

LIMITED PHASE 1 AIA

**for the Vuranok Prospecting Right
Application on the Farms Klipfontein 465
KS and Paschas Kraal 466 KS,
Sekhukhune, Limpopo**

**Author ©:
Tobias Coetzee, MA (Archaeology) (UP)
April 2022**

Limited Phase 1 AIA for the Vuranok Prospecting Right Application on the Farms Klipfontein 465 KS and Paschas Kraal 466 KS, Sekhukhune, Limpopo

For: Red Kite Environmental Solutions (Pty) Ltd

21 Kingfisher Crescent

Willow Acres Estate

Pretoria

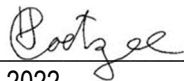
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Email: tcoetzee.heritage@gmail.com

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



Date: 8 April 2022

Executive Summary

The author was appointed by Red Kite Environmental Solutions (Pty) Ltd to undertake a limited Phase 1 Archaeological Impact Assessment for Vuranok (Pty) Ltd on the Farms Klipfontein 465 KS and Paschas Kraal 466 KS within the Sekhukhune District Municipality in the Limpopo Province (**Table 1**). The study area is located roughly 44 km north-northwest of Steelpoort. The aim of this report is to determine the scope of archaeological resources that could be impacted by the proposed bulk sampling, as well as to contextualise the general study area in terms of heritage resources. This will provide the developers with general information regarding potentially sensitive areas and, will shed light on what is to be expected during subsequent heritage studies and aid in interpreting finds.

No sites of heritage significance were observed within the demarcated Bulk Sampling Pits (A & B) during the pedestrian survey and no potential heritage sites were noted on historical aerial imagery and historical topographical maps. Since both areas have been disturbed by past mining activities, the areas are not considered to be sensitive from a heritage perspective.

A total of 58 sites were noted on the remainder of the study area. These sites consist of a combination of buildings, structures and building ruins identified on historical topographical maps and historical aerial imagery (**Table 2**). Based on contemporary satellite imagery, one of these sites is associated with surface remains and one with a building ruin. Twenty-six of the potentially historical sites appear to have been replaced by modern buildings, while 30 appear to have been demolished as no surface remains are visible on satellite imagery. Although no surface remains are evident at the demolished sites, subsurface culturally significant material might still be present. Since the demolished sites are likely to be associated with subsurface culturally sensitive material, these sites should be avoided by the proposed prospecting activities. The two sites associated with surface remains that might exceed 60 years of age might be protected by the National Heritage Resources Act (NHRA) (25 of 1999) and should also be avoided by the proposed prospecting activities.

Contemporary buildings associated with the demarcated study area, whether intact or demolished, are not regarded to be significant from a heritage perspective. However, the potential presence of graves at some of these sites should be considered. It is also recommended that should any of the built environment be impacted, an inspection of the specific area must first be conducted by a qualified archaeologist.

Thirty-six heritage sites falling within the demarcated study area were identified in previous heritage studies and were plotted. These sites consist of a combination of Iron Age, Historic and burial sites that are considered to be sensitive from a heritage perspective, are protected by the NHRA (25 of 1999) and should be avoided by the proposed prospecting activities.

Areas previously/currently associated with cultivated fields are considered to be disturbed and are less sensitive from a heritage perspective. The least sensitive areas are therefore areas that are located more than 500 m from a water source, fall within previously/currently cultivated fields and are not located within close proximity of potential heritage sites or contemporary infrastructure. Although, from a heritage perspective, these areas are considered to be more favourable for the proposed prospecting activities, such areas are near non-existent in the demarcated project area. The previously/currently cultivated areas that intersect the 500 m river buffer are also considered to be disturbed. However, the potential for subsurface cultural material is slightly higher compared to areas falling outside of the buffer zone and care should therefore be exercised when prospecting in such areas.

Apart from the identified potential sites, open and undisturbed areas falling outside of the previously/currently cultivated areas are considered to be the most sensitive, especially due the presence of LIA, Historic and burial sites in the general vicinity of the demarcated study area. Care should therefore be exercised when prospecting in these areas. The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some cultivated fields fell into disuse, meaning that burial sites might be located in disturbed areas as well.

A full Phase 1 AIA 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.

Subject to adherence to the recommendations and approval by the South African Heritage Resources Agency (SAHRA), the proposed Vuranok Prospecting Project as per the indicated boundary may continue. Should skeletal remains be exposed during the prospecting phase, 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.

List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

DMR – Department of Mineral Resources

EIA – Environmental Impact Assessment

ESA – Early Stone Age

ha – Hectare

HIA – Heritage Impact Assessment

km – Kilometre

LIA – Late Iron Age

LSA – Later Stone Age

m – Metre

MASL – Metres Above Sea Level

MEC – Member of the Executive Council

MSA – Middle Stone Age

NHRA – National Heritage Resources Act

SAHRA – South African Heritage Resources Agency

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1. Project Background

1.1 Introduction

Red Kite Environmental Solutions (Pty) Ltd appointed the author to undertake a limited Phase 1 Archaeological Impact Assessment for Vuranok (Pty) Ltd on the Farms Klipfontein 465 KS and Paschas Kraal 466 KS within the Sekhukhune District Municipality in the Limpopo Province. The study area is located roughly 44 km north-northwest of Steelpoort (**Figure 1**). The identified land parcels are listed in **Table 1**. The purpose of this study is to examine the areas demarcated for bulk sampling in order to determine if any archaeological resources of heritage value will be impacted, as well to contextualise the remaining prospecting area to determine the scope of heritage resources that might be encountered during the proposed prospecting activities and subsequent heritage studies. The aim of this report is to provide the developer with information regarding heritage resources in the vicinity of the study area based on a combination of pedestrian surveys, results from previous studies, written historical information and historical topographical maps and aerial photographs. The recommendations made in this report aim to ensure the safeguarding of archaeological resources during the prospecting process.

In the following report, a broad overview of the proposed prospecting project is provided and the study area is contextualised in terms of heritage resources. The prospecting right application is for chrome ore (LG and MG seems). 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 proposed prospecting project.

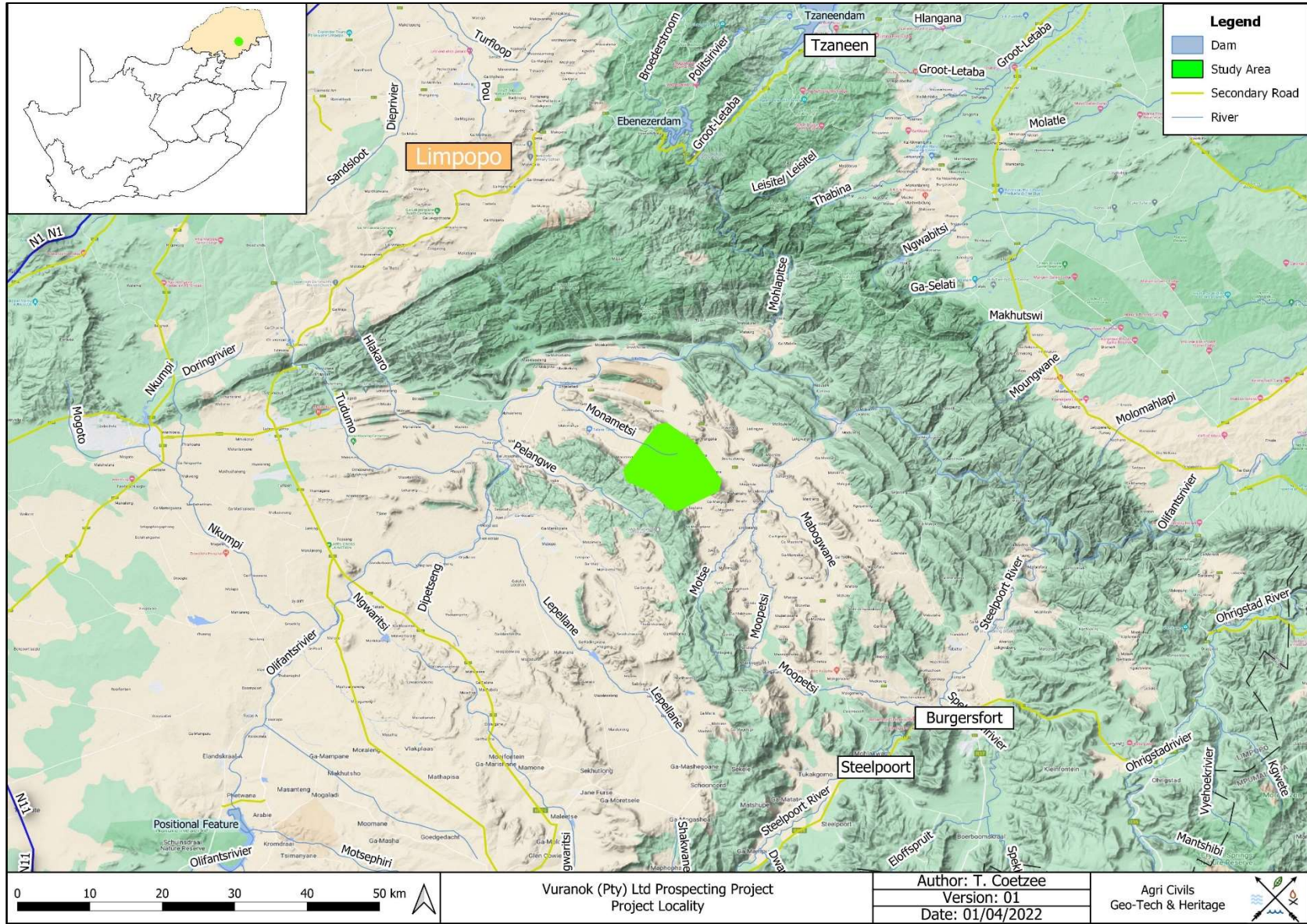


Figure 1: Regional and provincial location of the study area.

1.2 Legislation

The South African Heritage Resources Agency (SAHRA) aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an AIA if triggered.

Archaeological Impact Assessments (AIAs) should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact of the sites.

1.2.1 The EIA (Environmental Impact Assessment) and AIA processes

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

All Archaeological Impact Assessment reports should include:

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

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

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

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

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

1.2.2 Legislation regarding archaeology and heritage sites

National Heritage Resource Act No.25 of April 1999

Buildings are among the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Farming Community settlements. The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives;
- any other prescribed category.

With regards to activities and work on archaeological and heritage sites this Act states that:

“No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.” (34. [1] 1999:58)

and

“No person may, without a permit issued by the responsible heritage resources authority:

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”(35. [4] 1999:58)*

and

“No person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals.” (36. [3] 1999:60)*

On the development of any area the gazette states that:

“...any person who intends to undertake a development categorised as:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*

- (c) *any development or other activity which will change the character of a site-*
 - i. *exceeding 5000m² in extent; or*
 - ii. *involving three or more existing erven or subdivisions thereof; or*
 - iii. *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - iv. *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10000m² in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.” (38. [1] 1999:62-64)*

and

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

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

The Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities. Graves 60 years or older fall under the jurisdiction of the National Heritage Resources Act as well as the Human Tissues Act, 1983.

2. Study Area and Project Description

2.1 Location & Physical Environment

The Vuranok (Pty) Ltd project is situated on the three land parcels listed in **Table 1**. The two areas demarcated for bulk sampling are listed as well.

Table 1: Property name & coordinates.

No	Activity	Parent Farm	Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Farm Portion Extent (ha)	Bulk Sampling (ha)
1	Drilling	Klipfontein 465 KS	0	2429BD	-24.347046	29.948010	2853.9	-
2	Drilling	Paschas Kraal 466 KS	RE	2429BD	-24.387441	29.965747	748.7	-
3	Drilling	Paschas Kraal 466 KS	1	2429BD & 2430AC	-24.376948	29.991562	2164.7	-
4	Bulk Sampling Pit A	Klipfontein 465 KS	0	2429BD	-24.314265	29.955485	-	2.47
5	Bulk Sampling Pit B	Paschas Kraal 466 KS	1	2429BD	-24.345653	29.986873	-	2.63
	Total Extent						5767.3 ha	5.1 ha

Steelpoort is located roughly 44 km to the south-southeast of the proposed prospecting area, while Burgersfort is located 49 km to the southeast and Tzaneen 57 km to the northeast. Villages located in or near the study area include Sealane, Manotwane, Paschas Kraal, Mosotse and Ga-Phasha. The demarcated study area falls within the Greater Tubatse/Fetakgomo Local Municipality and the Sekhukhune District Municipality in the Limpopo Province. The R37 primary road runs in a northwest-southeast direction approximately 3 km to the east of the study area, while several local roads intersect the study area (**Figures 1 – 3**).

In terms of vegetation, the study area falls within the Savanna Biome and Central Bushveld Bioregion. On a local scale, the vegetation of the proposed study area varies between Sekhukhune Plains Bushveld and Sekhukhune Mountain Bushveld. According to Mucina & Rutherford (2006), Sekhukhune Mountain Bushveld is associated with mountains and undulating hills above the Sekhukhune Plains Bushveld Vegetation type, as well as steeper slopes of certain mountains in the area. Sekhukhune Mountain Bushveld is considered to be least threatened, although roughly 15% consist of transformed cultivation and urban built-up. Mining activities also play an increasing role in the transformation of this vegetation type. Erosion range between moderate and high levels and donga's occur in some places (Mucina & Rutherford 2006). Previous classifications (Acocks 1953) identified this vegetation type as Mixed Bushveld with Sourish Mixed Bushveld along the upper slopes.

Sekhukhune Plains Bushveld stretches from the lowlands surrounding Burgersfort and Steelpoort towards Legwareng. It also continues up the Olifants River basin to Tswaing. The Sekhukhune Plains vegetation type is considered vulnerable and sections are threatened by Chrome and Platinum mining activities, as well as urbanisation. Erosion is high within this vegetation type and donga's often occur (Mucina & Rutherford 2006).

According to Mucina & Rutherford (2006), the average elevation for Sekhukhune Mountain Bushveld ranges from 900 to 1600 MASL (metres above sea level), while the elevation for Sekhukhune Plains Bushveld varies between 700 and 1100 MASL. The average elevation of the project area is 910 MASL and is generally located on the eastern slopes of the Leolo Mountains. A ridge is also located further to the east, resulting in a valley between the north-western and south-eastern borders of the study area.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 415 mm. The average maximum temperature for the study area is recorded during February when an average of 23 °C is reached. The average minimum temperature is recorded during July when an average of 13.8 °C is reached (Climate-data.org 1/4/2022).

The Klipfontein section of the study area intersects the B52E, B52J, B71B and B71E Quaternary Catchment, while the Paschas Kraal section intersects the B52J and B71E Quaternary Catchment. Both the Klipfontein and Paschas Kraal sections fall within the Olifants Water Management Area. The closest perennial rivers to the study area are the Motse River that flows approximately 7.2 km to the east and the Olifants River that flows approximately 9.8 km to the northwest. It should be noted that a high number non-perennial rivers intersect the study area.

Access to the demarcated study area is through a local dirt road turning from the R37 primary road approximately 11 km to the northwest of the project area. The local road roughly splits the study area into a northern and southern section. The low-lying areas of the study area are associated with dense concentrations of villages and sections of cultivated fields, while the general area is characterised by extensive mining operations. A high

number of illegal mining operations also occur within the demarcated study area, as well as the surrounding environment.

2.2 Project description

The area demarcated for the prospecting of chrome ore (LG and MG seems) covers about 5767.3 ha, of which 5.1 ha is demarcated for bulk sampling (**Figures 2 & 3**). The proposed prospecting programme will include non-invasive, as well as invasive activities. The proposed activities as mentioned in the Prospecting Work Programme are described below:

Planned Non-Invasive Activities

The Desktop Study planned for the proposed prospecting programme:

- Data collection, geological interpretation, and projection
- Resource mapping and surface sampling
- Desktop study which involves the collection of existing information or data interpretation and report.
- Planning of logistics of the physical drilling programme;
- Geological mapping sampling and analyses.
- Planning of logistics of the physical drilling programme.

Invasive Activities

- **Drilling:**

The principal prospecting activity will be diamond core drilling. Drill rigs, drilling at least 60mm size core will be utilized. This core size provides sufficient sample mass for core lengths from approximately 2.0m upwards for mineral analysis on thin samples. It provides sufficient sample mass for standard observation and analytical work on normal sample widths.

Approximately 20 boreholes are expected to be of an average of 100 meters in Phase 2 and 50 meters in Phase 3 respectively, distributed evenly and proportionately in a grid across the target areas.

- **Bulk sampling:**

Depending on the economic viability, a bulk sample of 50 000 m³ is planned in the completion of phase 2 and 3 drilling programme. The bulk sample will be removed by means of back actor and dump trucks. The bulk sample will be taken from strategic points of the area after having studied the characteristics of the rocks during the first phase of the prospecting programme.

- **Phases 2a and 2b – Exploration Drilling:**
 - Drilling - 20 boreholes will be drilled during this phase with a total estimated depth of 200 meters;
 - A minimum of 1 sample per strata/band intersection will be taken. More samples will be required when large variations in mineral quality occur within a stratum. Therefore an estimated 2 samples per borehole is budgeted for;
 - Full analyses will be carried out on all samples. Reporting of results is expected within 30 days of submission at laboratory;
 - Establishment of the database, recording of borehole logs, evaluation and profile modelling will be carried out after all the results have been recorded.

- **Phase 3 – Bulk sample:**
 - Bulk sample permission in terms of Section 20(2) of the Mineral and Petroleum Resources Act, 2002, (Act no. 28 of 2002) forms part of this application and it is anticipated that a bulk sample will cover a size of 50 000 m³. The bulk sample will be extracted from different strategic points of the target area depending on the results of the initial drilling and the understanding of the geological characteristics studied on initial phases.

- **Phase 4:**
 - A further 10 boreholes will be drilled during this phase with a total estimated depth of 200 meters;
 - A minimum of 1 sample per band intersection will be taken. More samples will be required when large variations in mineral quality occur within a band. Therefore an estimated 2 samples per borehole is budgeted for;
 - Mineral analyses will be carried out on all samples and reporting thereof will be expected within 30 days after submission to the laboratory. Establishment of the data base, recording of borehole logs, evaluation and profile modelling will be carried out after all the results have been recorded.

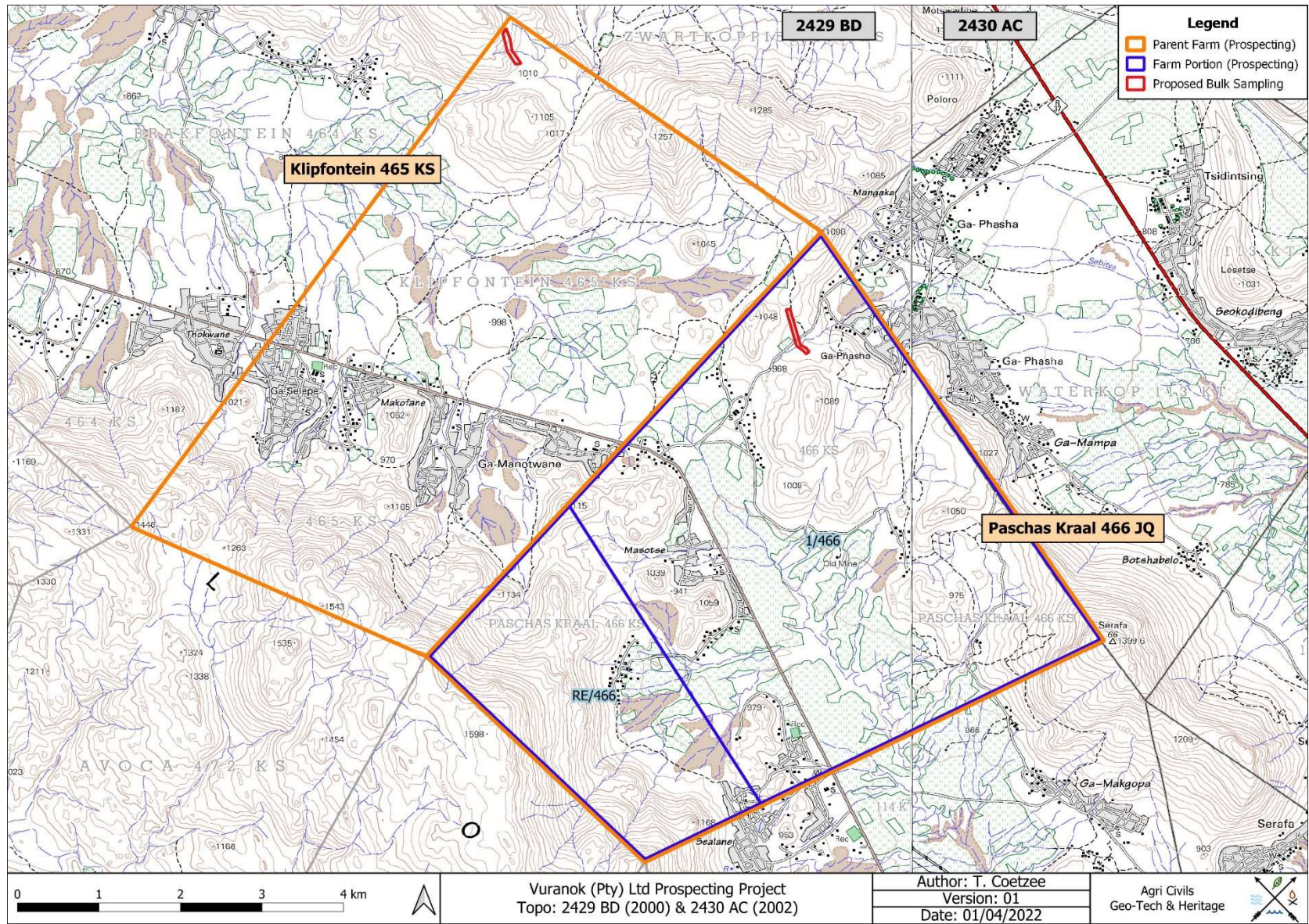


Figure 2: Segments of SA 1:50 000 2429 BD & 2430 AC indicating the area demarcated for prospecting.

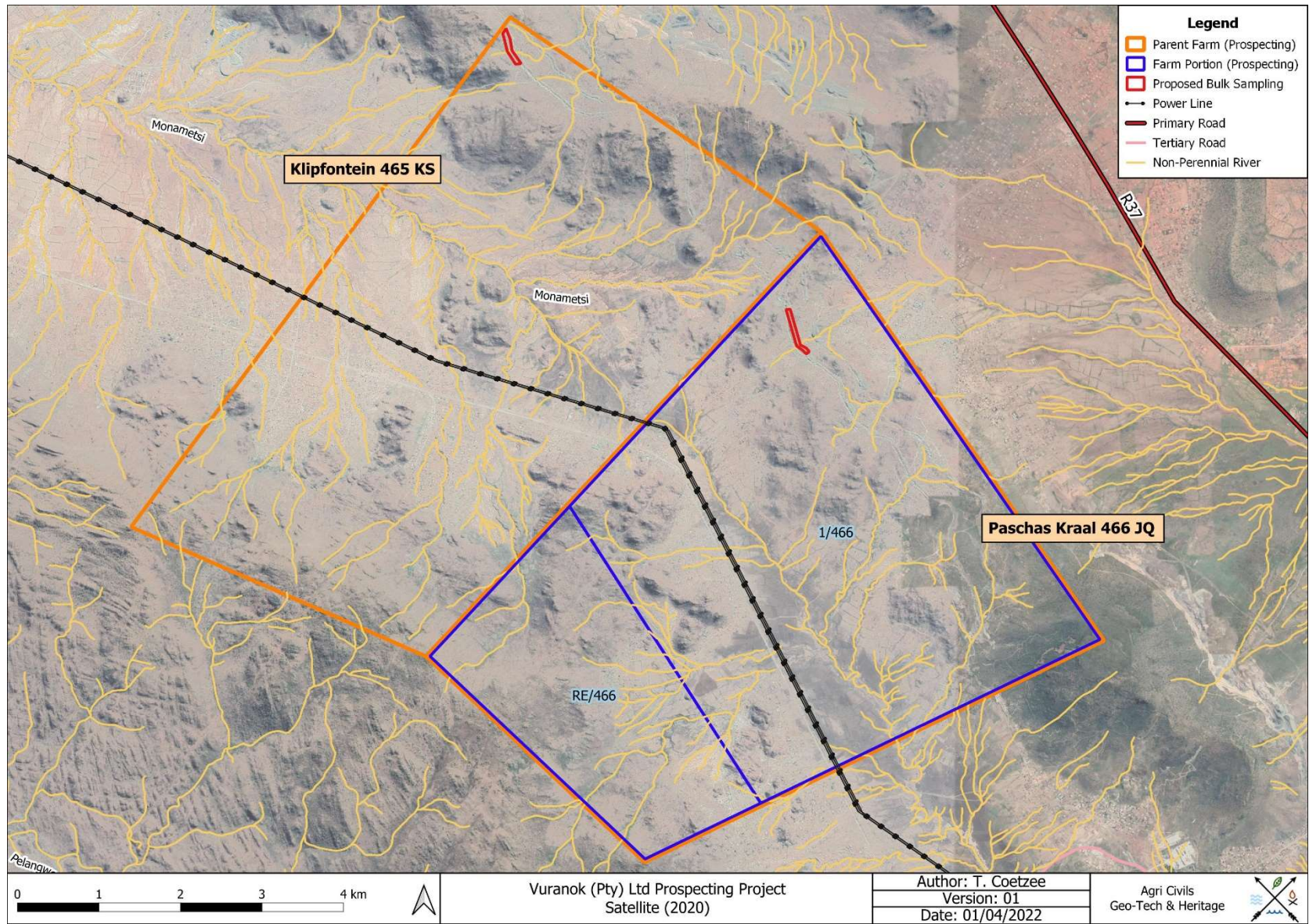


Figure 3: Proposed prospecting area portrayed on a 2020 satellite image.

3. Methodology

Archaeological reconnaissance of the areas demarcated for bulk sampling (Pit A & Pit B) was conducted during March 2022 through a systematic pedestrian survey (**Figures 4 & 5**). The transects were spaced roughly 50 m apart, depending on the topography. General site conditions were recorded via photographic record (**Figures 7 – 20**). Also, the two demarcated areas were inspected beforehand on Google Earth, historical topographical maps dating to 1963, 1975 and 2000 and aerial imagery dating to 1950, 1954, 1957, 1964, 1970, 1977, 1987 and 2002 in order to identify potential heritage remains (**Appendix A & B**). No potential sites, however, were noted on these data sources. Although the two areas demarcated for bulk sampling measure 17.3 ha, each area was buffered by 100 m and surveyed. This was done to accommodate the potential alteration of the bulk sampling location. Therefore, the total area inspected during the pedestrian survey was 32 ha.

Reconnaissance of the remainder of the study area, where boreholes will be drilled, was conducted by means of inspecting historical aerial imagery and topographical maps in order to identify potential heritage remains (**Appendix C**). The historical topographical datasets dating to 1963, 1975, 200 and 2002, as well as the historical aerial images dating to 1950, 1954 and 1957, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Fifty-eight potential sites were observed within the demarcated boundary (**Table 2 & Figure 6**). It should be noted that the prefixes '2430AC' and '2429BD' are not used when referring to the site names due to the length of the name, but are recorded as such in **Table 4**. Based on contemporary satellite imagery, 30 of the sites appear to have been demolished as no surface remains are visible. Twenty-six of the identified sites appear to have been replaced by modern infrastructure. One ruin and one site associated with what appears to be intact surface remains (building), were also noted. The total area inspected was 5767.3 ha.

Because heritage resources are often associated with perennial and non-perennial rivers/streams, the non-perennial streams intersecting the study area were buffered by a distance of 500 m, indicating a potentially sensitive area. Hills and gradual gradients are also often associated with heritage resources. Based on this criteria, practically the entire study area is considered to be sensitive. However, the areas previously/currently associated with cultivated land were traced and plotted as shown on topographical maps dating to 1963, 1975, 2000 and 2002. These areas are considered to be disturbed and are less sensitive from a heritage perspective.

Additionally, a previous heritage study conducted by Karodia (2013), focussed on a section of the Farm Klipfontein 465 KS. The location of heritage sites in the general area were obtained from a variety of sources and several heritage sites were recorded during the survey. These sites were plotted on the sensitivity map (**Figure 33**).

Table 2: Potential site location.

Site No	Type	Parent Farm	Farm Portion	Current Status	Estimated Extent (ha)	Lat (y)	Lon (x)
K01	Hut	Klipfontein 465 KS	0	Demolished	1.7	-24.319545	29.950007
K02	Hut	Klipfontein 465 KS	0	Demolished	7.3	-24.332529	29.965058
K03	Hut	Klipfontein 465 KS	0	Demolished	1.3	-24.335990	29.982309
K04	Hut	Klipfontein 465 KS	0	Demolished	0.9	-24.337087	29.986831
K05	Hut	Klipfontein 465 KS	0	Demolished	1.5	-24.343511	29.977909
K06	Hut	Klipfontein 465 KS	0	Demolished	9.3	-24.343309	29.971778
K07	Hut	Klipfontein 465 KS	0	Demolished	3.8	-24.349720	29.969994
K08	Hut	Klipfontein 465 KS	0	Demolished	3.6	-24.348000	29.975348
K09	Hut	Klipfontein 465 KS	0	Demolished	3.0	-24.347082	29.947446
K10	Hut	Klipfontein 465 KS	0	Demolished	1.5	-24.343284	29.946317
K11	Hut	Klipfontein 465 KS	0	Demolished	3.2	-24.356856	29.940800
K12	Hut	Klipfontein 465 KS	0	Demolished	1.2	-24.342313	29.956014
K13	Hut	Klipfontein 465 KS	0	Demolished	2.5	-24.370012	29.922961
K14	Building	Klipfontein 465 KS	0	Modern	3.2	-24.356844	29.962030
K15	Building	Klipfontein 465 KS	0	Modern	1.3	-24.350073	29.945632
K16	Hut	Klipfontein 465 KS	0	Modern	11.5	-24.353468	29.928648
K17	Hut	Klipfontein 465 KS	0	Modern	9.3	-24.358225	29.932756
K18	Hut	Klipfontein 465 KS	0	Modern	7.9	-24.358279	29.928401
K19	Building	Klipfontein 465 KS	0	Modern	10.9	-24.357097	29.946149
K20	Building	Klipfontein 465 KS	0	Modern	4.3	-24.362914	29.944859
K21	Hut	Klipfontein 465 KS	0	Modern	2.7	-24.367040	29.949284
K22	Hut	Klipfontein 465 KS	0	Modern	0.8	-24.359740	29.966171
K23	Hut	Paschas Kraal 466 KS	RE/466	Demolished	1.3	-24.377153	29.968979
K24	Building	Paschas Kraal 466 KS	RE/466	Demolished	1.3	-24.389898	29.967268
K25	Building	Paschas Kraal 466 KS	RE/466	Demolished	9.8	-24.394241	29.971673
K26	Hut	Paschas Kraal 466 KS	RE/466	Demolished	1.1	-24.394165	29.976886
K27	Building	Paschas Kraal 466 KS	RE/466	Demolished	2.2	-24.386873	29.974982
K28	Building	Paschas Kraal 466 KS	RE/466	Demolished	0.9	-24.391971	29.967095
K29	Hut	Paschas Kraal 466 KS	RE/466	Modern	7.2	-24.385100	29.966311
K30	Building	Paschas Kraal 466 KS	RE/466	Modern	4.2	-24.397916	29.979308
K31	Hut	Paschas Kraal 466 KS	RE/466	Surface Remains	1.3	-24.371899	29.957994
K32	Hut	Paschas Kraal 466 KS	1/466	Demolished	2.7	-24.389132	29.991542
K33	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.4	-24.390417	29.995398
K34	Building	Paschas Kraal 466 KS	1/466	Demolished	1.9	-24.384453	30.001000
K35	Building	Paschas Kraal 466 KS	1/466	Demolished	3.4	-24.377833	29.994435
K36	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.4	-24.378934	29.998537
K37	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.7	-24.362706	29.980653
K38	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.1	-24.360611	29.984173
K39	Hut	Paschas Kraal 466 KS	1/466	Demolished	2.8	-24.349842	29.977102
K40	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.3	-24.348849	29.979293
K41	Hut	Paschas Kraal 466 KS	1/466	Demolished	1.4	-24.346661	29.985217
K42	Building	Paschas Kraal 466 KS	1/466	Demolished	1.5	-24.384847	29.999501
K43	Hut	Paschas Kraal 466 KS	1/466	Modern	7.2	-24.380034	29.976426
K44	Building	Paschas Kraal 466 KS	1/466	Modern	4.2	-24.392183	29.987343
K45	Hut	Paschas Kraal 466 KS	1/466	Modern	0.8	-24.394344	29.985905
K46	Hut	Paschas Kraal 466 KS	1/466	Modern	3.2	-24.372609	29.999403
K47	Hut	Paschas Kraal 466 KS	1/466	Modern	1.3	-24.370420	29.998665
K48	Hut	Paschas Kraal 466 KS	1/466	Modern	1.5	-24.359588	29.968812

Site No	Type	Parent Farm	Farm Portion	Current Status	Estimated Extent (ha)	Lat (y)	Lon (x)
K49	Hut	Paschas Kraal 466 KS	1/466	Modern	8.9	-24.359190	29.972638
K50	Hut	Paschas Kraal 466 KS	1/466	Modern	1.6	-24.353738	29.978062
K51	Hut	Paschas Kraal 466 KS	1/466	Modern	1.2	-24.351974	29.983024
K52	Hut	Paschas Kraal 466 KS	1/466	Modern	1.1	-24.339772	29.992158
K53	Hut	Paschas Kraal 466 KS	1/466	Modern	1.5	-24.345462	29.992603
K54	Hut	Paschas Kraal 466 KS	1/466	Modern	1.5	-24.348929	29.997405
K55	Hut	Paschas Kraal 466 KS	1/466	Modern	1.2	-24.367040	29.998386
K56	Building	Paschas Kraal 466 KS	1/466	Modern	2.4	-24.365644	29.974499
K57	Building	Paschas Kraal 466 KS	1/466	Modern	0.6	-24.367970	29.973097
K58	Building	Paschas Kraal 466 KS	1/466	Ruin	1.3	-24.382912	30.007073

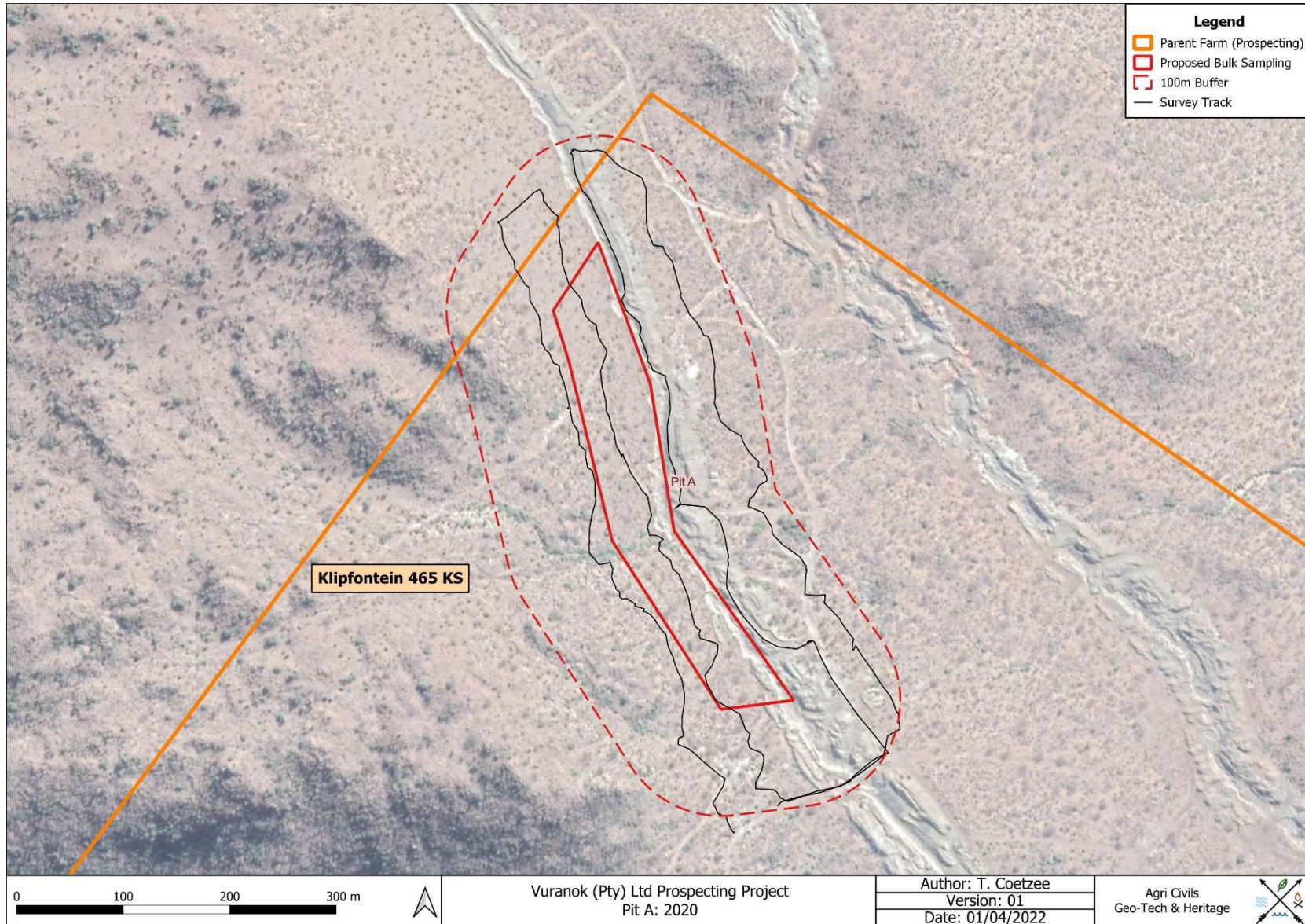


Figure 4: Proposed Bulk Sampling Pit A portrayed on a 2020 Satellite Image.

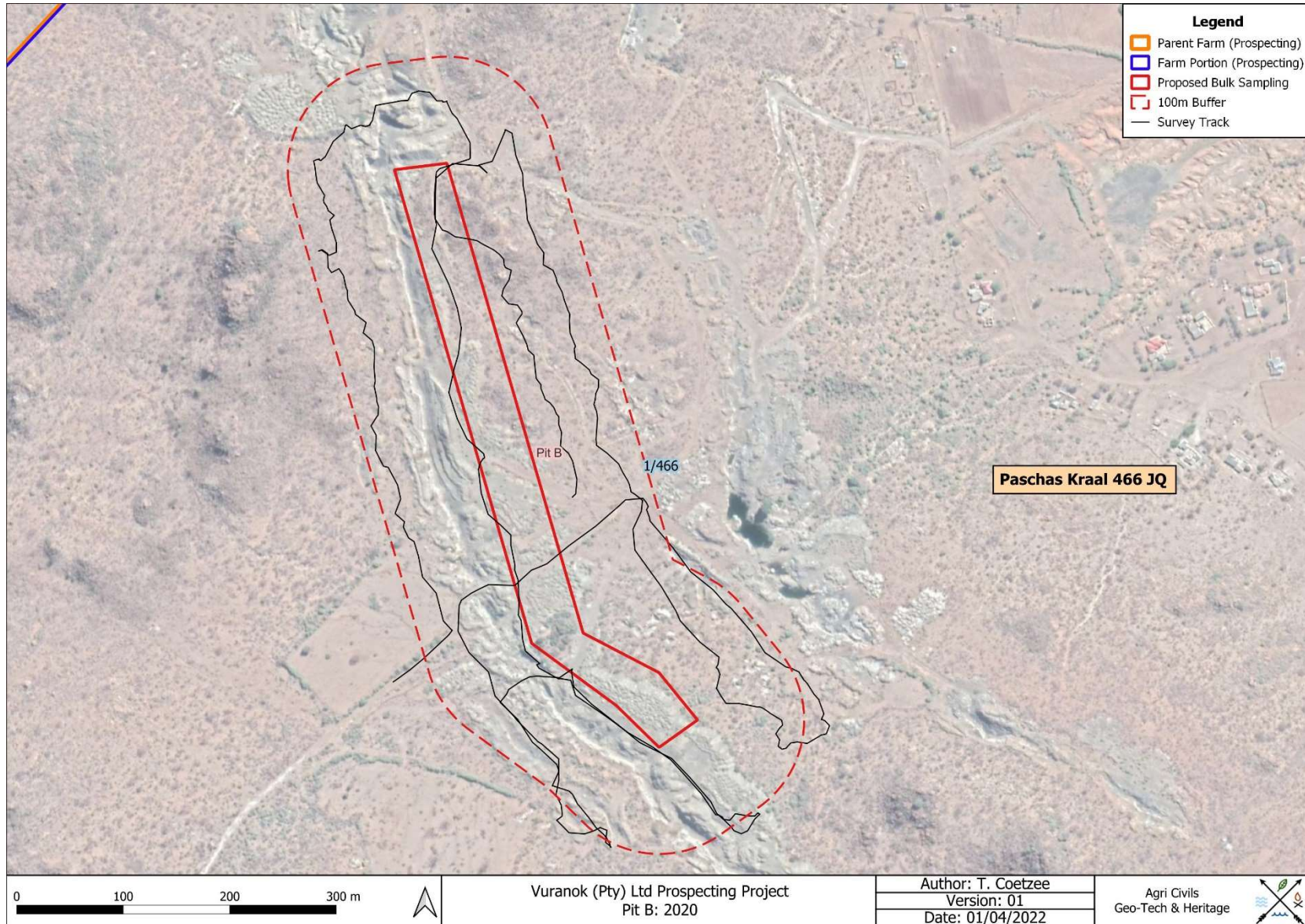


Figure 5: Proposed Bulk Sampling Pit B portrayed on a 2020 Satellite Image.

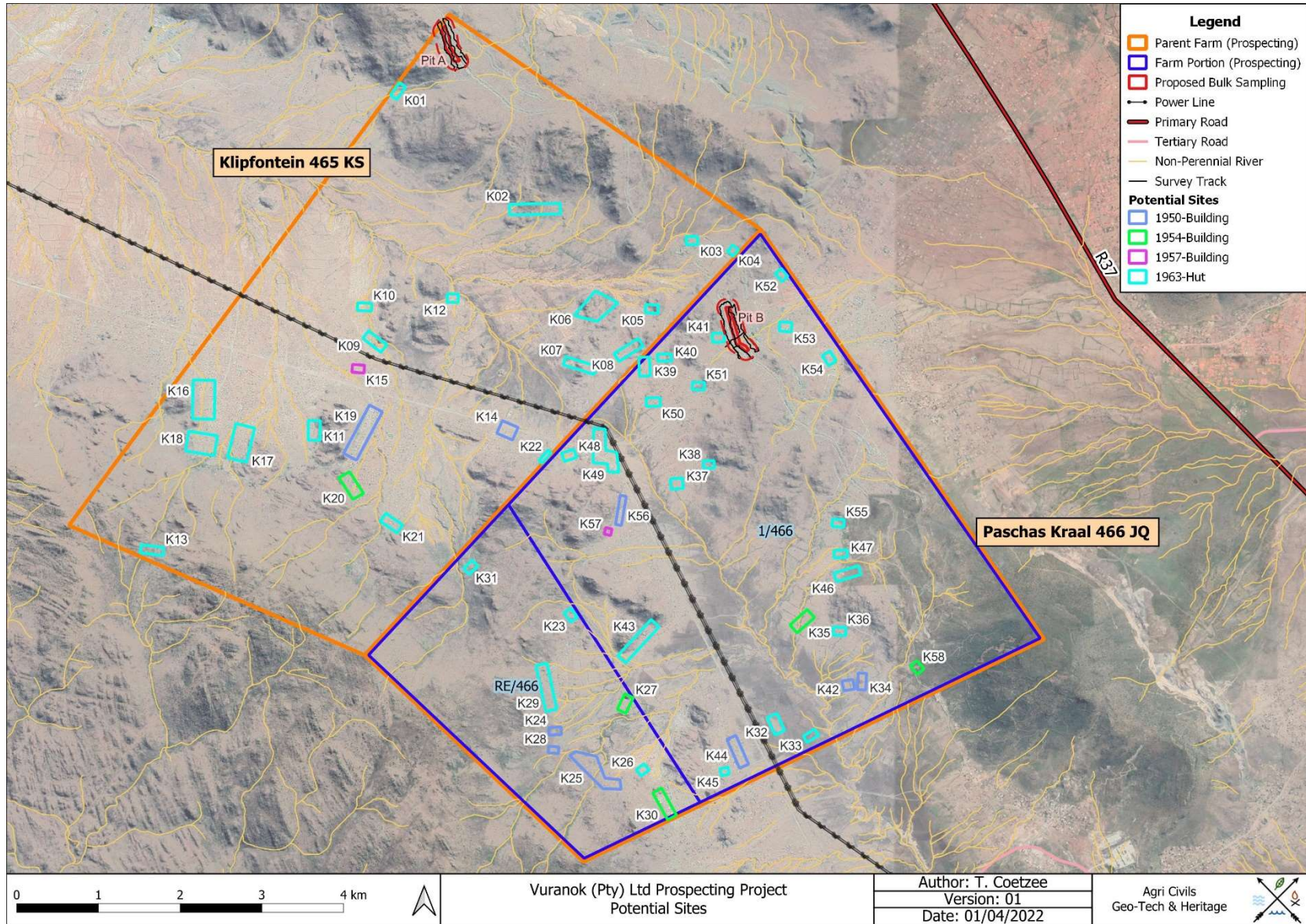


Figure 6: Potential Sites.



Figure 7: Proposed Pit A from a north-eastern perspective.



Figure 8: Proposed Pit A from a south-eastern perspective.



Figure 9: Proposed Pit A from a south-western perspective



Figure 10: Proposed Pit A from a north-western perspective.



Figure 11: Environment associated with the middle of proposed Pit A.



Figure 12: Proposed Pit B from a north-eastern perspective.



Figure 13: Proposed Pit B from a south-eastern perspective.



Figure 14: Proposed Pit B from a south-western perspective.



Figure 15: Proposed Pit B from a north-western perspective.



Figure 16: Environment associated with the middle of proposed Pit B.



Figure 17: Steep gradient along south-western boundary of proposed Pit A.



Figure 18: Dense vegetation and rocky terrain at proposed Pit A.



Figure 19: Dense vegetation at proposed Pit B.



Figure 20: Rocky terrain and steep gradient near the north-western corner of proposed Pit B.

3.1 Limitations

The pedestrian survey of the areas demarcated for bulk sampling (March 2022) confirmed the areas to be mostly disturbed by past mining activities. However, sections of open veldt exist and are utilised as grazing veldt for cattle. Proposed Pit A is associated with a very steep gradient along the western boundary, while both demarcated areas are characterised by patches of very dense vegetation, rocky terrain and a high tick population. Therefore, visibility and free movement were hampered in some places (**Figures 17 – 20**). It should also be noted that illegal mining activities occur at both areas and due to a significant safety hazard, an armed guard was required to access the areas.

The majority of the potential sites on the remainder of the study area were identified on historical topographical maps. Due to the poor resolution of the historical aerial images and the small building footprints, these structures are generally not visible on historical aerial imagery and only a few buildings/structures could be identified. Cultivated land, however, are clearly visible on these aerial images and aided in identifying past land uses.

4. Archaeological Background

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Later Iron Ages; and Historical or Colonial Periods. This section of the report provides a general background to archaeology in South Africa.

4.1 The Stone Age

The earliest stone tool industry, the Oldowan, was developed by early human ancestors which were the earliest members of the genus *Homo*, such as *Homo habilis*, around 2.6 million years ago. It comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). Archaeologists suggest these stone tools are the earliest direct evidence for culture in southern Africa (Clarke & Kuman 2000). The advent of culture indicates the advent of more cognitively modern hominins (Mitchell 2002: 56, 57).

The Acheulean industry completely replaced the Oldowan industry. The Acheulian industry was first developed by *Homo ergaster* between 1.8 to 1.65 million years ago and lasted until around 300 000 years ago. Archaeological evidence from this period is also found at Swartkrans, Kromdraai and Sterkfontein. The most typical tools of the ESA (Early Stone Age) are handaxes, cleavers, choppers and spheroids. Although hominins seemingly used handaxes often, scholars disagree about their use. There are no indications of hafting, and some artefacts are far too large for it. Hominins likely used choppers and scrapers for skinning and butchering scavenged animals and often obtained sharp ended sticks for digging up edible roots. Presumably, early humans used wooden spears as early as 5 million years ago to hunt small animals.

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

Although the transition from the Middle Stone Age to the Later Stone Age (LSA) did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999).

4.2 The Iron Age & Historical Period

The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). These groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Archaeological evidence from Early Iron Age sites is mostly artefacts in the form of ceramic assemblages. The origins and archaeological identities of this period are largely based upon ceramic typologies. Some scholars classify Early Iron Age ceramic traditions into different “streams” or “trends” in pot types and decoration, which emerged over time in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). Early Iron Age ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. This period continued until the end of the first millennium AD (Mitchell 2002; Huffman 2007). Some well-known Early Iron Age sites include the Lydenburg Heads in Mpumalanga, Happy Rest in the Limpopo Province and Mzonjani in Kwa-Zulu Natal.

The Middle Iron Age roughly stretches from AD 900 to 1300 and marks the origins of the Zimbabwe culture. During this period cattle herding appeared to play an increasingly important role in society. However, it was proved that cattle remained an important source of wealth throughout the Iron Age. An important shift in the Iron Age of southern Africa took place in the Shashe-Limpopo basin during this period, namely the development of class distinction and sacred leadership. The Zimbabwe culture can be divided into three periods based on certain capitals. Mapungubwe, the first period, dates from AD 1220 to 1300, Great Zimbabwe from AD 1300 to 1450, and Khami from AD 1450 to 1820 (Huffman 2007: 361, 362).

The Late Iron Age (LIA) roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, as can be seen from the distribution of iron slag which tend to occur only in certain localities compared to a wide distribution during earlier times. It was also during the Late Iron Age that different areas of South Africa were populated, such as the interior of KwaZulu Natal, the Free State, the Gauteng Highveld and the Transkei. Another characteristic is the increased use of stone as building material. Some artefacts associated with this period are knife-blades, hoes, adzes, awls, other metal objects as well as bone tools and grinding stones.

The Historical period mainly deals with Europe's discovery, settlement and impact on southern Africa. Some topics covered by the Historical period include Dutch settlement in the Western Cape, early mission stations, Voortrekker routes and the Anglo Boer War. This time period also saw the compilation of early maps by missionaries, explorers, military personnel, etc.

4.2.1 Steelpoort Archaeo-History

The Steelpoort area has a rich history spanning from early to historical times. Below is a brief account of earlier events in the Steelpoort area.

The general study area is associated with the Pedi, especially since Phiring, a Pedi town, is located roughly 50km the southwest of the study area.

Pedi origins are not clear-cut, but Van Warmelo (1935: 108-110) classified the Pedi under the Central Sotho living in Bopedi (Mönnig 1988: 11). Although oral histories differ, it is generally accepted that Thobele, also known as Lellelateng, is considered to be the founder of the Pedi. Accordingly, they moved from the southwest in the vicinity of Pretoria, crossed the Leolo Mountains and settled at Mogokgomeng just south of the Steelpoort station around 1650 (Hunt 1931: 281). It should be noted, however, that when the Pedi first arrived in what later became known as Bopedi, several other groups were already established there. These include Kwena, Roka and Koni groups, of which all recognised the superiority of the first arrivals in the area, the Mongatane (Kwena) (Mönnig 1988: 17). The Pedi recognised the authority of the Mongatane and paid tribute as well. According to Hunt (1931: 277), oral traditions recall conflict between the Pedi and people known as Mapalakat, who were described as having light complexions, long hair, wore long white dresses and carried rifles. It is possible that the Mapalakat might have been of Arabian origin. Accordingly, a few such parties were killed and their rifles taken. Thobele was succeeded by Kabu, who in turn was succeeded by Thobejane. The reign of Thobejane was characterised by a period of peace and prosperity. Moukangwe eventually succeeded Thobejane and in turn was succeeded by Mohube (Mönnig 1988: 19).

During Mohube's reign, a significant change took place which led to the creation of the Pedi empire. The exact reasons are not very clear but resulted in the death of Mohube at the hand of the Komane, a Koni group. The new Pedi leader, Mampuru, successfully repulsed a Mongatane attack and defeat the Komane. The Pedi proved victorious and Mampuru organised his regiments into fighting units (Mönnig 1988: 19-20). Conflict ensued between Mampuru and Morwamotše, the rightful heir, and resulted in Mampuru moving away to the north (Hunt 1931: 280). Mampuru also rebuilt his village at a safer location slightly to the north along the Steelpoort River. Dikotope succeeded Morwamotše but clashed with his brother, Thulare. Thulare, with the help of Mampuru, defeated Dikotope who joined forces with the Mongatane. Under Thulare's reign, the Pedi saw their greatest expansion and period of prosperity (Mönnig 1988: 21).

After Thulare's death in 1824 a period of confusion and disorder followed as disagreement existed among the sons of Thulare. This also resulted in gaps in historic events. During this period of turmoil, the Matabele under Mzilikazi raided a large number of cattle and fled from the Zulu to the south-western Transvaal. From here, Mzilikazi raided surrounding communities (Posselt 1919: 4). Phethedi, a son of Thulare, encountered one such party and successfully defeated them (Bryant 1929: 427 & Hunt 1931: 285). This, however, was answered by Mzilikazi who sent an army that crushed the Pedi and killed all remaining sons of Thulare, except for two. Sekwati, one of the two sons who remained, fled with the remaining Pedi to the north and took refuge with the Ramapulana. They returned to Bopedi four years later (Merensky 1899: 71 & Hunt 1931: 286).

After Sekwati's return, his greatest opposition was Morangrang, a Koni leader. Morangrang was apparently defeated by the Kgaga of Mphahlele. Sekwati also defeated his half-brother, Kabu, reduced the power of the Magakala, and re-established the paramountcy of the Pedi (Mönnig 1988: 23). Sekwati settled at Phiring, which is roughly 50 km southwest of the study area. The settlement was located on a rocky hilltop where Sekwati successfully repulsed Swazi and Zulu attacks.

In 1837, a trek under Louis Trichardt saw the first contact between the Voortrekkers and the Pedi under Sekwati. This initial contact was peaceful (Van Rooyen 1951: 97). In 1845 the Voortrekker Hendrik Potgieter entered Bopedi from the south and met with Sekwati. The Voortrekkers then settled to the east at Ohrigstad (Mönnig 1988: 24). The Pedi heartland at this stage was located in the triangular area between the Steelpoort and Olifants Rivers. In certain places, however, their territory extended to areas north of the Olifants River (Bergh 1999: 157), an area associated with rich iron and copper deposits (Bergh 1999: 8).

The initial peaceful relationship between the Voortrekkers and the Pedi was short-lived as a result of arguments relating to land encroachment and stock-theft. Potgieter unsuccessfully attacked the Pedi at Phiring in 1847 and again in 1852. Afterwards, Sekwati relocated his stronghold to Thaba-Mosego on the eastern slopes of the Leolo Mountains and called his village Tšate. It should be noted that the study area forms part of the Leolo Mountains.

On 17 November 1857, a peace treaty was signed between the Boers and the Pedi and saw a period of peace. On 22 September 1861, Sekwati died and the chieftainship was forcefully taken by Sekhukhune (Mönnig 1988: 24-26).

A period of strife and unrest existed during Sekhukhune's reign. Again, initial relations with the Boers were peaceful and both parties accepted the Steelpoort River as boundary. During this time, two groups of Swazi sought refuge with the Pedi and Sekhukhune allowed them to settle in the Leolo Mountains. The Swazi sent an army to recapture these groups, but was crushed by the Pedi. Sekhukhune also welcomed missionary work and allowed a mission station to be built closer to Tšate. Many people were converted, also Sekhukhune's half-brother, Johannes Dinkwanyane. In 1873 Dinkwanyane moved with a considerable Koni following to the Spekboom valley north of Lydenburg or Mashishing as it is known today, and Sekhukhune accepted him as a Pedi chief. Here, Johannes Dinkwanyane established Mafolofolo. His aim was to move to Elandspruit, which used to be Koni territory, but was made difficult by the Lydenburg Landdros (Delius & Schoeman 2008: 155). Johannes Dinkwanyane and Merensky, however, fled with their following to Botšabelo near Middelburg in November of 1864. This was the result of Sekhukhune regarding missionary work as a threat to his rule (Mönnig 1988: 26-28).

The first Sekhukhune War started on 16 May 1876 and to a large extent resulted from conflict originating from land encroachment. After the Boers successfully defeated Dinkwanyane's stronghold they moved towards Tšate, but retreated after they failed to dislodge the Pedi (Mönnig 1988: 28-29). Fort Weeber was built west of the Leolo Mountains to hold the boundary between the Pedi and the Boers, but also to harass the Pedi where possible. The fort was manned by Captain Ferreira and 100 men (Van Rooyen 1951: 266). Later, as second fort, Fort Burgers was built at the Steelpoort River.

In February of 1877, Pedi and Boer representatives met at Botšabelo to discuss peace terms and the treaty was signed on 15 February 1877. The treaty stated that the Pedi had to pay 2000 head of cattle and that the Pedi would become subjects of the Republic. Two months later, however, the British annexed the Transvaal but considered the treaty valid. The Pedi would therefore be recognised as British subjects. The British under Sir Theophilus Shepstone demanded a payment of 2000 head of cattle from the Pedi. This set the stage for the second Sekhukhune war when a full payment could not be made. Accordingly, the Pedi sent raiding parties across the border. With the end of the Zulu war, General Sir Garnet Wolseley proposed peace with the Pedi should they agree with the following terms: Sekhukhune should recognise the sovereignty of the British Crown, pay taxes to the British Government in Transvaal, permit the erection of several forts in Bopedi, and pay a fine of 2500 head of cattle. Sekhukhune refused and Sir Garnet Wolseley mobilised his army of about 12000 men. Sir Garnet Wolseley defeated Sekhukhune on 28 November 1878 and was sent to prison in Pretoria. This crushed the Pedi empire and ended the Sekhukhune era (Mönnig 1988: 30-31).

4.2.2 Historical aerial imagery and topographical maps

Bulk Sampling Pits A & B

Historical aerial images dating to 1950, 1954, 1957, 1964, 1970, 1977, 1987 and 2002, topographical maps dating to 1963, 1975 and 2002, as well as a Google Earth satellite image dating to 2017 (**Appendix A & B**) were used to determine the location and relative age of the structures and buildings associated with the demarcated portions, as well as the historical land uses. However, no sites of heritage significance were observed on these data sources since the areas appear to have been associated with open veldt until 2017, when the areas were disturbed by mining activities (**Appendix A: Figure 45 and Appendix B: Figure 57**).

Remainder of the study area

The aerial image dating to 1950 (**Appendix C: Figure 58**) indicates the presence of nine areas associated with buildings or structures (Sites K14, K19, K24, K25, K28, K34, K42, K44, K56) and several cultivated areas. Five of these sites (K24, K25, K28, K34, K42) appear to have been demolished as no surface indications are visible on contemporary satellite imagery. Four of the sites appear to be associated with modern infrastructure, suggesting that the original buildings have been demolished (K14, K19, K44, K56).

The aerial image dating to 1954 (**Appendix C: Figure 59**) indicates the presence of five areas associated with buildings or structures (Sites K20, K27, K30, K35, K58) not previously identified. Two of the sites (K27, K35) appear to have been demolished as no surface indications are visible on contemporary satellite imagery while another two sites (K20, K30) are associated with modern buildings, suggesting that the original buildings have been demolished. One site, K58, is associated with a building ruin. Should the building / structure, or parts thereof, form part of the original structure, it would at least be 68 years old.

Two sites (K15, K57), were identified on the aerial image dating to 1957 (**Appendix C: Figure 60**). Based on contemporary satellite imagery, these sites now appear to consist of modern buildings, suggesting that the original buildings have been demolished.

The remainder of the sites consist of 42 indications of huts on the 1963 topographical map (**Appendix C: Figure 61**). One of the sites (K31), is associated with surface remains that might be of historic origin. Should this be the case, the associated building/structure might exceed 59 years of age. Twenty-three of the identified sites (K01 – K13, K23, K26, K32, K33, K36 – K41) appear to have been demolished as no surface indications are visible on contemporary satellite imagery. The remaining 18 sites (K16 – 18, K21, K22, K29, K43, K45 – K55) now appear to consist of modern infrastructure, indicating that it is likely that the original buildings/structures have been demolished.

The 1975, 2000 and 2002 topographical maps (**Appendix C: Figures 62 & 63**) indicate the decline of cultivated fields and the significant expansion of urbanisation. Although several additional buildings and structures are indicated on these datasets, they are of contemporary origin.

4.3 Examples of Heritage Sites

Figures 21 – 31 are examples of heritage sites often encountered. Such sites are may be associated with water sources, rocky outcrops and hills and should be avoided by the prospecting activities.



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

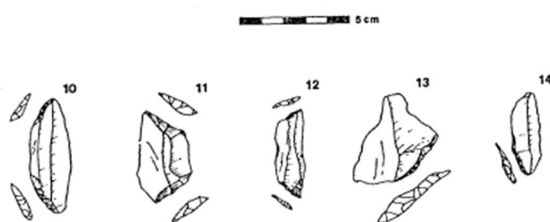


Figure 22: MSA artefacts from Howiesons Poort (Volman 1984).



Figure 23: LSA scrapers (Klein 1984).



Figure 24: Example of undecorated potsherds.



Figure 25: Example of a decorated potsherd.



Figure 26: Example of a potential granary base.



Figure 27: Example of a stone-walled site.



Figure 28 : Example of a broken lower grinding stone.



Figure 29: Example of a dilapidated stone-walled site.



Figure 30: Example of a historical building.



Figure 31: Example of a potential informal grave.

4.4 Previous Heritage Studies

Lebowa Platinum Mines: Atok Brakfontein Shaft & Associated Infrastructure

A study conducted by Frans Roodt (2003) on the farm Brakfontein 464 KS, which is located about 10 km northwest of the study area, identified several weathered pottery fragments. Some of these fragments were identified as belonging to the Eiland facies (Roodt 2003: 6) of the Kalundu Tradition. The most likely date range for these potsherds are between AD 1000 and 1300 (Huffman 2007: 227). Other material located during his study include grinding stones and an Achatina shell bead (Roodt 2003: 5). Roodt (2003) also identified seven clearly identifiable Early and Middle Iron Age sites. Remains include an Early Iron Age Doornkop site with associated midden deposits, a high concentration of pottery, bone and hut rubble. According to Roodt (2003), the Doornkop sites predate the Late Iron Age Pedi communities and are of scientific value. Recommendations included phase 2 test pit excavation at certain sites.

Potlaki: Farms Zwartkoppies 413 KS & Moeijelijk 412 KS

Frans Roodt conducted an archaeological study on the greater Zwartkoppies 413 KS and Moeijelijk 412 KS farms. These farms are located about 6 km north-northwest of the study area. Roodt (2002a) located nine Early Iron Age sites belonging to the Doornkop cultural tradition. Although some sites are disturbed, original floors were still found in situ. Two of these sites were classified as having medium significance and required mitigation before destruction. Sixteen Middle Iron Age sites belonging to the Eiland cultural tradition were located, of which at least one site is undisturbed. Again, two of these sites were classified as having medium significance and required mitigation before destruction. Roodt (2002a) also located one Late Iron Age site in a disturbed state. The associated pottery fragments belong to the Moloko cultural tradition. The allocated significance was low, but still required mitigation before being destroyed.

Lebowa Platinum Mines: Atok Lepelle Open Cast Mine Merensky and UG 2 Reefs

Another archaeological survey, located roughly 12 km to the west-northwest of the study area, was conducted by Frans Roodt (2002b) in 2002. This study identified similar material culture compared to the study conducted on the Brakfontein 464 KS farm with the exception of an eggshell and iron bead (Roodt 2002b). Roodt (2002a, 2002b & 2003) also observed scattered Middle Stone Age flakes.

Bokoni Klipfontein Opencast Mine Project

A heritage study conducted by Karodia (2013) on the Farm Klipfontein 465 KS, revealed several Iron Age/Historic open scatter sites as well as isolated Iron Age/Historic occurrences and features. Material associated with these sites include ceramic fragments and grinding stones located in abandoned fields and erosion gullies (Karodia 2013: 27, 38).

132kV Power Lines Between the Proposed Tshatane and Lesego Substations and Between the Proposed Tshatane Substation and the Existing Jane Furse Substation

Pistorius (2012) conducted an archaeological survey, located roughly 32 km to the south-southwest of the study area, for the construction of a 132kV power line between the Tshatana, Lesego and Jane Furse substations. This study identified no material culture of heritage significance.

5. Archaeological and Historical Remains

5.1 Stone Age Remains

No Stone Age archaeological remains were located within the demarcated bulk sampling areas.

Although no Stone Age archaeological remains were located, such artefacts do occur in the area. Because such sites are often associated with water sources, stone age material are more likely to be encountered within the 500 m river buffer zone of the study area. Stone Age sites are also not likely to be detectable on aerial imagery and are generally discovered during pedestrian surveys.

Three studies done by Frans Roodt (2002a, 2002b & 2003) identified scattered Middle Stone Age flakes in the general area

5.2 Iron Age Farmer Remains

No Iron Age Farmer remains were located within the demarcated bulk sampling areas.

Several of the studies conducted in the general area recorded Iron Age/Farmer Period remains, indicating a rich archaeological landscape.

Although stone-walled sites are often detectable on satellite and aerial imagery, none were observed within the greater prospecting area. This might be attributed to dense vegetation and poor preservation, especially since previous heritage studies recorded several LIA sites on the Farm Klipfontein 465 KS. It is therefore likely that such sites are associated with the rest of the study area as well.

5.3 Historical Remains

No historical remains were located within the demarcated bulk sampling areas. All the sites identified on the remainder of the study area, however, appear to date to historical times.

Based on historical aerial imagery and topographical maps, one potential ruin (K58) and one site associated with surface remains (K31) might date to the historical period. The remaining potentially historic sites appear to have either been replaced by modern buildings or have been demolished.

One of the studies conducted by Frans Roodt in 2002 on a farm towards the northern parts of the Leolo Mountains, identified a series of historical occupation sites along a mountain slope (Roodt 2002b: 11). Another study conducted by Roodt in 2002 in the general area identified 18 recent historical sites. Eight of these sites have associated burials (Roodt 2002a).

5.4 Contemporary Remains

Evidence from satellite imagery and topographical maps indicate the presence of several buildings and structures in the greater study area, while **Figure 32** illustrates typical contemporary remains associated with the proposed bulk sampling pits. Archaeological studies conducted in the surrounding areas did not record contemporary remains.



Figure 32: Contemporary remains.

5.5 Graves

No graves were located within the demarcated bulk sampling areas.

Other heritage studies conducted in the area, however, identified several cemeteries and burial sites. These cemeteries are generally associated with the nearby villages (Roodt 2003: 6). The study conducted by Karodia (2013) identified two informal burial grounds of roughly 21 graves. These graves consist of packed stones and were given a field rating of IV A. Due to the small size of burial sites and often poorly preserved surface features, such sites are rarely visible on satellite imagery and are generally detected during pedestrian surveys. Graves and cemeteries are also not always indicated on topographical maps.

6. Evaluation

The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

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

6.1 Field Ratings

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

Table 3: Prescribed Field Ratings

Rating	Field Rating/Grade	Significance	Recommendation
National	Grade 1		National site
Provincial	Grade 2		Provincial site
Local	Grade 3 A	High	Mitigation not advised
Local	Grade 3 B	High	Part of site should be retained
General protection A	4 A	High/Medium	Mitigate site
General Protection B	4 B	Medium	Record site
General Protection C	4 C	Low	No recording necessary

Table 4: Individual Site Ratings

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2429BD-K01	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K02	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K03	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K04	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K05	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K06	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K07	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K08	Hut-Demolished	General Protection C	4 C	Low	No recording necessary

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2429BD-K09	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K10	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K11	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K12	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K13	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2429BD-K14	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K15	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K16	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K17	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K18	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K19	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K20	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2429BD-K21	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K22	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K23	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K24	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K25	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K26	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K27	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K28	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K29	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2430AC-K30	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K31	Hut-Surface Remains	General Protection B	4 B	Medium	Record site
2430AC-K32	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K33	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K34	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K35	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K36	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K37	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K38	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K39	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K40	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K41	Hut-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K42	Building-Demolished	General Protection C	4 C	Low	No recording necessary
2430AC-K43	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K44	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K45	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K46	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K47	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K48	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K49	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K50	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2430AC-K51	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K52	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K53	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K54	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K55	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K56	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K57	Modern Infrastructur	General Protection C	4 C	Low	No recording necessary
2430AC-K58	Building-Ruin	General Protection B	4 B	Medium	Record site

*Note – These ratings are based on the sites and their age as identified on historical aerial imagery and topographical maps. Should any of the sites proposed to be impacted, an inspection of the specific site by a qualified archaeologist must first be conducted. It should also be noted that additional heritage sites might be located within the demarcated study area. No heritage sites were located within the demarcated bulk sampling areas.

7. Statement of Significance & Recommendations

7.1 Statement of Significance

The study area: The Farm Klipfontein 465 KS, and Portion 1 and the Remaining Extent of the Farm Paschas Kraal 466 KS, Limpopo Province.

Bulk Sampling Pit A & B

During the pedestrian survey no sites of heritage significance were observed within the demarcated bulk sampling pits or within a 100 m of the boundaries. Also, no potential heritage sites were noted on historical aerial imagery or on historical topographical maps and none of the heritage sites located by previous studies are located within the demarcated boundaries. Additionally, both areas demarcated for bulk sampling have been disturbed by mining activities in 2017. The two demarcated areas are therefore not considered to be sensitive from a heritage perspective.

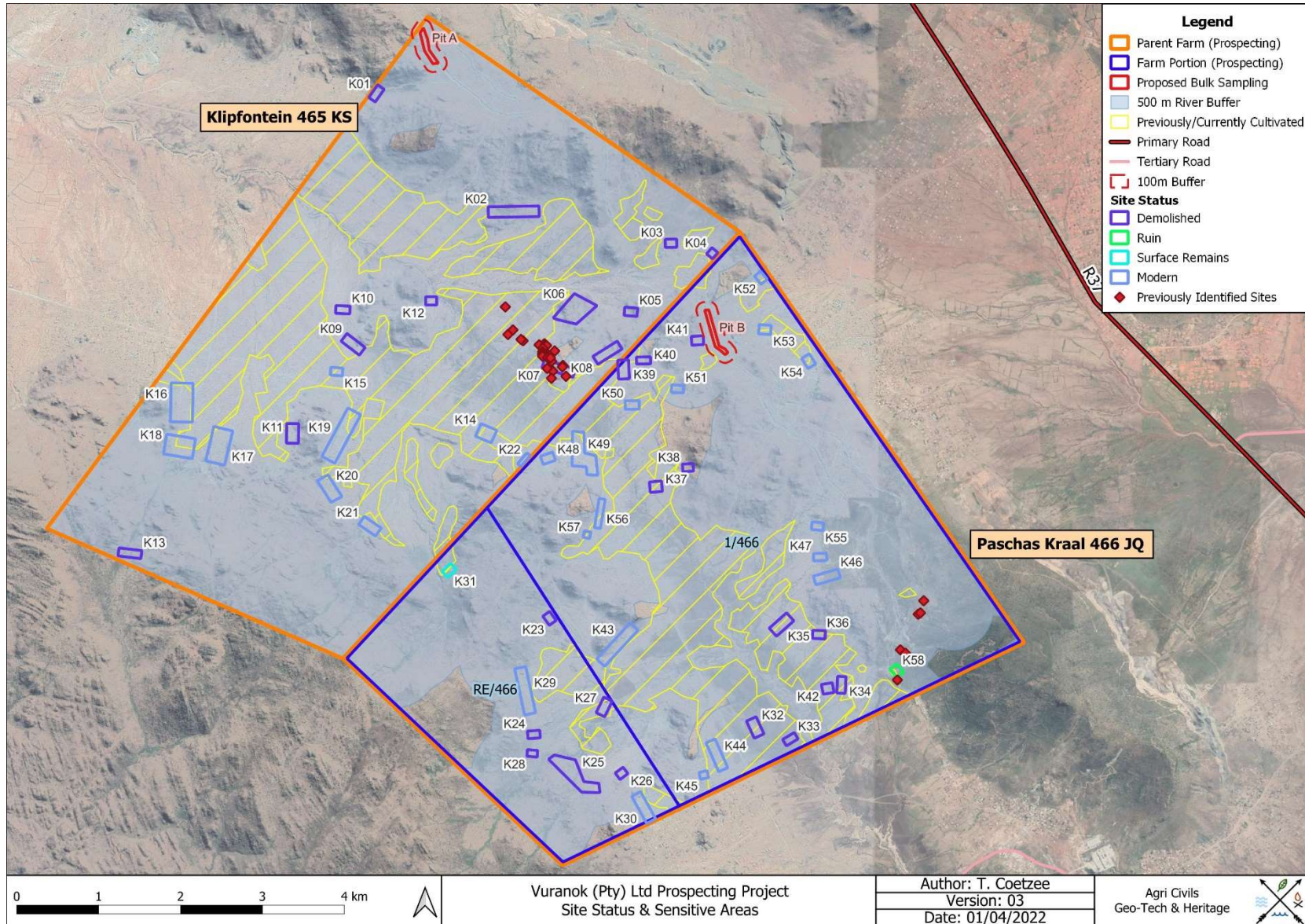
Remainder of the study area

The proposed prospecting project falls within an archaeologically rich and sensitive area, as can be seen from the studies conducted by Roodt (2002a, 2002b & 2003) and Karodia (2013). Accordingly, there is a strong association with Early and Middle Iron Age remains that stretch to the Historical Period in the post-Sekhukhune wars era. The most information available, however, is found in oral histories identifying the Pedi as a key role player in the general area. Since some heritage sites, such as graves, are not always clearly identifiable as it might consist of disturbed surface indications, care must be exercised when prospecting.

Figure 33 indicates the potential heritage sites as identified on historical aerial images and topographical maps, as well as heritage sites identified by previous heritage studies. The previously identified sites consist of Iron Age, Historical and burial sites. It should be noted that the sites that are associated with modern infrastructure likely replaced historical buildings and structures. The 500 m buffer area around rivers is shown as well. The 500 m buffer area is considered potentially sensitive from a heritage perspective since archaeological sites are often located within this zone. The areas previously/currently associated with cultivated fields are considered to be less sensitive from a heritage perspective due to the areas being disturbed. The least sensitive areas are therefore areas that are located more than 500 m from a water source, fall within previously/currently cultivated fields and are not located within close proximity of potential heritage sites or contemporary infrastructure. From a heritage perspective, these areas are considered to be more favourable for the proposed prospecting activities. Although the previously/currently cultivated areas that intersect the 500 m river buffer are also disturbed, the potential for subsurface cultural material is slightly higher compared to areas falling outside of the buffer zone. Apart from the identified potential sites, open areas falling outside of the previously/currently cultivated areas are considered to be the most sensitive areas from a heritage perspective, especially due to the presence of several heritage sites that were identified by previous heritage studies in the greater area. The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some of the cultivated fields fell into disuse, meaning that burial sites might be located in disturbed areas as well.

The contemporary buildings associated with the study area, as well as the historical buildings / structures that appear to have been replaced by modern buildings, do not exceed 60 years of age and are therefore not protected under the NHRA (25 of 1999). It should be kept in mind that the historical aerial images have a low resolution and that the infrastructure associated with the study area consist of relatively small footprints that are not easily detectable on such imagery.

Site K31, identified on the 1963 topographical map, appears still to be associated with buildings that are not of modern construction. The possibility, therefore, exists that the site exceeds 60 years of age and is protected under the NHRA (25 of 1999). Site K58 was identified as a building on the 1954 aerial image and appears to currently consist of a building ruin. Should the building ruin form part of the original structure identified on the 1954 aerial image, it would exceed 60 years of age and would be protected under the NHRA (25 of 1999).



7.2 Recommendations

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

Bulk Sampling Pit A & B

- No sites of heritage significance were observed within the demarcated boundaries or within the 100 m buffer area. Both areas have significantly been disturbed by past mining activities. The areas associated with Bulk Sampling Pit A & B are therefore not considered to be sensitive from a heritage perspective and no further action is required.

Remainder of the study area

- Although the 30 demolished sites dating to 1950, 1954 and 1963 appear not to be associated with surface remains, subsurface culturally significant material might be present. Therefore, it is recommended that these areas be avoided by the proposed prospecting activities.
- The 26 sites associated with historical infrastructure that appear to have been replaced by modern buildings are not considered to be significant from a heritage perspective. However, should any of the sites proposed to be impacted, an inspection of the specific site by a qualified archaeologist must first be conducted.
- Building ruin (K58) might date to 1954. The possibility therefore exists that the associated structure exceeds 60 years of age. It is therefore recommended that this area be avoided by the proposed prospecting activities.
- Site K31, identified on the 1963 topographical map, is associated with surface remains that might exceed 60 years of age. It is therefore recommended that this area be avoided by the proposed prospecting activities.
- The heritage sites identified by previous heritage studies, as shown on **Figure 33**, are considered to be potentially significant and sensitive and should be avoided by the proposed prospecting activities. These sites consist of a combination of Iron Age, Historical and burial sites.
- The remaining built environment associated with the demarcated study area appear to be of contemporary origin and are therefore not considered to be significant from a heritage perspective. However, the potential presence of graves at some of the modern buildings should be considered. Therefore, should impact to the built environment be envisaged, it is recommended that a qualified archaeologist first inspect the specific area.

- The area demarcated as previously/currently cultivated is considered to be less sensitive from a heritage perspective. The least sensitive areas are therefore areas that are located more than 500 m from a water source, fall within previously/currently cultivated fields and are not located within close proximity of potential heritage sites or contemporary infrastructure. Such areas, however, appear to be near non-existent in this specific case.
- Although the previously/currently cultivated areas that intersect the 500 m river buffer are also disturbed, the potential for subsurface cultural material is slightly higher compared to areas falling outside of the buffer zone. Care should therefore be exercised when prospecting within these areas.
- Apart from the identified potential sites, open and undisturbed areas falling outside of the previously/currently cultivated areas are considered to be the most sensitive from a heritage perspective, especially due the presence of LIA, Historical and burial sites in the general vicinity of the demarcated study area. Care should therefore be exercised when prospecting in these areas.
- Prospecting should not take place in the vicinity of stone cairns, potential burial sites, stone-walling, building ruins or any other heritage material or structures.
- Should uncertainty regarding the presence of heritage remains exist, a qualified archaeologist should be present on-site during the prospecting process. Alternatively, once the prospecting localities have been identified, a qualified archaeologist can inspect the proposed sites and produce recommendations that will aid the protection of heritage resources.
- 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 portion, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency.

8. 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: Pit A – Historical Aerial Imagery & Topographical Maps

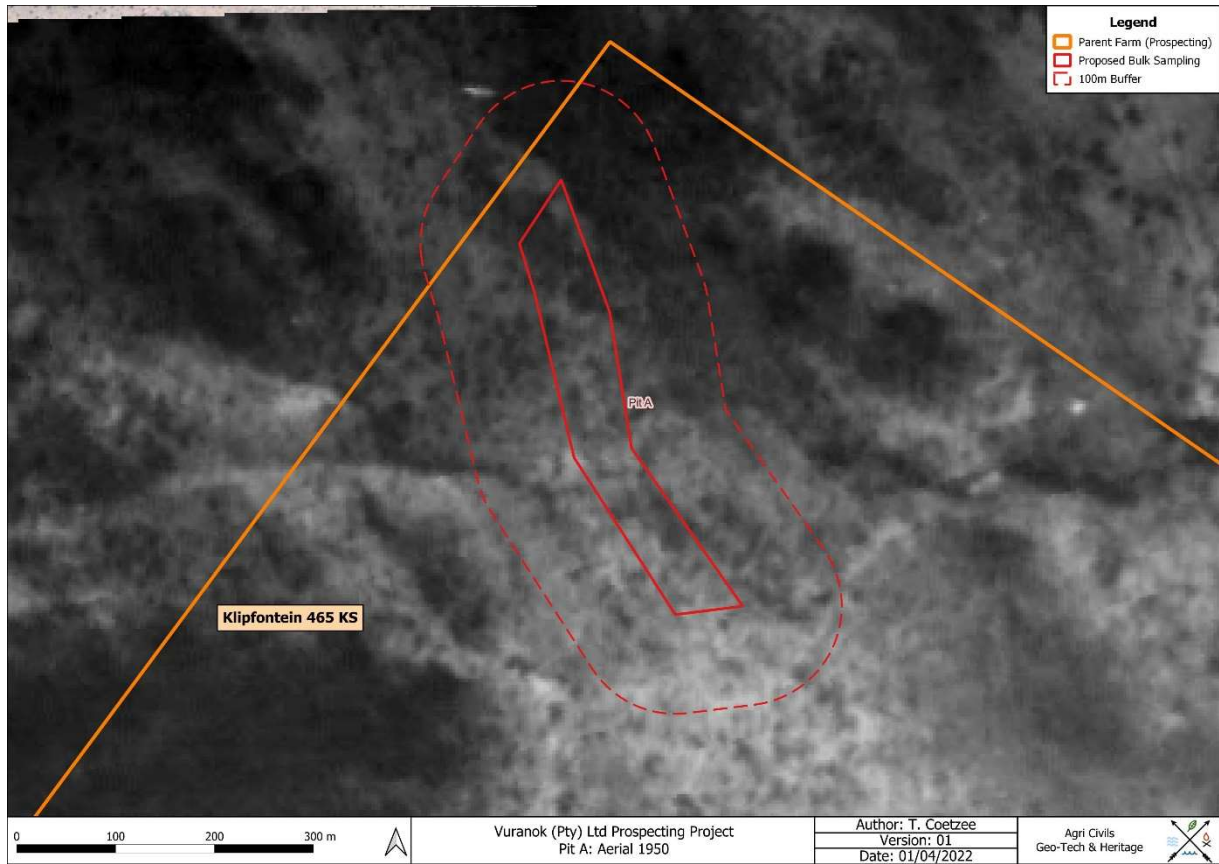


Figure 34: Proposed Pit A portrayed on a 1950 aerial image.

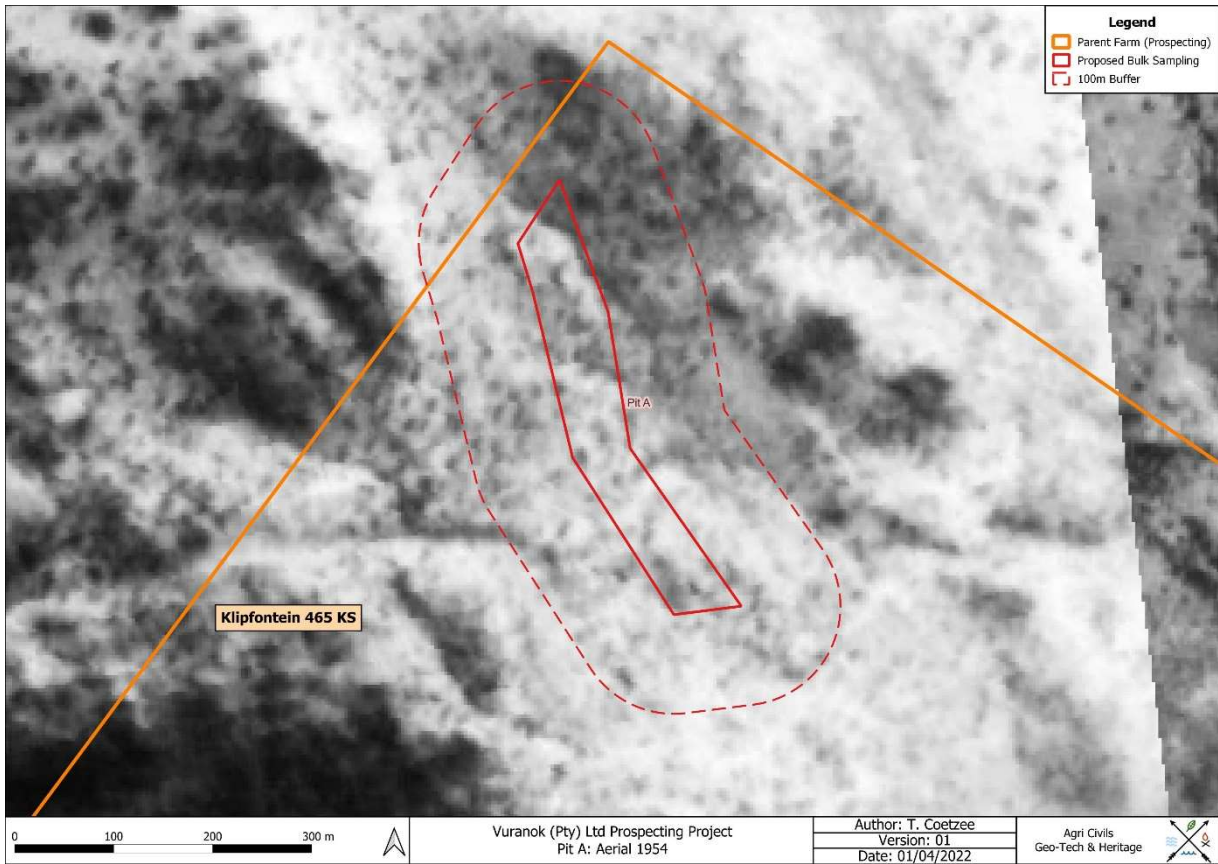


Figure 35: Proposed Pit A portrayed on a 1954 aerial image.

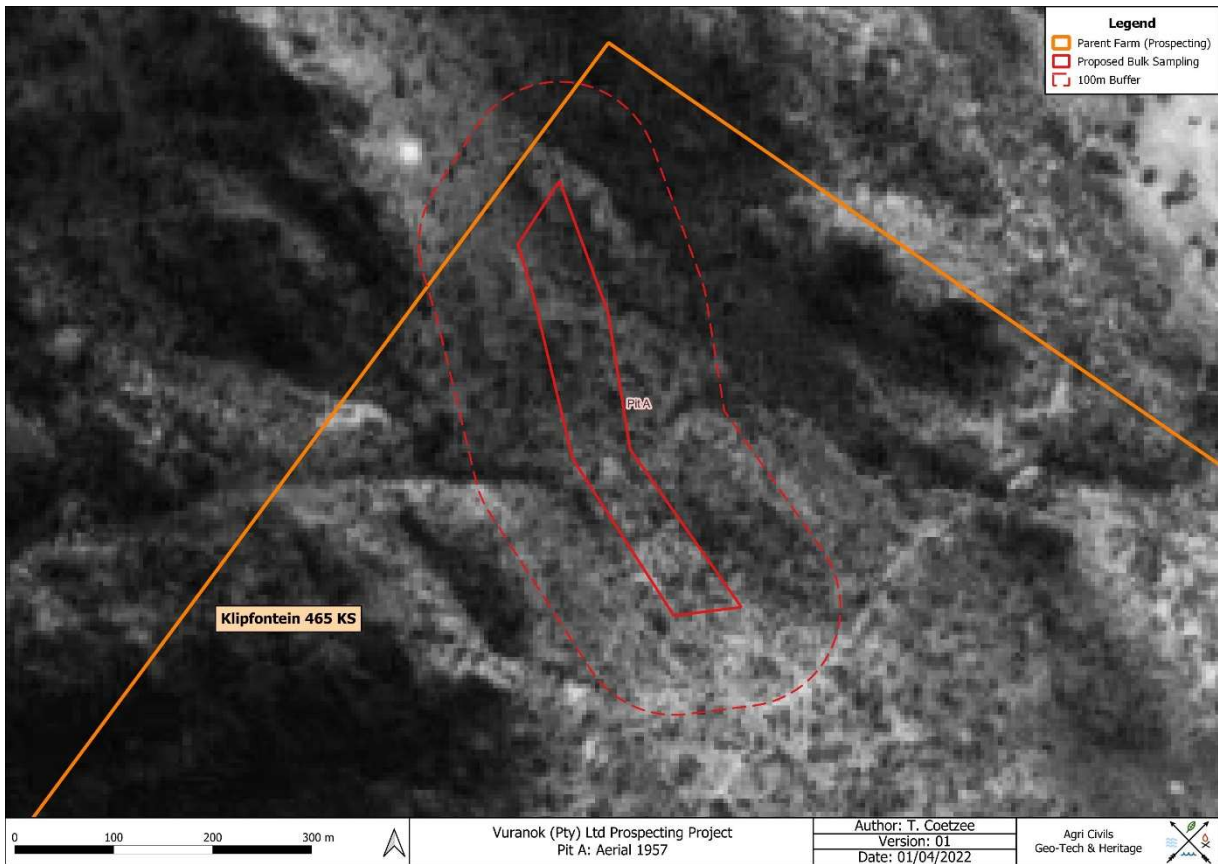


Figure 36: Proposed Pit A portrayed on a 1957 aerial image.

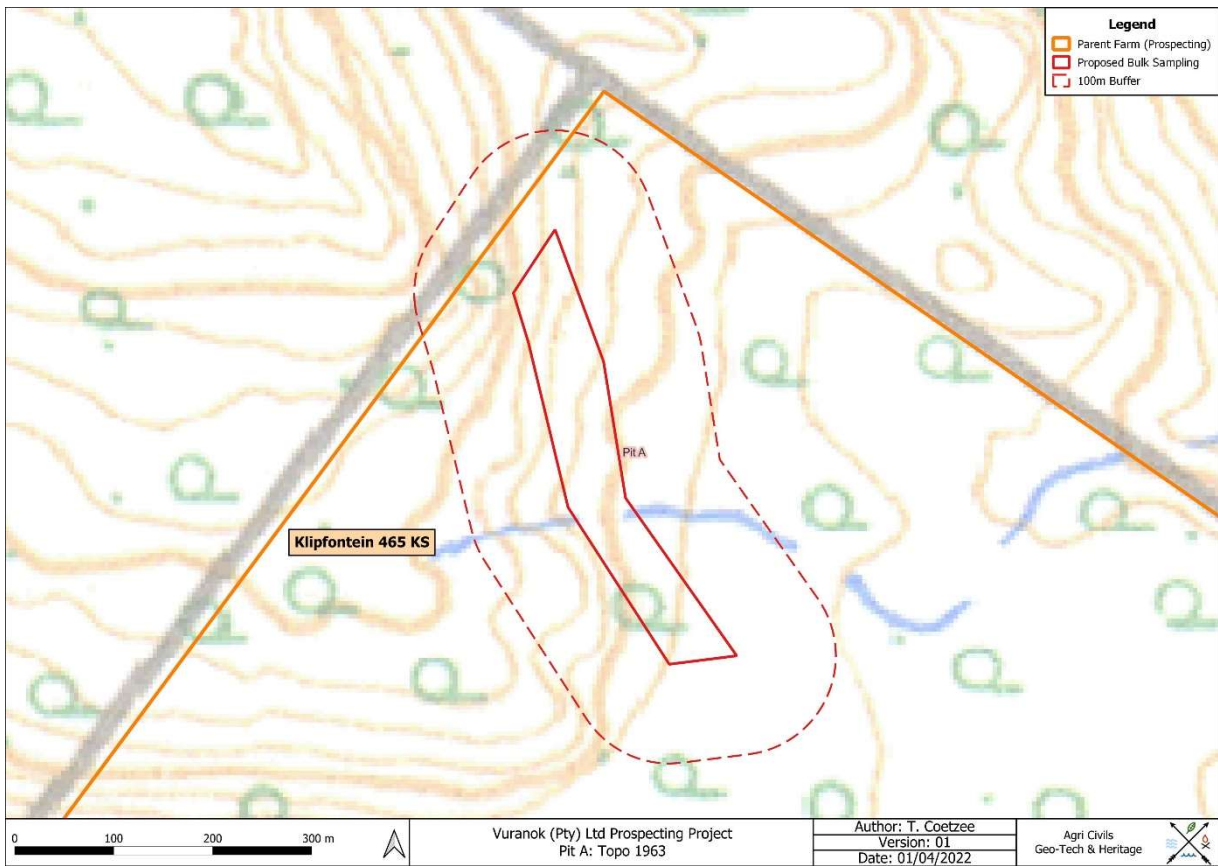


Figure 37: Proposed Pit A portrayed on a 1963 topographical map.

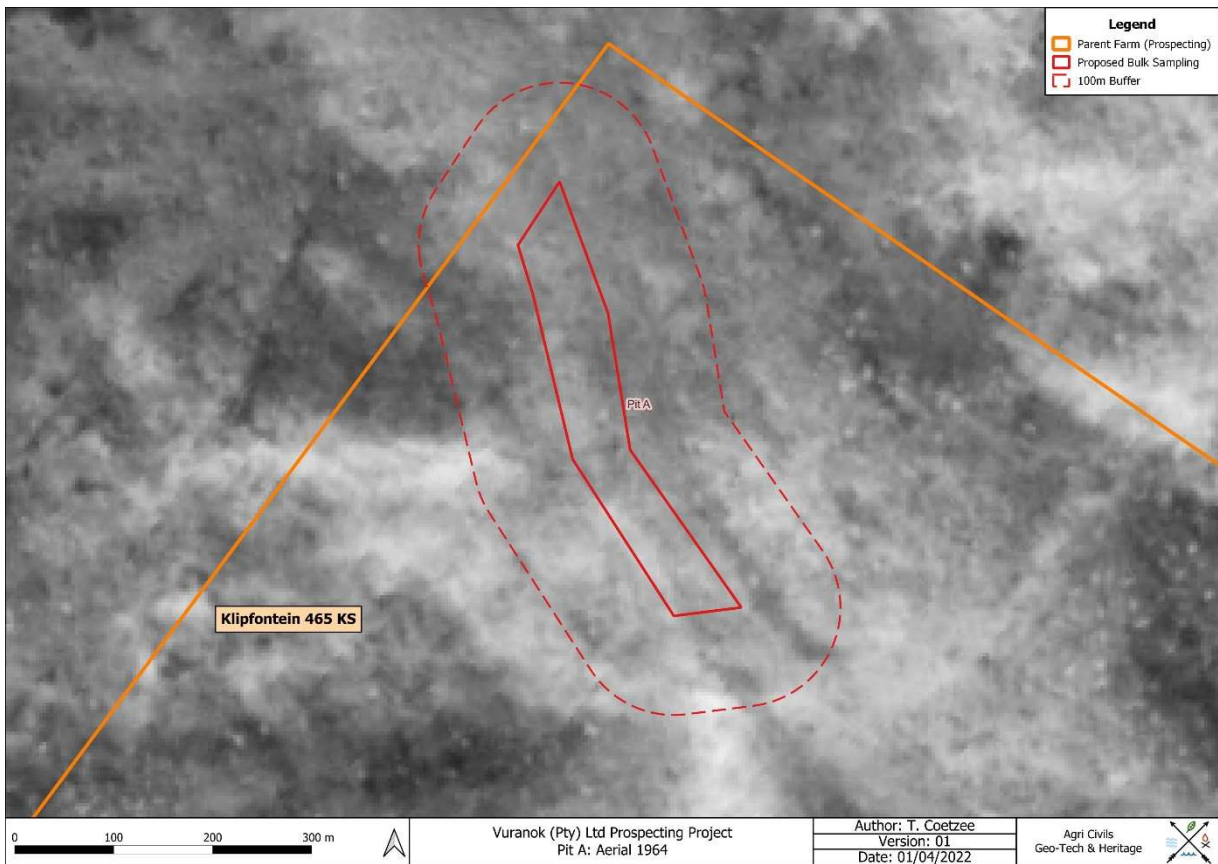


Figure 38: Proposed Pit A portrayed on a 1964 aerial image.

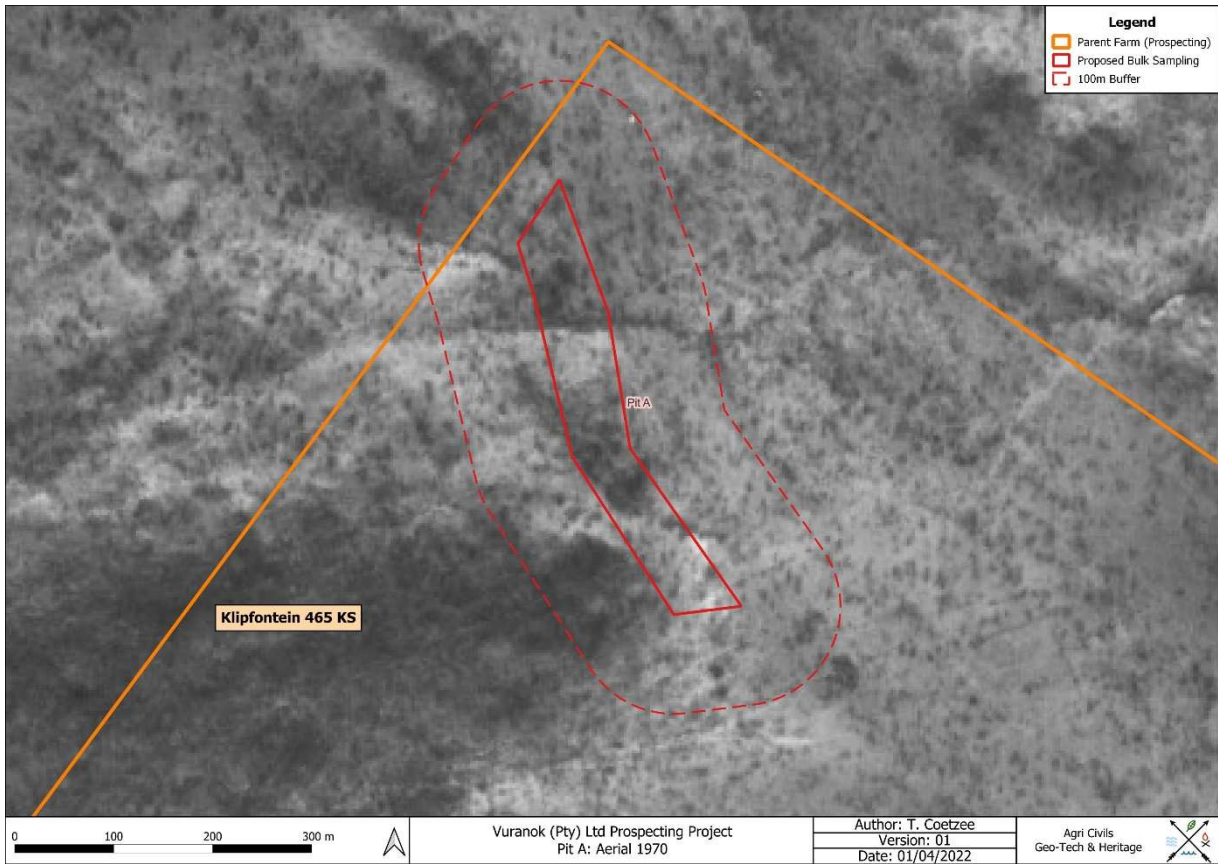


Figure 39: Proposed Pit A portrayed on a 1970 aerial image.

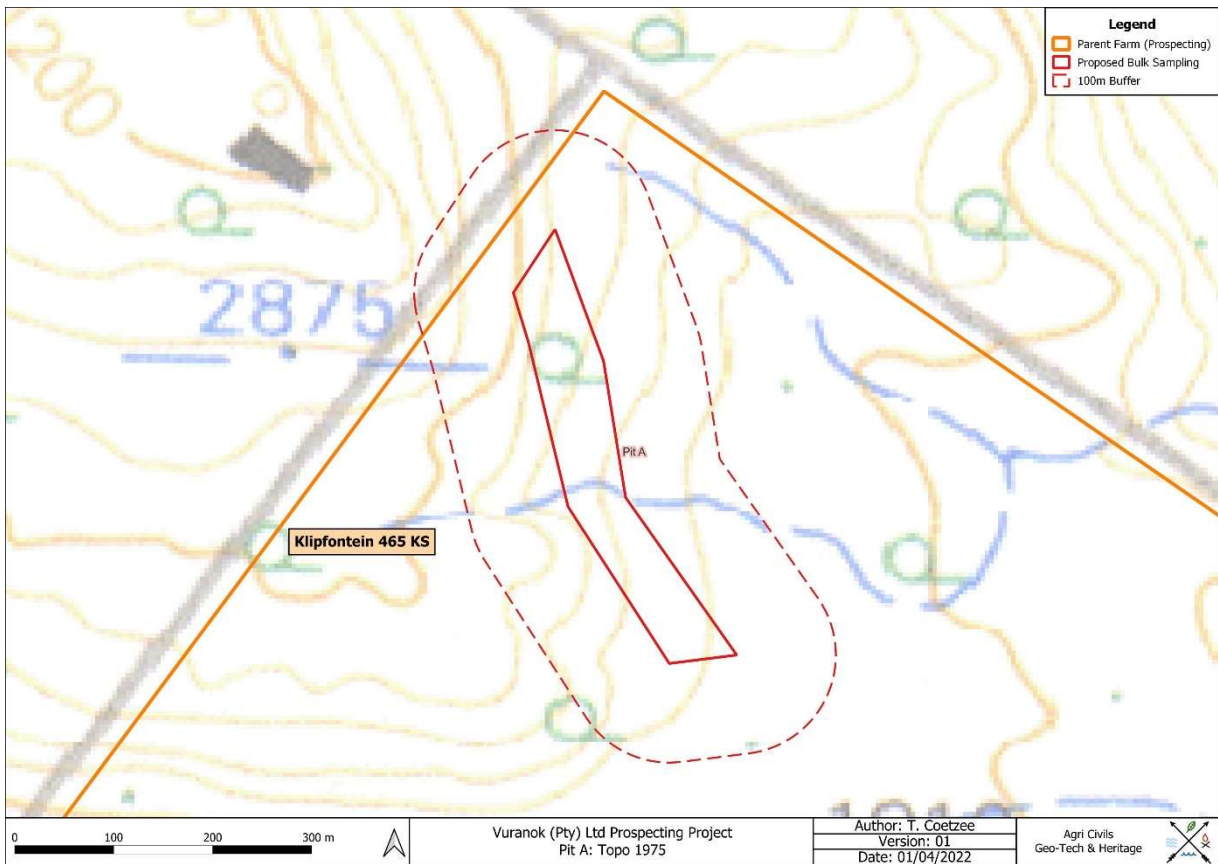


Figure 40: Proposed Pit A portrayed on a 1975 topographical map.

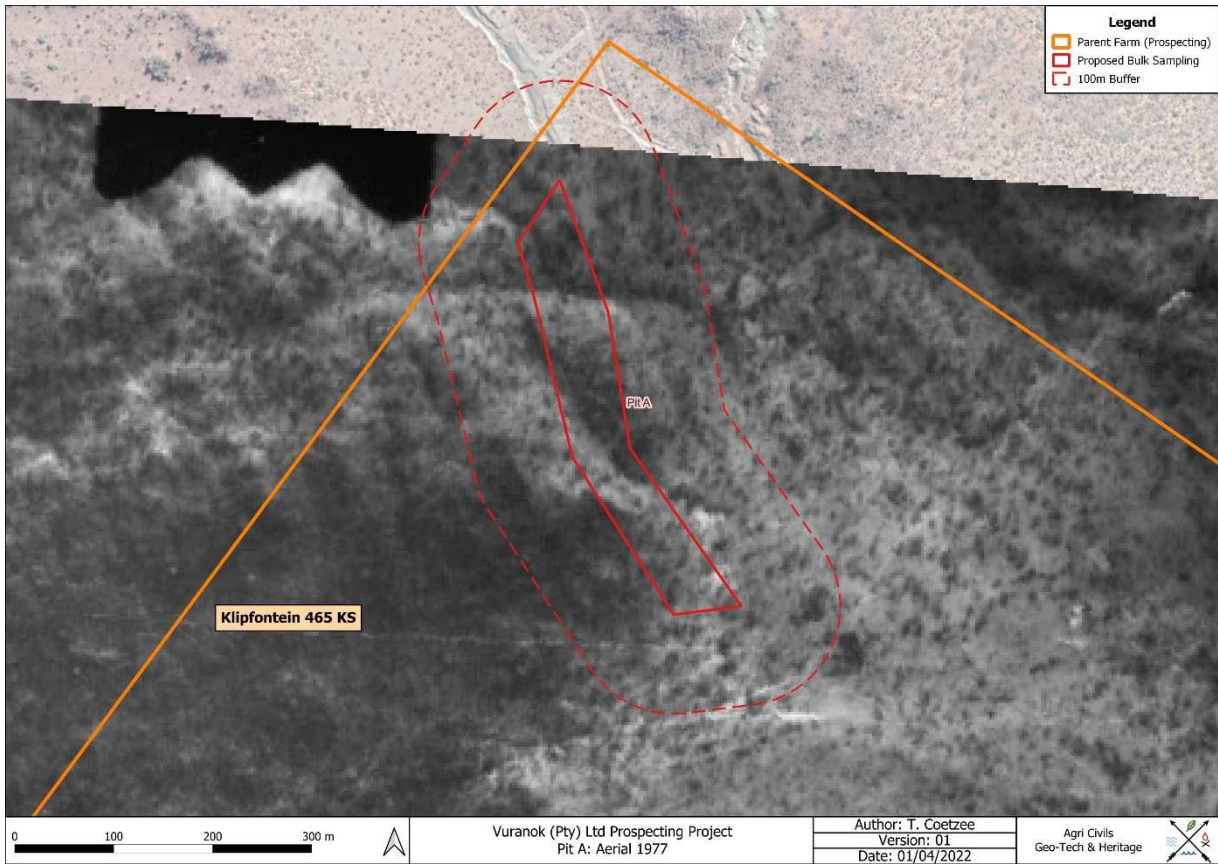


Figure 41: Proposed Pit A portrayed on a 1977 aerial image.

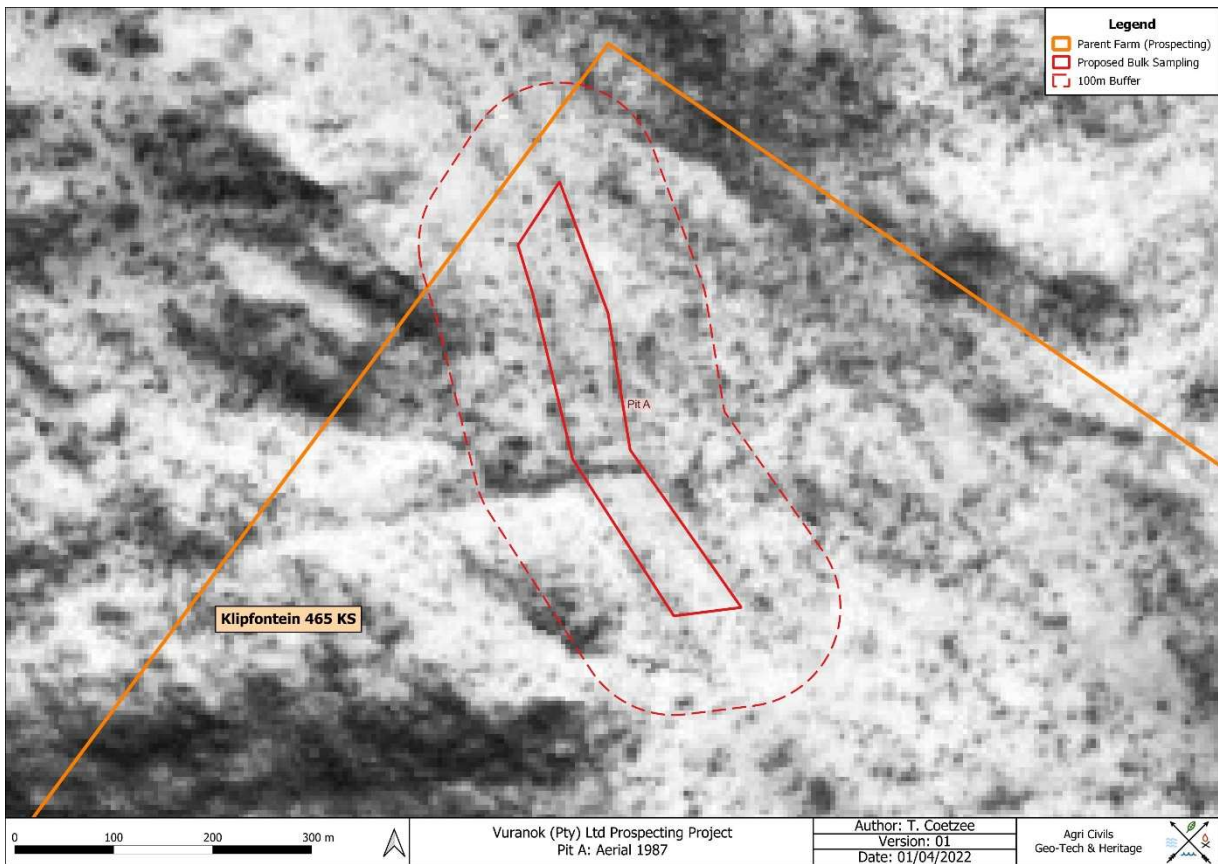


Figure 42: Proposed Pit A portrayed on a 1987 aerial image.

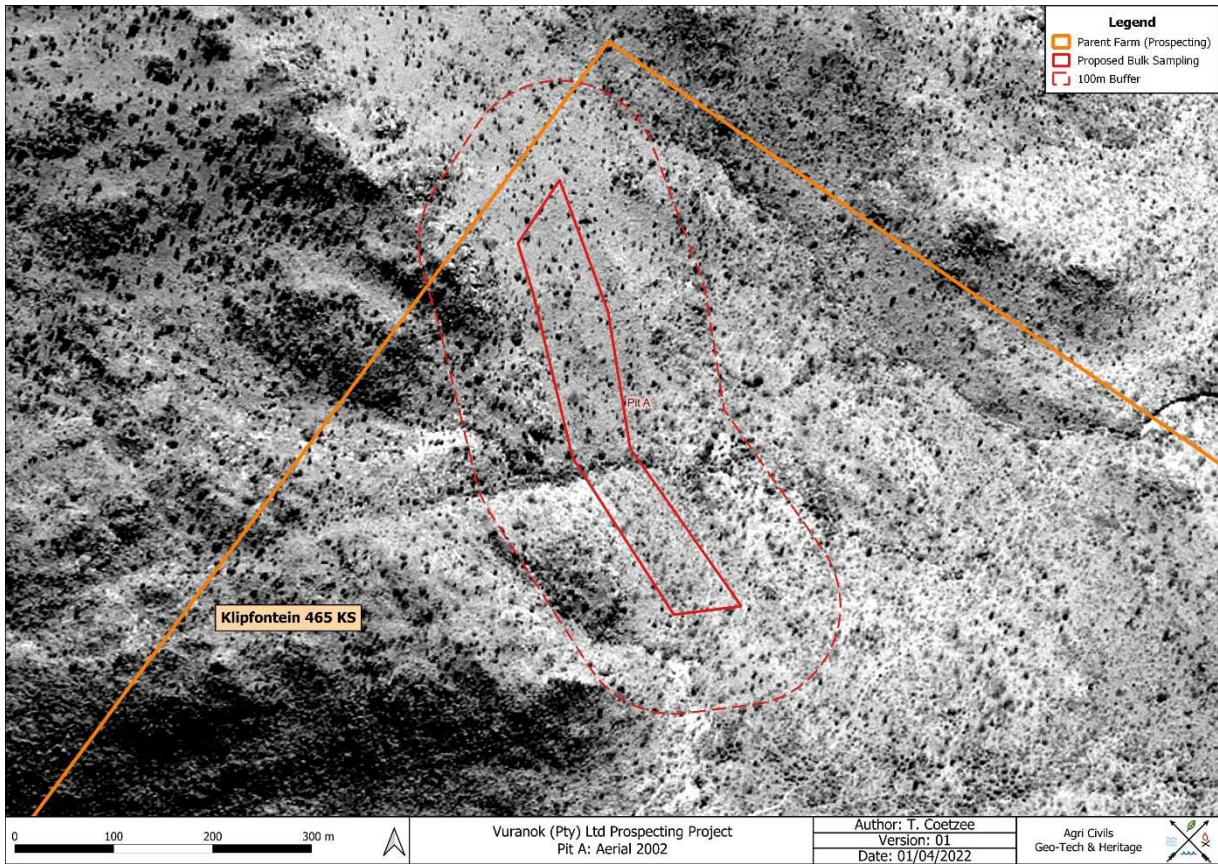


Figure 43: Proposed Pit A portrayed on a 2002 aerial image.

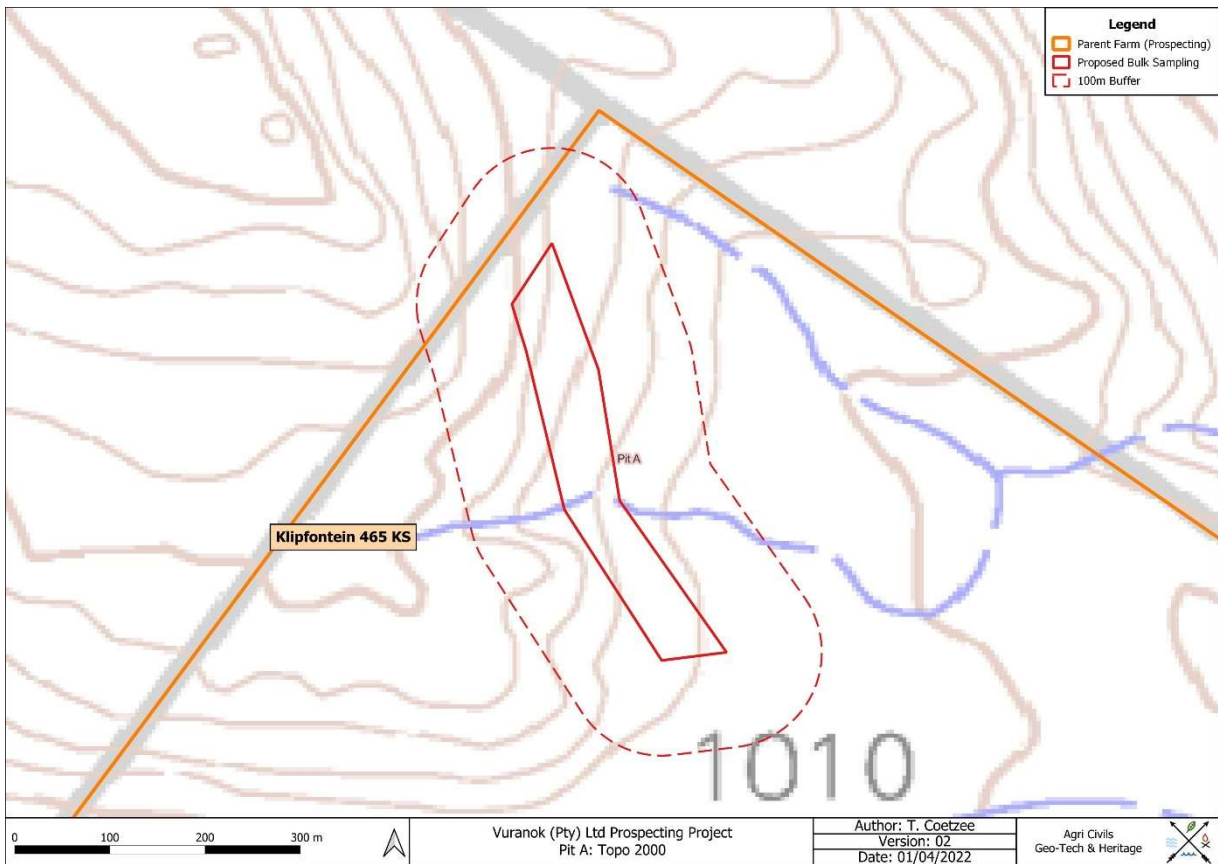


Figure 44: Proposed Pit A portrayed on a 2000 topographical map.

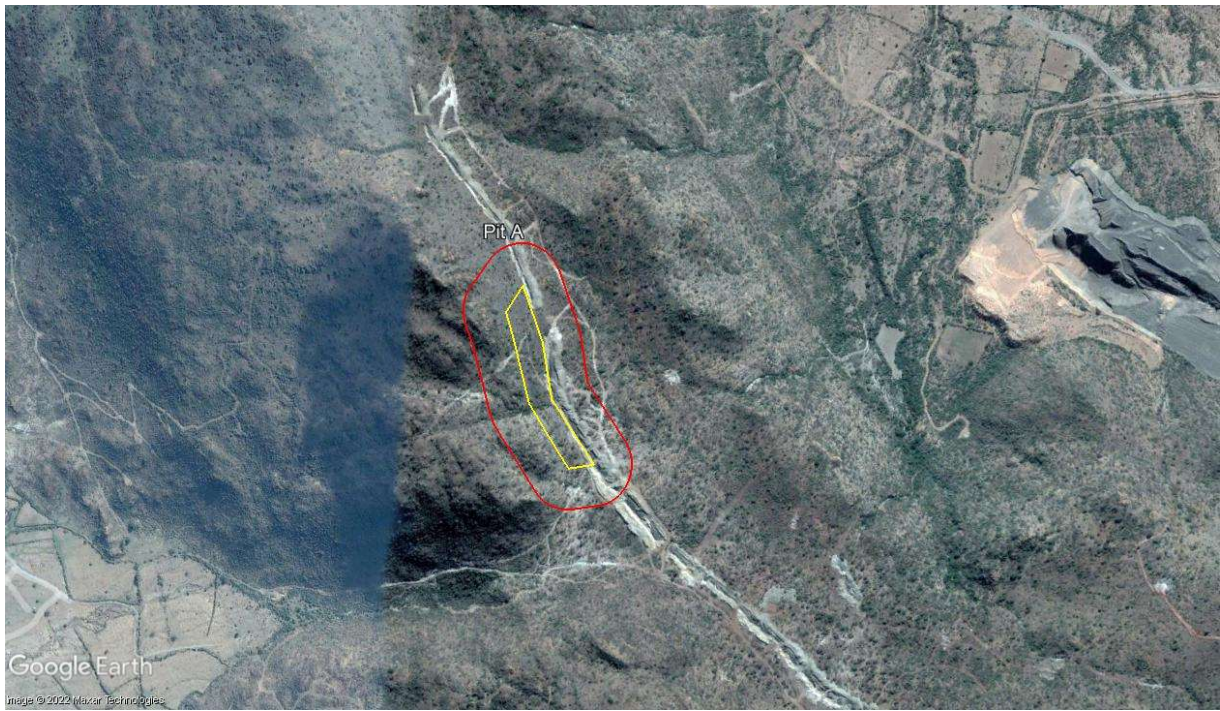


Figure 45: Proposed Pit A portrayed on a 2017 Google Earth satellite image.

Appendix B: Pit B – Historical Aerial Imagery & Topographical Maps

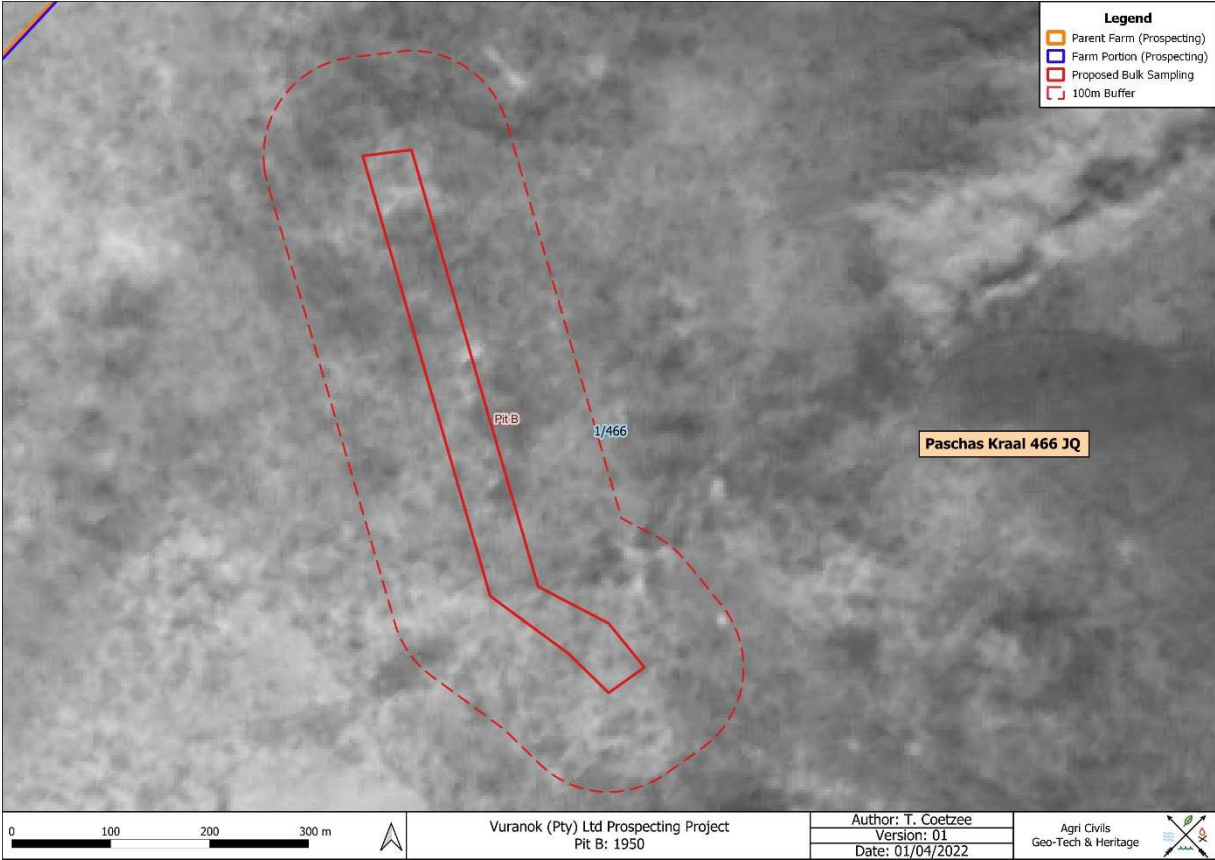


Figure 46: Proposed Pit B portrayed on a 1950 aerial image.

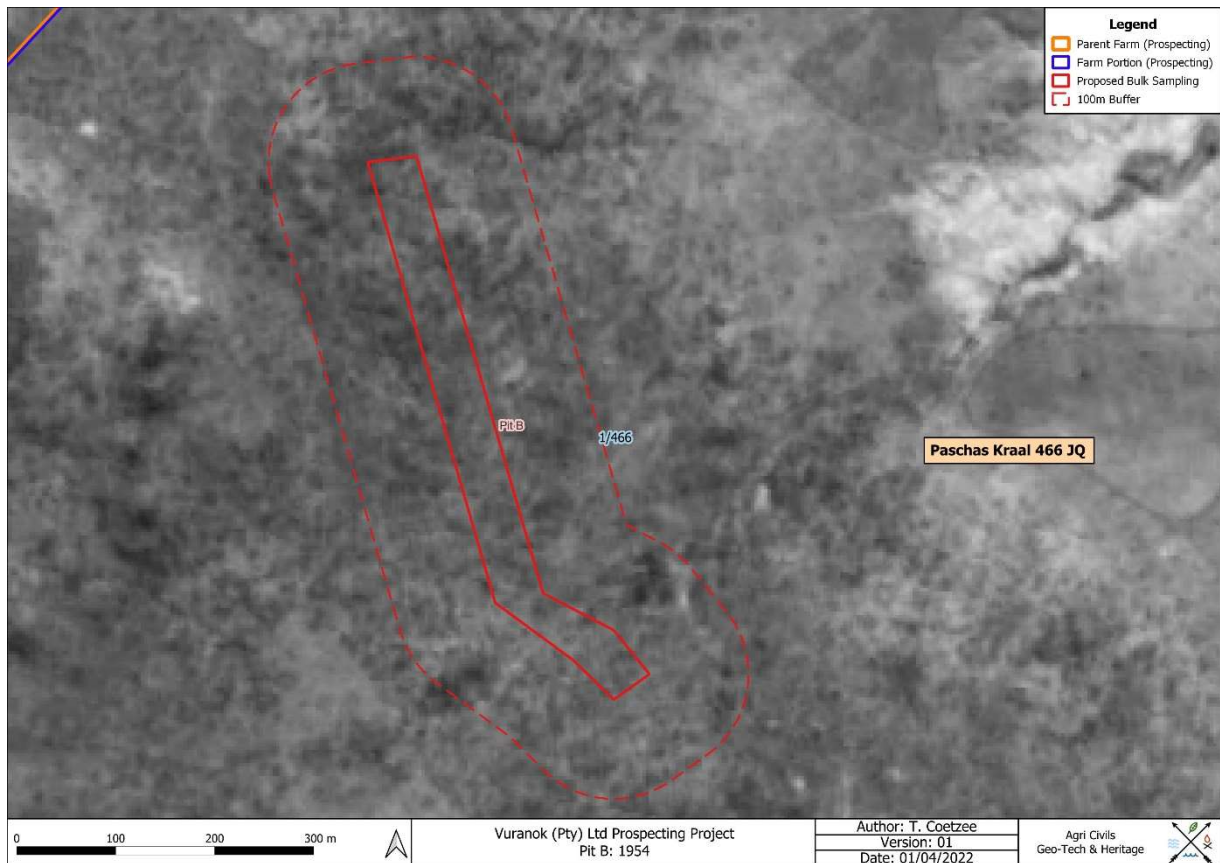


Figure 47: Proposed Pit B portrayed on a 1954 aerial image.

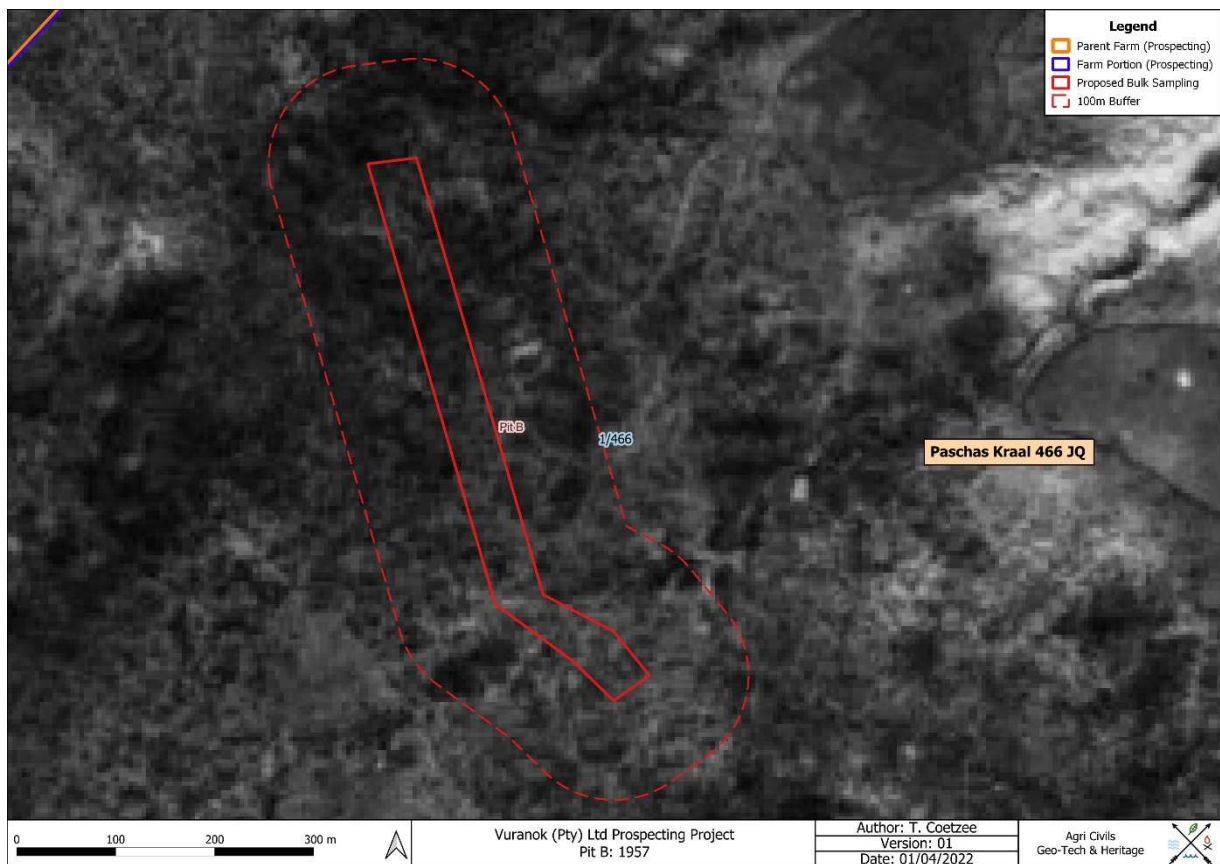


Figure 48: Proposed Pit B portrayed on a 1957 aerial image.

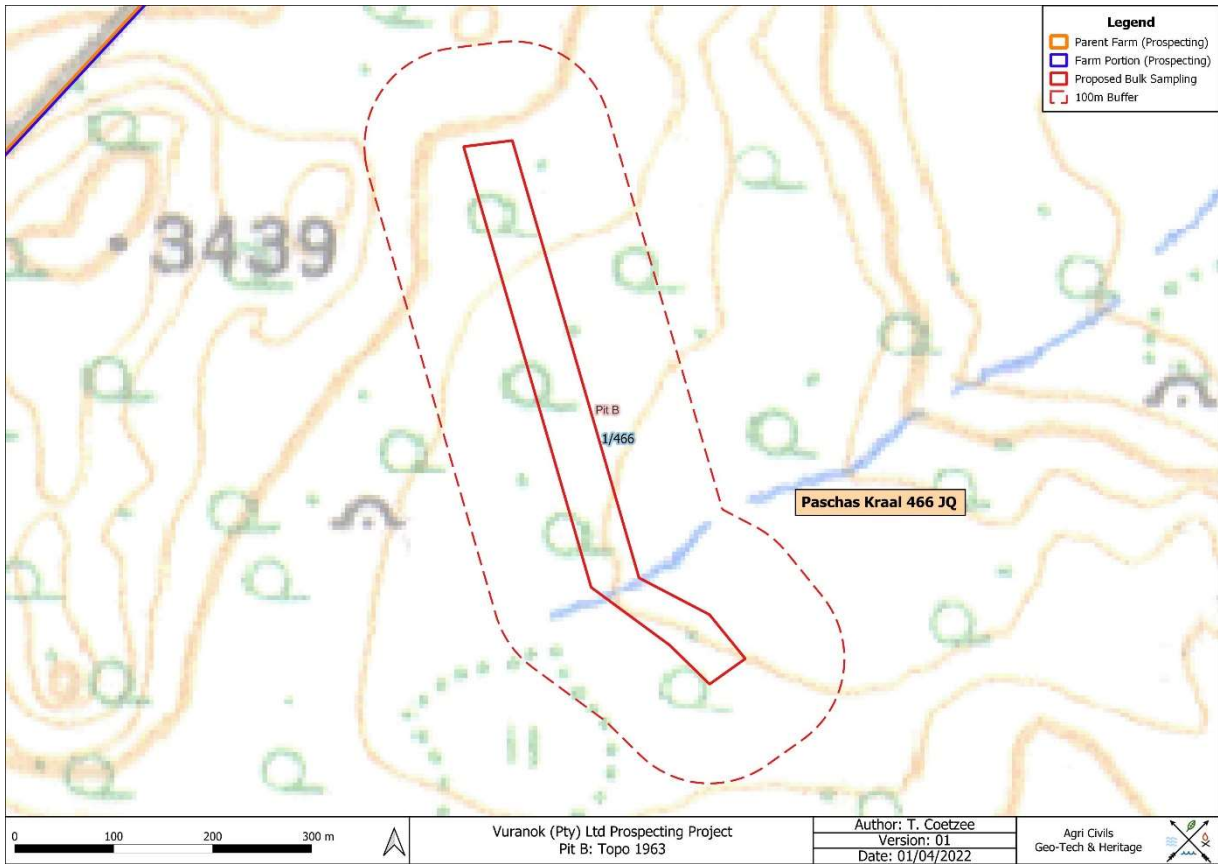


Figure 49: Proposed Pit B portrayed on a 1963 topographical map.

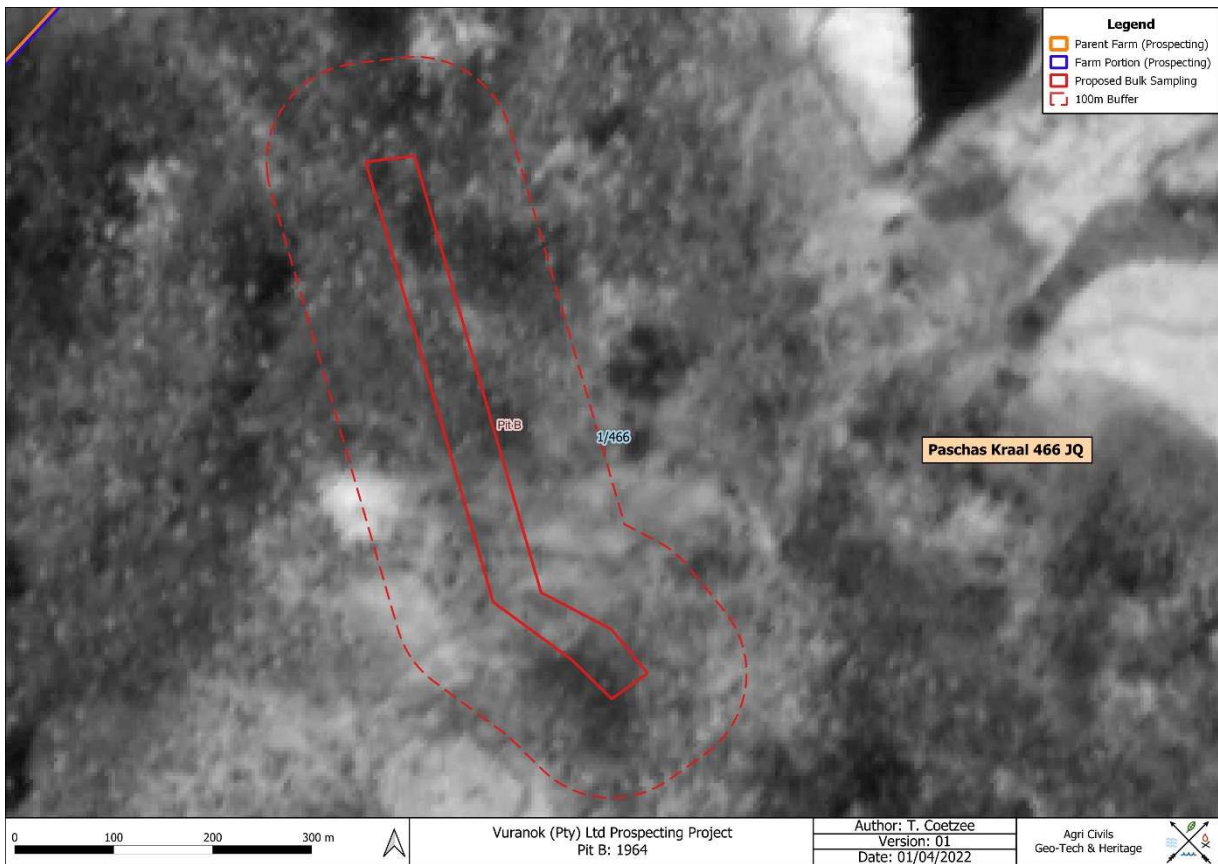


Figure 50: Proposed Pit B portrayed on a 1964 aerial image.

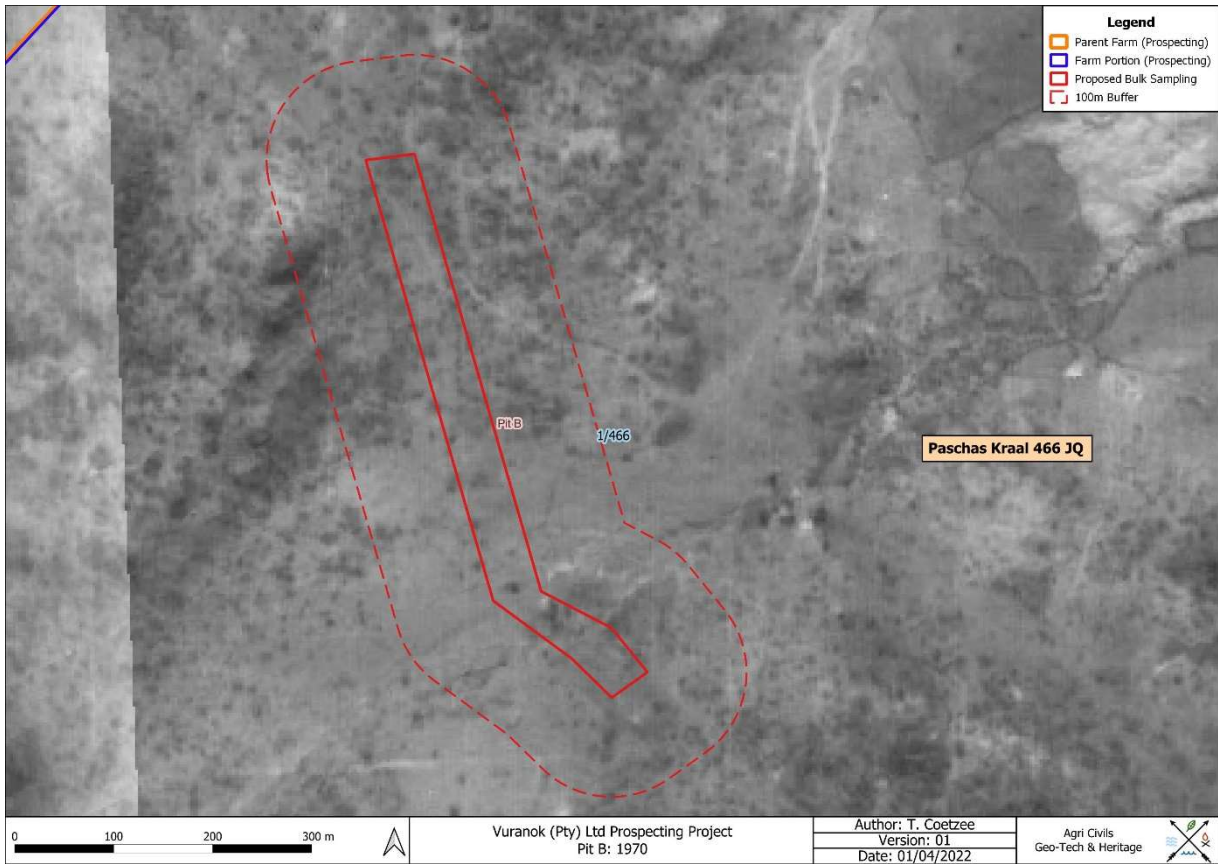


Figure 51: Proposed Pit B portrayed on a 1970 aerial image.

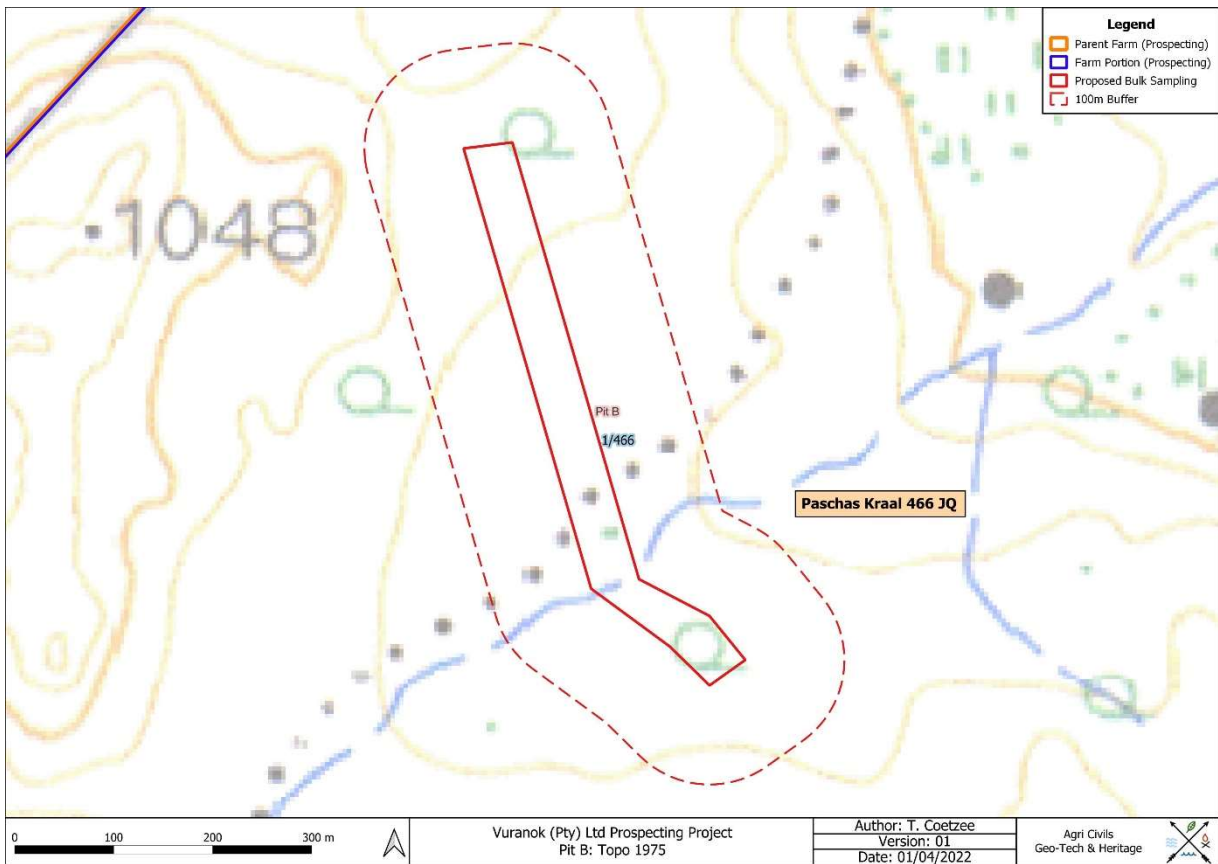


Figure 52: Proposed Pit B portrayed on a 1975 topographical map.

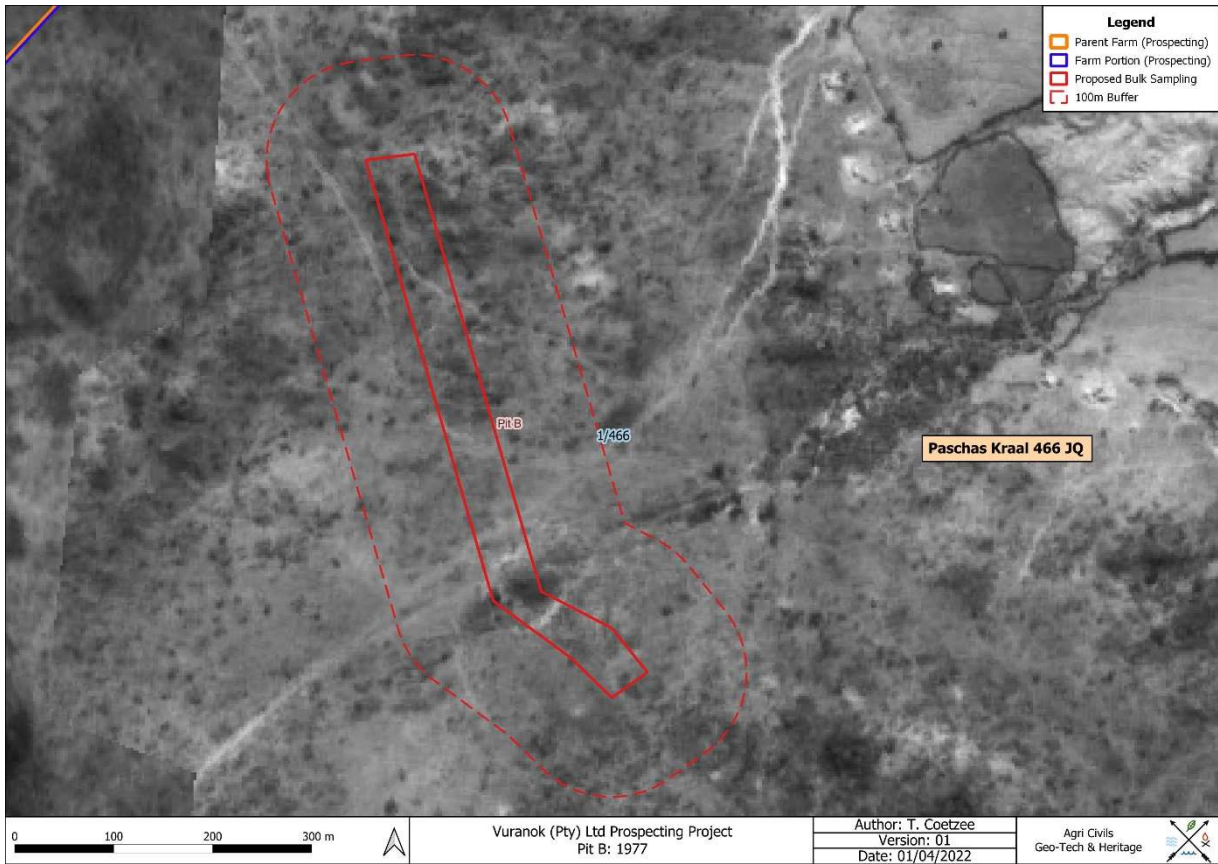


Figure 53: Proposed Pit B portrayed on a 1977 aerial image.

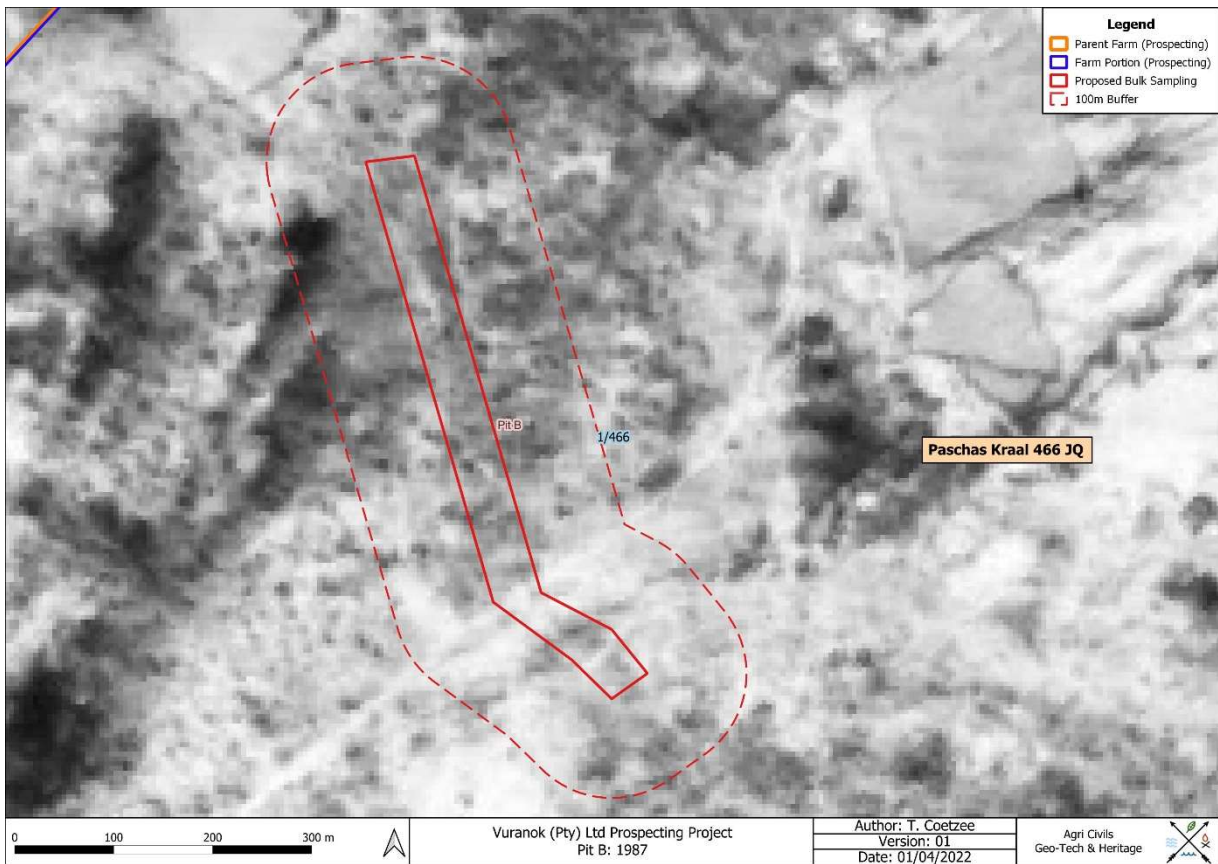


Figure 54: Proposed Pit B portrayed on a 1987 aerial image.

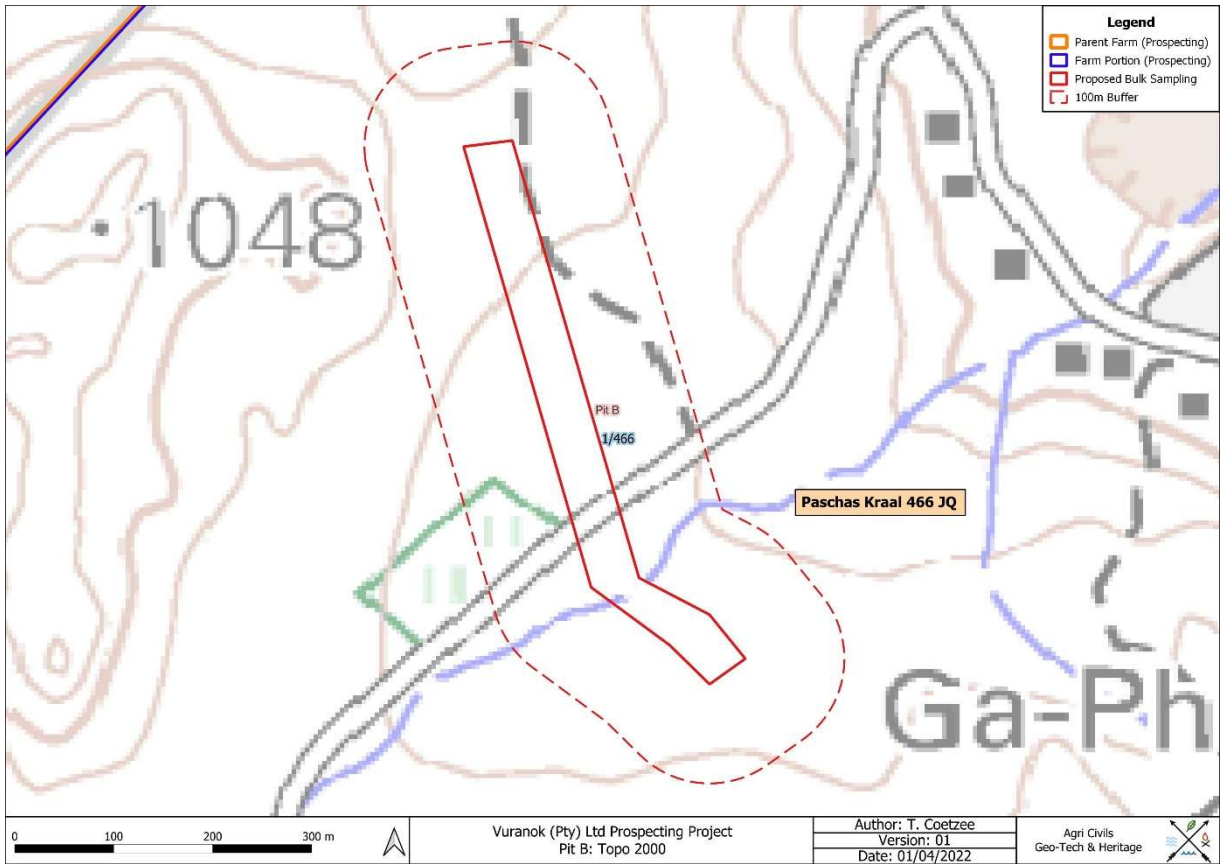


Figure 55: Proposed Pit B portrayed on a 2000 topographical map.

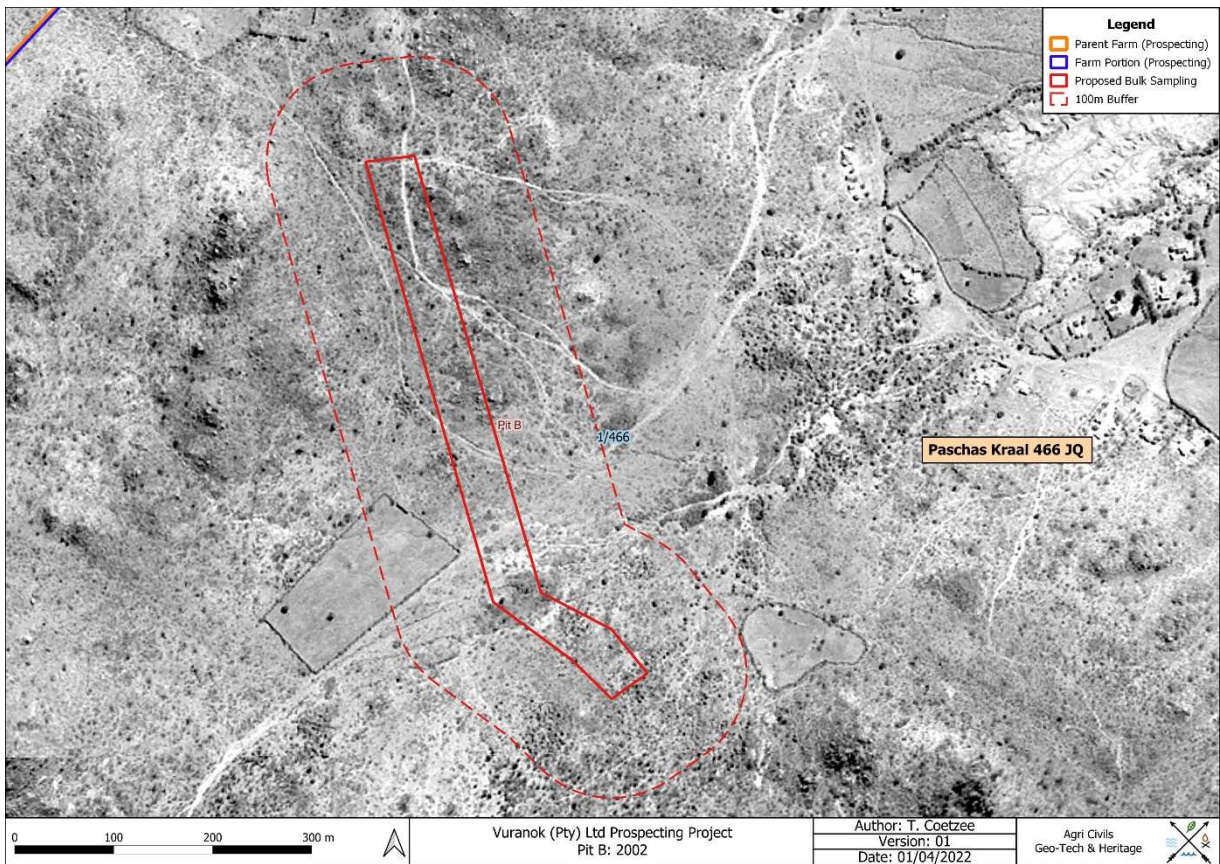
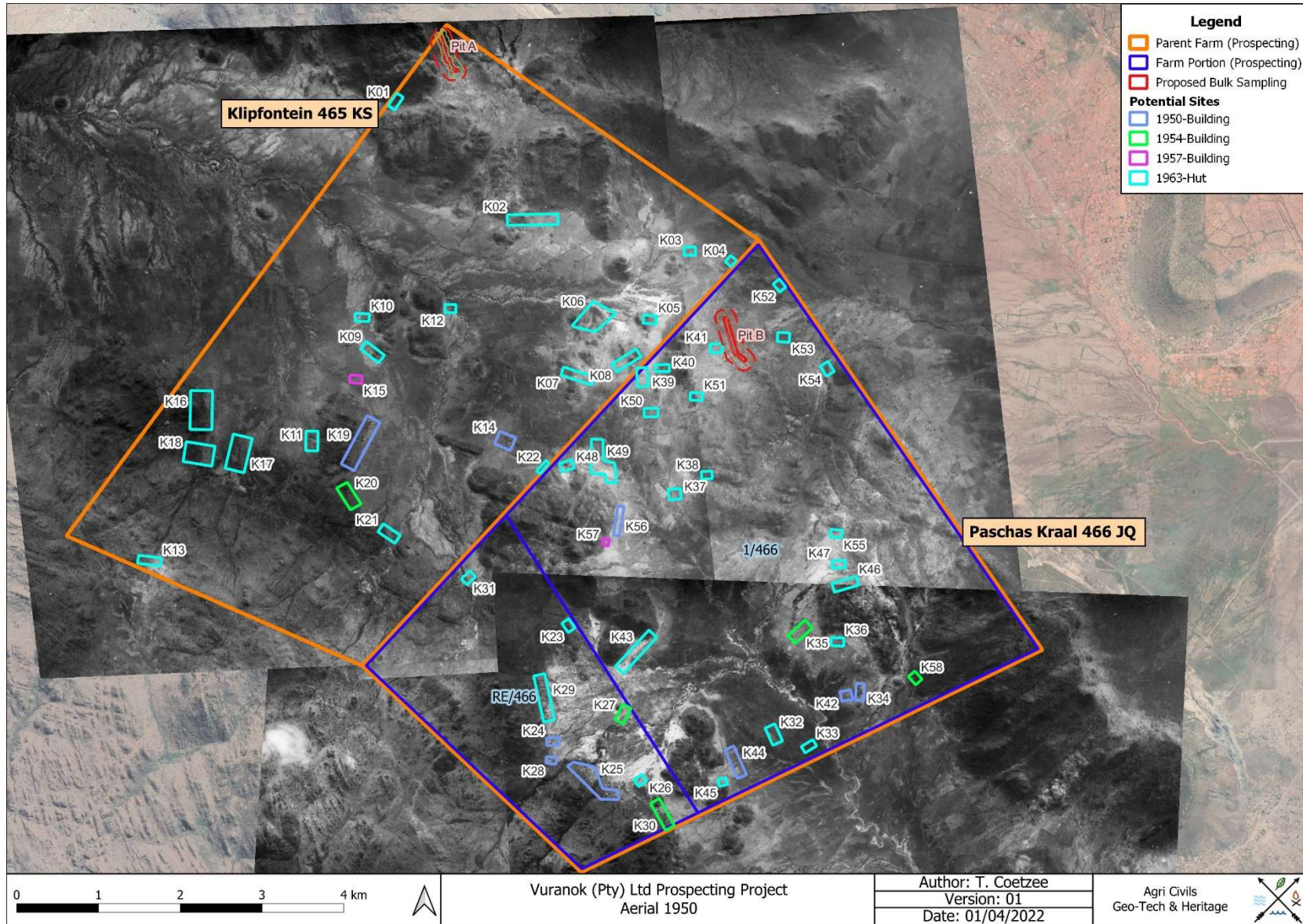


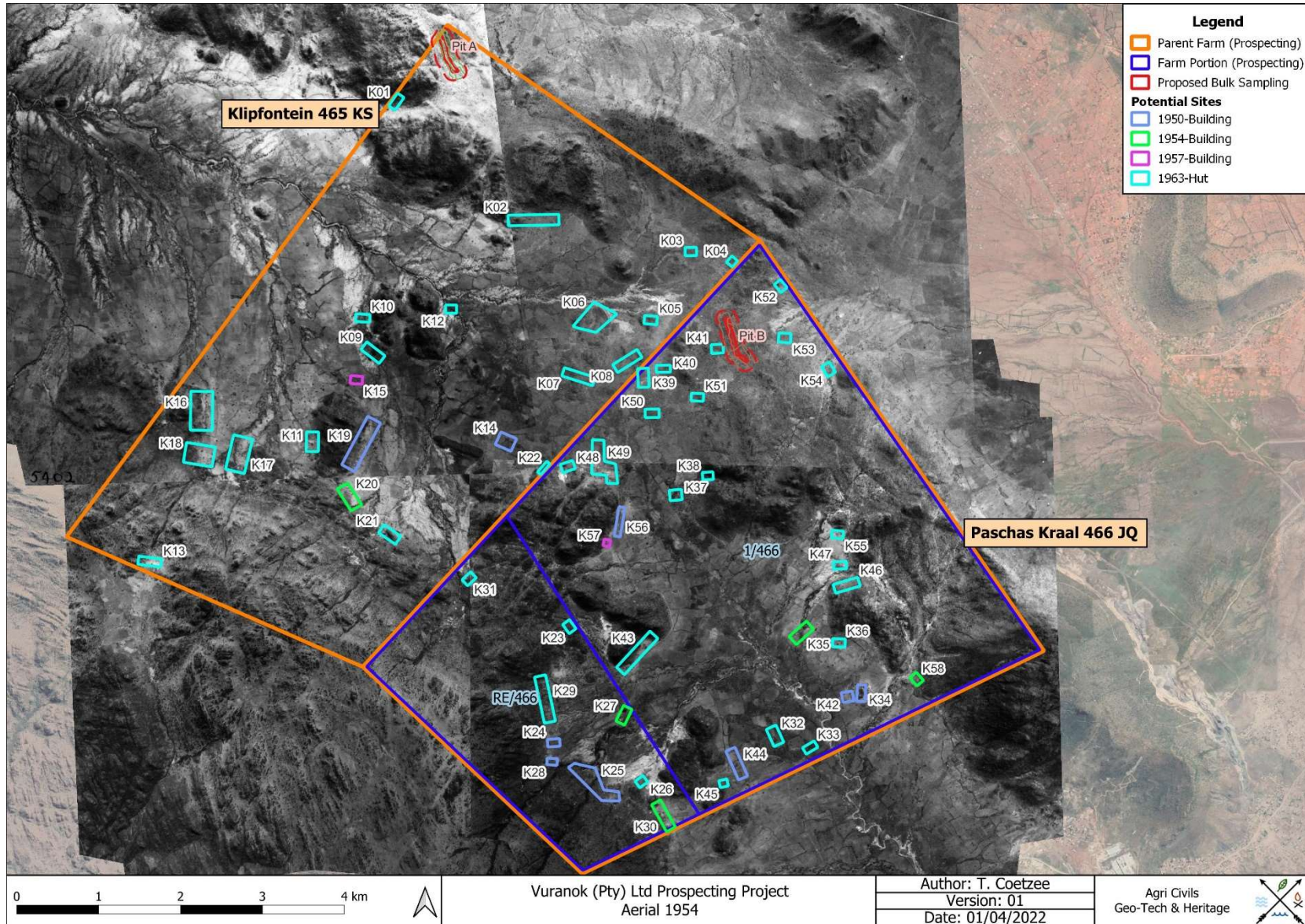
Figure 56: Proposed Pit B portrayed on a 2002 aerial image.



Figure 57: Proposed Pit B portrayed on a 2017 Google Earth satellite image.

Appendix C: Drilling – Historical Aerial Imagery & Topographical Maps





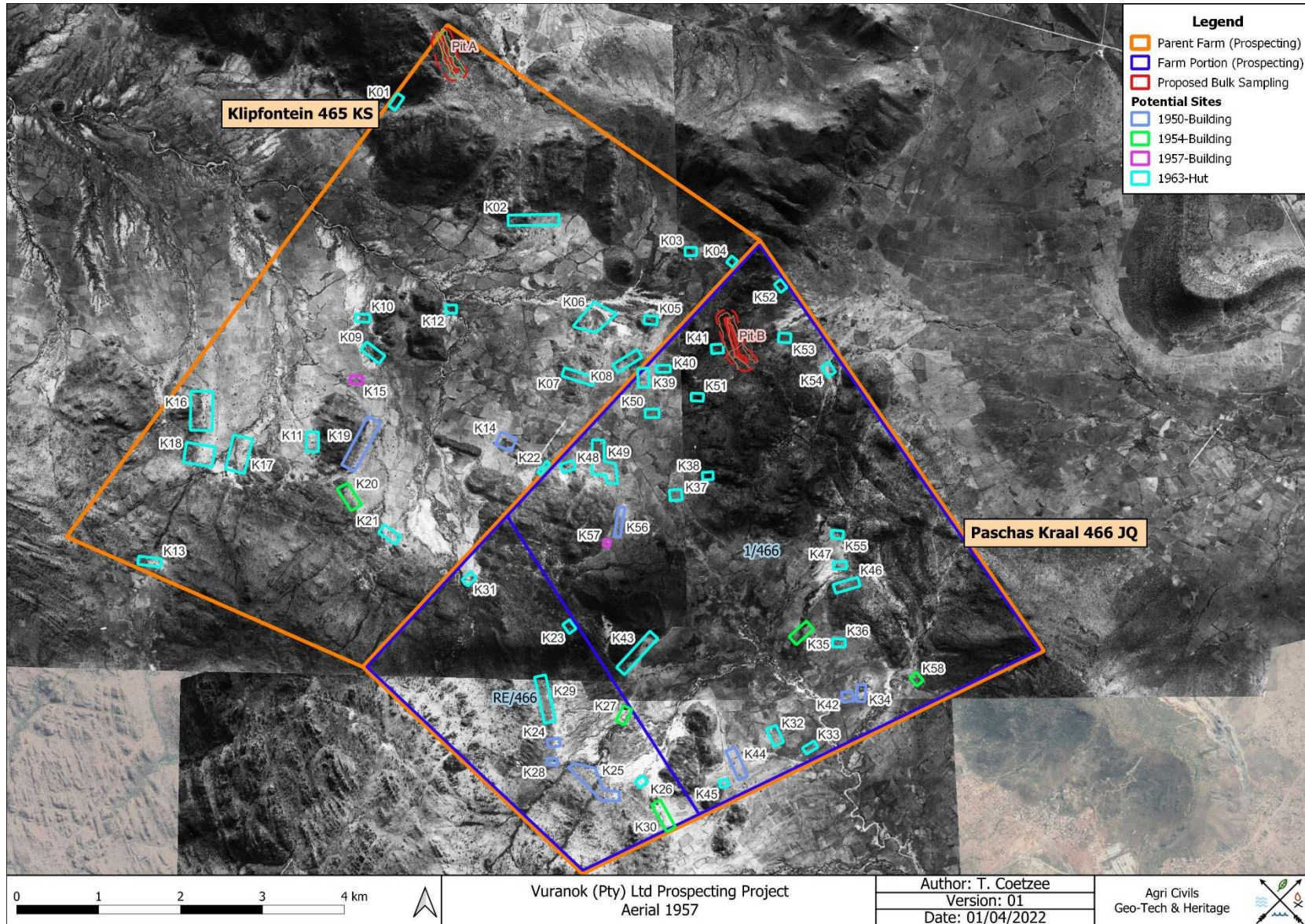


Figure 60: 1957 aerial image of the study area.

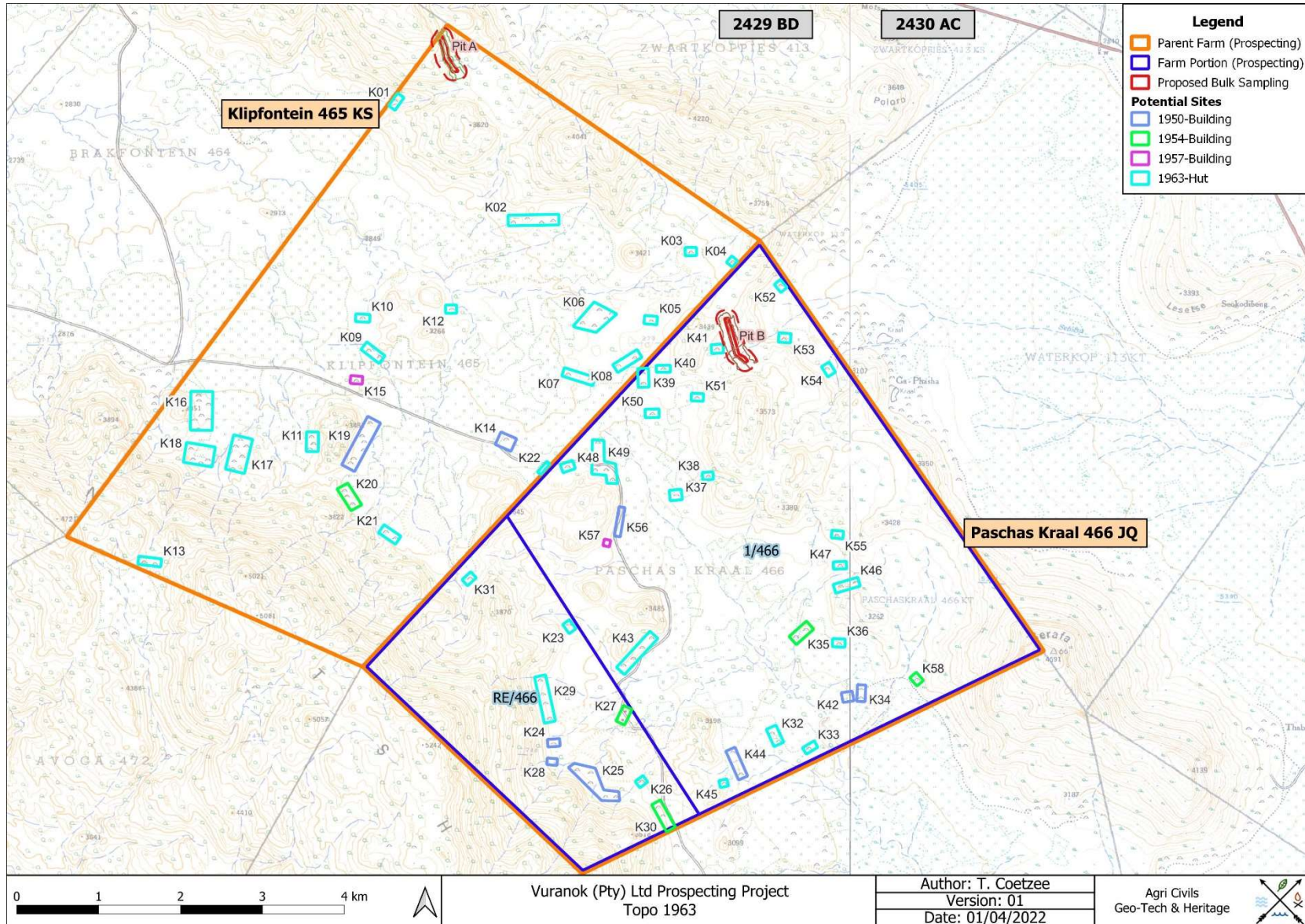


Figure 61: Segments of 1963 1:50 000 2429 BD & 2430 AC topographical maps indicating the study area.

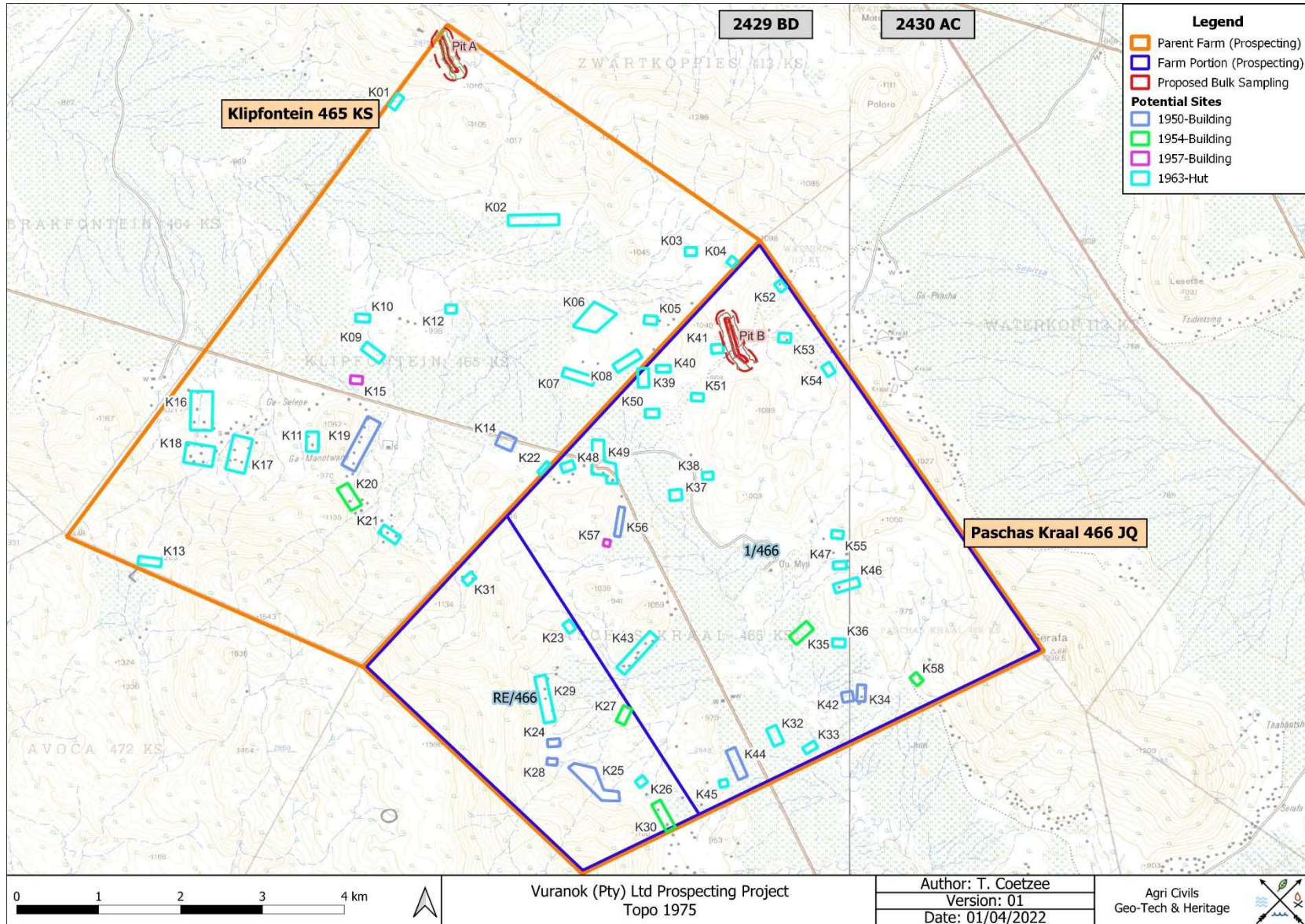


Figure 62: Segments of 1975 1:50 000 2429 BD & 2430 AC topographical maps indicating the study area.

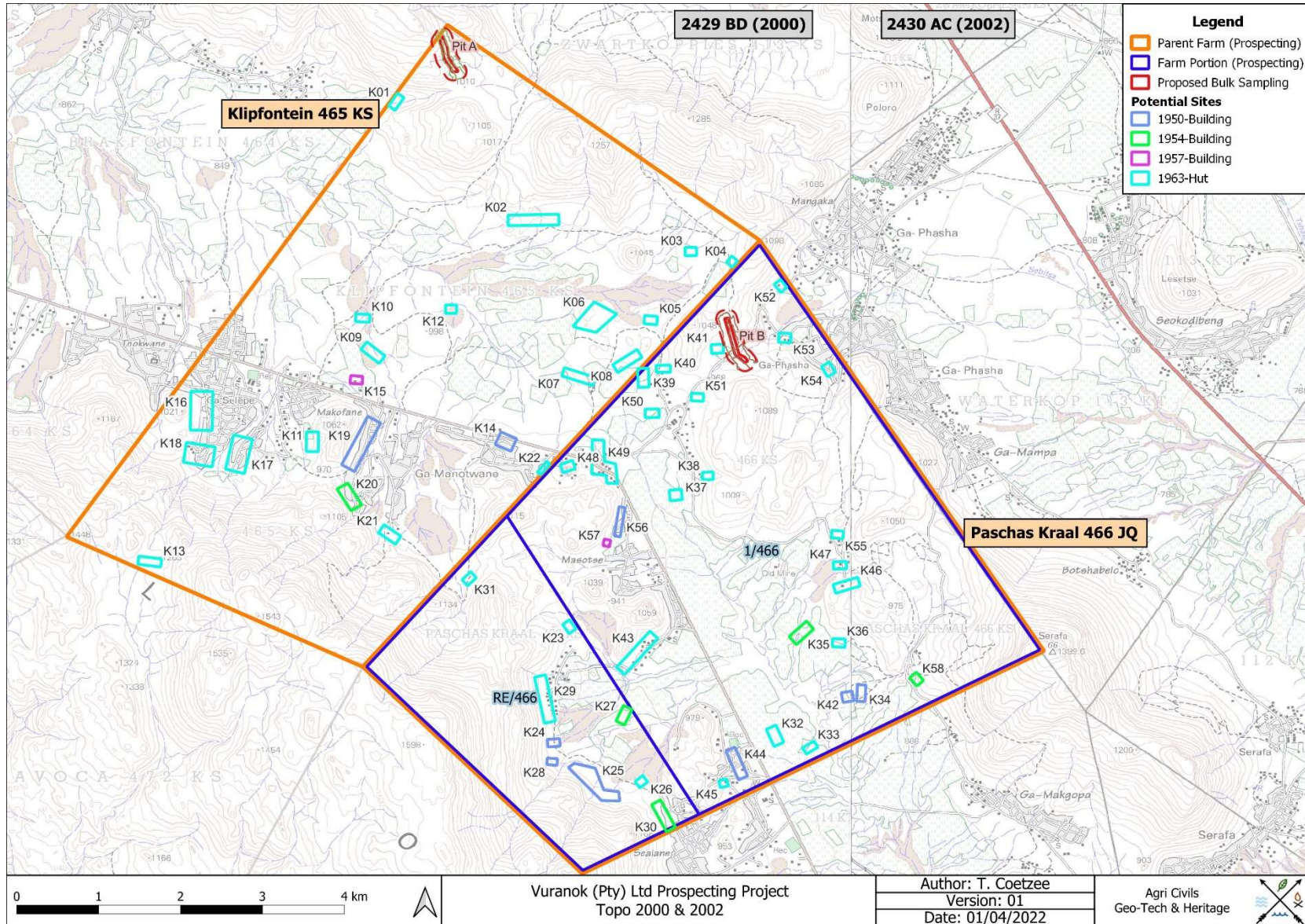


Figure 63: Segments of 2000 and 2002 1:50 000 2429 BD & 2430 AC topographical maps indicating the study area.