

HERITAGE DESKTOP REPORT

FOR THE PROPOSED RUGRON EXPLORATION PROJECT, HOTAZEL AREA,
NORTHERN CAPE PROVINCE

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EXECUTIVE SUMMARY

Site name and location: Rugron Exploration Co (Pty) Ltd intends to apply for a prospecting right and related infrastructural activities on the farms Rugby No. 43, Padstock No. 50, Rhokana No. 61, Magonat No. 507, Olney No. 44, Neven No. 45 and Holmby No. 49, which falls in the Motshaweng Local Municipality, Kgalagadi District Municipality, Kuruman Magisterial District, Northern Cape Province.

1: 50 000 Topographic Map: 2623 CA, CB, CC and CD.

EIA Consultant: Greenmined Environmental

Developer: Rugron Exploration Co (Pty) Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 6 December 2018

Findings of the Assessment:

The scope of work comprises a heritage desktop report for 17 drill points on a large prospecting right area comprising approximately 36 628 ha. Prospecting will consist of drill pads measuring 400m² mostly located in existing gravel roads to minimize the impact on the environment.

The Northern Cape has a wealth of heritage sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites in the general area worth mentioning include the world renowned Wonderwerk Cave 42 km south of Kuruman and the major Tswana town and the LIA stone-walled settlements at Dithakong 40 km north of Kuruman. Based on the results of field assessments in the vicinity of the prospecting right area (Dreyer 2005 and Beaumont 2008) few archaeological sites of significance are expected. However, if any pans or drainage lines occur in the study area Stone Age artefact scatters might be expected. Due to the limited footprint of the 17 drill sites on a large area of relative low heritage significance the impact of the project is expected to be low.

This desktop study is informed by available data for the area and based on these studies the following resources can be expected in the study area as indicated below.

- Standing structures older than 60 years are protected by Section 34 of the NHRA (Act 25 of 1999) and the destruction or demolition of structures older than 60 years will require relevant permits. Although it is not foreseen that exploration activities will impact on standing structures, features older than 60 years can be expected in the study area in the form of farmsteads.
- With regard to the archaeological component of Section 35 this brief background study indicates that the general area under investigation contain widespread scatters of Stone Age artefacts dating to the ESA, MSA and LSA.
- Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. There is an

extremely small chance that fossil algae may occur in the stromatolites of the Campbell Rand dolomites. Nonetheless a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample (Bamford 2018).

- In terms of Section 36 no known graves occur in the study area. It should be noted that graves can occur anywhere on the landscape and graves are expected in the study area.

It is anticipated that any sites that occur within the project area will have a Generally Protected B (GP. B) or lower field rating and all sites should be mitigatable and no red flags have been identified. It is therefore recommended that exploration can commence (based on approval from SAHRA) with the following management measures incorporated into the EMP for the project:

- All drilling points should be located on existing roads as far as possible.
- The environmentalist should inspect the location for each drill site to confirm that there are no stone packed features (Structures or graves) close to the impact area of the drill locations.
- Inclusion of a chance find protocol (both archaeology and palaeontology) in the EMPr.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency
SAHRIS: South African Heritage Resources Information System

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (2 million to 300 000 years ago)

Middle Stone Age (300 000 to 30 000 years ago)

Late Stone Age (30 000 years ago until recent)

Historic (approximately AD 1840 to 1950)

Historic building (over 60 years old)

Lithics: Stone Age artefacts

1. INTRODUCTION

HCAC was contracted by Greenmined Environmental to conduct a heritage desktop study for the proposed Rugron prospecting application. The proposed prospecting activities (17 drill pads) are located on the farms Rugby No. 43, Padstock No. 50, Rhokana No. 61, Magonat No. 507, Olney No. 44, Neven No. 45 and Holmby No. 49 situated approximately 53 km North-North- East of Hotazel, Northern Cape Province (Figure 1 -3). The towns of Padstow, Goedbegin and Rugby, Moed and Magonata falls within the proposed prospecting area. The commodity of interest is Iron Ore.

The aim of the desktop report is to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

This report outlines the approach and methodology utilised for the desktop report. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report.

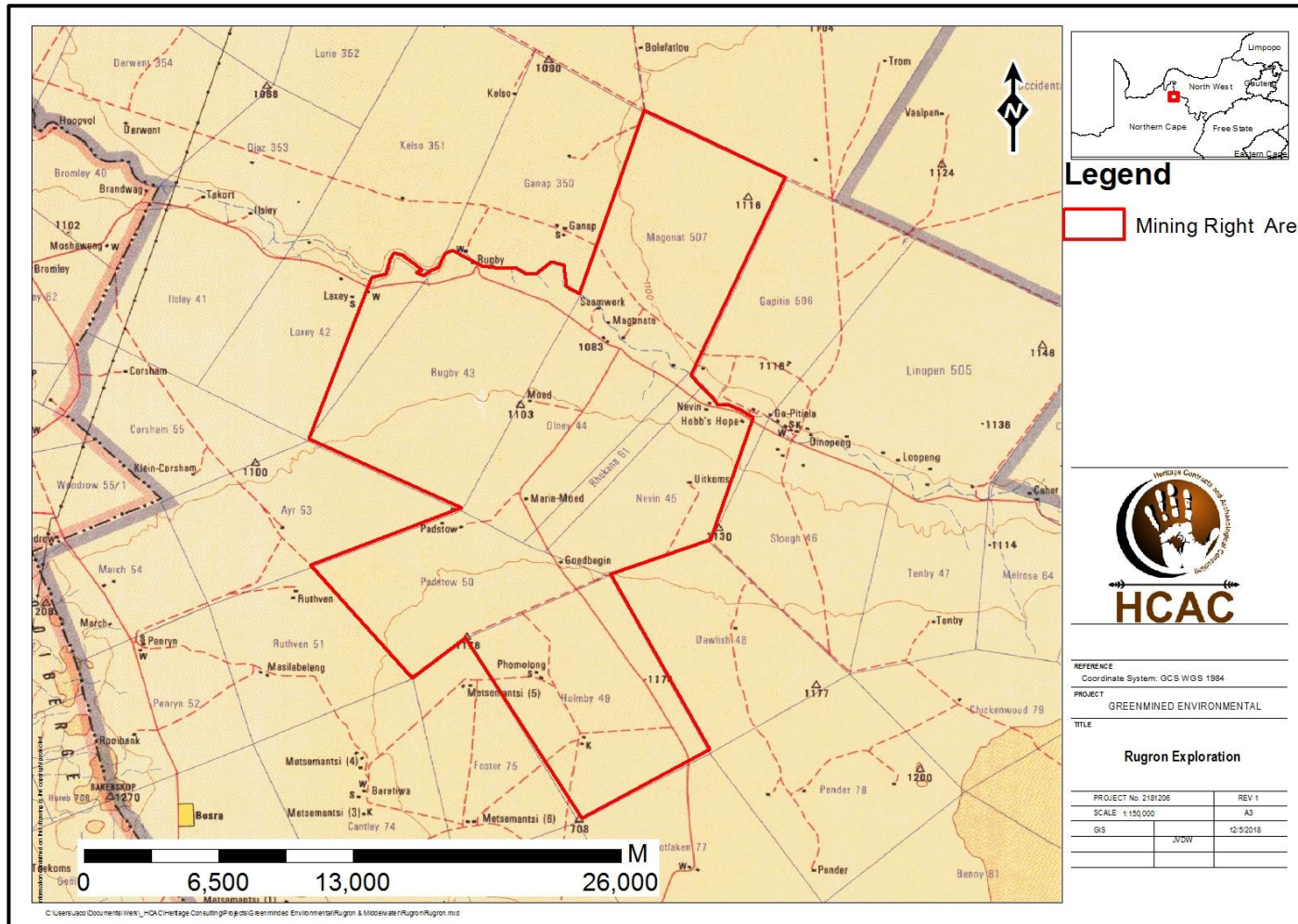


Figure 1. Regional Locality map of the site under investigation indicated in red

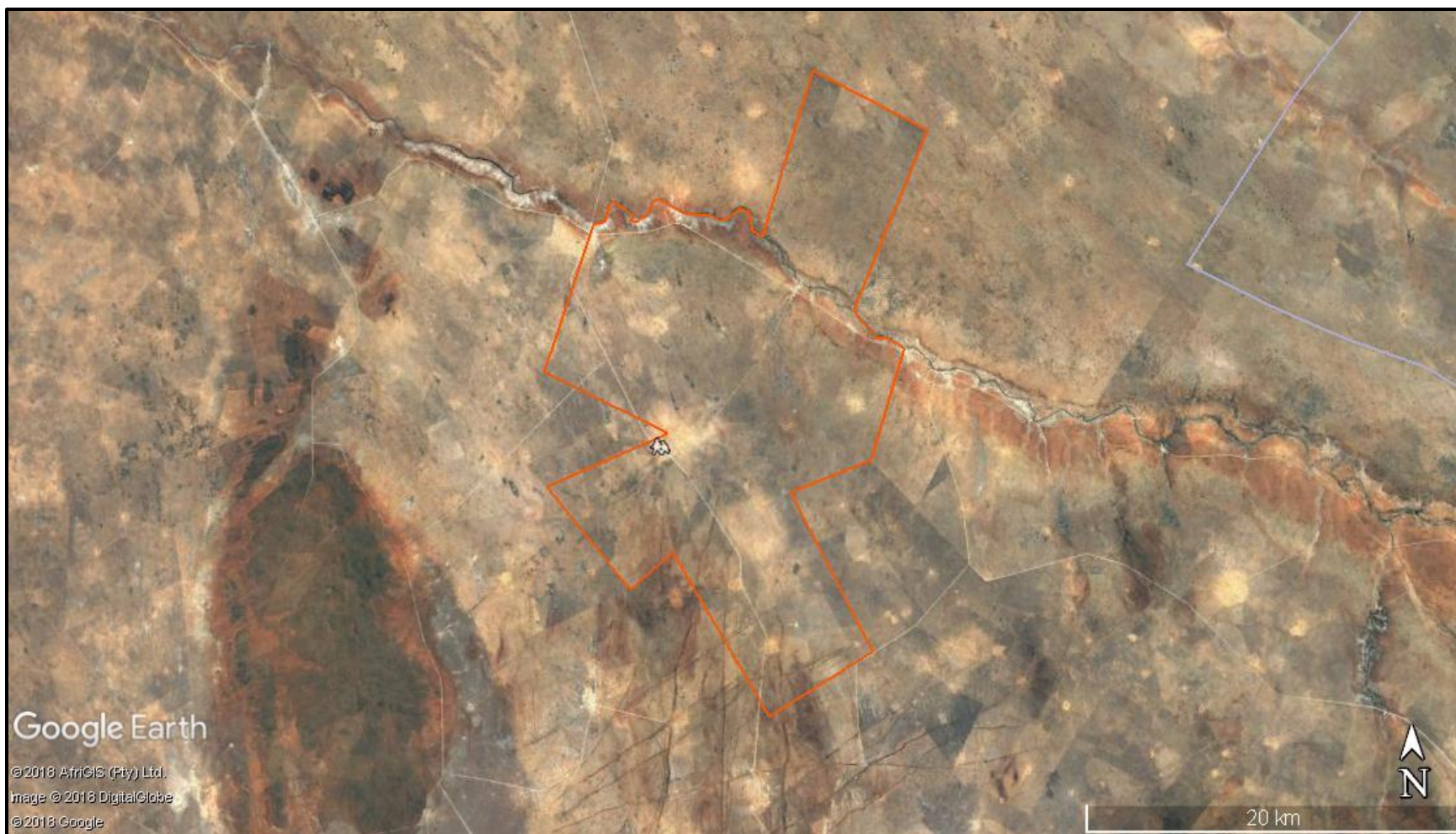


Figure 2. Google Earth image of the study area.

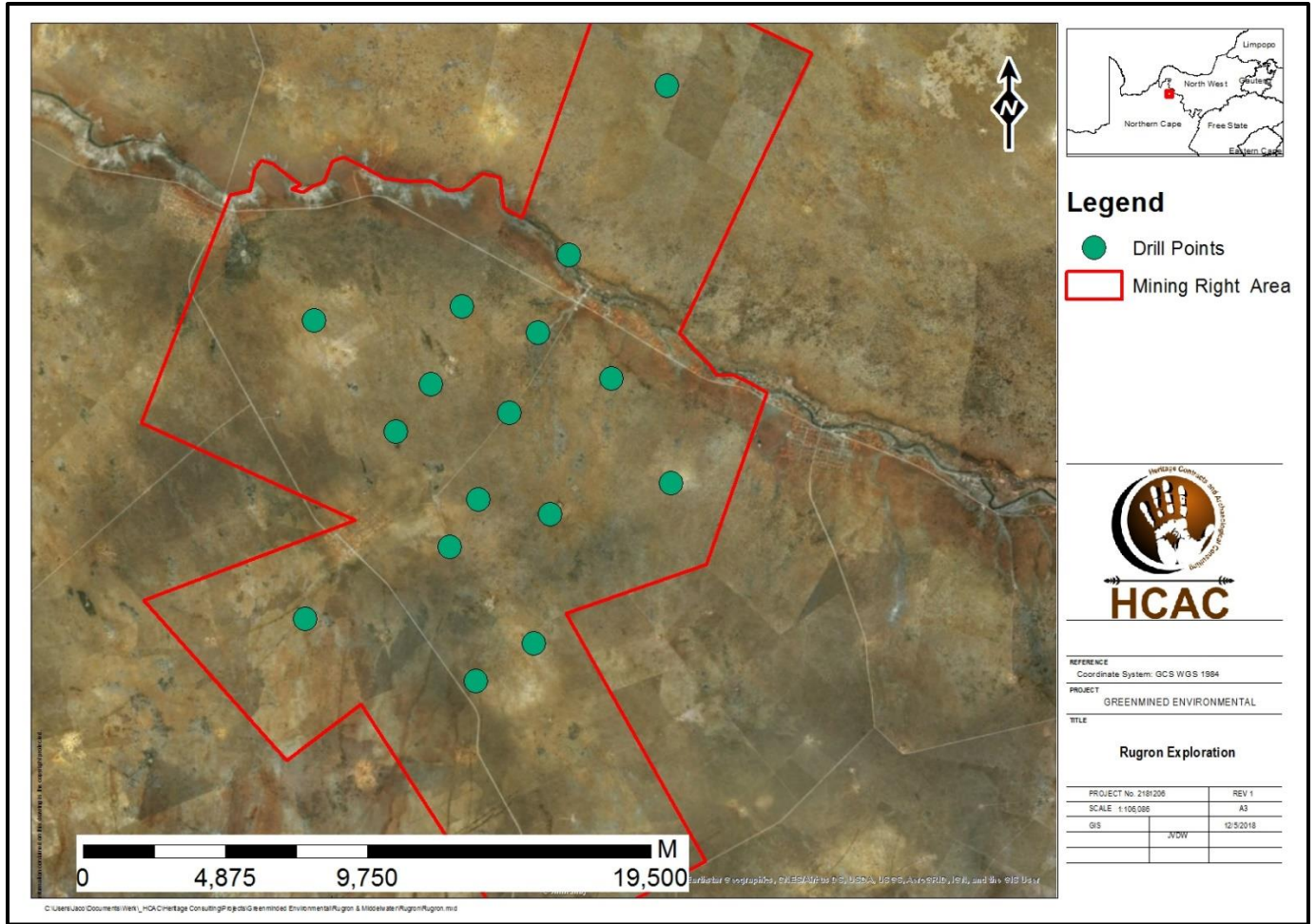


Figure 3. Exploration points.

1.1 Terms of Reference

The main aim of this desktop report is to determine if any known heritage resources occur within the project site. The objectives of the desktop report were to:

- » Conduct a desktop study:
 - * Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
 - * Identify known and recorded archaeological and cultural sites; and
 - * Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, informal graveyards or historical homesteads.
- » Compile a specialist Heritage Desktop Report in line with the requirements of the EIA Regulations, 2014, as amended on 07 April 2017.

The reporting is based on the results and findings of a desktop study, wherein potential issues associated with the proposed project will be identified. Reporting will aim to identify the anticipated impacts of the proposed project activity on heritage resources. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

1.2 Nature of the development

The proposed prospecting area is a natural area. The planned activities for the proposed sites are detailed below. All activities will be contained within the boundaries of the site.

DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:

(These activities do not disturb the land where prospecting will take place, e.g. aerial photography, desktop studies, aeromagnetic surveys, etc)

Phase 1 (month 0 to 6), phase 3 (months 15 to 27) and phase 4 (months 30 to 36)

- Desktop Studies
 - Desktop studies form a very important preparatory step in a new coal exploration project, and as the name suggests, this task is executed mainly from an office environment. Desktop studies will be conducted by the project geologist as part of preliminary investigations into the prospecting area by looking at all relevant published literature, geological maps, mining maps and any available evidence or records of coal findings. The outcome of the desktop studies will be a geological report of the prospecting area with a particular emphasis on the prospectivity of the area. This report will also inform other subsequent prospecting steps.
- Spatial Database Compilation
 - Spatial information will be compiled into a GIS database for access, correlation and evaluation. The GIS system will be used and maintained for the period of the prospecting right exploration program and regularly updated as new information is generated by the exploration program.
- Land Survey
 - All spatial information accessed and collected in the field will be standardized using the WGS84 datum.
- Remote Sensing
 - As part of the initial review, public domain aerial photos will be acquired and a detailed geological and structural interpretation will be done on these to aid in identifying target areas that are not readily evident on the ground and to provide an independent interpretation of the geology of the area. Satellite imagery will also be acquired to provide a more regional viewpoint of the area of interest. As before a detailed geological and structural interpretation will be done on these images to provide a more regional viewpoint on the target areas. Satellite imagery is used to complement the aerial photos interpretations as the combination of multi-spectral bands can be used to highlight certain lithology's, vegetation types, soil types, alteration minerals, etc.
- Geophysical survey to be undertaken
 - Both airborne and ground geophysical surveys may be undertaken for the prospecting right area, depending on the results of the desktop study. A small airborne magnetic/radiometric survey may be carried out over the prospect and surrounding areas to map the structural

geology of the area. Follow up ground geophysical surveys will be carried out on coincident targets from the compilation of geological and geophysical data. These surveys may include ground gravity, ground electromagnetics, IP and controlled source audio magnetotellurics (CSAMT).

- Field geological studies will follow after the desktop studies, and they typically include walking over the prospecting area making general observations of the geology and topography. Geological mapping activities, if terrain is suitable, may include detailed outcrop mapping, identification of iron ore hosting strata, iron ore seam outcrop mapping and sampling of exposed iron ore seams where available.
- The 3D geological modelling and resource estimation step will follow after favourable exploration drilling results. This geological modelling step mainly entails geological interpretation of collected log sheet data and the subsequent geological domain. The geological model, which shows the physical continuity of the iron ore seams and the distribution of the iron ore qualities, is a critical input in iron ore resource estimation. The iron ore resource statement, which is an outcome of the resource estimation process, gives an indication of the amount of available iron ore resources in tonnage and associated qualities.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

(These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc.)

Phase 2 (month 6 to 15) and phase 4 (months 27 to 30)

- Drilling:
- The exact location where drilling will be carried out will be determined by the results of geophysical and geological work carried out in Phase 1 of the prospecting programme. It will be assumed that a drill hole will be located in intervals of 350 meters (measured resource as per SAMREC code) with no more than 2 holes being actively drilled at any given time. The initial holes will be drilled on the Prospecting area that forms part of this application. All drill holes will be approved by the team's environmental manager prior to approval thereof. The environmental management plan related to this project will consider environmental sensitivities and advise on the location of drilling holes. By the quarter of exploration, there will be clearly defined targets that will warrant testing by diamond, reverse circulation or percussions drilling. It is envisaged that a combination of HQ (63.5 mm) and NQ (47.63 mm) drilling will be used to drill targets. The borehole depths are expected to vary between 25 m and 125 m with an average of approximately 70 m. The core will be logged, cut and sampled at a core yard to be located near the prospecting site. The samples will be crushed and milled and then analysed at an accredited laboratory in for iron ore quality. The resultant drill holes will be cased and capped to make it safe for people and animals, and also allow for future access by the exploration team.

MAIN PROSPECTING ACTIVITIES:

- Drill site establishment:
 - A drill site of approximately 400 m² will be established that will require:
 - Clearing of vegetation for sumps and the drill entrance point;
 - Earth sumps for water recycling;
 - Laydown area for drill rods, fuel and chemical storage;
 - Chemical toilets.

- Drilling and removal of geological cores:
- Drilling a hole of approximately 110 mm in diameter and removing of rock core. Number of boreholes will be finalised once non-invasive prospecting is completed.
- Casing of boreholes:
- 1m² per borehole.
- Rehabilitation of drill sites.

1.3. The receiving environment

The farms Rugby No. 43, Padstock No. 50, Rhokana No. 61, Magonat No. 507, Olney No. 44, Neven No. 45 and Holmby No. 49 is situated approximately 53 km North-North- East of Hotazel, Northern Cape Province. The towns of Padstow, Goedbegin and Rugby, Moed and Magonata falls within the proposed prospecting area. The commodity of interest is Iron Ore.

The foremost part of the prospecting area comprises of natural vegetated areas representative of the Molopo Bushveld and Kuruman Thornveld vegetation types (Figure 4 – 9)



Figure 4. General site conditions



Figure 5. General site conditions



Figure 6. General site conditions



Figure 7. General site conditions



Figure 8. General site conditions



Figure 9. General site conditions

2. APPROACH AND METHODOLOGY

This desktop report was conducted as part of the first phase of the prospecting activities (non-invasive activities). The aim of the study is to cover available data regarding archaeological and cultural heritage to compile a background history of the study area in order to identify possible heritage issues or fatal flaws that could possibly be associated with the project and should be avoided during development.

This was accomplished by means of the following phases (the results are represented in section 4 of this report):

2.1 Literature review

A review was conducted utilising data for information gathering from a range of sources on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

2.2 Information collection

The South African Heritage Resources Information System (SAHRIS) was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible. In addition, the archaeological database housed at the University of the Witwatersrand was consulted.

2.3 Public consultation

No public consultation was conducted during this phase by the author.

2.4 Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

2.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

2.6. Restrictions

This study did not assess the impact on intangible resources of the project. Based on available data and resources as outlined in the report additional information that becomes available at a later stage might change the outcome of assessment. No field work was conducted.

3. LEGISLATION

For this project, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is of importance and the following sites and features are protected:

- a. Archaeological artefacts, structures and sites older than 100 years;
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
- c. Objects of decorative and visual arts;
- d. Military objects, structures and sites older than 75 years;
- e. Historical objects, structures and sites older than 60 years;
- f. Proclaimed heritage sites;
- g. Grave yards and graves older than 60 years;

- h. Meteorites and fossils; and
- i. Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance;
- b. Places to which oral traditions are attached or which are associated with living heritage;
- c. Historical settlements and townscapes;
- d. Landscapes and features of cultural significance;
- e. Geological sites of scientific or cultural importance;
- f. Archaeological and palaeontological importance;
- g. Graves and burial grounds;
- h. Sites of significance relating to the history of slavery; and
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.).

Section 34 (1) of the Act deals with structures that are older than 60 years. Section 35(4) of this Act deals with archaeology, palaeontology and meteorites. Section 36(3) of the Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposit;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined or is known);
- » The preservation condition of the site; and
- » Potential to answer present research questions.

The criteria above will be used to place identified sites within the South African Heritage Resources Agency's (SAHRA's) (2006) system of grading of places and objects that form part of the national estate. This system is approved by the Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Database search

Although the current area under investigation does not seem to have been covered by heritage surveys, several sites are on record to the southwest of the area (Figure 10) indicating that similar sites can be expected in the study area.

In the immediate area the following recent studies were consulted of which the results are not included in Figure 10:

Author	Year	Project	Findings
Dreyer, C.	2005	Archaeological And Historical Investigation Of The Proposed New Sport Stadium At Geelboom, Kuruman District, Northern Cape	No sites
Van der Walt, J & Fourie, W.	2006	Kalahari Manganese Mines Heritage Assessment On Umtu 281 Olive Pan 282 Gama 283	Graves and Stone Age artefacts
Pistorius, JCC.	2006	A Phase I Heritage Impact Assessment (HIA) Study For The Proposed New United Manganese Of Kalahari (UMK) Mine On The Farms Botha 313, Smartt 314 And Rissik 330 Near Hotazel In The Northern Cape Province Of South Africa	Stone Age Occurrences and historic mining structures.
Beaumont, P.	2008	Phase 1 Archaeological Impact Assessment Report On Areas At Hotazel Mine On The Farm Hotazel 280, Kgalagadi District Municipality, Northern Cape Province.	No sites
Webley, L. & Halkett, D	2008	Phase 1 Heritage Impact Assessment: Proposed Prospecting On The Farms Adams 328 And Erin 316, Kuruman, Ga-Segonyana Municipality In The Northern Cape.	<ul style="list-style-type: none"> • Two ephemeral and isolated scatters of Middle Stone Age material on Erin; • Two 20th century graves (one farm owner and one farm worker) on Erin; • A possible hand-excavated well on Erin; • Farm buildings including a shed, workers cottages, a dam, kraals and boreholes on Erin dating to the 20th century;

		<ul style="list-style-type: none"> • Two graves (one farm owner, the other unknown) on Adams; • A 20th century worker's cottage on Adams; • One hand-excavated well on Adams; • A water trough and limestone dam on Adams; • A small scatter of MSA/LSA stone artifacts next to the well on Adams; • Some rectangular limestone blocks, an ash heap, iron and glass rubbish suggesting an early 20th century settlement near the well.
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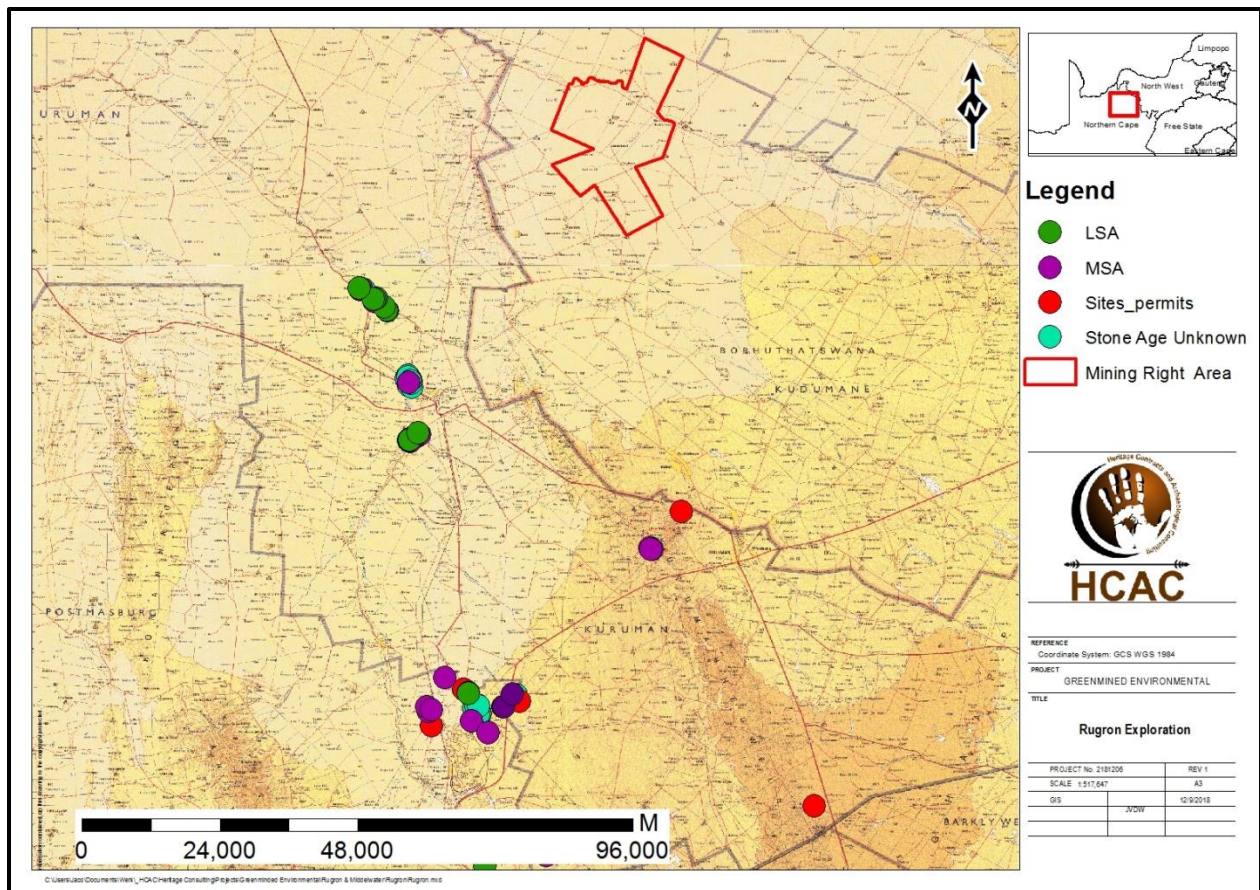


Figure 10: Known sites in relation to the study area.

4.1 2. Public consultation

No public consultation was conducted by the heritage consultant.

4.1.3. Google Earth and mapping survey

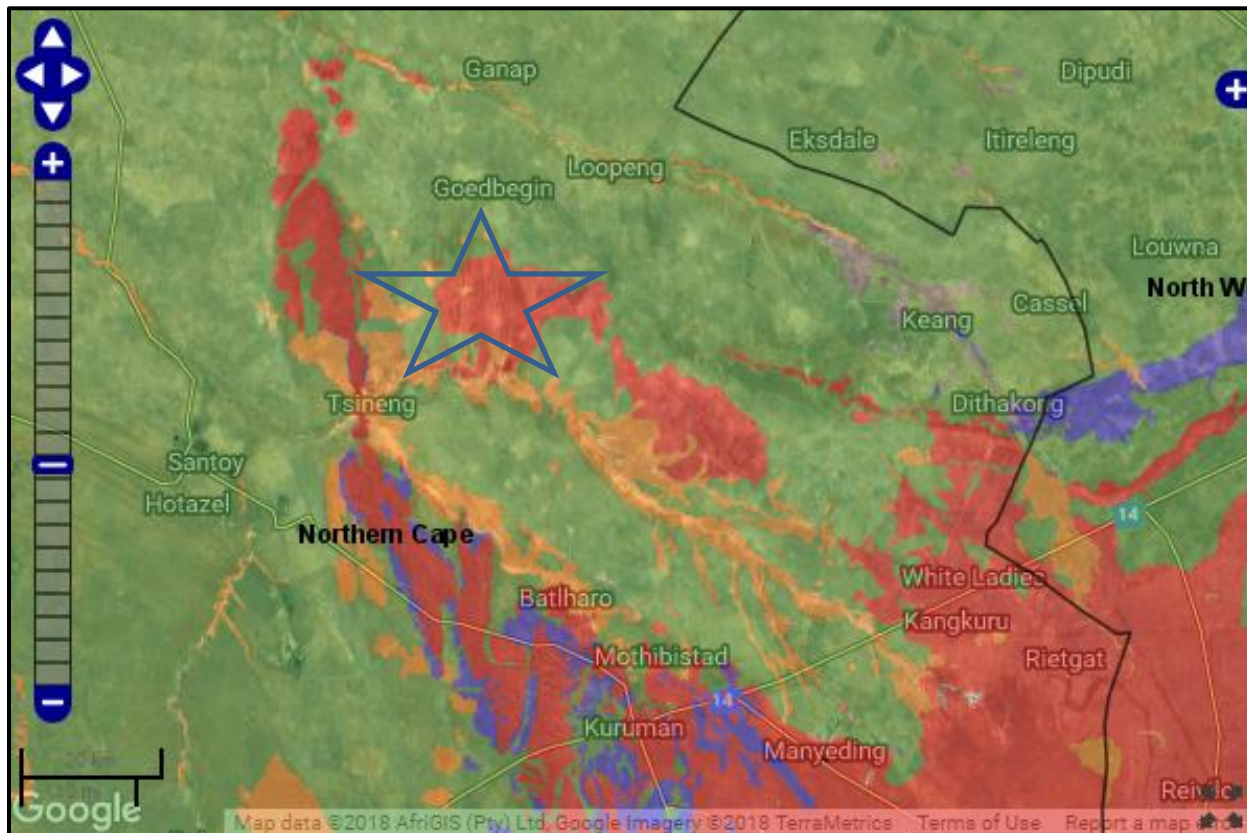
Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

4.1.4. Genealogical Society of South Africa

No grave sites are on record for the study area.

5. BACKGROUND INFORMATION AVAILABLE ON THE STUDY AREA

5.1. Palaeontology of the study area



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 11. The approximate study area indicated on the SAHRIS Paleontological map as ranging from moderate to very high significance.

5.2. Archaeological Overview of the study area.

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. Relevant to the study area is the Stone Age.

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected / possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- » Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago,
- » Middle Stone Age; associated with *Homo sapiens* and archaic modern humans. 30-300 thousand years ago,
- » Earlier Stone Age; associated with early *Homo* groups such as *Homo habilis* and *Homo erectus*. 400 000-> 2 million years ago.

The Northern Cape has a wealth of heritage sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites include the world renowned Wonderwerk Cave and the major Tswana town and the LIA stone-walled settlements at Dithakong 40 km north of Kuruman (De Jong 2010). Other important sites in the larger area include Tsantsabane, an ancient specularite working site on the eastern side of Postmasburg and Doornfontein, another specularite working site north of Beeshoek. Closer to Kuruman two shelters on the northern and southern faces of GaMohaana (in the Kuruman Hills north west of the town) contain Later Stone Age remains and rock paintings. Rock art is known to occur at Danielskuil to the north and on Carter Block itself (Morris 2008). Middle Stone Age material is on record around the study area.

Sotho-Tswana and Nguni societies, the descendants of the LIA mixed farming communities, found the region already sparsely inhabited by the Late Stone Age (LSA) Khoisan groups, the so-called 'first people'. Most of them were eventually assimilated by LIA communities and only a few managed to survive, such as the Korana and Griqua. This period of contact is referred to as the Ceramic Late Stone Age (De Jong 2010) and is represented by the Blinkklipkop specularite mine near Postmasburg and a cluster of important finds at Kathu Pan. Additional specularite workings with associated Ceramic Later Stone Age material and older Fauresmith sites (early Middle Stone Age) are known from Lylyfeld, Demaneng, Mashwening, King, Rust & Vrede, Paling, Gloucester and Mount Huxley to the north. Rock engraving sites are known from Beeshoek and Bruce (Morris 2005: 3). More locally, the two shelters on the northern and southern faces of GaMohaana (in the Kuruman Hills north west of the town) contain Later Stone Age remains and rock paintings.

The Kathu area has witnessed several infrastructural development projects in recent years, including the Heritage Square Mall (Walker et al. 2013), the Neotel Optical fibre cable line (Van Ryneveld 2016a) and the present solar park and associated pylons. The two former heritage studies found high incidences of ESA, particularly Acheulean and Fauresmith, lithic materials, but concluded that these occurrences were not sufficiently significant to warrant declaration. Both Walker et al. (2013) and Van Ryneveld (2016b) made

detailed descriptions of these artefacts. With the exception of the main graded Kathu Complex, which is a protected national heritage site, the general vicinity around Kathu may be categorised as a “Type 4 prehistoric cultural landscape” (Orton 2016). This implies large tracts of ground containing a high density of artefacts, but which are not separable into individual sites. Artefacts occur predominantly in a secondary context due to erosion, deflation and other environmental phenomena. The formation processes of these deposits preclude most organic survival (Van der Walt and Bradfield 2017).

Archaeological surveys have shown rocky outcrops and hills, drainage lines, riverbanks and confluences to be prime localities for archaeological finds and specifically Stone Age sites, as these areas were utilized for settlement of base camps close to water and hunting ranges. Studies in the larger area collaborate this e.g. Henderson 2005, Webley 2010, Fourie 2011 and an example is the Kathu Pan site.

The Difaqane coincided with the penetration of the interior of South Africa by white traders, hunters, explorers and missionaries. The first was PJ Truter’s and William Somerville’s journey of 1801, which reached Dithakong at Kuruman. They were followed by Cowan, Donovan, Burchell and Campbell and resulted in the establishment of a London Mission Society station near Kuruman in 1817 by James Read. Robert Moffat and his wife Mary came to Kuruman in 1820 and the mission has been known as The Moffat Mission Station ever since.

5.4 Historical maps relating to the area under investigation

Rugron Exploration Co (Pty) Ltd intends to apply for prospecting rights and related infrastructural activities on the following farms in the Motshaweng Local Municipality, Kgalagadi District Municipality, Kuruman Magisterial District, Northern Cape Province:

- Holmby No. 49 IM
- Magonat No. 507 IM
- Nevin No. 45 IM
- Olney No. 44 IM
- Padstow No. 50 IM
- Rhokana No. 61 IM
- Rugby No. 43 IM

Holmby 49 IM:

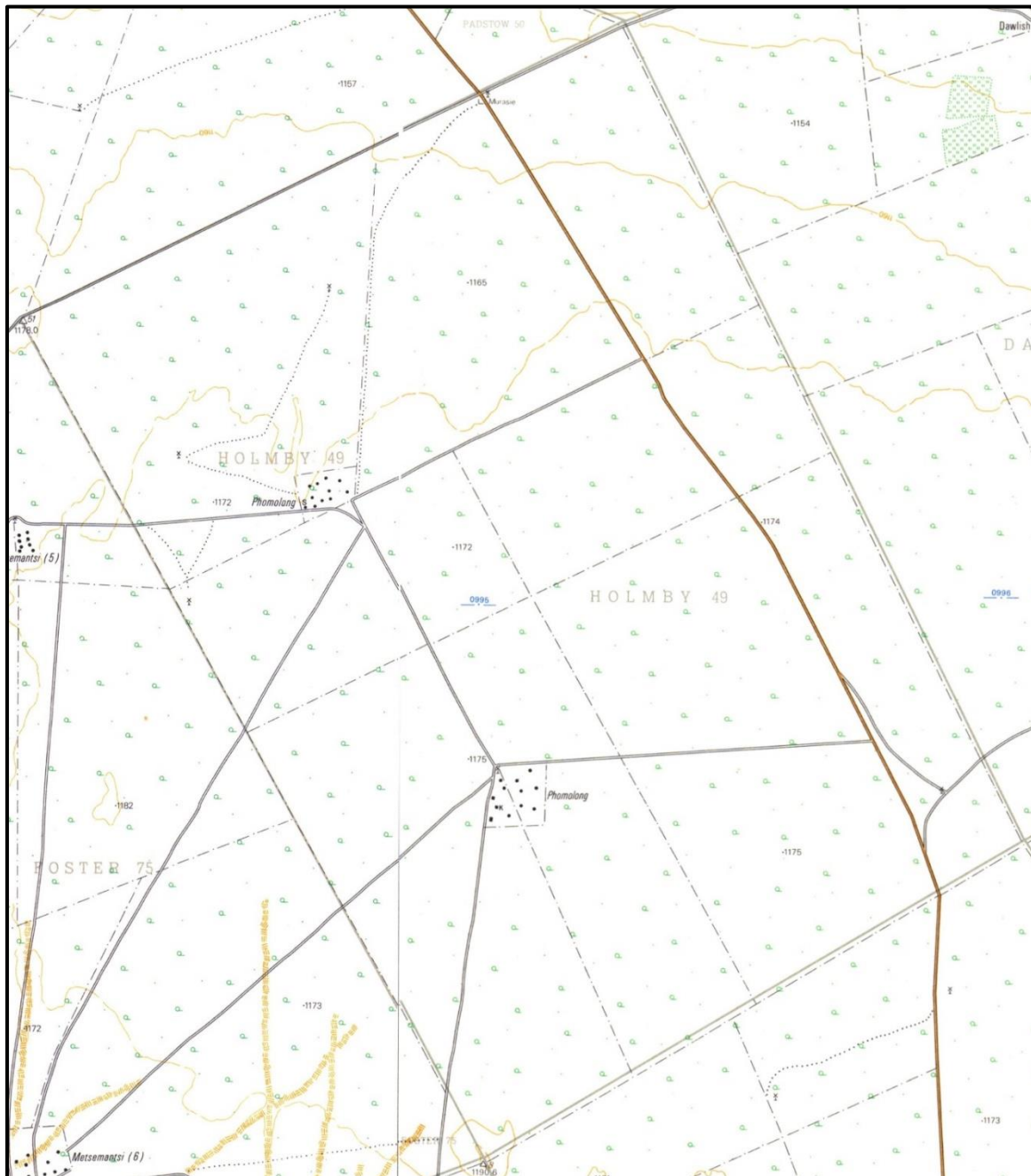


Figure 12. 1974 Topographical map of the farm Holmby 49. A secondary road, a number of minor roads and some tracks / footpaths are visible in the study area. There were two settlement sites on the farm, both known as Phomolong. The northern settlement contained 11 huts, including a school, and three windmills can be seen in the vicinity. To the south east, the second site consisted of nine huts, three European buildings including a church, as well as a windmill. One ruin and a windmill can be seen near the north eastern corner of the farm. (Topographical Map 1974)



Figure 13. 1990 Topographical map of the farm Holmby 49. A secondary road, a number of minor roads and some tracks / footpaths are visible in the study area. There were two settlement sites on the farm, both known as Phomolong. The northern settlement contained 14 buildings, of which one was a school and the majority were traditional huts, and three windmills can be seen in the vicinity. To the south east, the second site consisted of nine huts, three European buildings including a church, as well as a windmill. One ruin and a windmill can be seen near the north eastern corner of the farm. (Topographical Map 1990)

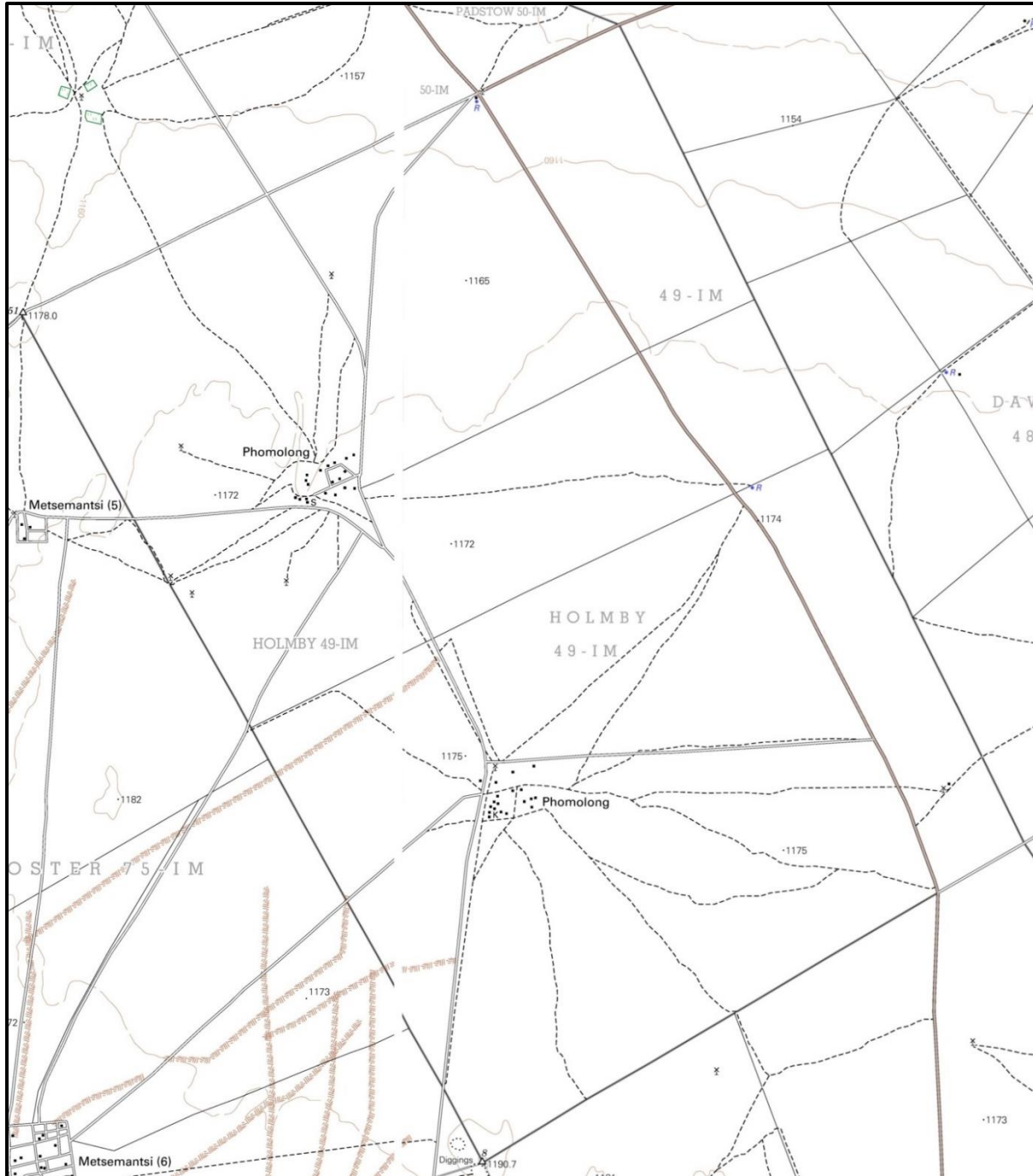


Figure 14. 2002 Topographical map of the farm Holmby 49. A secondary road, a number of minor roads and several tracks / footpaths are visible in the study area. There were two settlement sites on the farm, both known as Phomolong. The northern settlement contained 19 buildings, of which one was a school, and five windmills can be seen in the vicinity. To the south east, the second site consisted of 19 buildings, including a church, as well as a windmill. One building, a windmill and a water reservoir can be seen near the north eastern corner of the farm, and one building and a windmill is visible near the south eastern corner of the farm. (Topographical Map 2002)

Magonat 507 IM

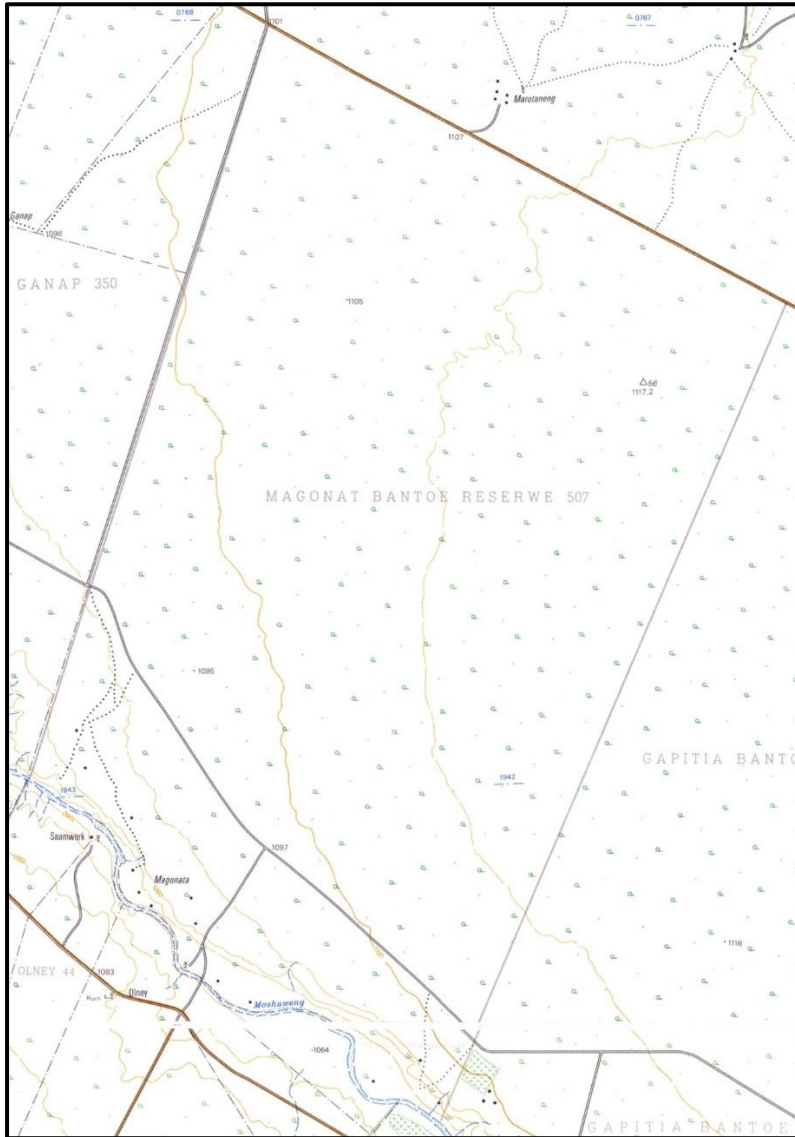


Figure 15. 1974 Topographical map of the Magonat Bantu Reserve. The Moshaweng River formed the south western boundary of the farm, and a secondary road formed its north eastern boundary. A few minor roads and tracks / footpaths went through the property. One can see about 13 huts and one windmill spaced out along the north eastern bank of the river. (Topographical Map 1974)

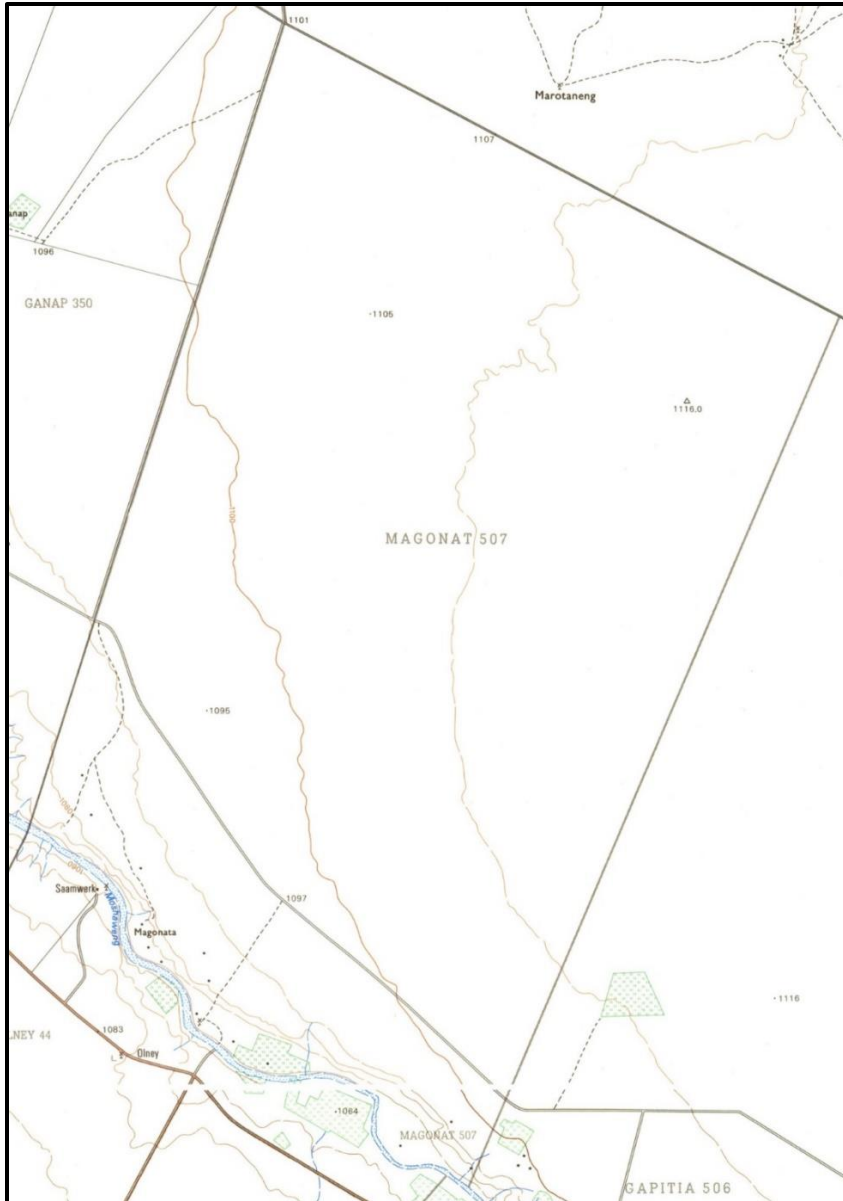


Figure 16. 1990 Topographical map of Magonat 507. The Moshaweng River formed the south western boundary of the farm, and a secondary road formed its north eastern boundary. A few minor roads and tracks / footpaths went through the property. One can see about 14 huts and

one windmill spaced out along the north eastern bank of the river. A section of cultivated land can also be seen in this area. (Topographical Map 1990)

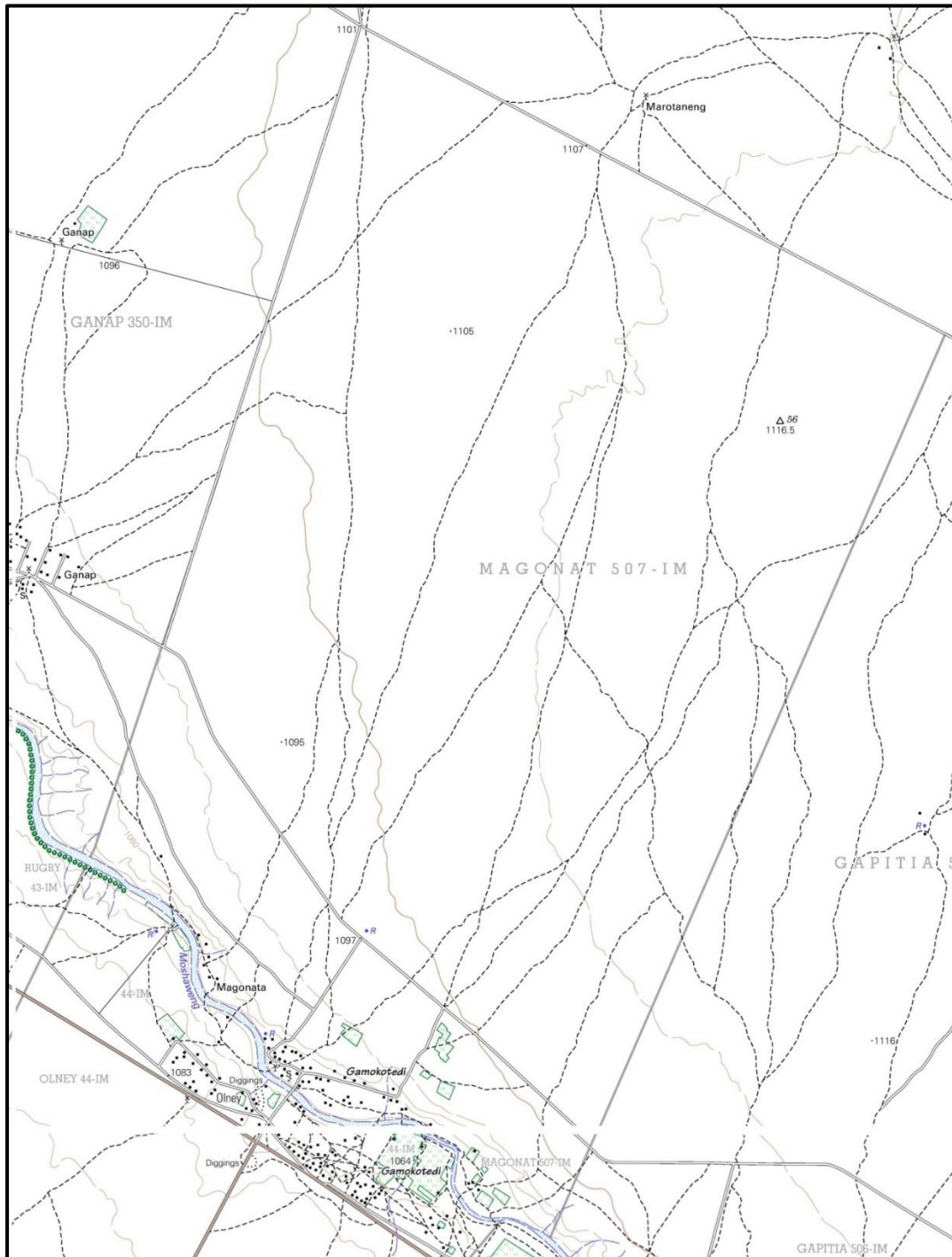


Figure 17. 2002 Topographical map of Magonat 507 IM. The Moshaweng River formed the south western boundary of the farm, and a secondary road formed its north eastern boundary. A few minor roads and many tracks / footpaths went through the property. The Gamokotedi settlement had been established on both banks of the river. One can see about 50 buildings, a school, a windmill and a water reservoir spaced out along the north

eastern bank of the river. A number of small sections of cultivated land can also be seen in this area.
(Topographical Map 2002)

Nevin 45 IM:

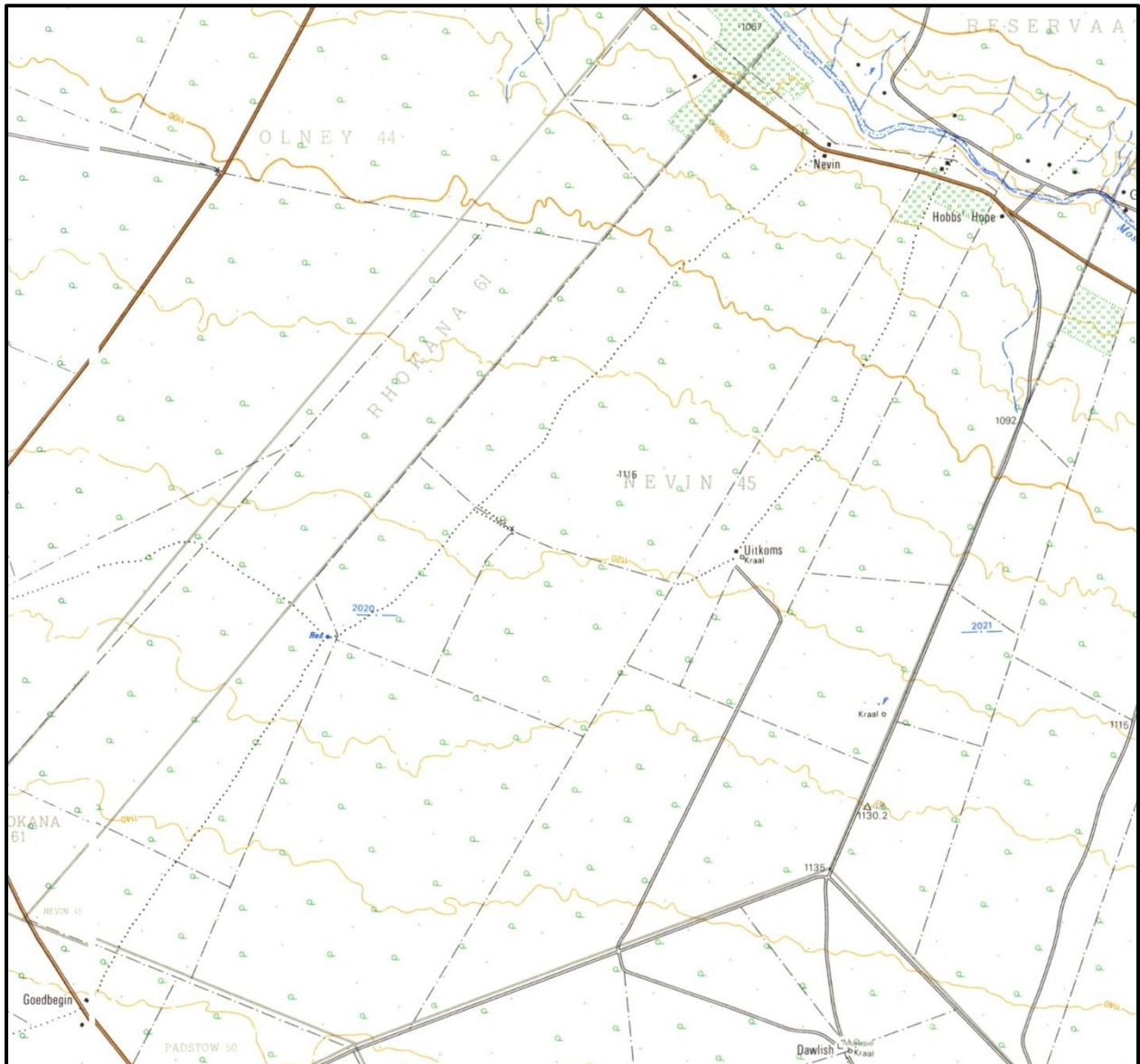


Figure 18. 1974 Topographical map of Nevin 45. The Moshaweng River formed the north eastern boundary of the farm. A secondary road, as well as a number of minor roads and tracks / footpaths went through the property. About five buildings can be seen to the south of the river bank – two at Nevin and Hobbs Hope respectively. Further to the south one building and a kraal can be seen at Uitkoms, and another kraal is visible further to the south east. One water reservoir is visible near the western boundary of the property. (Topographical Map 1974)

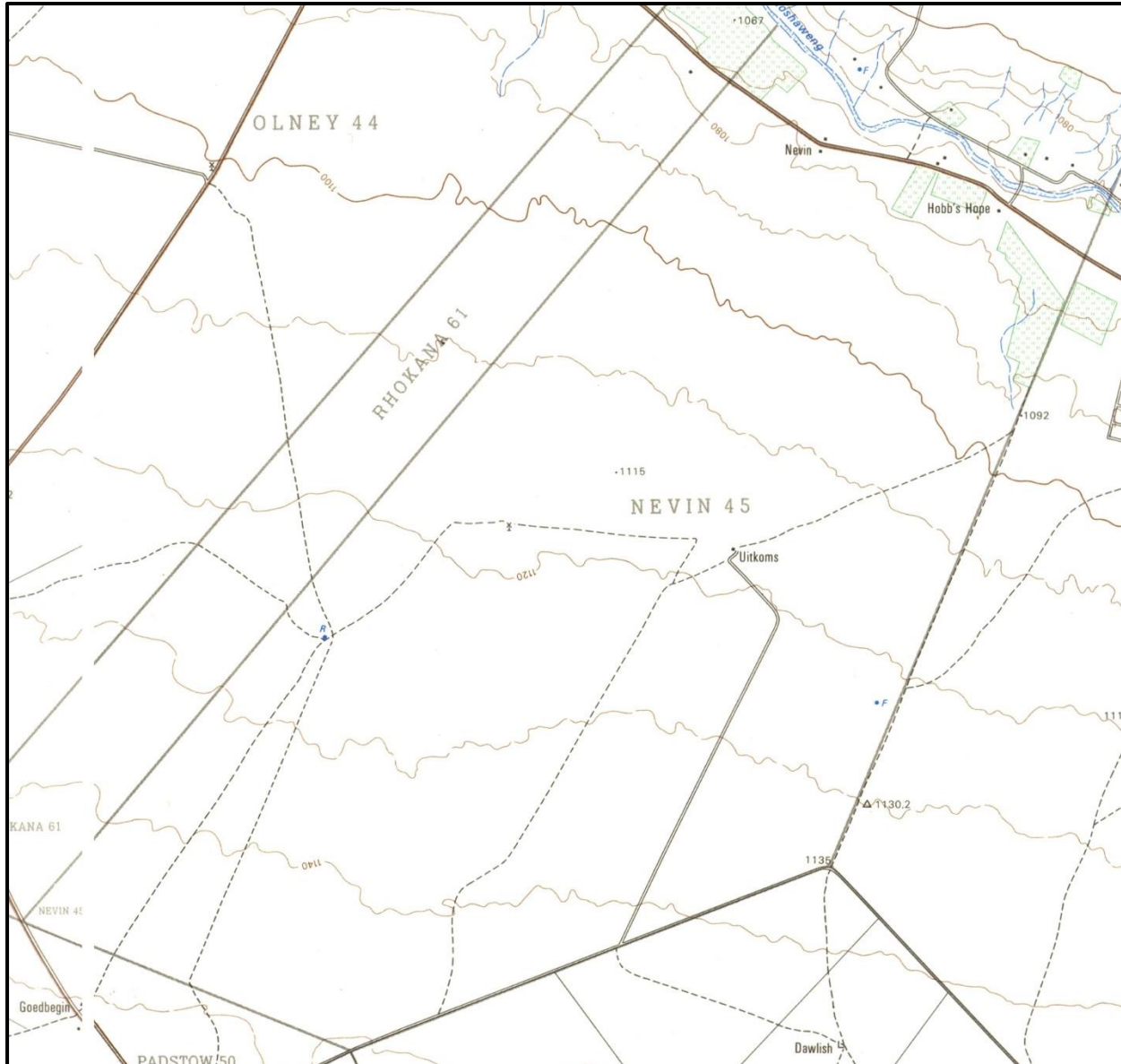


Figure 19. 1990 Topographical map of Nevin 45. The Moshaweng River formed the north eastern boundary of the farm. A secondary road, as well as a number of minor roads and tracks / footpaths went through the property. About five buildings can be seen to the south of the river bank – two at Nevin and Hobb's Hope respectively. Further to the south one building can be seen at Uitkoms. A windmill and a water reservoir are visible to the west of Uitkoms. (Topographical Map 1990)

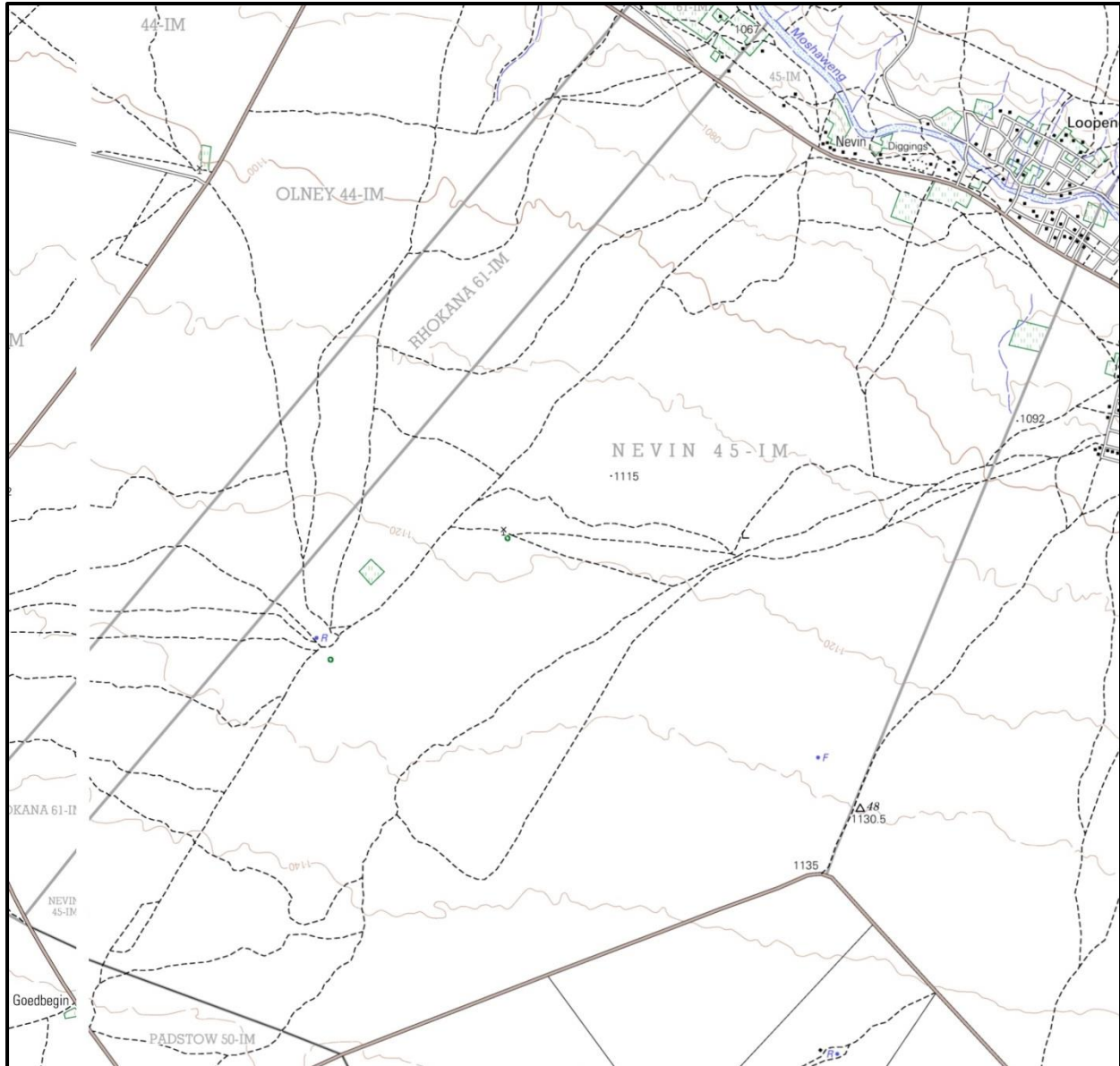


Figure 20. 2002 Topographical map of Nevin 45 IM. The Moshaweng River formed the north eastern boundary of the farm. A secondary road and several tracks / footpaths went through the property. The Loopeng Settlement had been established on both sides of the river. To the south of the river on Nevin one can see built up areas, sections of cultivated land, diggings and about 30 buildings. Developments on the rest of the farm include only two small sections of cultivated land, a ruin (at the old Uitkoms site), a windmill and a water reservoir. (Topographical Map 2002)

Olney 44 IM & Rhokana 61 IM:

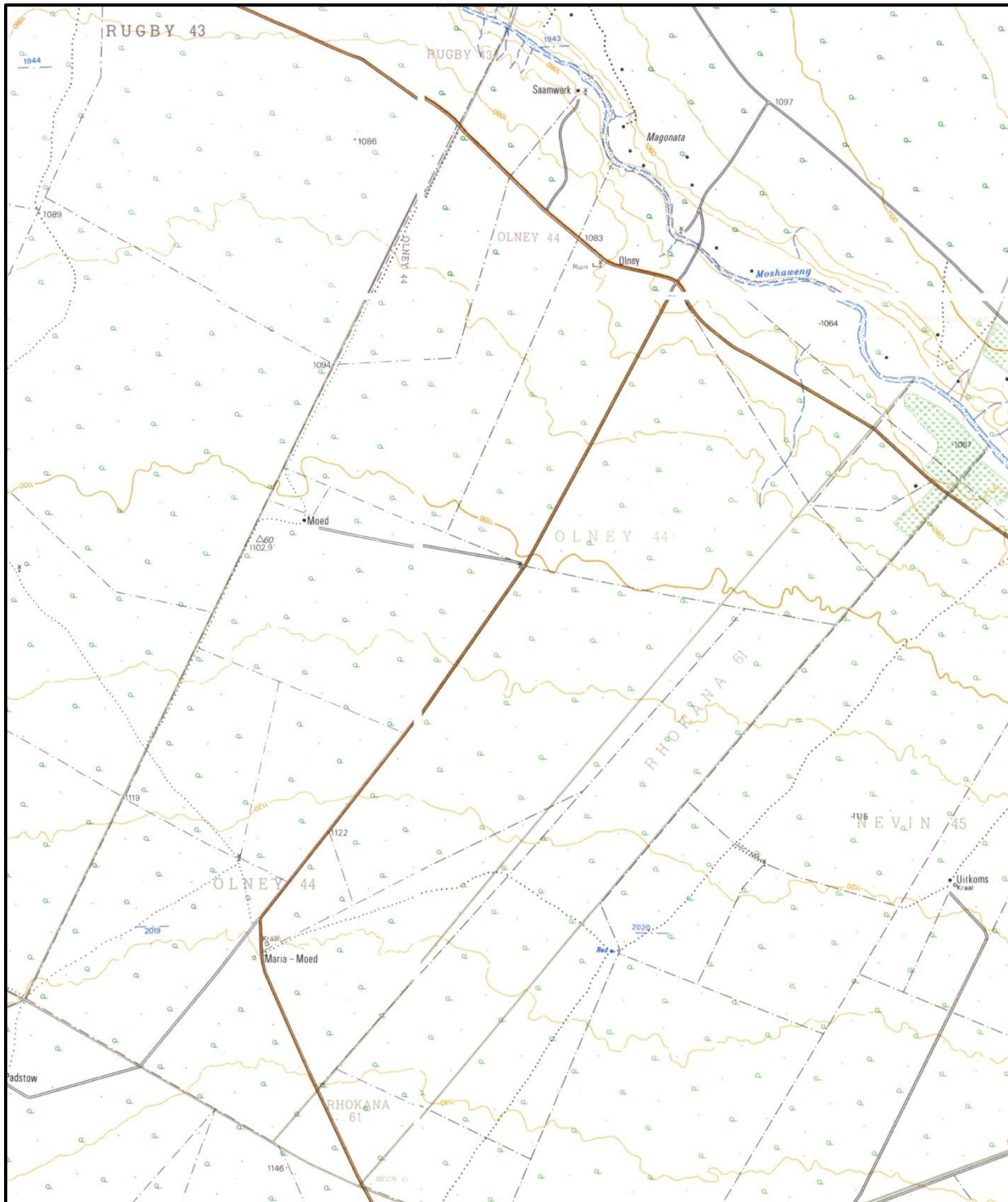


Figure 21. 1974 Topographical map of Olney 44 and Rhokana 61. The Moshaweng River formed the north eastern boundary of both properties. Two secondary roads and a few minor roads and tracks / footpaths went through Olney. Other developments on this farm included one building and a windmill at Saamwerk (near the river), a ruin and a windmill at Olney (near secondary road), a building at Moed (near the western farm boundary), a kraal at “Maria-Moed” (in the southern part of the farm) and two windmills in other

locations. Two secondary roads also went through Rhokana and one can see a section of cultivated land and one building to the south west of the river. (Topographical Map 1974)

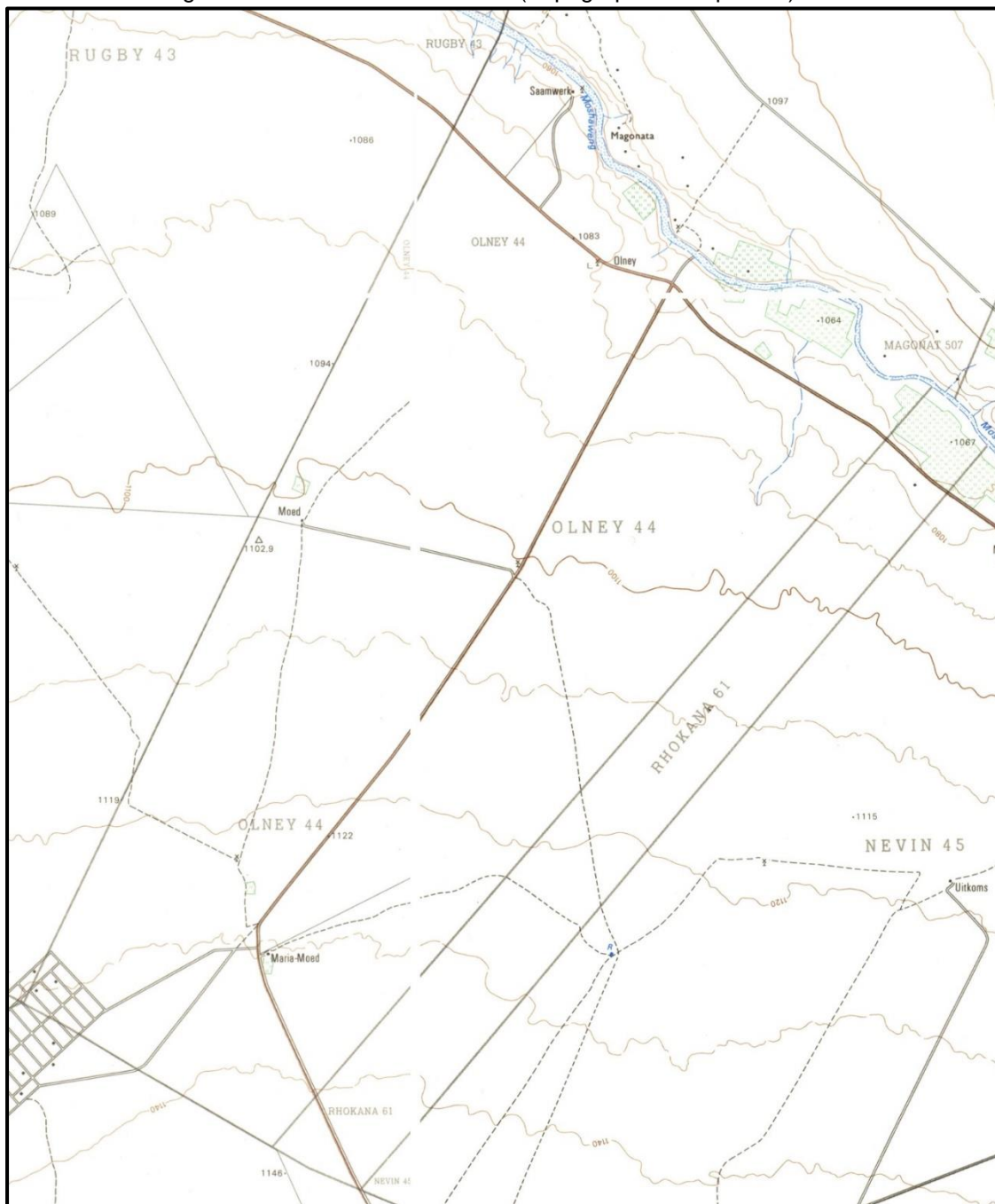
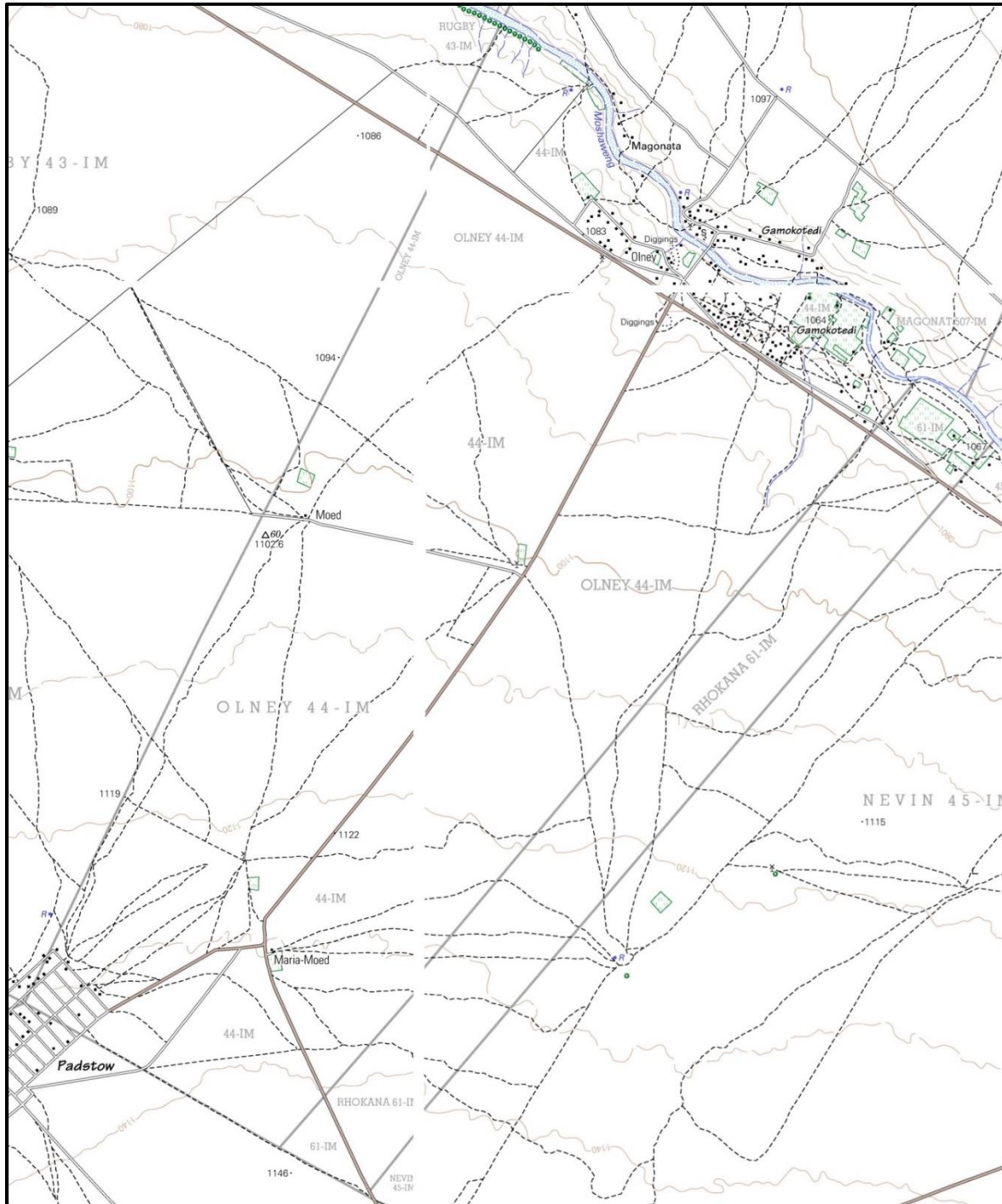


Figure 22. 1990 Topographical map of Olney 44 and Rhokana 61. The Moshaweng River formed the north eastern boundary of both properties. Two secondary roads and a few minor roads and tracks / footpaths went through Olney. Other developments on this farm included one building and a windmill at Saamwerk (near the river), a ruin and a windmill at Olney (near secondary road), a building at Moed (near the western farm boundary), a building and two sections of cultivated land near “Maria-Moed” (in the southern part of the farm) and two windmills in other locations. One can also see an area laid out with streets with a few scattered buildings in the south western part of Olney (this development later became known as Padstow).

Two secondary roads went through Rhokana and one can see a section of cultivated land and one building to the south west of the river. (Topographical Map 1990)



Figure

23. 2002 Topographical map of Olney 44 IM and Rhokana 61 IM. The Moshaweng River formed the north eastern boundary of both properties. Two secondary roads and a number of minor roads and tracks / footpaths went through Olney. The Gamokotedi settlement had been established to both sides of the river, and one can see sections of cultivated land and many buildings to the south of the river on Olney. Other developments on this farm included two buildings and a section of cultivated land at Moed (near the western

farm boundary) and two buildings and two sections of cultivated land near “Maria-Moed” (in the southern part of the farm). One can see the Padstow development in the south western part of Olney. Two secondary roads went through Rhokana and one can see several sections of cultivated land and five buildings to the south west of the river. (Topographical Map 2002)

Padstow 50 IM:

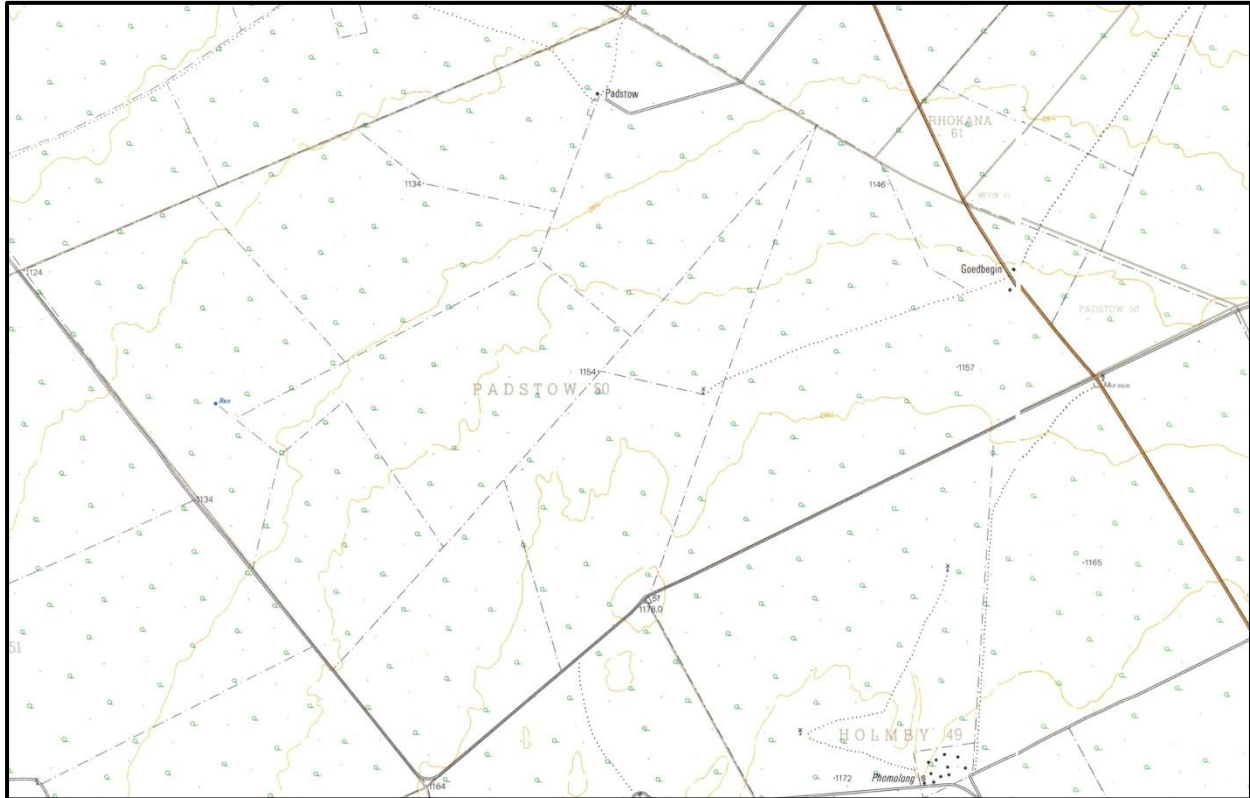


Figure 24, 1974 Topographical map of Padstow 50. A secondary road, a minor road and a few tracks / footpaths went through the property. Other developments included one building at Padstow and two buildings at the Goedbegin site (near the secondary road). A windmill and a water reservoir can also be seen in other parts of the farm. (Topographical Map 1974)

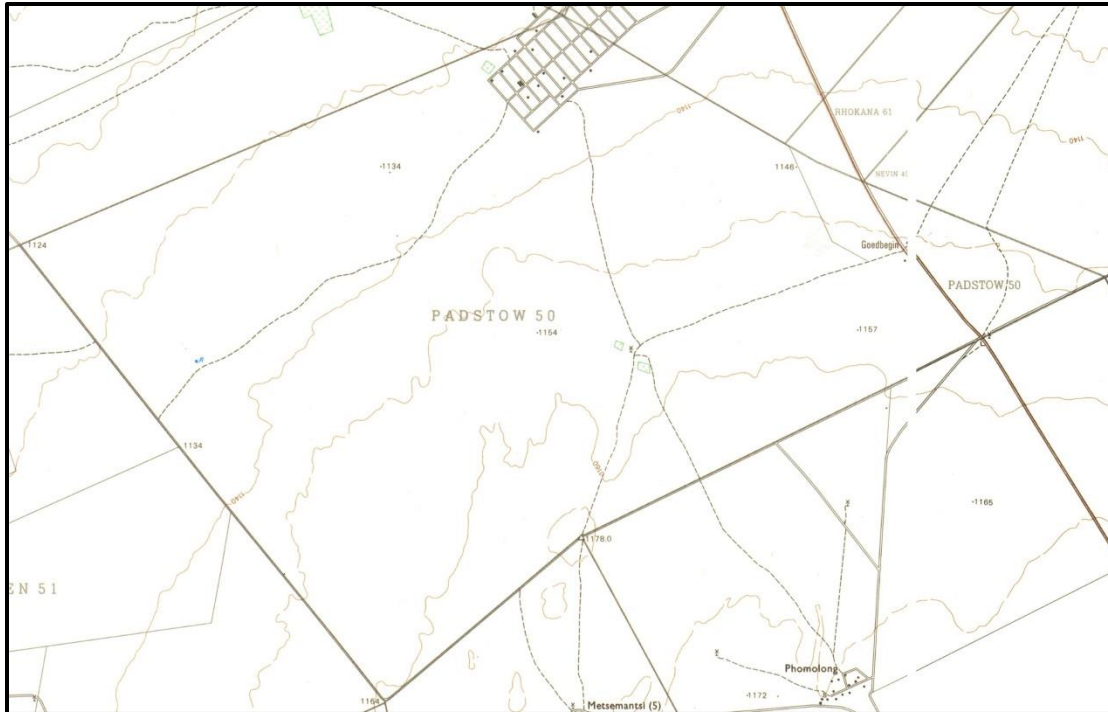


Figure 25. 1990 Topographical map of Padstow 50. A secondary road and a number of tracks / footpaths went through the property. One can see the layout of a settlement with minor roads and buildings in the northern part of the farm. Other developments included two buildings at Goedbegin (near the secondary road), as well as a windmill, small sections of cultivated land and a water reservoir in other parts of the farm. (Topographical Map 1990)

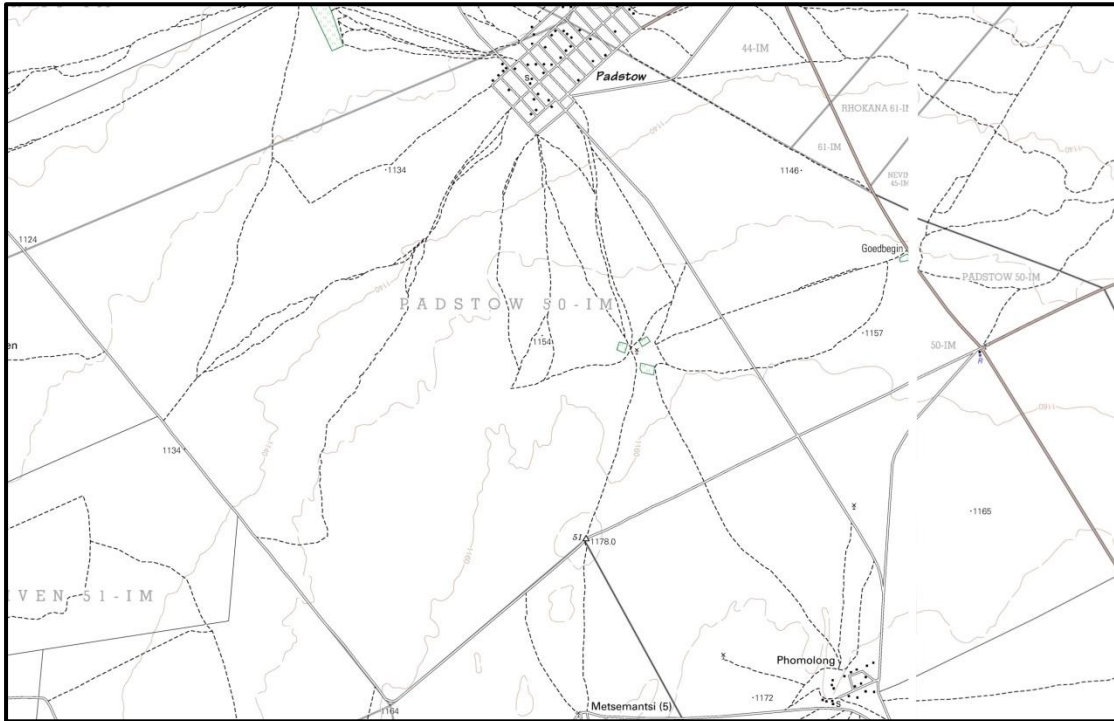


Figure 26. 2002 Topographical map of Padstow 50 IM. A secondary road, minor roads and several tracks / footpaths went through the property. One can see the Padstow settlement in the northern part of the farm. Other developments included a small section of cultivated land at Goedbegin (near the secondary road), as well as a windmill and small sections of cultivated land in other parts of the farm. (Topographical Map 2002)

Rugby 43 IM:

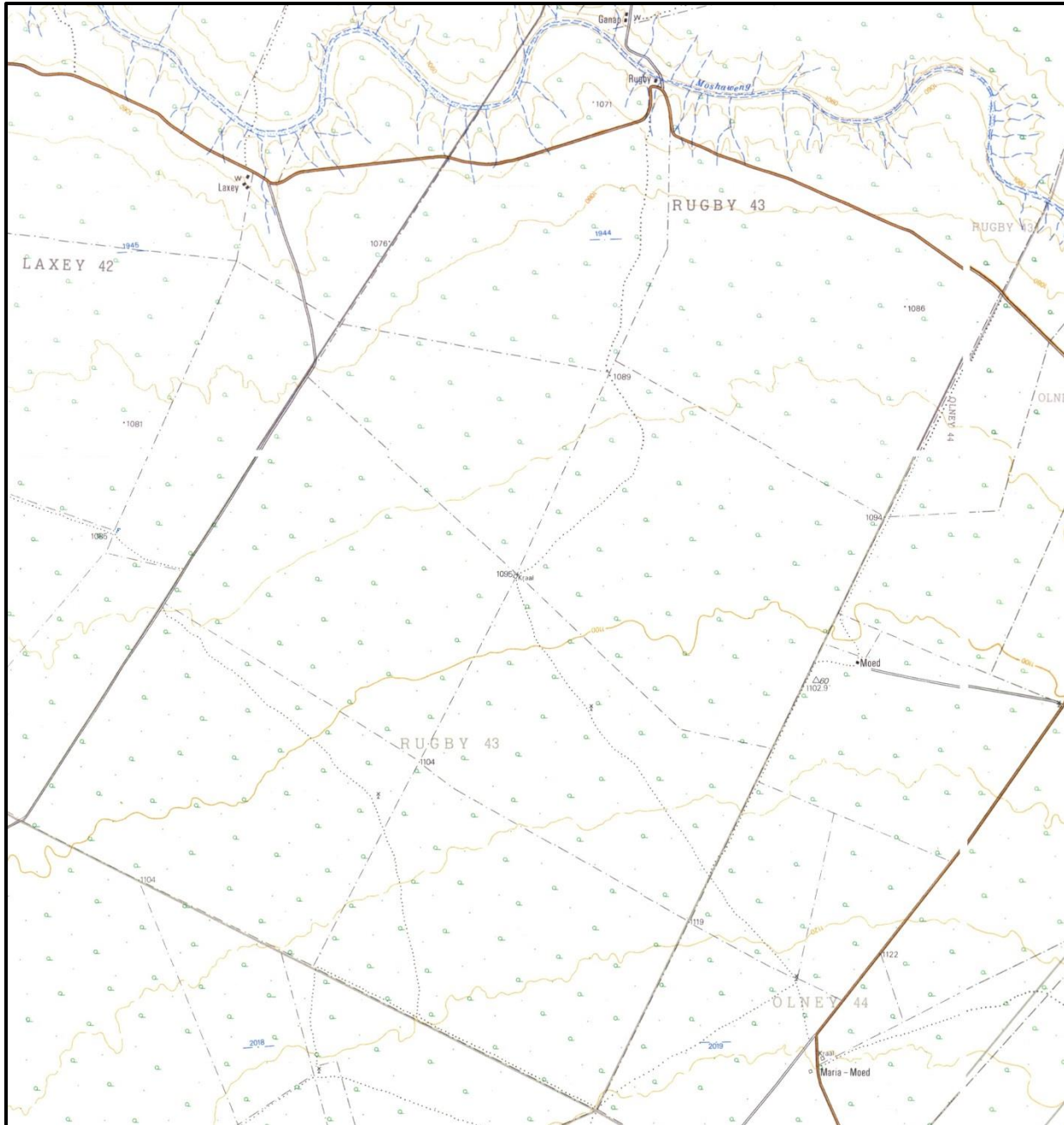


Figure 27. 1974 Topographical map of Rugby 43. The Moshaweng River formed the northern boundary of the farm. A secondary road, a minor road and a track / footpath went through the property. Other developments included a building at Rugby (near the river), a kraal (near the centre of the farm) and two windmills (further to the south). (Topographical Map 1974)

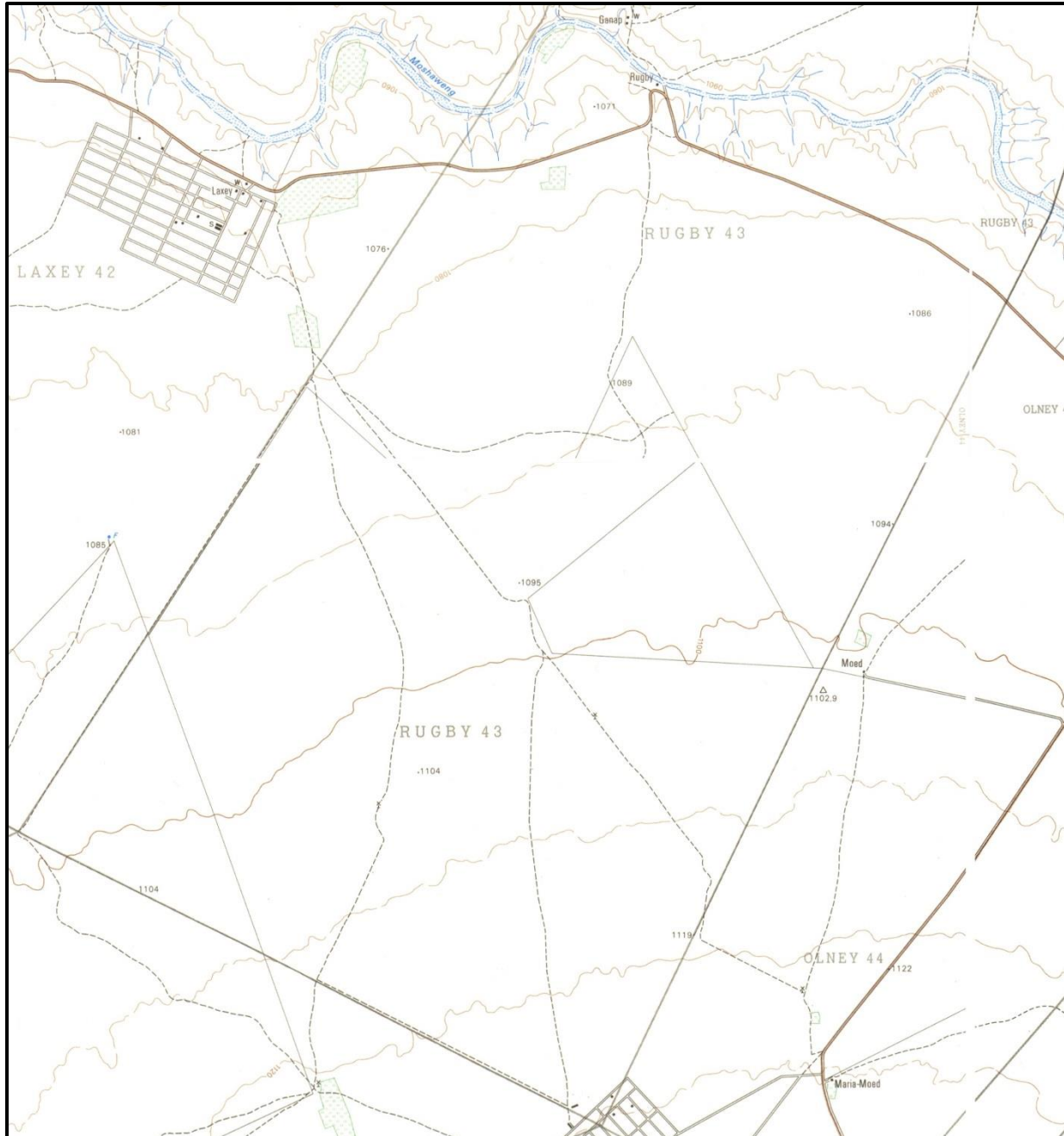


Figure 28. 1990 Topographical map of Rugby 43. The Moshaweng River formed the northern boundary of the farm. A secondary road, a minor road and a number of tracks / footpaths went through the property. Other developments included a building at Rugby and two sections of cultivated land (near the river) and two windmills (further to the south). (Topographical Map 1990)

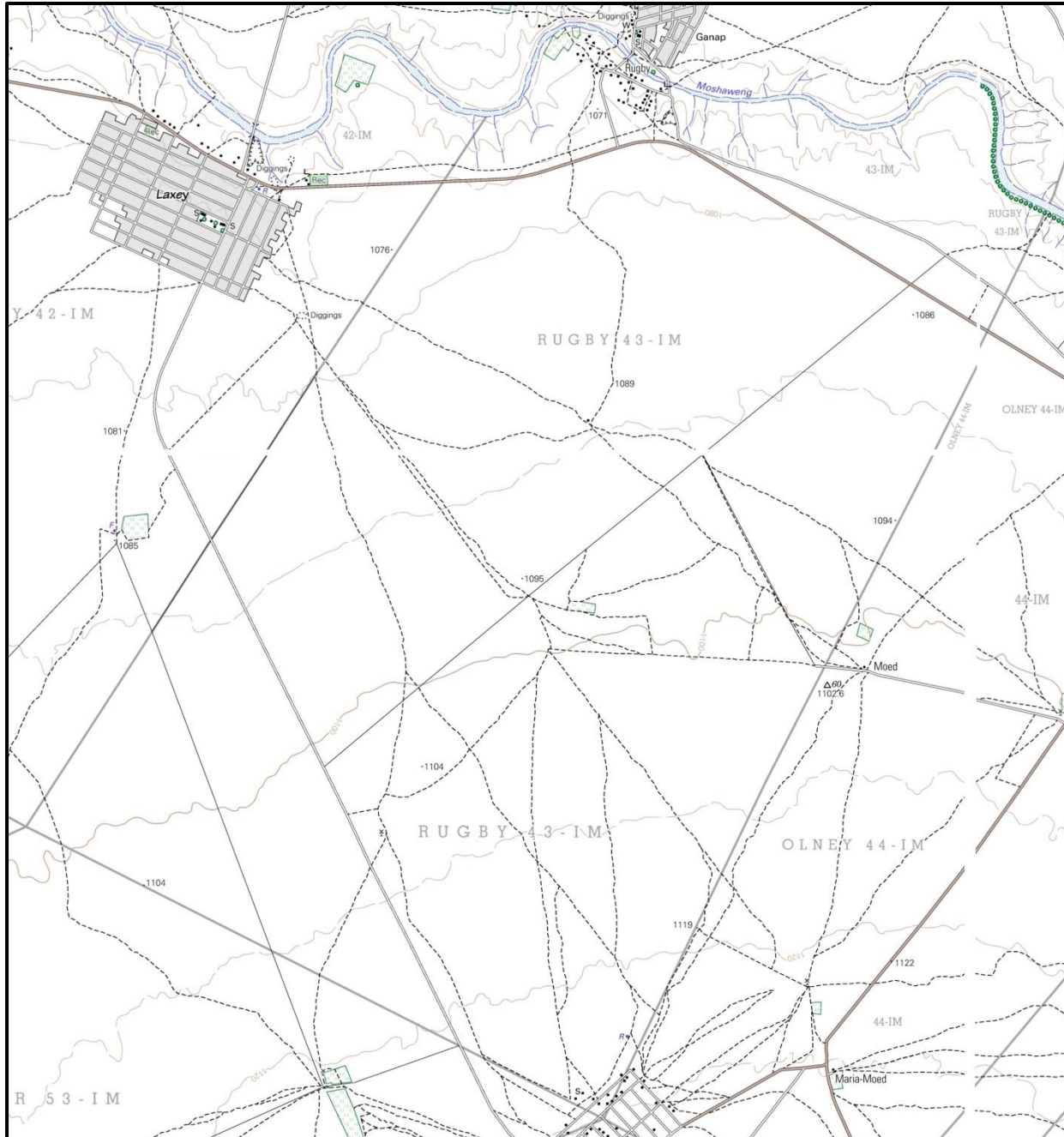


Figure 29. 2002 Topographical map of Rugby 43 IM. The Moshaweng River formed the northern boundary of the farm. A secondary road and a number of minor roads and tracks / footpaths went through the property. To the south of Ganap (north of the river), one can see about 35 buildings, an excavation site and sections of cultivated land. One building, a section of cultivated land, a windmill and a water reservoir can be seen in other parts of the property. One can see another township development in the south eastern corner of the farm, of which about six buildings (including a school) were located on Rugby. (Topographical Map 2002)

Google Earth images showing the area in its entirety:

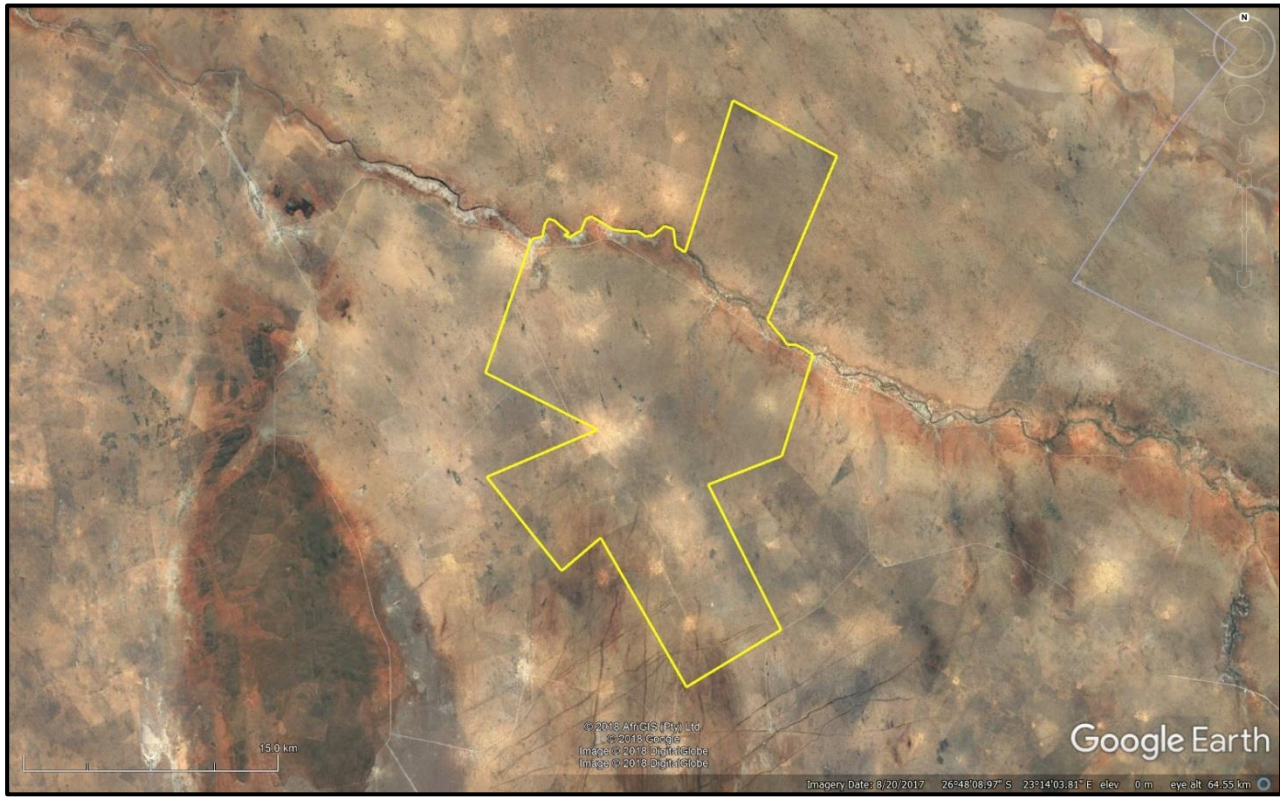


Figure 30. 2017 Google Earth image showing the location of the study area. (Google Earth 2017)



Figure 31. 2018 Google Earth image showing the study area in relation to Kuruman, the N14 and other sites. (Google Earth 2018)

6. PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low probability indicates that no known occurrences of sites have been found previously in the general study area. Medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area. A high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability for the occurrence of sites.

- Archaeological and Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.*

Archaeological remains dating to the following periods can be expected within the study areas:

- Stone Age finds
 - ESA: *Low -medium Probability*
 - MSA: *Medium - High Probability*
 - LSA: *Medium - High Probability*

LSA –Herder: Low Probability

- Iron Age finds
EIA: *Low Probability*
MIA: *Low Probability*
LIA: *Low Probability*
- Historical finds
Historical period: *Low-Medium Probability*
Historical dumps: *Low Probability*
Structural remains: *Medium - High Probability*
- Living Heritage
For example, rainmaking sites: *Low Probability*
- Burial/Cemeteries
Burials over 100 years: *Medium Probability*
Burials younger than 60 years: *Medium to high Probability*

Subsurface excavations including prospecting, ground levelling, landscaping, and foundation preparation can expose any number of these resources.

7. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a field survey and it is assumed that information obtained for the wider area is applicable to the study area. Additional information could become available in future that could change the results of this report. It is assumed that the EAP will upload all relevant documents to the SAHRIS.

8. FINDINGS

Based on previous studies conducted in the wider area, widely dispersed scatters of artefacts dating back to the Stone Age (mostly dating to the MSA and LSA) is expected in the study area. Several hamlets occur in the study area that might also contain graves, but will not be impacted on by the proposed prospecting activities. Based on a desktop assessment of the study area no known heritage sites occur within the prospecting area. Due to the importance of environmental indicators such as water sources, higher lying areas etc. that attracted human activity in antiquity, these factors were used as the main criteria for generating a four-tier sensitivity map of the study area (Figure 32). The relative sensitivity mapping followed the following four tier sensitivity classes approach with:

- Dark Red: Very High Sensitivity
- Red: High Sensitivity,
- Orange: Medium Sensitivity
- Green: Low Sensitivity

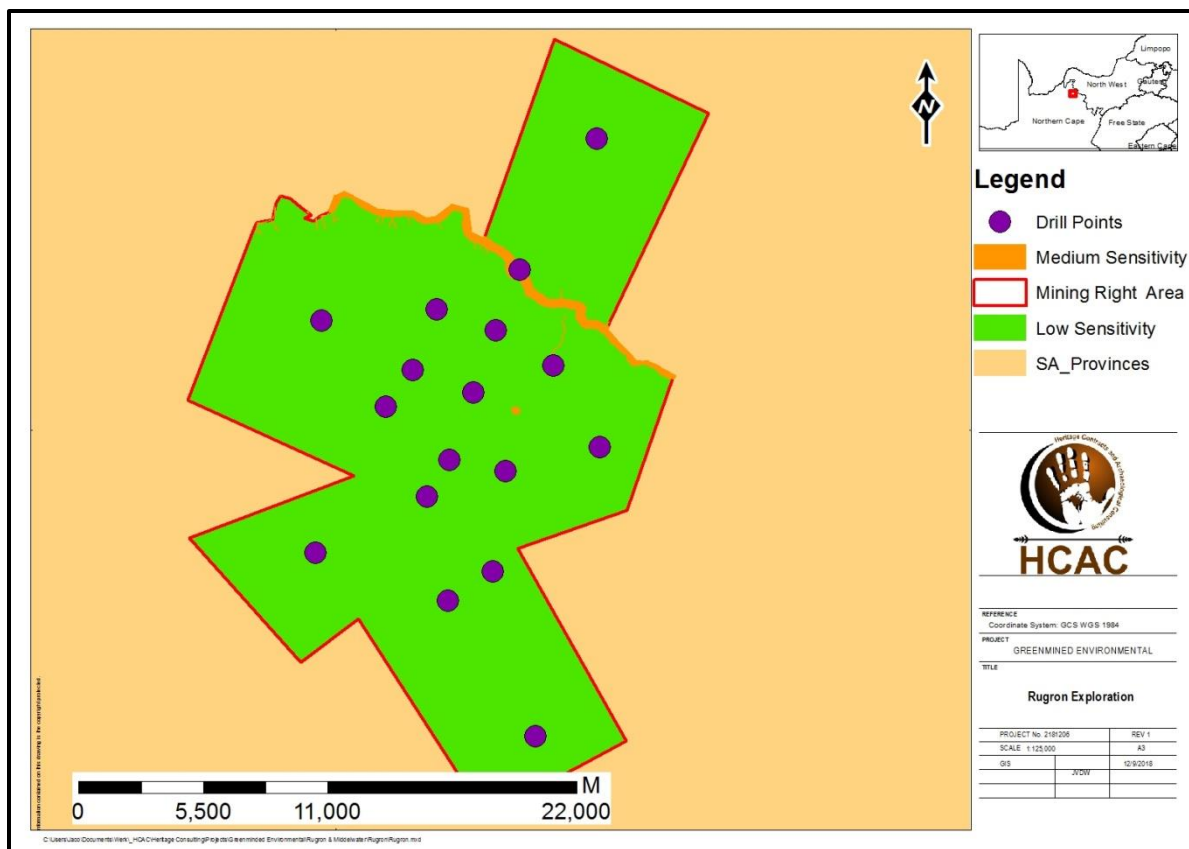


Figure 32. Relative sensitivity map.

8.1. Archaeology and Palaeontology

8.1.1 Archaeological finds

Based on CRM studies conducted in the area MSA and LSA scatters and to a lesser extend isolated ESA artefacts can be expected. No Impacts to heritage resources is envisaged during the non-invasive prospecting activities and invasive activities (drilling) will, due to the small impact area of drill sites, have a negligible impact on heritage resources.

8.1.2. Paleontological resources

Bamford (2018) conducted an independent paleontological study and found that the proposed site lies on the Kalahari Sands that do not preserve fossils except around pans. Below the sands are the non-fossiliferous Asbestos Hills Subgroup iron formation (the target of the operation) and potentially fossiliferous stromatolites of the Campbell Rand Subgroup. Although there is only an extremely small chance that microscopic green and blue-green algae could be preserved in the stromatolites a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required and a prospecting right can be granted (Bamford 2018).

8.1.3. Nature of Impact

The invasive phase of the project could directly impact on surface and subsurface archaeological sites.

8.1.4. Extent of impact

The project could have a low impact on a local scale.

8.2. Historical period

8.2.1 Historical finds:

Historical finds include middens, structural remains and the cultural landscape. Impacts to heritage resources will occur primarily during invasive activities and no impacts are expected during the initial non-invasive activities.

8.2.2 Nature of Impact

The non-invasive activities will not have an impact on heritage resources, but invasive activities could alter/destroy non-renewable resources.

8.2.3 Extent of impact

The project could have a low impact on a local scale.

8.3. Burials and Cemeteries

8.3.1 Burials and Cemeteries

There are no graves on record for the study area but graves and informal cemeteries can be expected anywhere on the landscape

8.3.2 Nature of Impact

The invasive prospecting activities during later phases of the proposed project could directly impact on marked and unmarked graves.

8.3.3 Extent of impact

The project could have a low to medium impact on a local scale.

Impact on Heritage resources			
<p>During the non-invasive prospecting no impacts are foreseen on heritage resources. The future invasive prospecting activities of the proposed project could directly impact on graves, archaeological sites and historical sites.</p>			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites, historical sites and graves.	Invasive exploration activities could cause irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Low to Medium on a local scale.	NA
Description of expected significance of impact			
<p>Based on previous work in the area widely scattered Stone Age finds and graves can be expected. The project is not expected to have an impact on significant heritage resources and due to the size of the drilling areas relative to the study area the impact will be very low.</p>			
Gaps in knowledge & recommendations for further study			
<p>It is assumed that information obtained for the wider region is applicable to the study area. A chance find procedure should be implemented for the project.</p>			

9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have a Generally Protected B (GP. B) or lower field rating and all sites should be mitigatable. No red flags have been identified.

10. CONCLUSIONS AND RECOMMENDATIONS

The scope of work comprises a heritage desktop report for 17 drill points on a large prospecting right area comprising approximately 36 628 ha. Prospecting will consist of drill pads measuring 400m² mostly located in existing gravel roads to minimize the impact on the environment. Due to the limited footprint of the 17 drill sites on a large area of relative low heritage significance the impact of the project is expected to be low.

This desktop study is informed by available data for the area and based on these studies the following resources can be expected in the study area as indicated below.

- Standing structures older than 60 years are protected by Section 34 of the NHRA (Act 25 of 1999) and the destruction or demolition of structures older than 60 years will require relevant permits. Although it is not foreseen that exploration activities will impact on standing structures, features older than 60 years can be expected in the study area in the form of farmsteads.
- With regard to the archaeological component of Section 35 this brief background study indicates that the general area under investigation contain widespread scatters of Stone Age artefacts dating to the ESA, MSA and LSA.
- Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. There is an extremely small chance that fossil algae may occur in the stromatolites of the Campbell Rand dolomites. Nonetheless a Fossil Chance Find Protocol should be added to the EMP: if fossils are found once drilling has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample (Bamford 2018).
- In terms of Section 36 no known graves occur in the study area. It should be noted that graves can occur anywhere on the landscape and graves are expected in the study area.

It is anticipated that any sites that occur within the project area will have a Generally Protected B (GP. B) or lower field rating and no red flags have been identified. It is therefore recommended that exploration can commence (based on approval from SAHRA) with the following management measures incorporated into the EMP for the project:

- All drilling points should be located on existing roads as far as possible.
- The environmentalist should inspect the location for each drill site to confirm that there are no stone packed features (Structures or graves) close to the impact area of the drill locations.
- Inclusion of a chance find protocol (both archaeology and palaeontology) in the EMP as outlined below.

10.1. Chance Find Procedure – Archaeology

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

10.2. Monitoring Programme for Palaeontology – to commence once the drilling and prospecting begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling or excavations commence.
2. When drilling or excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, wood, bone, coal) should be put aside in a suitably protected place. This way the prospecting activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 5, 6). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then the site inspections by the palaeontologist will not be necessary. Annual reports by the palaeontologist must be sent to SAHRA.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

11. PLAN OF STUDY

With cognisance of the small impact of the drill sites it is recommended the project can continue with no further studies, incorporating chance find procedures and the recommended management measures into the EMP.

11.1 Reasoned Opinion

If the above recommendations are adhered to, HCAC is of the opinion that the impact of exploration on heritage resources is low and that the project can continue.

If during the any stage of the project, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded.

12. LIST OF PREPARERS

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13. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. Jaco is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe, Tanzania and the DRC and conducted well over 300 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

14. STATEMENT OF INDEPENDENCE

I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.



SIGNATURE:

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MAPS

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