

# **PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT**

**For**

**The proposed Astral Organic Waste  
Composting and Pelleting/Pelletising  
Facility on Portion 13 of the Farm  
Boschkop 543 JR, Bronkhorstspuit,  
Gauteng**

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March 2021**

A Phase 1 Archaeological Impact Assessment for the proposed Astral Organic Waste Composting and Pelleting/Pelletising Facility on Portion 13 of the Farm Boschkop 543 JR, Bronkhorstspuit, Gauteng

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Version: 4

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

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Date: 3 March 2021

## List of Abbreviations

**AIA** – Archaeological Impact Assessment

**CRM** – Cultural Resource Management

**EIA** – Environmental Impact Assessment

**ESA** – Early Stone Age

**GPS** – Global Positioning System)

**ha** – Hectare

**HIA** – Heritage Impact Assessment

**km** – Kilometre

**LIA** – Late Iron Age

**LSA** – Later Stone Age

**m** – Metre

**MASL** – Metres Above Sea Level

**MEC** – Member of the Executive Council

**MSA** – Middle Stone Age

**NHRA** – National Heritage Resources Act

**NEMA** - National Environmental Management Act

**SAHRA** – South African Heritage Resources Agency

## **Executive Summary**

The author was appointed by IQS Holdings (Pty) Ltd to undertake a Phase 1 Archaeological Impact Assessment (AIA) for Astral Operations Ltd on a portion of Portion 13 of the Farm Boschkop 543 JR within the City of Tshwane Metropolitan Municipality in the Gauteng Province. The study area is located roughly 20 km southwest of Bronkhorstspuit, 20 km south-southeast of Rayton and 26 km north-northwest of Delmas. The aim of this report is to determine the scope of archaeological resources that could be impacted on by the construction of the proposed Organic Waste Composting and Pelleting/Pelletising Facility.

The Environmental Screening Tool Report identifies the south-eastern corner of the demarcated study area as highly sensitive in terms of archaeological and cultural heritage. However, no heritage sites were observed during the pedestrian survey and no structures exceeding 60 years of age appear on historical aerial images and topographical maps as the area appears to have been associated with crop cultivation since at least 1939, thereby disturbing the archeological context. Therefore, this area can be regarded as having a low sensitivity in terms of archaeological and cultural heritage.

The revised site boundary, obtained after the site visit, includes a small section to the north of the fenced-off area where the existing chicken coops are located. This area is unlikely to be associated with culturally significant material as the area has been disturbed by past agricultural activities. However, care should be exercised when developing in this area and a qualified archaeologist should be contacted whenever uncertainty regarding potential heritage remains are encountered.

Due to no visible heritage material exceeding 60 years of age within the demarcated project area and subject to the approval by SAHRA (South African Heritage Resources Agency), the proposed construction of the Organic Waste Composting and Pelleting/Pelletising Facility may continue. Should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

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# 1. Project Background

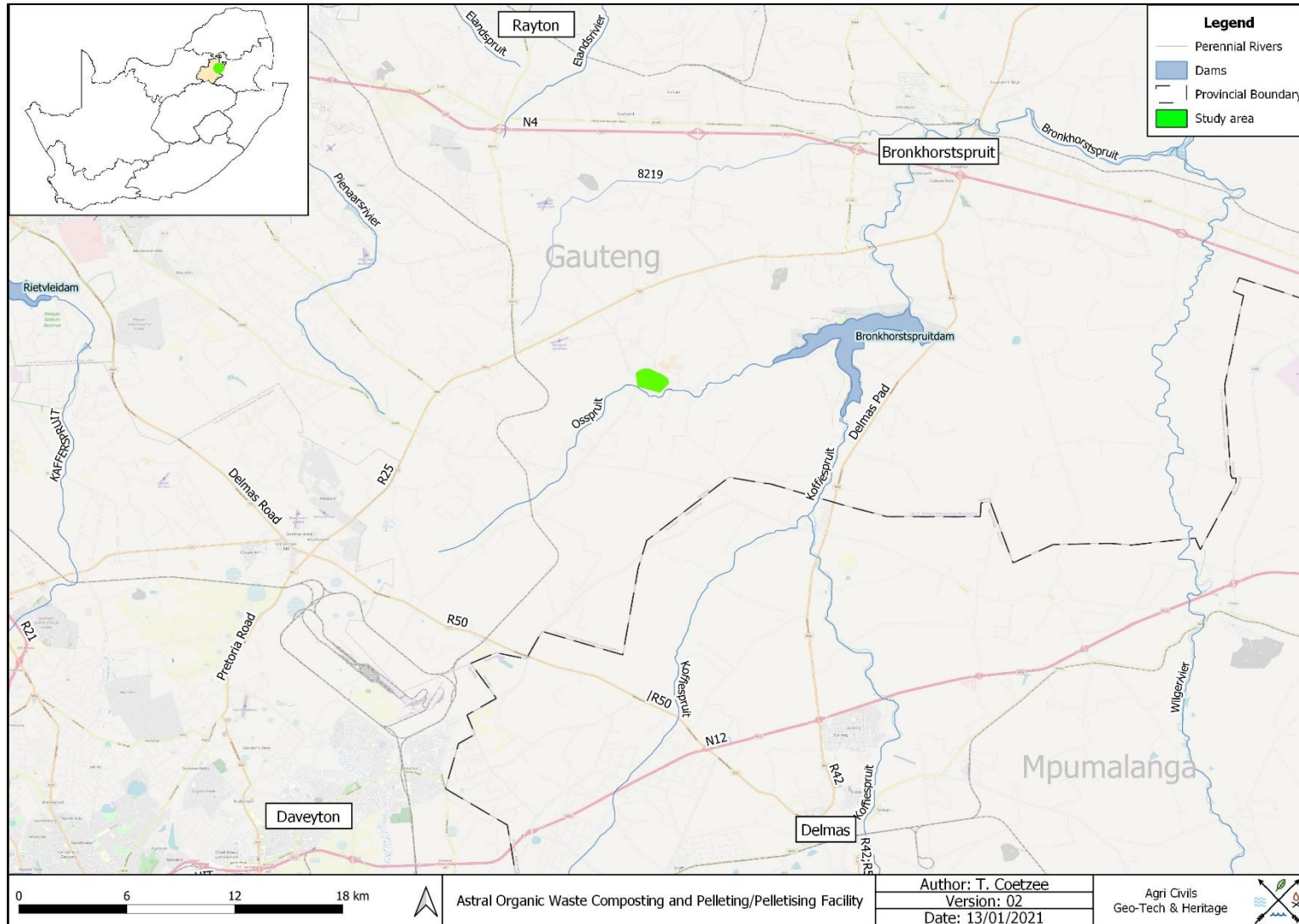
## 1.1 Introduction

IQS Holdings (Pty) Ltd appointed the author to undertake a Phase 1 Archaeological Impact Assessment for Astral Operations Ltd on a portion of Portion 13 of the Farm Boschkop 543 JR within the City of Tshwane Metropolitan Municipality in the Gauteng Province (**Table 1**). The study area is located roughly 20 km southwest of Bronkhorstspuit, 20 km south-southeast of Rayton and 26 km north-northwest of Delmas (**Figure 1**).

The purpose of this study is to examine the demarcated portion in order to determine the scope of heritage resources that might be impacted by the proposed Organic Waste Composting and Pelleting/Pelletising Facility, as well as to archaeologically contextualise the general study area. The aim of this report is to provide the developer with information regarding the location of heritage resources on the demarcated portion based on the results of a pedestrian survey, previous heritage studies, written historical information and historical topographical maps and aerial photographs.

In the following report, the implications for the construction of the Organic Waste Composting and Pelleting/Pelletising Facility and the associated activities on the demarcated portion of Portion 13 of the Farm Boschkop 543 JR are discussed with regard to 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.

It should be noted that a small discrepancy regarding the study area boundary and land parcel boundary is observed (**Figures 2 & 4**). This discrepancy might be attributed to the variation in aerial imagery or inaccuracies in spatial datasets. Whichever the case, the proposed study area is located on Portion 13 of the Farm Boschkop 543 JR only.



**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.

AIA's 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 5000m<sup>2</sup> in extent; or*
  - ii. *involving three or more existing erven or subdivisions thereof; or*
  - iii. *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
  - iv. *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10000m<sup>2</sup> in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.” (38. [1] 1999:62-64)*

and

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

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

*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

According to IQS Holdings (Pty) Ltd, the proposed Astral Organic Waste Composting and Pelleting/Pelletising Facility is situated on the following property:

**Table 1:** Property name & coordinates.

Property	Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Farm Portion Extent (ha)
Boschkop 543 JR	13	2528 DC	-25.922203	28.592090	345.8

Bronkhorstspuit is located about 20 km northeast of the proposed Astral Organic Waste Composting and Pelleting/Pelletising Facility, while Rayton is located 20 km to the north-northwest and Delmas 26 km to the south-southeast. The study area falls within the Tshwane Metropolitan Municipality in the Gauteng Province. The R25 primary road runs in a northeast – southwest direction approximately 4 km north of the study area, while several local roads are found in the general area (**Figure 1**). Access to the study area is via local dirt roads turning from the R25 primary road.

In terms of vegetation, the study area falls within the Grassland Biome and Mesic Highveld Grassland Bioregion. On a local scale, the proposed prospecting area is classified as Rand Highveld Grassland. According to Mucina & Rutherford (2006) Rand Highveld Grassland has a conservation status of endangered. The conservation target for this area is 24% and only a small portion is conserved in statutory and private conservation areas. Rand Highveld Grassland consists of the areas between rocky ridges from Pretoria to eMalahleni, extending onto ridges in the Stofberg and Roosenekal regions. Other localities include the area west of Krugersdorp, as well as the Potchefstroom and Derby surroundings. Almost 50% of this vegetation unit has been transformed by cultivation, plantations, urbanisation and the building of dams. Scattered alien invasive species are found in about 7% of the vegetation unit. Erosion in this area is moderate to high in only about 7% of the vegetation unit.

The average elevation for Rand Highveld Grassland varies between 1300 and 1635 MASL while the average elevation of the study area is 1480 MASL and slopes from the slightly more elevated north-western corner to the lower south-eastern corner.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 677 mm per year. The average maximum temperature for the study area is recorded during January when an average of 21.3 °C is reached. The average minimum temperature is recorded during June when an average of 10 °C is reached (Climate-data.org 17/11/2020).

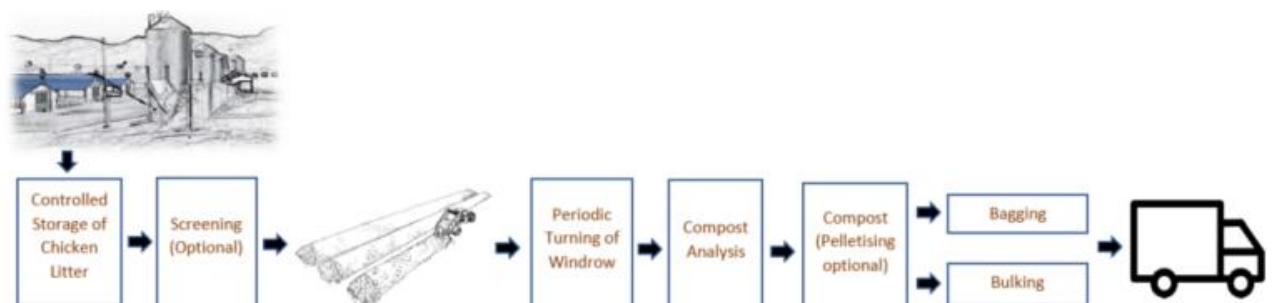
The study area falls within the B20C Quaternary Catchment within the Olifants Water Management Area. The closest perennial river to the study area is Osspruit and flows approximately 350 m to the south of the proposed Organic Waste Composting and Pelleting/Pelletising Facility. A few non-perennial offshoots are found in the general area as well.

On a local scale, the study area is fenced-off and consists of an eastern and western section. The eastern section is characterised by several buildings, while the smaller western section is associated with open veldt, a livestock camp and feedlot structures. The greater area is generally associated with farming related activities. According to IQS Holdings (2020a), the demarcated study area is utilised for chicken farming and feedlots. Historical topographical maps and aerial images indicate crop cultivation since at least 1939 (**Appendix A**).

## 2.2 Project description

The area demarcated for the construction of the Astral Organic Waste Composting and Pelleting/Pelletising Facility is approximately 10.6 ha (**Figures 2 & 4**). The following project description was adapted from the IQS PP BID document (IQS Holdings 2020a: 1 – 2):

*“Composting can be used to recycle biodegradable organic material such as chicken litter into stable useful material such as organic fertilizer in bulk or as pellets. The compost contains plant nutrients such as carbon, phosphate, and nitrogen.*



*The process requires the presence of air. For this reason, the chicken litter from Astral will be composted using windrows that are monitored and periodically turned around until fully decomposed. The decomposed material will be biologically stable and odorless. Composting has “upstream” benefits by avoiding the generation of*

*greenhouse gases, particularly methane, and conserve resources. Downstream the application of compost can feed and replenishes soils by adding nutrients and organic material to the soil, increase soil moisture holding capacity and even assist with reducing soil erosion.”*

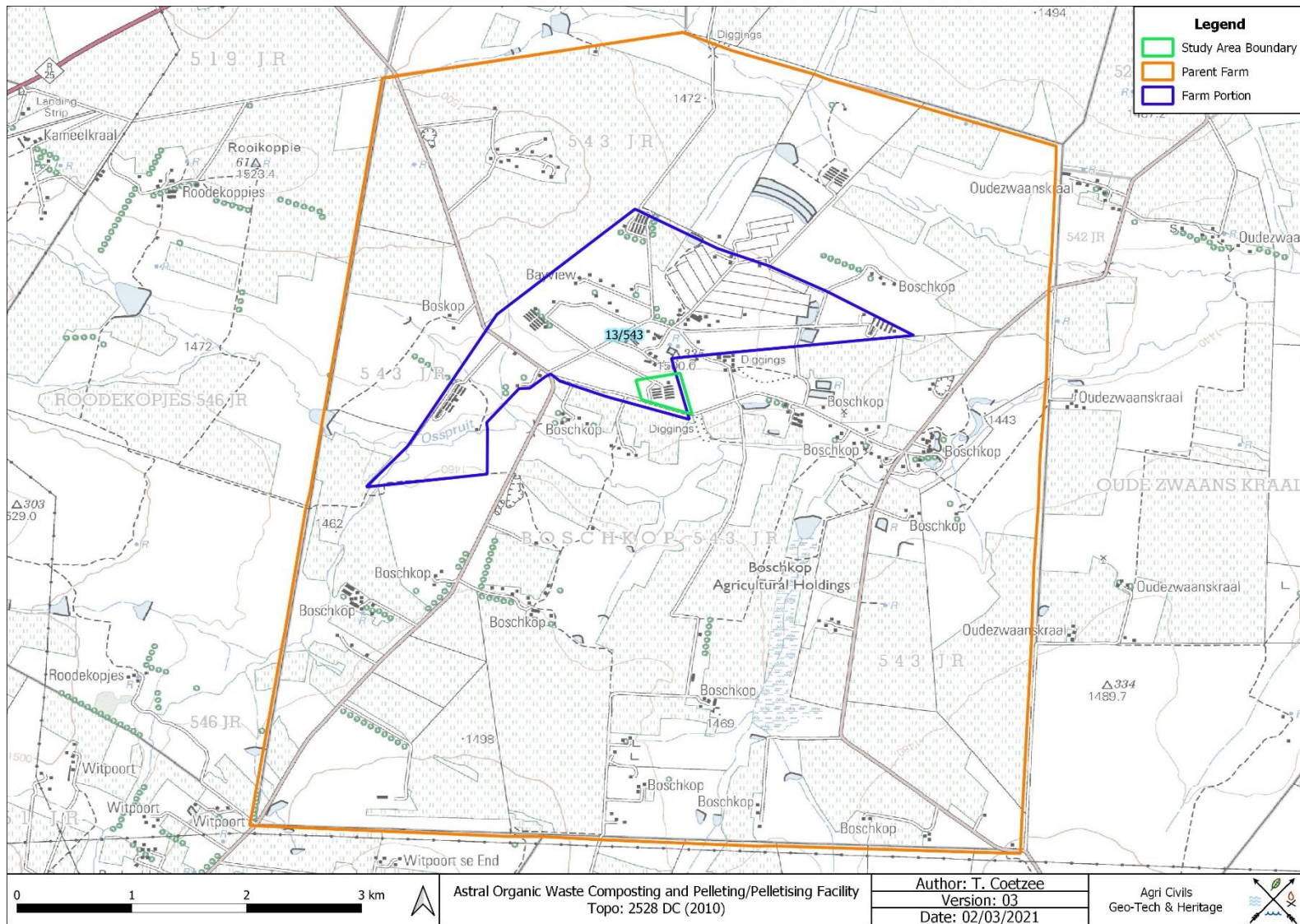


Figure 2: Segment of 2010 SA 1: 50 000 2528 DC indicating the study area.



### 3. Archaeological Background

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

Although the transition from the Middle Stone Age to the Later Stone Age did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999). These artefacts are often associated with rocky outcrops or water sources. The LSA site, Fort Troje, is located just north of Cullinan and approximately 37 km north of the proposed Astral Organic Waste Composting and Pelleting/Pelletising Facility (Korsman et al. 1998: 95).

## 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).

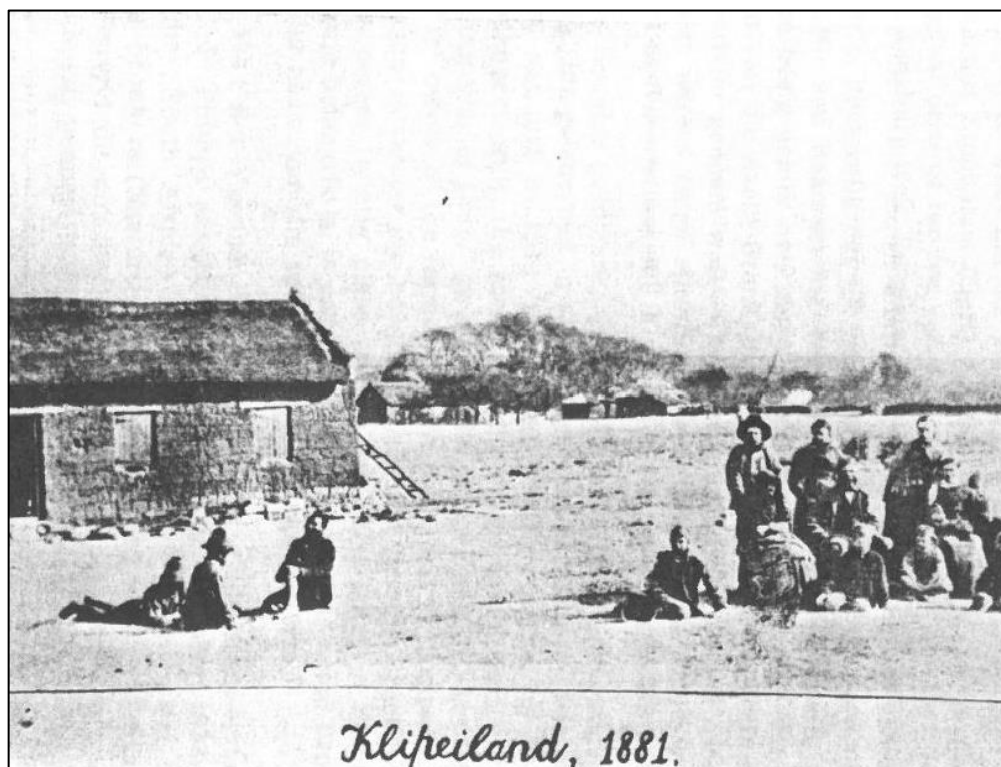
The Late Iron Age (LIA) roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, 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.

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.

### 3.2.1 The 1<sup>st</sup> Anglo-Boer War - The Battle of Bronkhorstspuit

In 1874 Lord Carnarvon, the Colonial State Secretary, wished to unite British territory and the two Republics under the British flag. Because none of these states were in favour of uniting, Carnarvon reasoned that through uniting with the Transvaal, the others would follow. Due to poor relations, the only option left was annexation. In 1877 Shepstone was sent from Natal to Pretoria with a police force of 25 with the goal to annex the Transvaal. On 12 April 1877, Shepstone raised the British flag and the Transvaal was annexed without firing a single shot. Several deputations were sent to England to regain independence, but both failed. Consequently S. P. J. Kruger, P. Joubert and M. W. Pretorius decided to gather the nation at Paardekraal to discuss the future of the Transvaal. During the meeting, which lasted from 12 to 16 December 1880, it was decided that Heidelberg would serve as the seat of the government. British forces were stationed in most of the towns, but were too weak to launch attacks on the Boer forces. British forces were therefore ordered from Lydenburg to support forces in Pretoria. Upon receiving this news, Frans Joubert was sent from Heidelberg to Pretoria with a force consisting of between 200 and 300 men to intercept and stop these reinforcements. According to the historian, Theal, the British forces under Col. Anstruther consisted of 257 men and 34 wagons. On 20 December 1880 they arrived at the place known today as Bronkhorstspuit. A brief exchange of words in which Joubert requested Anstruther to discontinue his mission resulted in a 10 to 20-minute battle over open field. After a significant number of casualties on the British side, Col. Anstruther, who was mortally wounded, requested that the white flag be raised. According to Theal, 66 on the British side were killed and 72 wounded. Later, 10 of the wounded died as well. On the Boers' side, one commando member was killed in action and another five wounded. Later, another succumbed to his wounds. The captives were transported to Heidelberg and from there to the Vaal River. From there they were allowed to go to the Free State. This was the first open battle of the First Boer War (Roodt 1949: 7-9).

The photo below (**Figure 3**) depicts the settlement of Paul Grobler on the farm Klippeiland, where the Battle of Bronkhorstspuit took place. Grobler bought the farm from Salomon Prinsloo in the 1850's and renamed it from Kalkoenkrans to Klippeiland. One of the wounded commando members was treated in this homestead. In the background the homesteads of Marthinus Johannes Grobler can be observed (Rex 1969: 14).



**Figure 3:** Grobler residence on Klippeiland (adapted from Rex 1969).

#### 4. Methodology

Archaeological reconnaissance of the study area was conducted during January 2021 (Summer) through a systematic pedestrian site survey that lasted one day. The survey consisted of transects spaced roughly 50 m apart (**Figure 4**). General site conditions were recorded via photographic record (**Figures 5 – 9**). Also, the site was inspected beforehand on Google Earth, historical aerial imagery and topographical maps in order to identify possible heritage remains (**Appendix A**). The historical topographical datasets dating to 1944 and 1984, as well as the historical aerial photographs dating to 1939, 1962, 1965 and 1976 proved useful in terms of determining the location and age of some of the structures and features associated with the study area. The total area surveyed was 25.9 ha. It should be noted that the study area was subsequently reduced to 10.6 ha while the site boundary was slightly altered to include a small section towards the north.

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

- To obtain an indication of heritage material found in the general area as well as to identify or locate archaeological sites on the area demarcated for development. This was done in order to establish a heritage context and to supplement background information that would benefit developers through identifying areas that are sensitive from a heritage perspective.

- All archaeological and historical events have spatial definitions in addition to their cultural and chronological context. Where applicable, spatial recording of these definitions were done by means of a handheld GPS during the site visit.

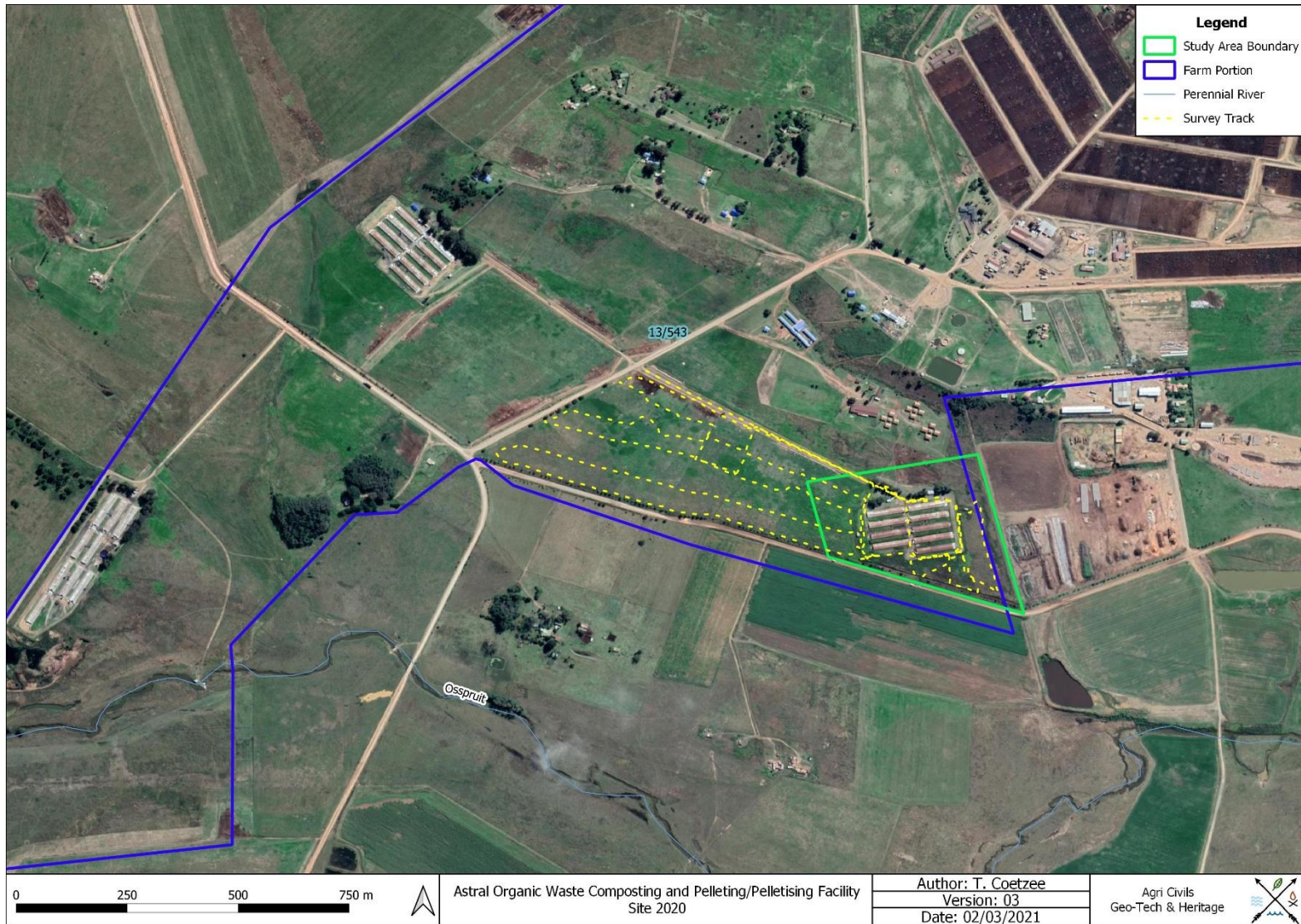


Figure 4: Proposed study area on a 2020 aerial backdrop.



**Figure 5:** Eastern boundary of the study area.



**Figure 6:** Southern boundary as seen from the south-eastern corner.



**Figure 7:** Study area from the south-western corner (not part of revised study area).



**Figure 8:** Study area from the entrance towards to southwest.





**Figure 9:** Study area from the north-western corner (not part of revised study area).

## 4.1 Limitations

No access constraints to the site were encountered. However, some open veldt section consisted of dense vegetation cover at the time of surveying (January 2021) that hampered visibility (**Figures 10 & 11**). Also, the revised study area boundary, received after the site visit, includes a small section towards the north of the existing chicken coops. This area was therefore not surveyed. However, based on historical areal imagery it is unlikely that features of cultural significance exist here as the area appears to have been cultivated since at least 1939.



**Figure 10:** Dense vegetation associated with the south-eastern section of the study area.



**Figure 11:** A patch of dense vegetation associated with the western section of the study area.

## 5. Sources of Information

At all times during the survey, standard archaeological procedures for the observation of heritage resources were followed. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention to disturbances were paid; both man-made such as roads and clearings, and those made by natural agents such as burrowing animals and erosion. No archaeological material remains were recorded during the pedestrian survey, while the existing buildings and structures, as well as the general site conditions, were photographed with a Sony Cyber-shot camera.

A literature study which incorporated previous work done in the region was conducted in order to place the study area into context from a heritage perspective. The **Appendix A** figures indicate the study area on 1939, 1962, 1965 and 1976 aerial images, as well as on 1944 and 1984 topographical maps and proved useful in tracing past activities on the portion demarcated for development.

### 5.1 Previous Heritage Studies

#### **Clover Hill Development, Bronkhorstspuit Dam**

A phase 1 HIA (Heritage Impact Assessment) was done for the Clover Hill Housing Estate, which is located about 6 km east-northeast of the study area on Portion 13 of the Farm Boschkop 543 JR. The Housing Estate is located on the banks of the Bronkhorstspuit Dam. The HIA revealed several stone-walled enclosures belonging to the Late Iron Age, as well as potshards and middens. Several structures with a square layout were also located, but probably do not exceed 60 years of age (National Cultural History Museum 2003).

## Nooitgedacht 525JR

The HIA survey done for the development of a housing estate on Portion 9 of the Farm Nooitgedacht 525 JR, located 20 km northeast of the proposed development, revealed two heritage sites. It is in the same area where the Battle of Bronkhorstspruit took place. These sites date to the Historic period (Van Schalkwyk 2007).

## Ekangala Borrow Pit Extension

Van Schalkwyk (2013) conducted a Heritage Impact Assessment for the extension of the Ekangala Borrow Pit located approximately 26 km north-northeast of the proposed Astral Organic Waste Composting and Pelleting/Pelletising Facility. The HIA did not record any heritage sites in close proximity of the borrow pit, but noted that the following sites occur in the general vicinity: farmsteads and cemeteries.

## 5.2 Historical Aerial Images & Topographical Maps

The 1939, 1962 and 1965 aerial images (**Appendix A: Figures 21 – 23**) indicate the demarcated study area to be cultivated and buildings or structures are visible. By 1976 (**Appendix A: Figure 24**), however, the buildings presently associated with the study area are shown.

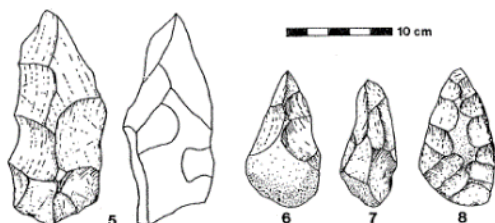
The 1944 and 1984 topographical maps (**Appendix A: Figures 25 & 26**) reflect what is observed on the historical aerial imagery of the same era: The 1944 topographical map indicates a cultivated study area, while the 1984 topographical map shows the addition of the chicken coops.

## 6. Archaeological and Historical Remains

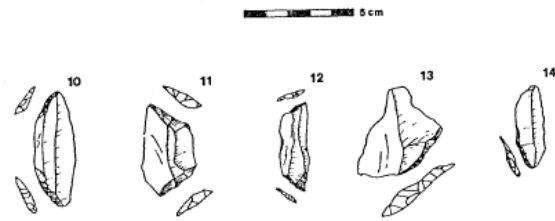
### 6.1 Stone Age Remains

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

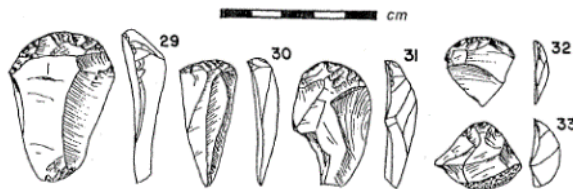
Although no Stone Age archaeological remains were located, such artefacts may occur in the area. These artefacts are often associated with rocky outcrops or water sources. **Figures 12 – 14** below are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa.



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



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



**Figure 14:** LSA scrapers (Klein 1984).

Archaeological studies done on the surrounding areas also did not locate material pertaining to the Stone Age.

## 6.2 Iron Age Farmer Remains

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

One of the heritage studies done in the surrounding area recorded stone-walled enclosures, potshards and middens dating the HIA (National Cultural History Museum 2003).

## 6.3 Historical

No Historical remains were observed within the demarcated study area.

The heritage study done by Van Schalkwyk (2007) recorded two heritage sites that might date to the Battle of Bronkhorstspuit, while in another study, Van Schalkwyk (2013) notes the presence of farmsteads dating to the Historic Period.

## 6.4 Contemporary Remains

The infrastructure associated with the study area is fenced-off by a dilapidated fence, measures approximately 3 ha and consists of nine chicken coops and seven smaller buildings dating to the same time period (**Figures 15 – 18**). Two of the buildings, however, are not located within the fenced-off section (**Figures 17 & 18**). These buildings appear not be in use anymore. According to the historical aerial images and topographical maps (**Appendix A**), the existing infrastructure on the area demarcated for development were constructed between 1965 and 1976. The feedlot equipment and infrastructure found on the fenced-off western section of the study

area, consisting of cement cattle water troughs and metal bale feeders, date to contemporary times and appear to be still in use (**Figures 19 & 20**).

The HIA done by the National Cultural History Museum (2003) mentions square structures that might date to contemporary times.



**Figure 15:** Entrance to the fenced-off infrastructure.



**Figure 16:** Chicken coops.



**Figure 17:** Contemporary infrastructure to the north of the chicken coops.



**Figure 18:** Contemporary infrastructure to the east of the chicken coops.



**Figure 19:** Cattle water trough.





**Figure 20:** Metal bale feeder.

## 6.5 Graves

No graves or burial sites were observed within the demarcated study area.

Only the HIA by Van Schalkwyk (2013) notes the presence of cemeteries occurring in the general study area.

## 7. 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.

## 7.1 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 2:** 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

\*It should be noted that no sites of heritage importance were located.

## 8. Statement of Significance & Recommendations

### 8.1 Statement of significance

**The study area: A portion of Portion 13 of the Farm Boschkop 543 JR, Bronkhorstspuit, Gauteng**

As can be seen from previous research done in the area, the general region is significant from a heritage perspective as LSA material, LIA sites, cemeteries and historical structures have been identified.

On a local scale, however, no material of cultural significance were observed and historical aerial images and topographical maps indicate no infrastructure prior to 1961 as the demarcated area consisted of a cultivated field during this time. The buildings present within the demarcated portion were constructed between 1965 and 1976 and therefore do not exceed 60 years of age. Subsequently these structures are not protected under the NHRA 25 of 1999.

Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features and dense vegetation, care must be exercised during the development and construction phases.

It should also be noted that the Environmental Screening Tool Report identifies the south-eastern corner of the demarcated study area as highly sensitive in terms of archaeological and cultural heritage (IQS Holdings 2020b). This sensitivity is based on the fact that the demarcated land parcel is located within 500 m of an important river. However, the pedestrian survey revealed no material of cultural significance and historical aerial images and

topographical maps indicate that the area has been cultivated since at least 1939, thereby disturbing the archaeological context. Therefore, this area can be regarded as having a low sensitivity in terms of archaeological and cultural heritage.

## 8.2 Recommendations

The following recommendations are made in order to avoid the destruction of heritage remains on the area demarcated for the development of the Astral Organic Waste Composting and Pelleting/Pelletising Facility:

- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6))
- Should the need arise to expand the proposed development beyond the surveyed areas outlined in this study, the following applies: A qualified archaeologist must conduct a full Phase 1 Archaeological Impact Assessment (AIA) on the sections beyond the demarcated area that will be affected by the development in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.
- The revised site boundary includes a small section towards the north of the fenced-off area that was not surveyed. Although the presence of culturally significant material is unlikely due to past cultivation, care should be exercised when developing in this vicinity. It is advised that a qualified archaeologist be contacted whenever uncertainty regarding potential heritage remains are encountered.
- No sites of heritage importance were observed on the demarcated surveyed portion of Portion 13 of the Farm Boschkop 543 JR. From a heritage point of view, development may proceed on the demarcated project area, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency.

## 9. Addendum: Terminology

### **Archaeology:**

The study of the human past through its material remains.

### **Artefact:**

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

### **Assemblage:**

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

### **Context:**

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

### **Cultural Resource Management (CRM):**

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

### **Excavation:**

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

### **Feature:**

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

### **Ground Reconnaissance:**

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

### **Matrix:**

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

### **Phase 1 Assessments:**

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

### **Phase 2 Assessments:**

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

### **Sensitive:**

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

**Site:**

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

**Surface survey:**

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

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

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

## **Appendix A: Historical Aerial Imagery & Topographical Maps**



**Figure 21:** 1939 Aerial image of the study area.



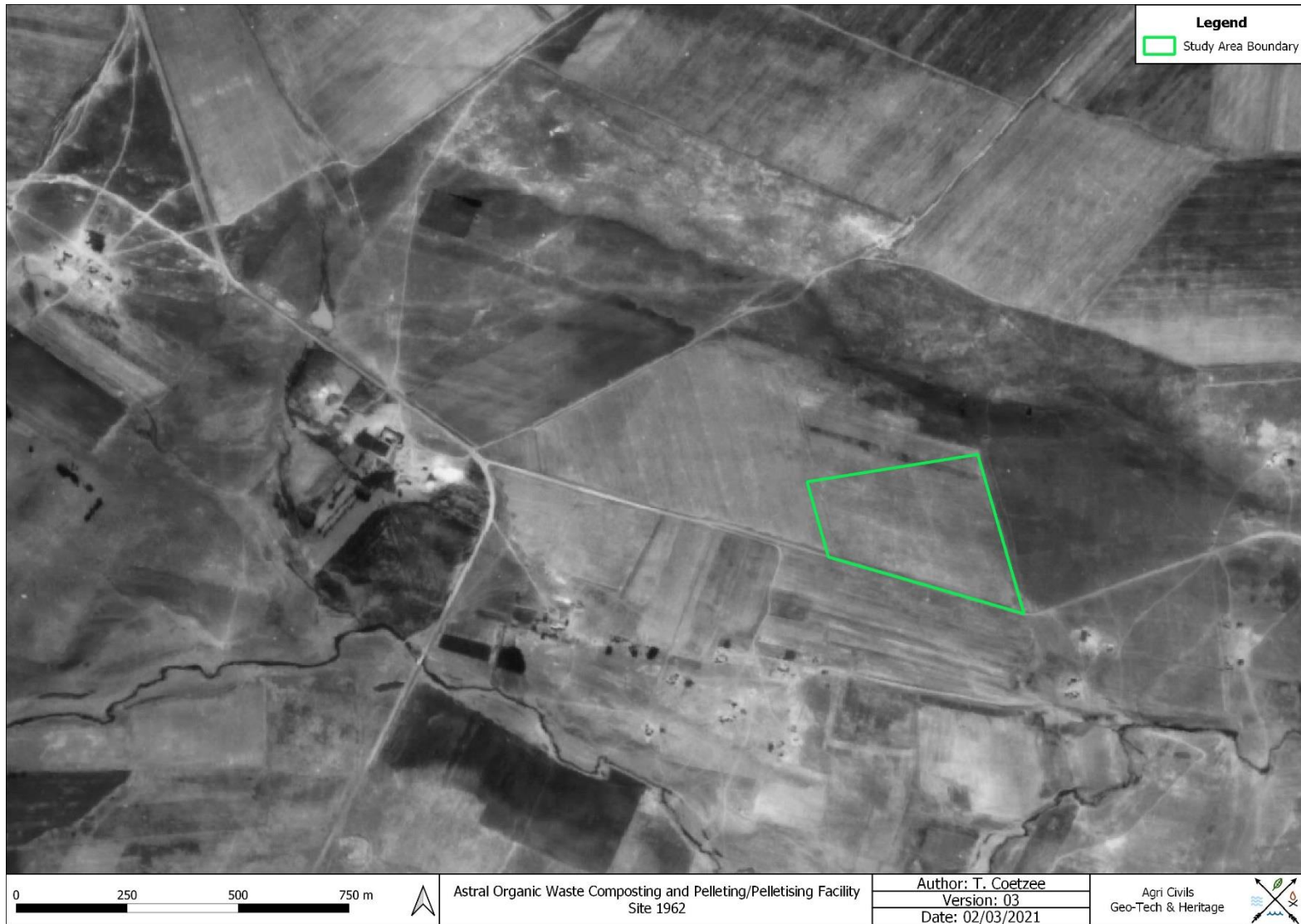


Figure 22: 1962 Aerial image of the study area.



**Figure 23:** 1965 Aerial image of the study area.



**Figure 24:** 1976 Aerial mage of the study area.

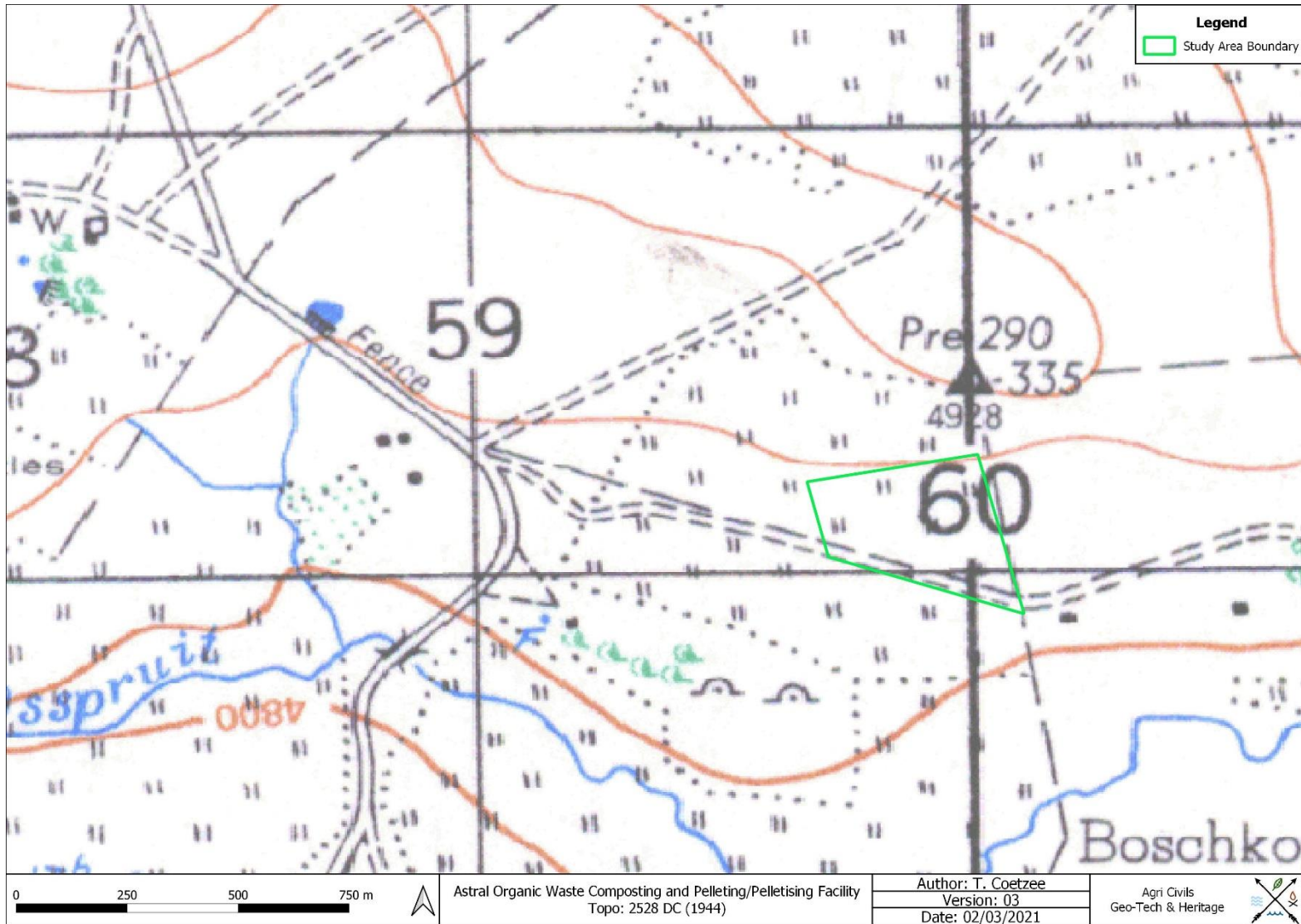


Figure 25: Segment of 1944 SA 1: 50 000 2528 DC indicating the study area.

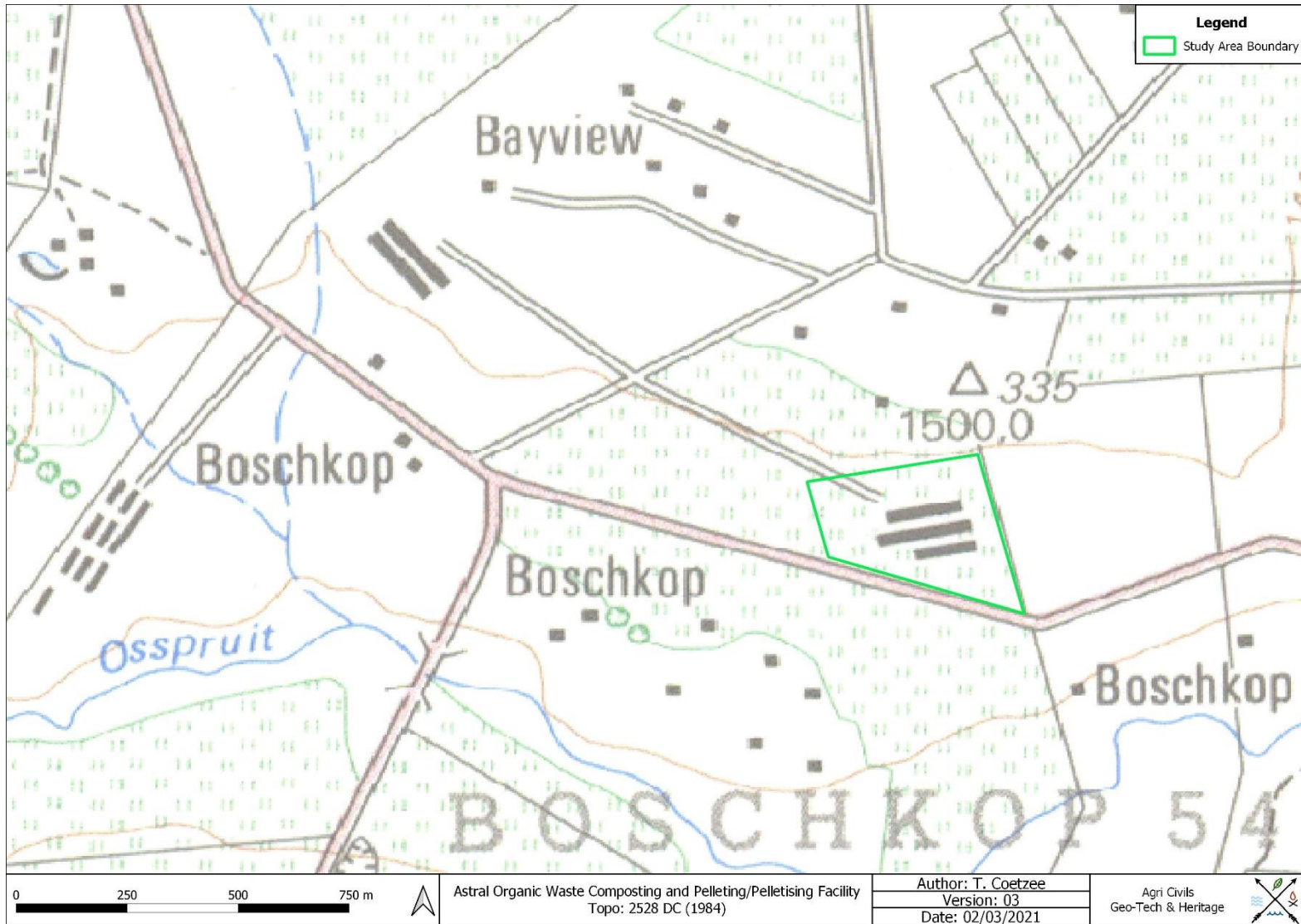


Figure 26: Segment of 1984 SA 1: 50 000 2528 DC indicating the study area.