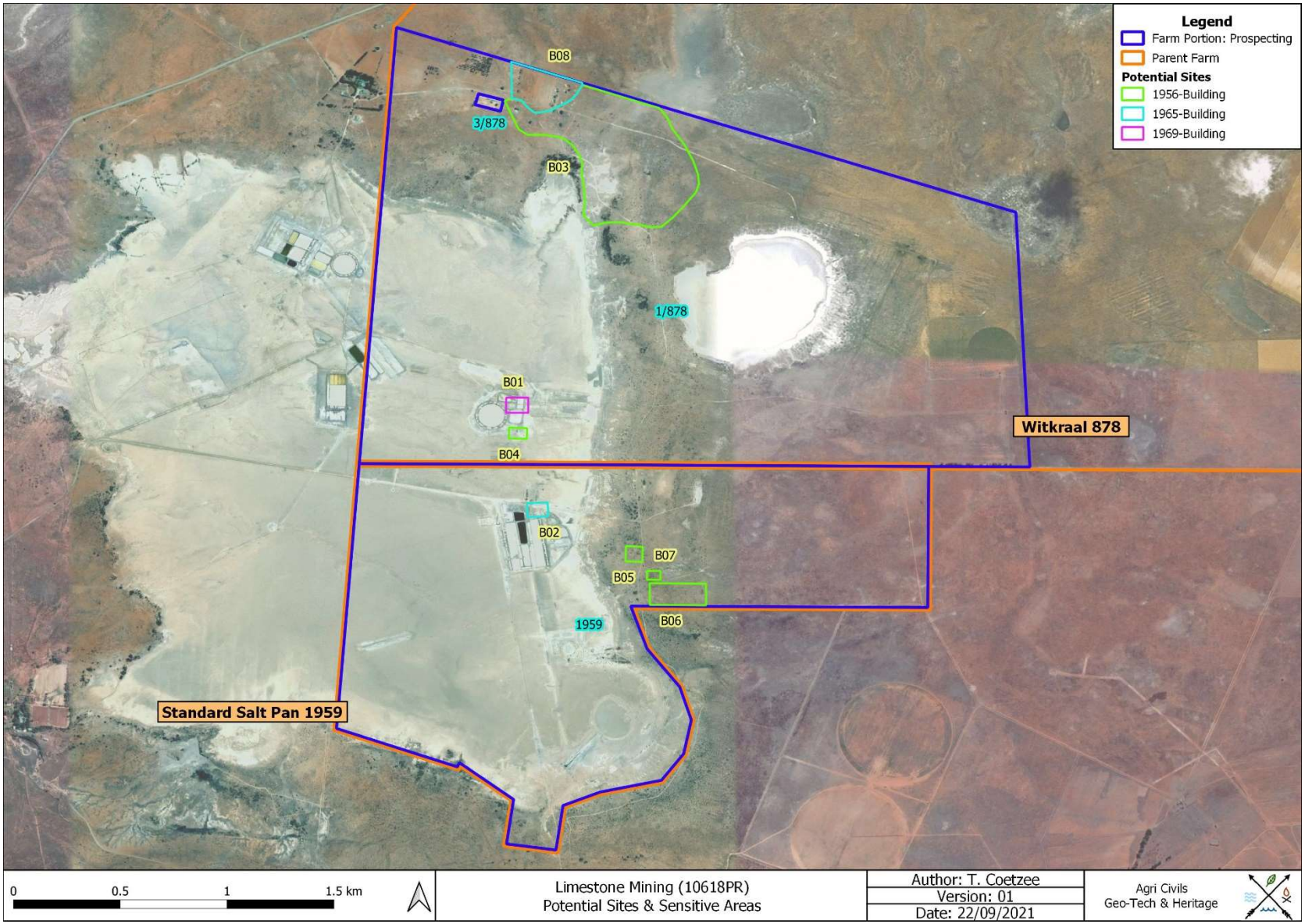

Figure 16: Potential Sites & Sensitive Areas.

5.2 Recommendations

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

- Although the three demolished sites dating to 1956 and the two demolished sites dating to 1965 (**Table 2**) appear not to be associated with surface remains, subsurface culturally significant material might be present (B02, B04, B05, B06, B07). Therefore, it is recommended that these sites be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should be present on-site during prospecting in order to limit potential impact on heritage resources.

- The three sites (B01, B03, B08) associated with surface remains (**Table 2**) might be of cultural significance as the possibility exists that the associated buildings and structures exceed 60 years of age. It is therefore recommended that the demarcated areas be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should be present on-site during prospecting in order to limit potential impact on heritage resources.

- It is advised that a qualified archaeologist be contacted whenever uncertainty regarding potential heritage remains exists.

- Prospecting should not take place in the vicinity of stone cairns, potential burial sites, stone-walled sites, building ruins or any other heritage 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 done 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.

6. 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 selvage 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.

7. References

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

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

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

Appendix A: Historical Aerial Imagery & Topographical Maps

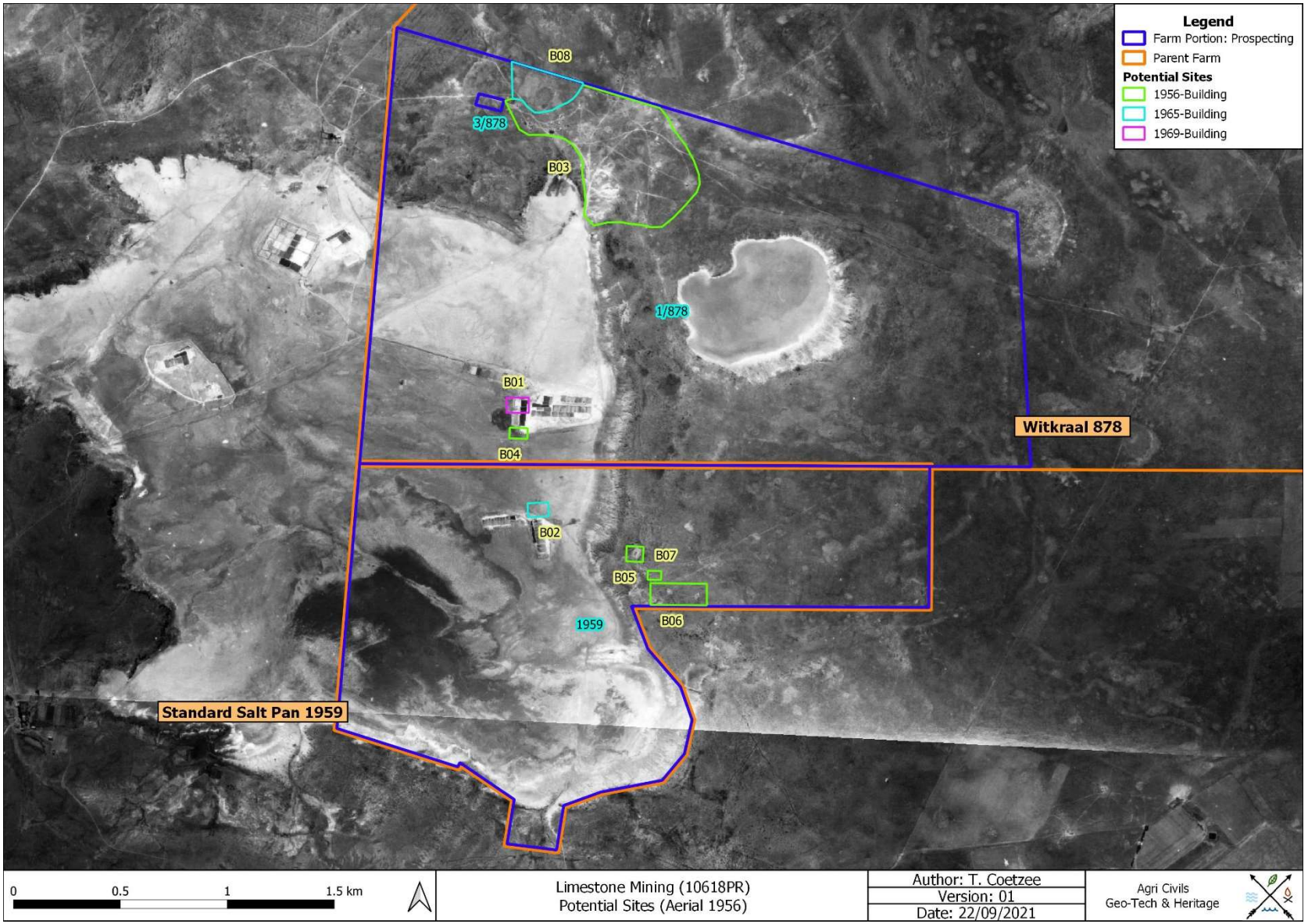

Figure 17: 1956 Aerial mage of the study area.

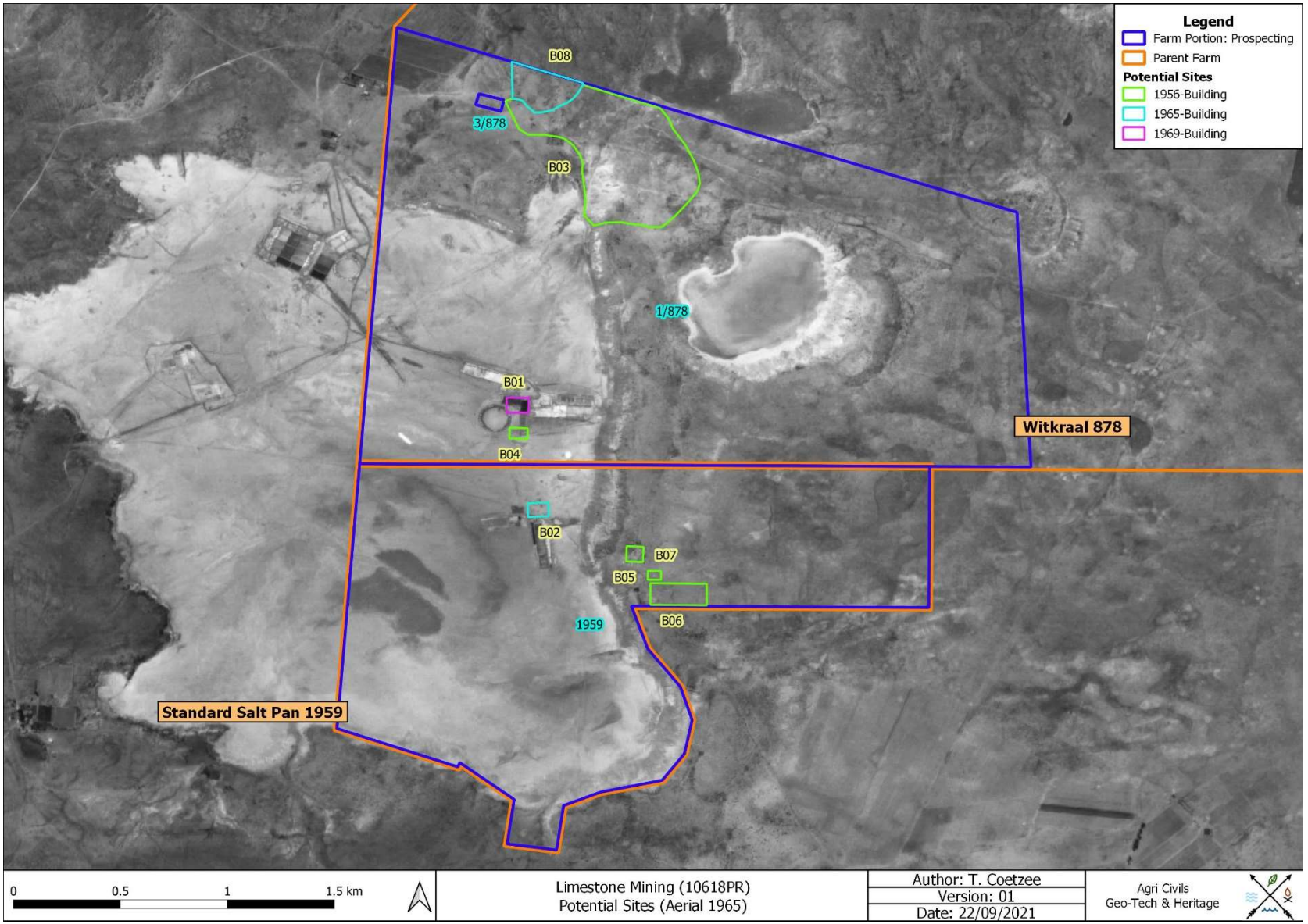

Figure 18: 1965 Aerial mage of the study area.

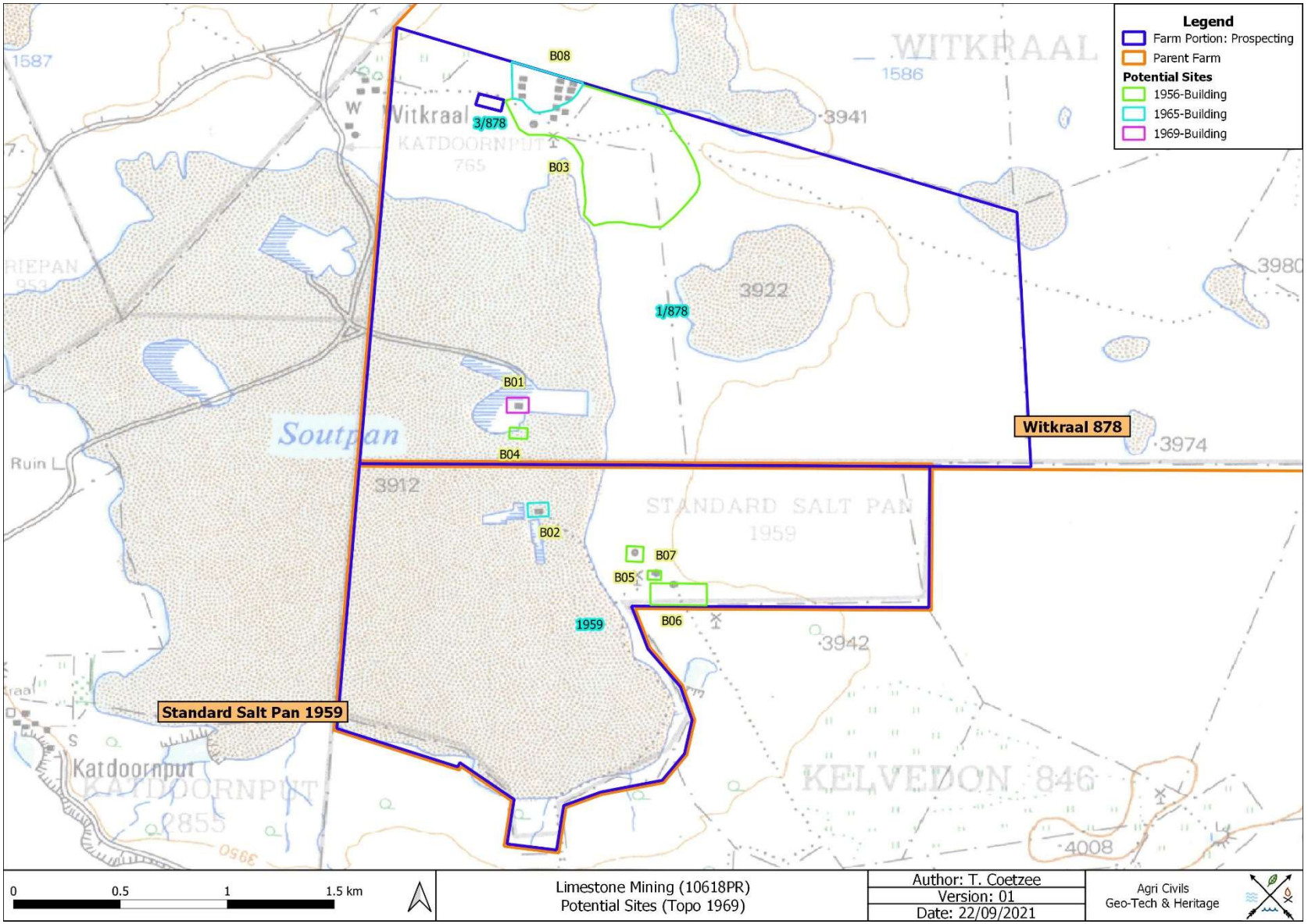

Figure 19: Segment of 1969 SA 1:50 000 2825 DC indicating the study area.

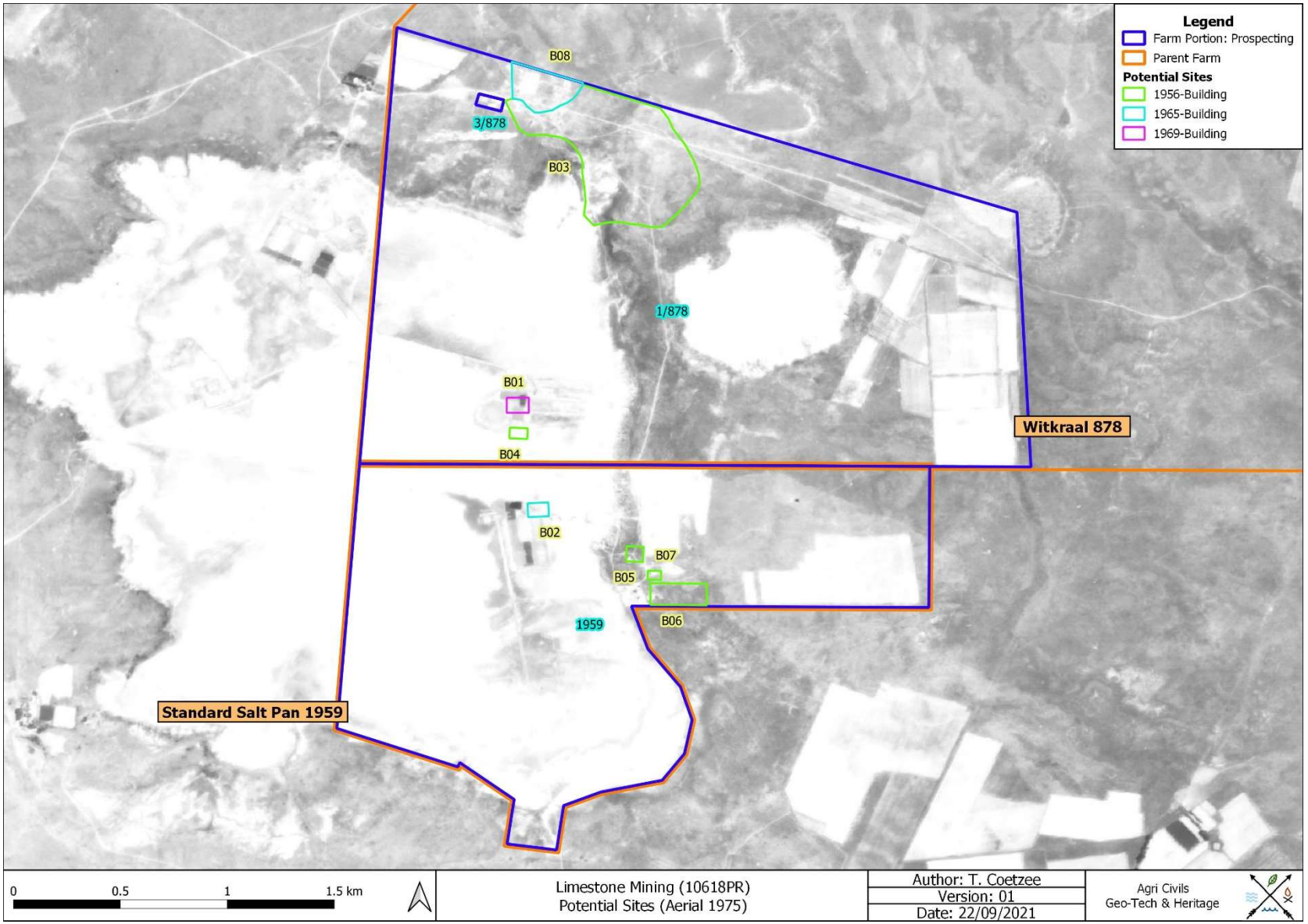

Figure 20: 1975 Aerial mage of the study area.

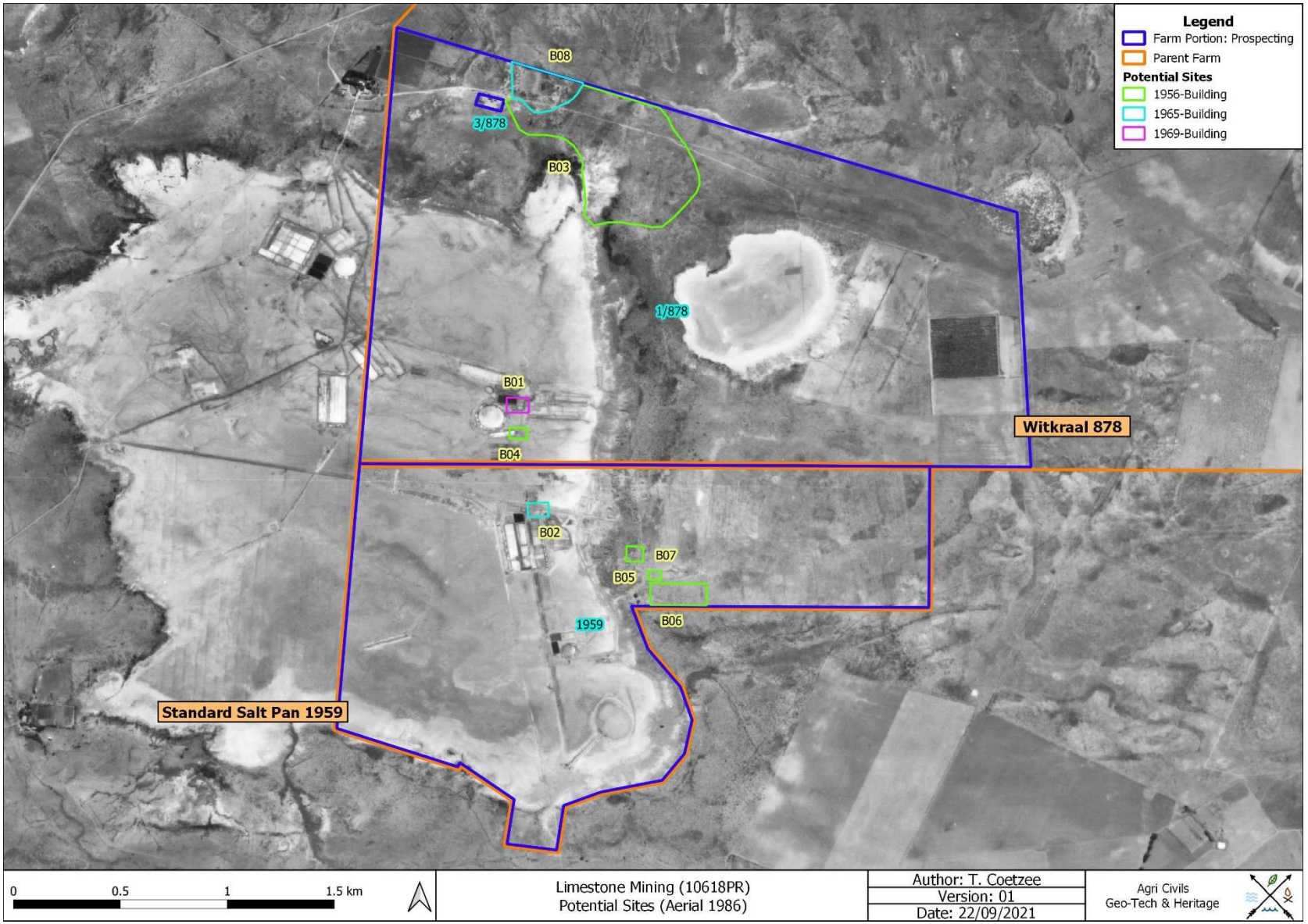

Figure 21: 1986 Aerial mage of the study area.

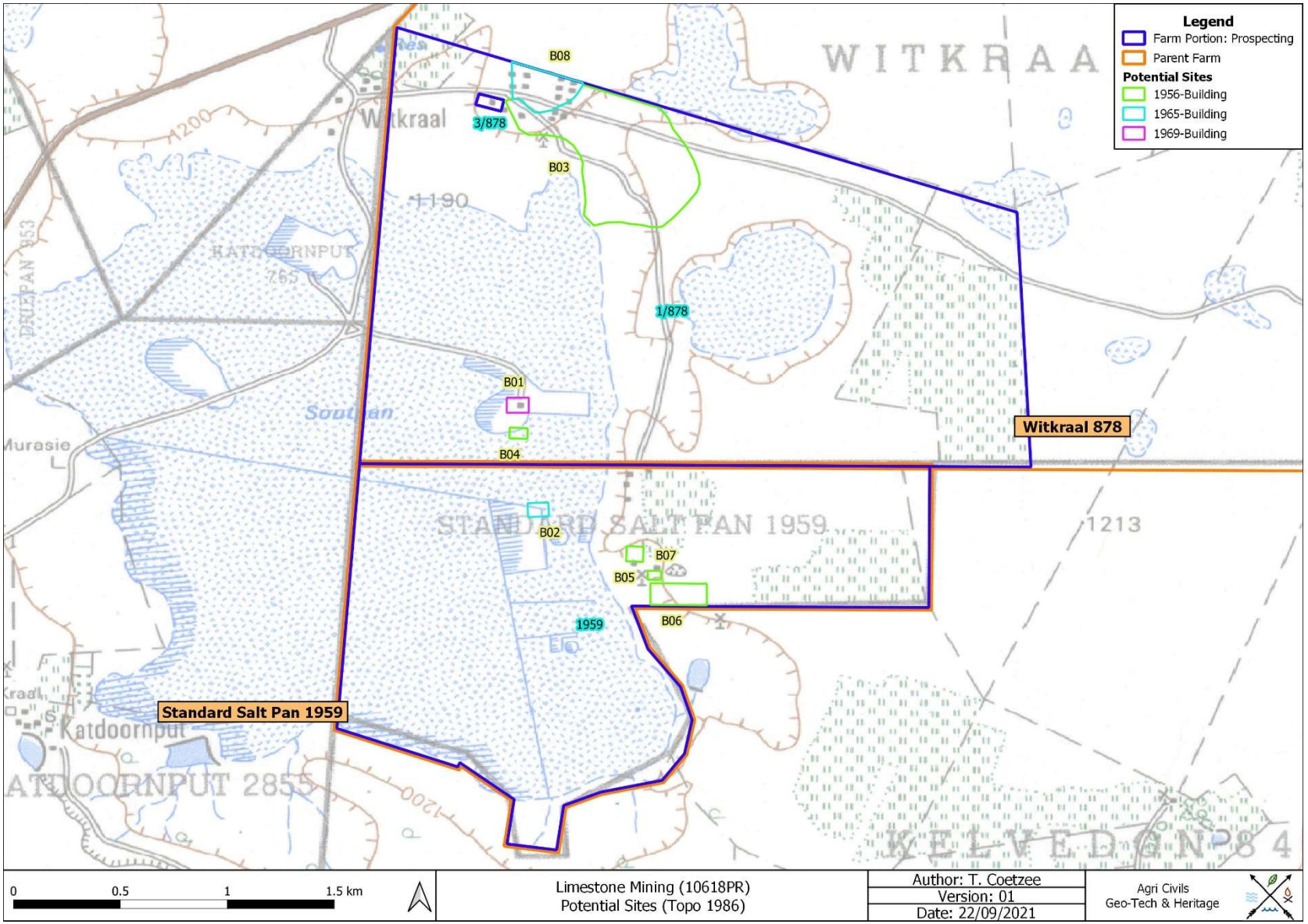

Figure 22: Segment of 1986 SA 1:50 000 2825 DC indicating the study area.

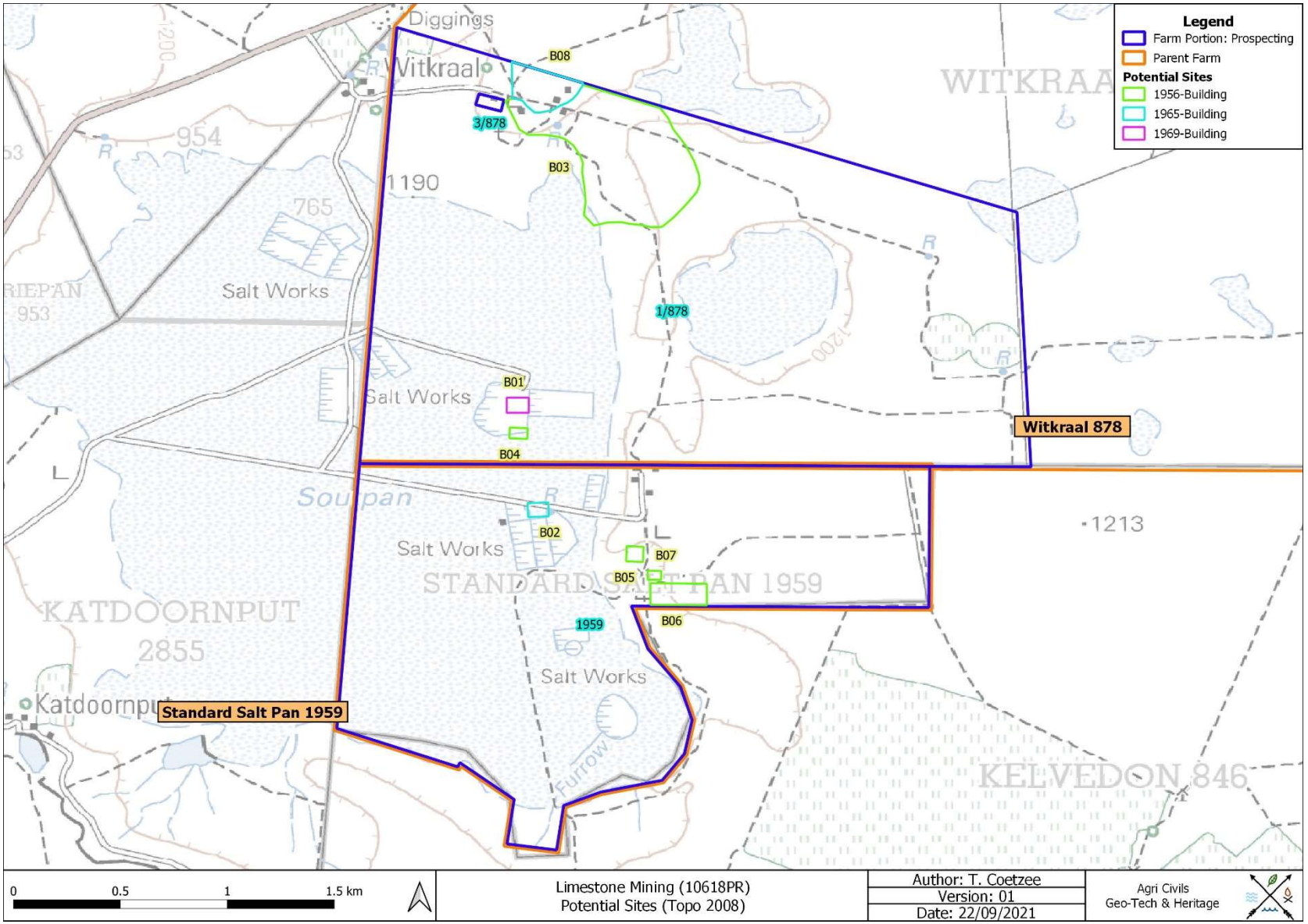

Figure 23: Segment of 2008 SA 1:50 000 2825 DC indicating the study area.