HERITAGE IMPACT ASSESSMENT

REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

PROPOSED BLOEMENDAL COAL MINE

Type of development:

Coal Mine

Client:

Enviro-Insight CC

Client info:

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Project Reference:

HCAC Project number 218906

Report date:

September 2018

APPROVAL PAGE

Project Name	Bloemendal Coal Mine
Report Title	Heritage Impact Assessment for the proposed Bloemendal Coal Mine
Authority Reference Number	DMR REF NO: GP30/5/1/2/2/10071MR
Report Status	Final Report
Applicant Name	Totapix (Pty) Ltd

	Name	Qualifications and Certifications	Date
Archaeologist	Jaco van der Walt	MA Archaeology PhD Candidate ASAPA #159 APHP # 114	September 2018
Archival Specialist	Liesl Bester	BHCS Honours	September 2018
Palaeontology	Dr Barry Millsteed	B.Sc Geology (Hons), Ph.D Geology,	September 2018

DOCUMENT PROGRESS

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Amendments on Document

Date	Report Reference Number	Description of Amendment
11 October 2018	218906	Revisions as per comments from client.

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REPORT OUTLINE

Appendix 6 of the GNR 982 EIA Regulations, 2014 [as amended] provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GNR 982 EIA Regulations, 2014 [as amended]	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity **including identified alternatives on the environment** or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9 and 10
(l) Conditions for inclusion in the environmental authorisation	Section 9 and 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9 and 10
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Totapix (Pty) Ltd (hereafter the applicant) has appointed Enviro-Insight CC to undertake environmental authorisations associated with the proposed Bloemendal Coal Mine. The applicant has obtained a Prospecting Right (reference number GP 30/5/1/1/2 (126) PR) on 7 June 2013 from the Department of Mineral Resources (DMR) to prospect for coal in an area of 11 166 ha. The application of a mining right to the DMR includes: Portions 1, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14 and 16 of the Farm Bloemendal 283 IR, Portion 3 and the Remaining Extent of the Farm Rietfontein 276 IR, Portions 4, 5, 9, 12, 22, 28 and the Remaining Extent of the Farm Nooitgedacht 286 IR, Portions 1, 2 and the Remaining Extent of the Farm Potfontein 285 IR, Portions 2 and 7 of the Farm Vlakfontein 281 IR, Portions 16 and 17 of the Farm Vischkuil 274 IR and Portions 1 and 4 of the Farm Langzeekoegat 285 IR, Gauteng province.

The Integrated Environmental Authorisation (IEA) application includes the above-mentioned properties where the proposed two mining blocks identified with an estimated life of mine (LoM) of approximately nineteen years and associated infrastructure is located on Portions 6, 9, 10, and 11 of the Farm Bloemendal 283 IR and a Portion of the Remaining Extent of the Farm Rietfontein 276 IR.

HCAC was appointed by Enviro-Insight to conduct a Heritage Impact Assessment for the project to determine the presence of cultural heritage sites and the impact of the proposed project on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the footprint of the mine surface layout. A Proposed alternative location was assessed on a desktop level only.

The study area is characterised by extensive maize fields that have been cultivated from prior to 1966. These agricultural activities would have impacted on surface indicators of heritage sites and during the survey no archaeological sites or artefacts of significance was recorded. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed project to proceed. An independent paleontological study (Millsteed 2018) found that the proposed mining operations pose a significant risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required. Detailed recommended damage control mitigation measures are included in Section 10.

In terms of the built environment (Section 34 of the NHRA) two farmsteads were recorded (Feature 1 and 2), located within the mining pit. At both these locations are structures older than 60 years. Although these buildings potential to contribute to aesthetic, historic, scientific and social aspects is low to moderate, these features are protected by legislation and must be assessed by a conservation architect.

In terms of Section 36 of the Act two cemeteries (Feature 3, 4 and 5) were recorded within the pit area and will be directly impacted. A third cemetery (Feature 6) is located outside but on the periphery of the opencast pit and will be indirectly impacted on. It is recommended that these cemeteries should be retained *in situ*, with a 50 m buffer zone and demarcated with an access gate where possible. If this is not possible these cemeteries can be relocated adhering to legislation. Similarly, if any additional graves are identified they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

No public monuments are located within or close to the study area. The study area is rural in character surrounded by residential developments and road infrastructure and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. During the public participation process conducted for the project no heritage concerns were raised.

Table 2. Recorded sites.

Feature	LONGITUDE	LATITUDE	Description

Feature 1 – Residential ruin	28° 34' 56.0122" E	26° 19' 13.0593" S	Building Older than 60 years
Feature 1 – Shed	28° 34' 57.7026" E	26° 19' 09.9747" S	Building Older than 60 years
Feature 2 – Shed	28° 34' 00.0587" E	26° 18' 58.6189" S	Building Older than 60 years
Feature 3	28° 34' 57.6911" E	26° 19' 12.0253" S	Graves
Feature 4	28° 34' 03.7343" E	26° 18' 58.9895" S	Graves
Feature 5	28° 32' 20.8247" E	26° 19' 24.8089" S	Graves
Feature 6	28° 35' 29.6267" E	26° 21' 03.5244" S	Graves

The impact of the proposed project on heritage resources is considered low to medium and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr together with site specific recommendations and based on approval from SAHRA:

- The historic structures (Feature 1 and 2) should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.
- The cemeteries located in the pit area (Feature 3 and 4) will be directly impacted on. It is recommended that these cemeteries are preserved *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone. If this is not possible the cemeteries can be relocated adhering to all legal requirements.
- A Third cemetery (Feature 5) is also located in the pit area but on the western periphery and it is therefore recommend that the cemetery is preserved *in situ*, fenced with an access gate for family members, with a feasible buffer zone.
- Feature 6 is located outside of the Pit area and should be retained *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone;
- Through the social consultation process the existence of unknown and unmarked graves especially those of still born babies must be assessed.
- Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;
- Implementation of a chance find procedure

In terms of the palaeontological heritage the following recommendations apply:

It is evident that the proposed mining operations pose a significant risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required. Accordingly, it is recommended that:

- A thorough field investigation be conducted by an appropriately experienced Karoo palaeontologist prior to the commencement of the project in the area identified in the current environmental authorisation application and a Full Palaeontological Impact assessment report be submitted to SAHRA.
- This would allow a meaningful evaluation of the presence of fossil materials being present at surface.
- If fossil materials prove to be present the process would allow the identification of any scientifically significant fossils and resultant recommendations that they should be either be protected completely *in situ* or could have damage mitigation procedures emplaced (i.e., excavation by a suitability by a suitably experienced palaeontologist) to minimise negative impacts.

It was identified that the disruption of the geological strata underlying the project area will result in the complete and permanent disaggregation and destruction of the geological strata from the land surface to the complete depth of the in the mine voids. This in effect means that in the two areas identified for opencast mining The Vryheid Formation will be completely destroyed down to the base of Seam 2. It is recommended that once excavation of the pit voids begins:

- On-site checks for the occurrence of any fossils of the excavated pits and stockpiled material should be conducted every six months by an appropriately experienced Karoo palaeontologist. The frequency of these checks should be assessed after six months based on the findings and the planned mining programme.
- The Karoo palaeobotanist should submit a monitoring report to SAHRA on this work.

In addition,

- Should any fossil materials be identified, the palaeontologist should ascertain their scientific and cultural importance.
- Should the fossil prove scientifically or culturally significant the particular excavations involved should be halted and SAHRA informed of the discovery
- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.
- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, 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 form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	27/09/2018

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
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, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**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 (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (HCAC) has been contracted by Enviro- Insight CC to conduct a heritage impact assessment of the proposed Bloemendal Coal Mine. The report forms part of the Environmental Impact Assessment (EIA) Report and Environmental Management Programme Report (EMPR) for the proposed project.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, 2 historical structures and 4 burial sites were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified, and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Environmental Impact Report and its appendices must be submitted to the case officer as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study
Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting
Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.
To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Project description

The proposed project relates to the opencast mining extracting the No.4 lower coal seam ("S4L"), No.2 upper coal seam ("S2U") and the No.2 lower coal seam ("S2L") of approximately 26.13 million tons Run of Mine (ROM) of thermal coal over a period of approximately nineteen years. When coal seams are near the surface, it may be economical to extract the coal using open cut (also referred to as open cast, open pit, or strip) mining methods. Open cast coal mining recovers a greater proportion of the coal deposit than underground methods, as more of the coal seams in the strata may be exploited

The proposed infrastructure required on site includes the following:

• Access & Haul roads (with necessary security) including the upgrading of the access point to the gravel road;

• Contractor's Yard with septic/chemical ablution facilities;

• Offices;

• Weighbridge, workshop and stores (with septic/chemical ablution facilities);

• Rail Siding;

• Diesel facilities and a hardstand;

• Power and Water;

• Boxcut;

• Stockpiles (topsoil, overburden, subsoil/softs, ROM);

• Surface water management measures (stormwater diversion berms and trenches, pollution control dams etc);

• Crushing, screening & wash facility; and

The proposed mining method and sequence comprised of the following main mining activities for both waste and coal:

• Initial topsoil and soft overburden removal which will be stockpiled to ensure it can be replaced back in the initial box cut;

• The physical mining of the coal seam which includes drilling of hard overburden material, charging and blasting;

• The coal is loaded into trucks and hauled to the crushing and screening facility;

• Discard coal will be extracted and replaced in the bottom of the opencast pit, while the product will be taken to the weighbridge via trucks and then removed off site;

• The overburden is replaced back into the pit as mining progresses leaving a minimum area open at a single time;

• The topsoil which was stripped and stockpiled separately before mining commenced is then replaced. The findings of the land capability study will determine the optimal composition to ensure pre-mining conditions for utilisation.

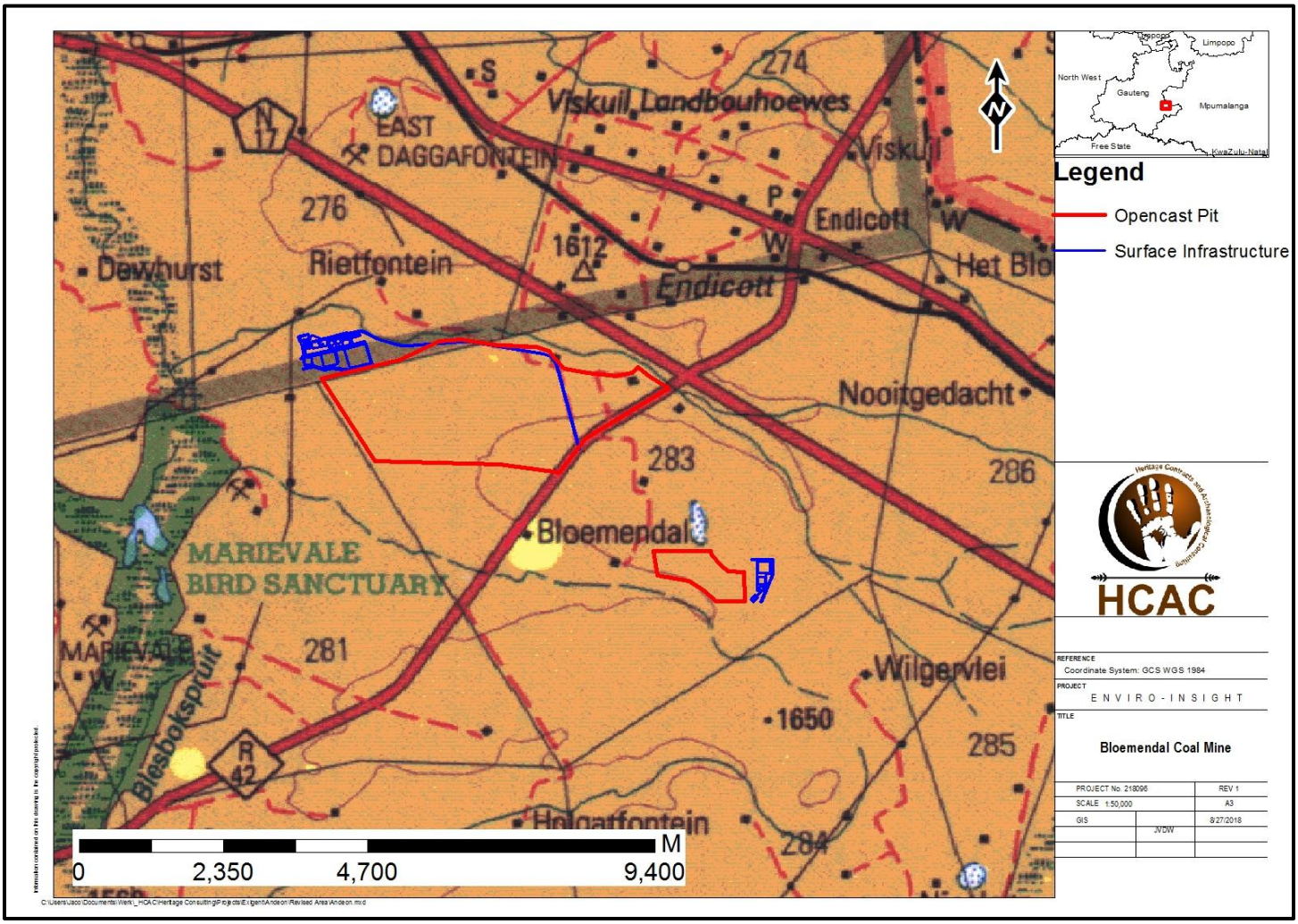

Figure 1. Provincial locality map (1: 250 000 topographical map)

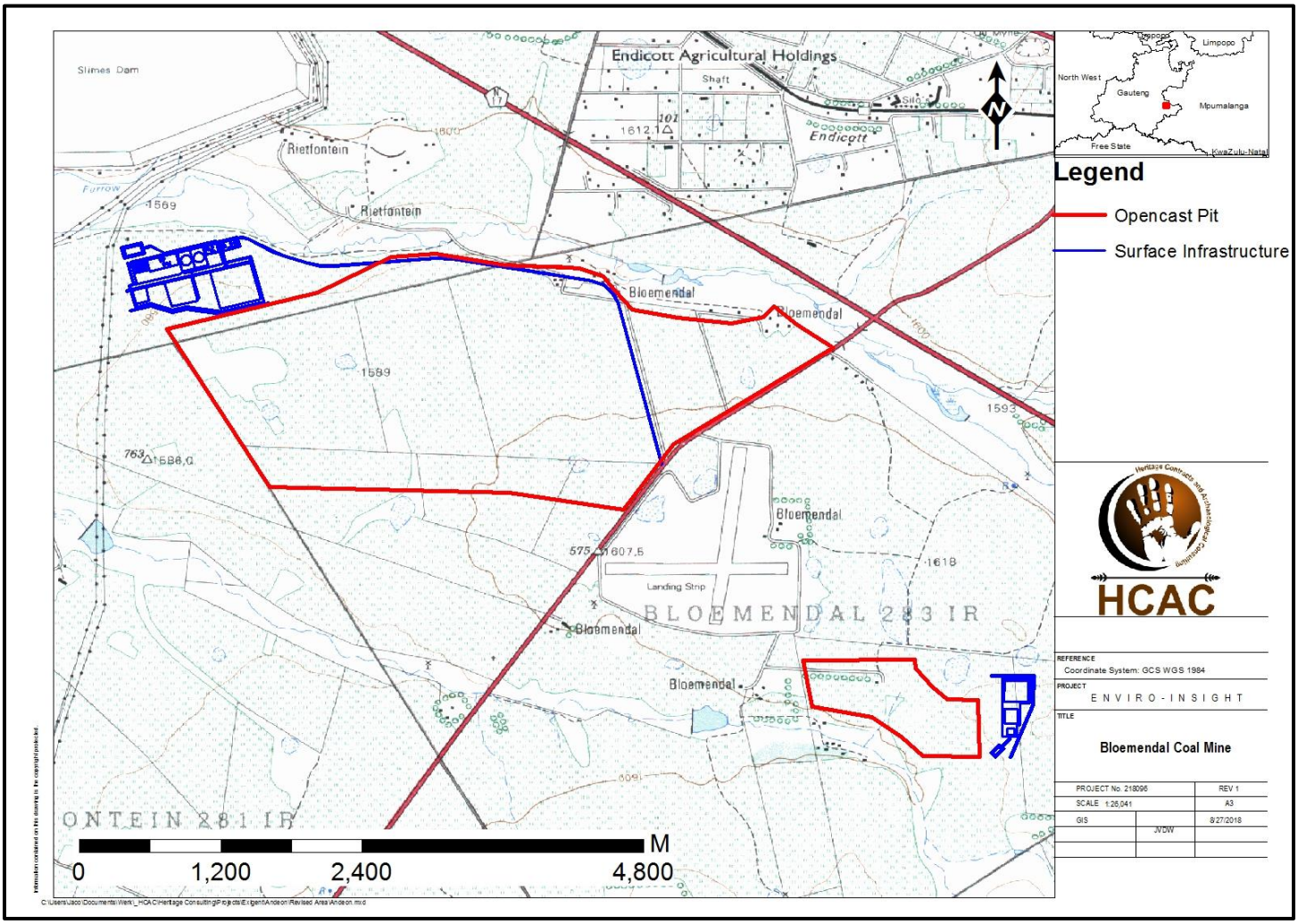

Figure 2. Regional locality map (1:50 000 Topographical map)

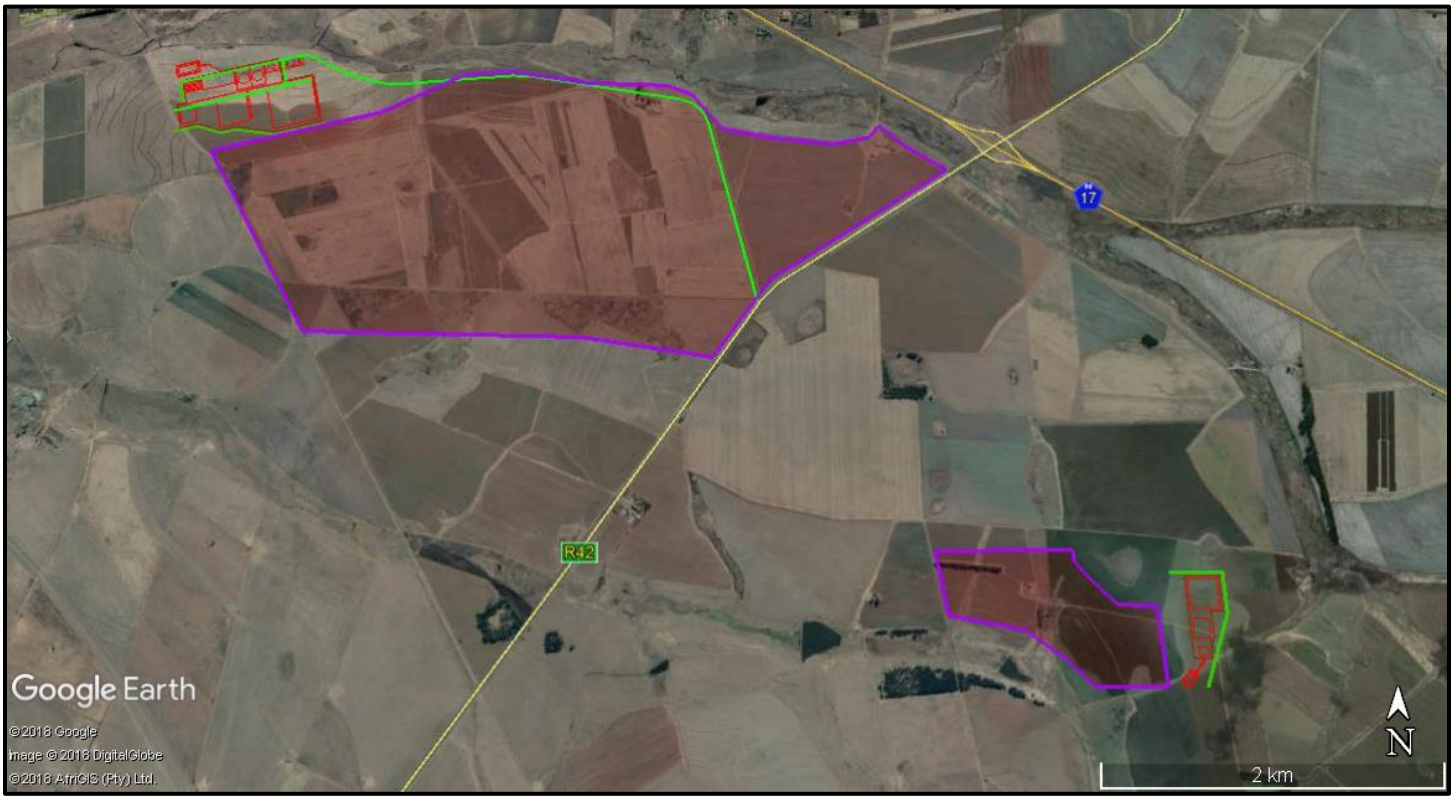

Figure 3. Google image of the study area.

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 reports upon which review comments will be issued. 'Best practice' requires Phase 1 reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices;
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation;
- The compilation of an Environmental Impact Assessment Report and opportunity for I&APs to comment on the draft reports.
- The compilation of a Comments and Response Report (CRR).

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 3: Site Investigation Details

	Site Investigation
Date	24 - 27 September 2018
Season	Spring - The area has been extensively cultivated and the maize were harvested at the time of the field visit. The impact area was sufficiently covered to adequately record the presence of heritage resources.

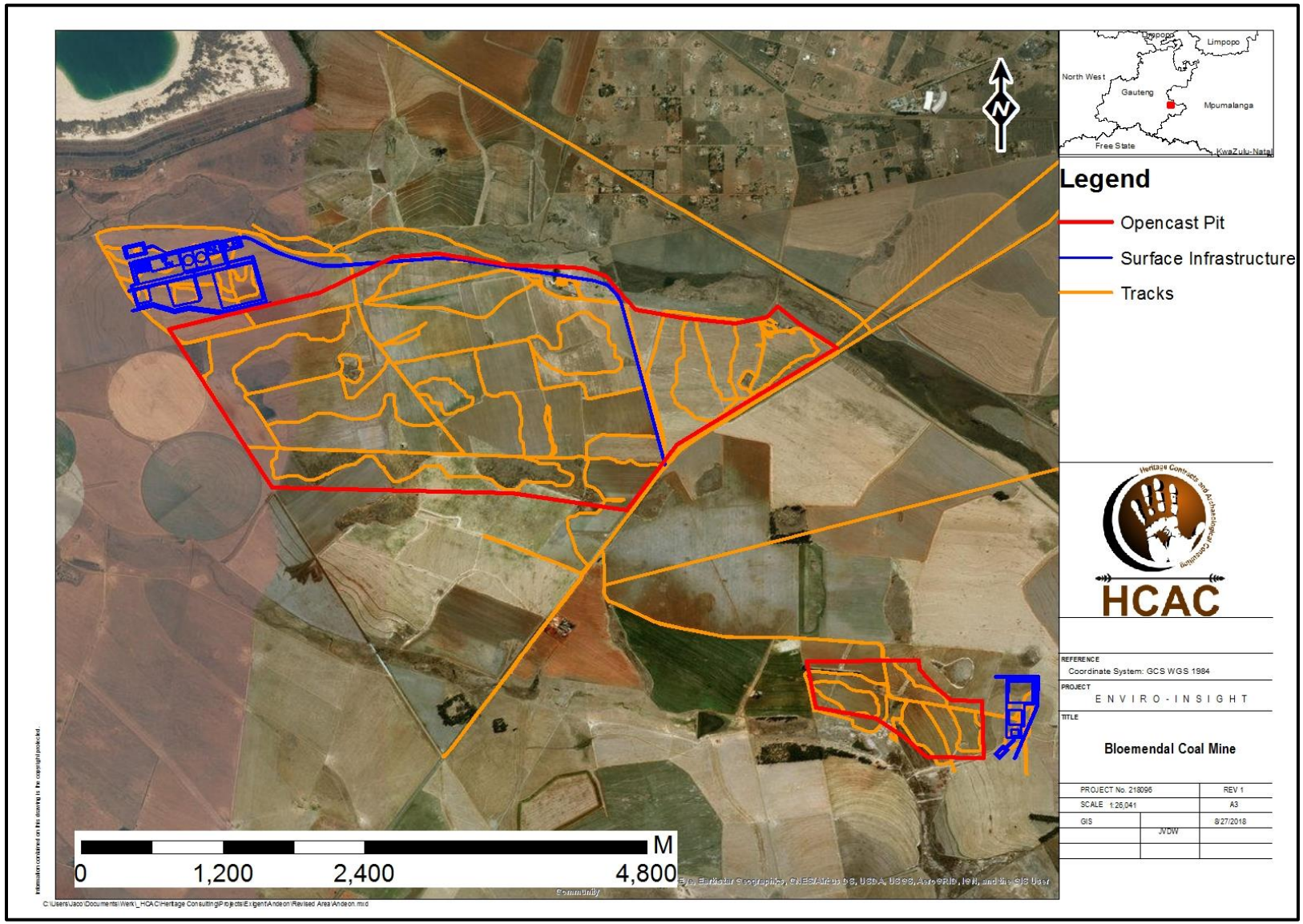

Figure 4: Track logs of the survey in yellow.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

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, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. 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. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- 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/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

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

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
  - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
  - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
  - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
  - the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M) P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

Stats SÁ provides the following information:

The total population of the Sedibeng District is 916 484. Lesedi has a population of 99 520, Midvaal 95 301 and Emfuleni 721 663 (Stats SA 2011). It is clear from the stats that 8 out of every 10 people in Sedibeng live in Emfuleni and the vast majority (more than 700 000 people) live in the township area (IDP Sedibeng 2015 – 2016). The Sedibeng District has continually struggled with poverty and while the district municipality has numerous projects in place to ensure that housing and community needs such as health care and social needs are met, there is certainly a need for employment in the area.

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5 Description of the Physical Environment:

The mining right application is for 11 166 ha and falls within an isolated coal basin at the western edges of the Springs-Witbank Coalfield. The study area falls in the Sedibeng District Municipality and Lesedi Local Municipality, Gauteng Province. It is located approximately 13 km south-east of Springs and 13.73 km north-east of Nigel. The Agricultural Holdings of Endicott and Vischkuil are located immediately north of the study area. The R42, N17 and the R550 run through the study area.

From the prospecting phase and exploration drilling results, there are 2 clearly identifiable coal seams, Seams 2 and 4, and rarely Seam 1. Both Seams 2 and 4 are divided into sub plies. Seam 2 Upper, 2 Lower and 4 Lower can be regarded as potentially mineable and economic while Seam 4 Upper was only intersected in 2 boreholes and thus is not regarded as a resource. For this application, these seams will be mined via opencast pit (approximately 730 ha in extent).

The entire study area is characterised by extensive agricultural fields mostly maize (Figure 6 and 7). The study area's flat with no major topographical features like rocky outcrops or hills. However, to the north is an intermittent stream and a few small pans do occur in the study area.

Figure 5. General site conditions

Figure 6. Agricultural activities in the study area

Figure 7. Existing powerline in the study area.

Figure 8. General site conditions – vegetation

6 Results of Public Consultation and Stakeholder Engagement:

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Literature / Background Study:

7.1 Literature Review

The following CRM reports were consulted:

Author	Year	Project	Findings
Du Piesanie, J.	2017	Application for a Mining Right and Environmental Authorisation of the proposed Palmietkuilen Mine, Gauteng Province Heritage Impact Assessment	Structures and grave sites
Coetzee, F.	2017	Cultural Heritage Impact Assessment of the Proposed Coal Mining on the Farm Grootfontein 165 IR, District Nigel, Ekurhuleni Metropolitan Municipality, Gauteng	No sites
Higgitt, N.	2015	Prospecting Right and Environmental Authorisation Application for the 7L4 Slimes Dam on Vogelstruisbult 127 IR and Daggafontein 125 IR Notification of Intent to Develop	Structures

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are on record close to the impact areas.

7.2 General History of the area

J. S. Bergh's historical atlas of the four northern provinces of South Africa is a very useful source for researching local and regional history. This source serves as a helpful tool in plotting where certain events had taken place in the past. In Southern Africa the domestication of the environment began only a couple of thousands of years ago, when agriculture and herding were introduced. At some time during the last half of the first millennium BC, people living in the region where Botswana, Zambia and Angola are today, started moving southward, until they reached the Highveld and the Cape in the area of modern South Africa. Over the centuries, as the sub-continent became fully settled, these agro-pastoralists, who spoke Bantu languages, started dominating all those areas which were ecologically suitable for their way of life. This included roughly the eastern half of modern South Africa, the eastern fringe of Botswana and the north of Namibia. There are no signs that Stone Age or Iron Age communities had been active in the modern-day Springs area in the past, and at the beginning of the 19th century no prominent black tribe had settled in this area yet. This would soon change. The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. By 1827 Mzilikazi's Ndebele were moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence. By 1832 Zulu raiders however travelled close by the Springs area to attack the Ndebele tribe (Ross 1995: 6, 7; Packard 2001: 594; Bergh 1999: 4-8, 10, 11, 14, 116-119).

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's. One Hume travelled through the area north of Springs in 1830, but it does not seem that any of the early travellers visited this specific area (Bergh 1999: 13).

It was only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. Between 1839 and 1840, farm boundaries were drawn up in an area that includes the present-day Springs. As can be expected, the migration of whites into the northern provinces would have a significant impact on the black people who populated the land (Ross 2002: 39; Bergh 1999: 15).

The first gold discovered in this part of the Witwatersrand was on the farm Varkensfontein in 1888, only two years after gold was first discovered in the Witwatersrand. The discovery of diamonds and gold in the northern provinces had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonized the Cape and Natal, had intensions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history (Till 1992: 1).

The situation in the Witwatersrand also served as a trigger for the commencement of the Anglo-Boer War. The rush of *uitlanders* (foreigners) that followed the discovery of gold in the Witwatersrand, and the resultant fear of the Afrikaners of being overwhelmed, caused President Kruger to resist the granting of the franchise to incomers. Increased resentment towards Kruger fuelled Cecil Rhodes' plot to oust Kruger's government.

By the late 1940s mining was booming on the East Rand. There were 22 mines in operation working the Main and Kimberley reefs from more than 90 shafts. The area's prosperity however did not last; during the 1950's and 1960's many of the mines closed because their ore reserves had become depleted. The mines that stayed in operation started to mine their second reef low grade ore because the high-grade ore had been depleted. By 1992 only four operating mines were left in the East Rand.

7.2.1 Archaeology of the area

7.2.1.1 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 contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. 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.

Although there are no well-known Stone Age sites located on or around the study area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999).

7.2.1.2 Iron Age remains

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

Extensive Stone walled sites are recorded at Klipriviers Berg Nature reserve 20 km to the south west belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and was built by people in the Fokeng cluster. In this area the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

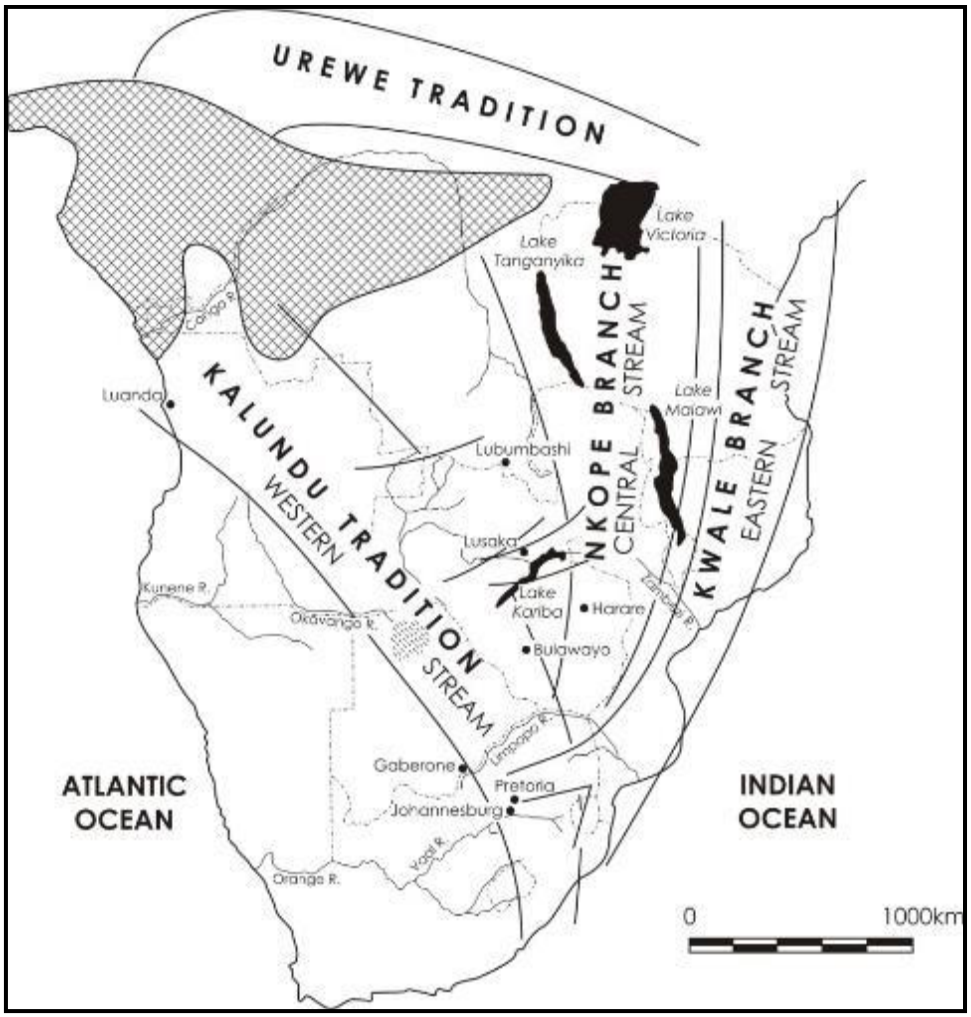

Figure 9. Movement of Bantu speaking farmers (Huffman 2007)

7.2.1.3 Battles close to the study area

At the outbreak of the war in October 1899, Johannesburg provided a commando under Commandant B. J. Viljoen, whilst the *uitlanders* left for Lourenco Marques to join the British troops at Durban. To the south of the Magaliesberg range, between Johannesburg and Mafeking, stands the Witwatersrand range of hills. These hills were skilfully exploited by Boers during the guerrilla phase of the war, and especially by Assistant Commandant-general Koos de la Rey and Chief-commandant Christiaan de Wet (Marix Evans 2000: 128-129, 163).

Some skirmishes were recorded near Springs. The Johannesburg Mounted Rifles British corps was founded in December 1900, and the greater portion of these troops was stationed in the Springs district in the early part of 1901. Here the Boer enemy was always in the vicinity, and opportunities for confrontation often came up. On 17 January 1901, Lieutenant S. A. Anderson and Captain D. W. Talbot ambushed Boer troops near Springs. (Angloboerwar.com 1999)

7.3 Cultural Landscape

These two sites are situated in Gauteng Province, to the east of Daggafontein, south of Vischkuil and Endicott, and about 10 and 17 kilometres to the south east of Springs, respectively. They are respectively situated about 10 and 13 kilometres to the north east of Nigel.

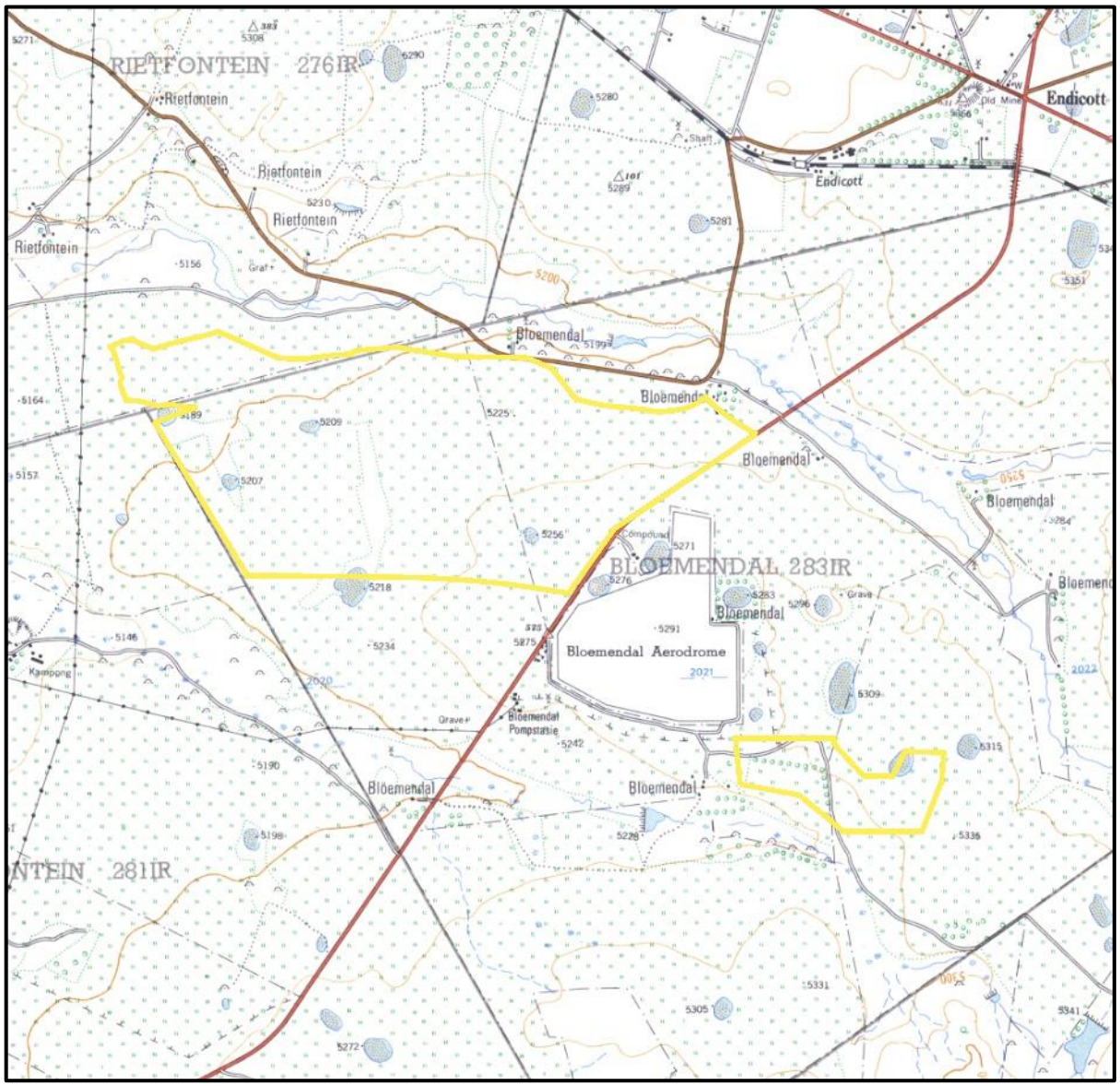

Figure 10. 1966 Topographical map of the sites under investigation. The approximate study area is indicated with a yellow border. The larger site was used as cultivated lands, and five small dams are visible. A main road formed its eastern boundary. No buildings or other developments are indicated. The smaller site was also used as cultivated lands, and one can see a small dam. A minor road went through the property. No other developments can be seen. (Topographical Map 1966)

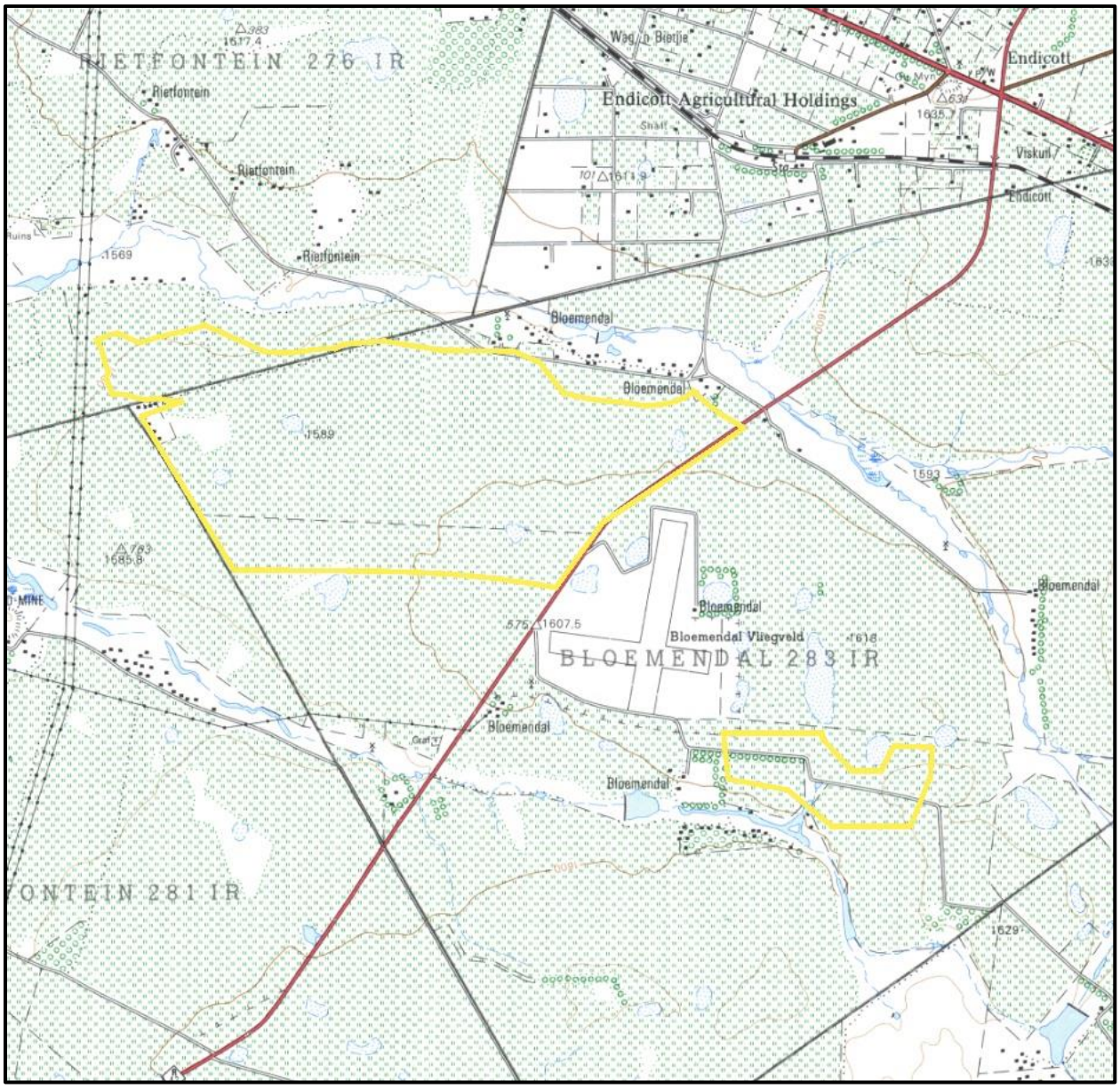

Figure 11. 1984 Topographical map of the sites under investigation. The approximate study area is indicated with a yellow border. The larger site was used as cultivated lands, and four small dams are visible. A main road formed its eastern boundary. Three buildings are visible in the western part of the study area. The smaller site was also used as cultivated lands. A minor road went through the property. No other developments can be seen. (Topographical Map 1984)

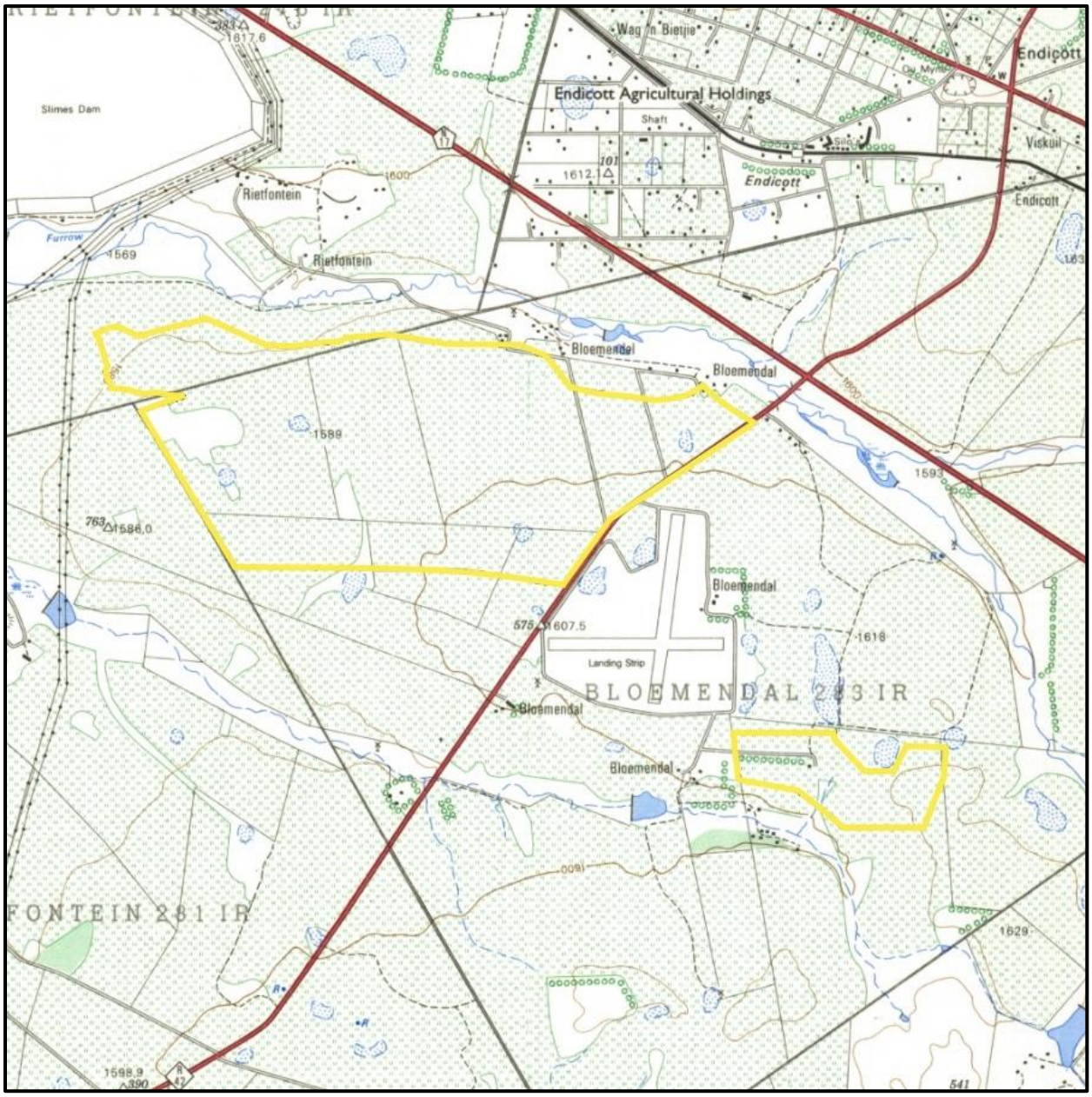

Figure 12. 1991 Topographical map of the sites under investigation. The approximate study area is indicated with a yellow border. The larger site was used as cultivated lands, and four small dams are visible. A main road formed its eastern boundary, and two minor roads went through the study area. The smaller site was also used as cultivated lands. A minor road and a track / footpath went through the property. One building can be seen near the road. (Topographical Map 1991)

8 Findings of the Survey

The greater area is characterised by agricultural activities and has been extensively cultivated. The area has been used for agricultural purposes from prior to the 1960's (Figure 10) and evidence of historical occupation of the area was recorded in the form of historical buildings (Figure 13) and burial sites (Figure 22). Below is a short description of identified Heritage Resources (NHRA Section 34 - 36) as protected by the NHRA.

8.1.1 Built Environment (Section 34 of the NHRA)

On Portion 10 Bloemendal 283 a modern farmstead and labourer accommodation occurs. These structures are not older than 60 years and of no heritage significance and was therefore not recorded. Two features that are older than 60 years were recorded and is described below.

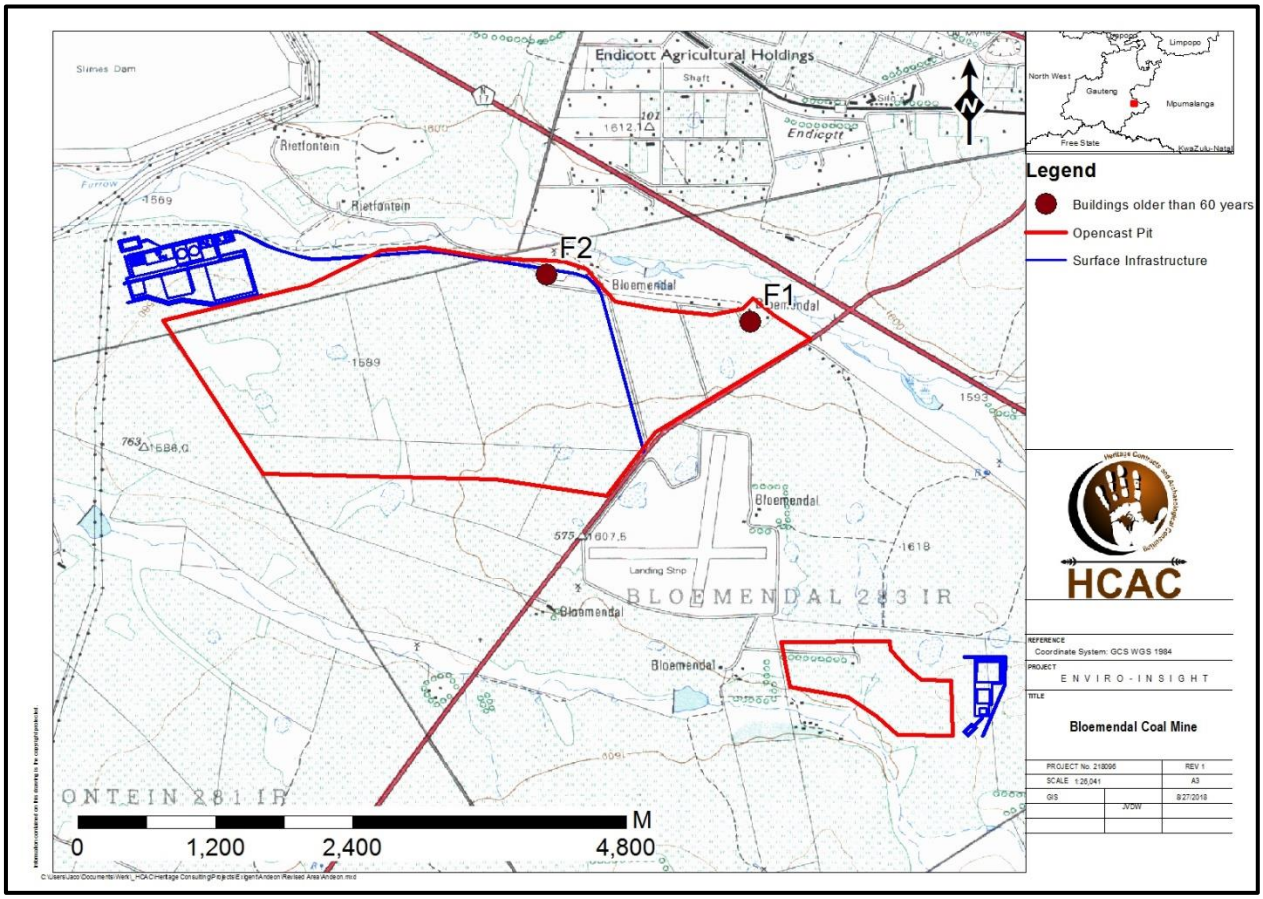

Figure 13. Location of the recorded structures.

Feature 1

Feature one consists of a disused farm house and outbuildings (over an area of approximately 1 ha) and a cemetery recorded as Feature 3. The farm house has a hipped roof and some portions has been added onto like a section on the east of the building. It seems as if the house had a combination of wooden floors and clay. All the doors and the windows have been built up.

According to the farm owner (Frikkie Rossouw) the main residential dwelling (Figure 14 and 15) dates to 1860 with a corrugated iron shed (Figure 16) with Oregon pine timber on a stone foundation dating to the same period. The shed measures approximately 30 m long and 15 m wide.

In addition to the historical shed, is a modern shed (to the east) and even further to the east is a red brick ruin consisting of four rooms (Figure 17). These features are probably not older than 60 years.

The structures' potential to contribute to aesthetic, historic, scientific and social aspects are low to moderate and it is therefore of low heritage significance. No further actions are recommended based on approval from SAHRA.

Figure 14. Northern view of historical dwelling.

Figure 15. Southern view of historical dwelling.

Figure 16. Historical shed.

Figure 17. Modern brick ruin.

Feature 2

This feature consists of an old shed (Figure 18 - 21) that has recently been converted into a wedding venue. According to the owner David Groesbeek this side dates to 1880. The main structure is still standing but added onto on the northern and southern sections and was used as a sheep shed in the past.

This feature is surrounded by a farmhouse complex with modern infrastructure and associated outbuildings. These structures are not older than 60 years and therefore not protected by the Act and of no heritage significance.

Figure 18. Interior view of Feature 2

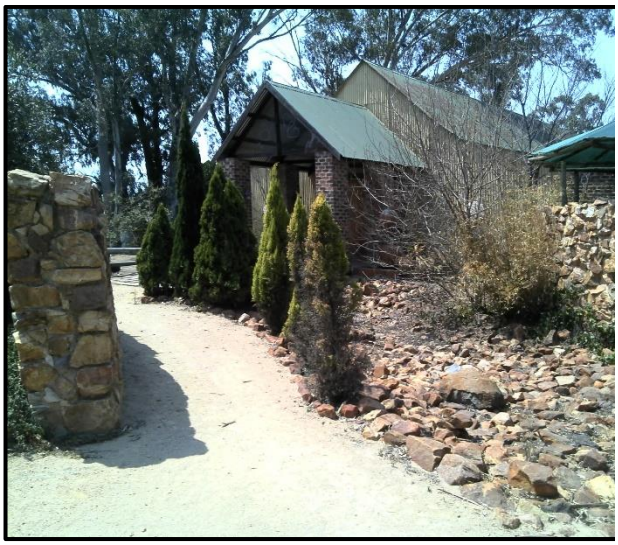

Figure 19. Feature 2

Figure 20. Feature 2

Figure 21. Feature 2

Field Rating: GP B - Moderate significance

8.1.2 Archaeological and paleontological resources (Section 35 of the NHRA)

No archaeological sites or artefacts of significance were recorded during the survey for the proposed project.

In terms of the palaeontological component an independent study was conducted by Prof Barry Millsteed and found that" "*The aerial extent of the Mining Right application area is underlain by a lithologically diverse assemblage of stratigraphic units consisting of Swazian (Archaean) granite- gneiss of the Johannesburg Dome, predominantly siliciclastic sediments of the Hospital Hill Subgroup (and probably also the Government Subgroup), carbonate sediments of the Malmani Group, glaciogene sediments of the Dwyka Group, coal-bearing sediments of the Vryheid Formation and intrusive dolorite of the Karoo Dolorite Suite. It is interpreted that Cainozoic regolith forms the land surface over the majority of the Mining Right application area.*

Due to the methodologies employed in the mining process and also the extreme costs of mining no negative impact upon the geological sequence will be expected to occur below the base of Seam 2 as the mine voids will not extend deeper than that. The maximum depth of this impact is unknown (but will probably be on the scale of 10's of meters). What is significant, however, is that the negative impacts will be constrained to the Vryheid Formation and any overlaying geological units. The nature and extent of the mining operations and the details and location of the associated infrastructure is only described,
herein, for Phase one of the proposed mining operations; this is the area covered by the current environmental authorisation application. These details may well be different in subsequent phases of the life of mine. Accordingly, the findings of this report are valid only for the area covered by the current environmental authorisation application.

The required mine infrastructure, other than the two opencast pits, will all be located on the land surface. Of the non-opencast pit infrastructure, the excavations required for the foundations for offices, a weighbridge, stormwater trenches and trenches to provide power and water access will result in the deepest impact upon the underlying geology. It is assumed that the maximum depth of the negative impact they will cause upon the underlying geology will be < 2 m.

The rocks comprising the Swazian granite-gneiss, Hospital Hill Subgroup, Government Subgroup, and the Karoo Dolerite Suite are unfossiliferous. It is also interpreted, herein, that the interpreted Cainozoic regolith is unfossiliferous. Any impacts upon the rocks comprising these units caused by the progression of the mining operations will have a ***negligible to nil*** *probability of resulting in a negative impact upon their palaeontological heritage. The carbonate sediments of the Malmani Group are fossiliferous, and are known to contain prolific stromatolite assemblages. The probability of any significance of any negative impact upon the palaeontological heritage of the Malmani Group is assessed high, but the significance is* ***low****. The sediments of the Vryheid Formation and the Dwyka Formation are known to contain plant macrofossil assemblages of the Glossopteris flora (the former also containing trace fossil assemblages). The significance of the fossil assemblages contained in these two units was assessed as* ***high****, but the probability of any negative impact is* ***moderate to good*** *for the Vryheid Formation and* ***low*** *for the Dwyka Group. It is evident that the proposed mining operations pose a significant risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required."* (Millsteed 2018).

Recommended damage mitigation protocols for the paleontological component are included in Section 10 of the report.

8.1.3 Burial Grounds and Graves (Section 36 of the NHRA)

In terms of Section 36 of the Act 4 burial sites were recorded. These were all known to the current land owners who are not aware of any other burial sites in the impact areas (personal communication Frikkie Rossouw, Dawid Groesbeek and Helmut van Eeden 25 September 2018).

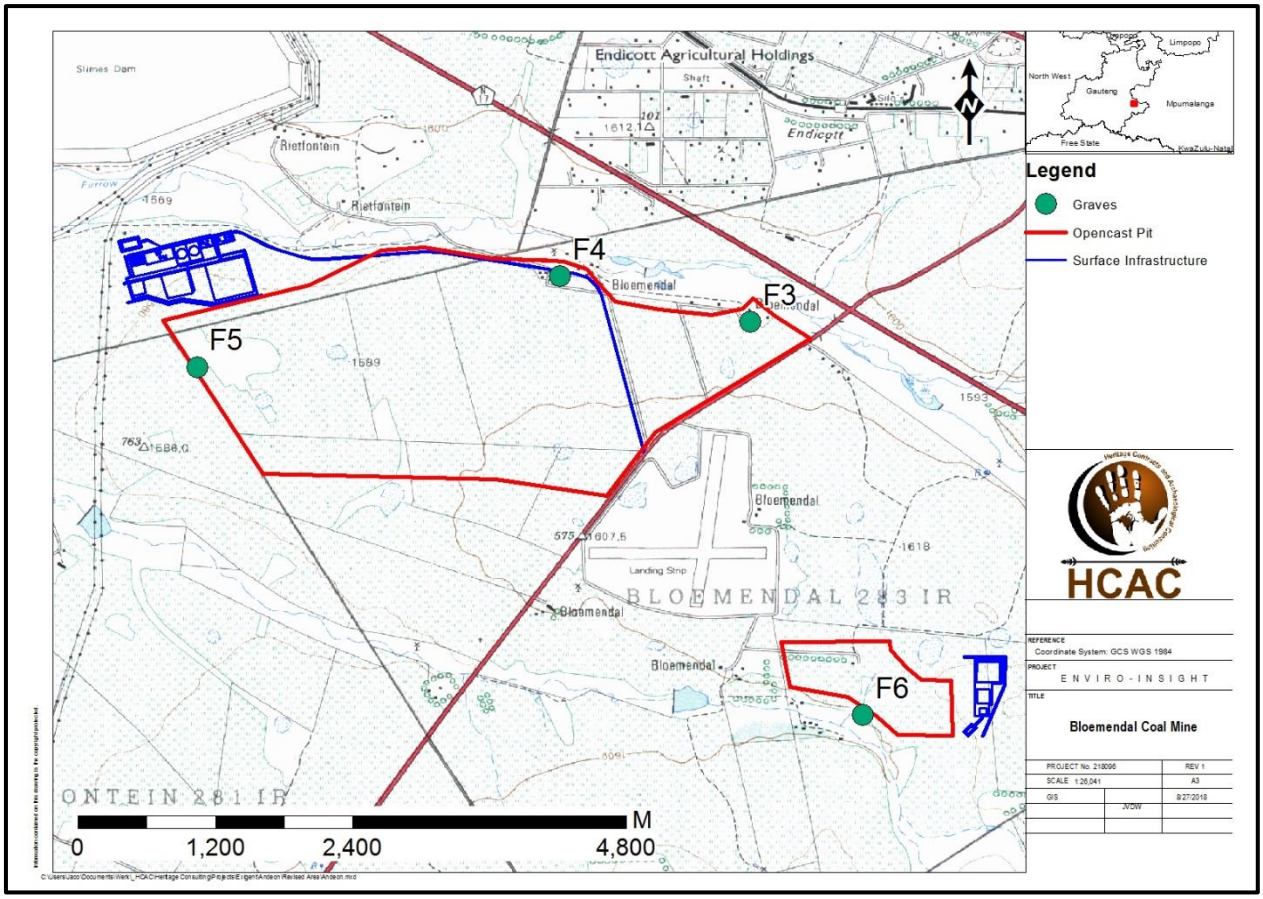

Figure 22. Location of recorded cemeteries.

Feature 3

This cemetery forms part of the set up at feature one and consist of a marked grave with a small granite headstone of Johannes Bekker who was born in 1918 and passed away in 1921 (Figure 24), another grave is demarcated next to this one with no inscriptions.

Figure 23. Feature 3 in relation to Feature 1 (viewed from the north).

Figure 24. Granite headstone marking the grave of Johannes Bekker.

Figure 25. Feature 3 viewed from the west.

Feature 4

This cemetery consists of at least three graves orientated east to west (Figure 26 - 28). Two graves are marked by a stone dressing and one grave by a brick boundary. A single inscription on the cement of the brick boundary that is very faded indicates the grave to be that of Pieter Botha born in 1877 passed away in 1918.

Figure 26. Feature 4 viewed from the east

Figure 27. Feature 4 viewed from the north.

Figure 28. Feature 4 viewed from the south west.

Feature 5

This feature consists of a large cemetery of at least 35 graves that is orientated east to west. The cemetery is highly overgrown, although according to the farm owner descendants often come to clean up the graves. Some graves have headstones but most are only marked by an upright standing stone or with a stone grave dressing (Figure 30). This site is located on the western boundary of the large open cast pit.

Figure 29. General site conditions at Feature 5

Figure 30. Grave dressing at feature 5.

Figure 31. Graves in cemetery at Feature 5.

Feature 6

This feature consists of approximately 16 graves orientated east to west. The graves are mostly in a single row with no formal headstones but the graves are marked with single upright standing stones or with stone grave dressings (Figure 32- 35). The site is located to the south and outside of the small opencast pit but due to secondary impacts will require mitigation.

Figure 32. Stone packed graves.

Figure 33. Graves at Feature 6

Figure 34. General site conditions at Feature 6

Figure 35. General site conditions at Feature 6.

Graves are always of high social significance. If any additional graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

Field Rating: GP A - High significance

8.2 Cultural Landscapes, Intangible and Living Heritage.

The study area is rural in character surrounded by residential developments and road infrastructure and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. From a heritage point of view the area has been extensively disturbed and this would have impacted on heritage resources. Visual impacts to scenic routes and sense of place are also considered to be low due to the extensive developments in the area.

8.3 Battlefields and Concentration Camps

There are no battlefields or related concentration camp sites located in the study area.

9 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. If the correct mitigation measures are implemented, impacts on the graves can be avoided or mitigated to an acceptable level. Structures older than 60 years are protected by the NHRA and should be mitigated prior to development. Any direct impacts that did occur would be during the construction phase only with secondary impacts on sites that will be retained and preserved. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any significant heritage resources directly. However, this and other projects in the area could have an indirect impact on the heritage landscape.

9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase

No impact is envisaged for the recorded heritage resources during this phase.

9.1.4 Assessment of Alternative

One alternative was assessed located on an existing mine footprint (Figure 37). The alternative was only assessed on a desktop level and has been extensively disturbed by previous mining activities (Figure 36). The Alternative will most probably have a lower impact due to the disturbed nature of the site, which would have destroyed all surface indicators of heritage resources.

Figure 36. Google image of the alternative.

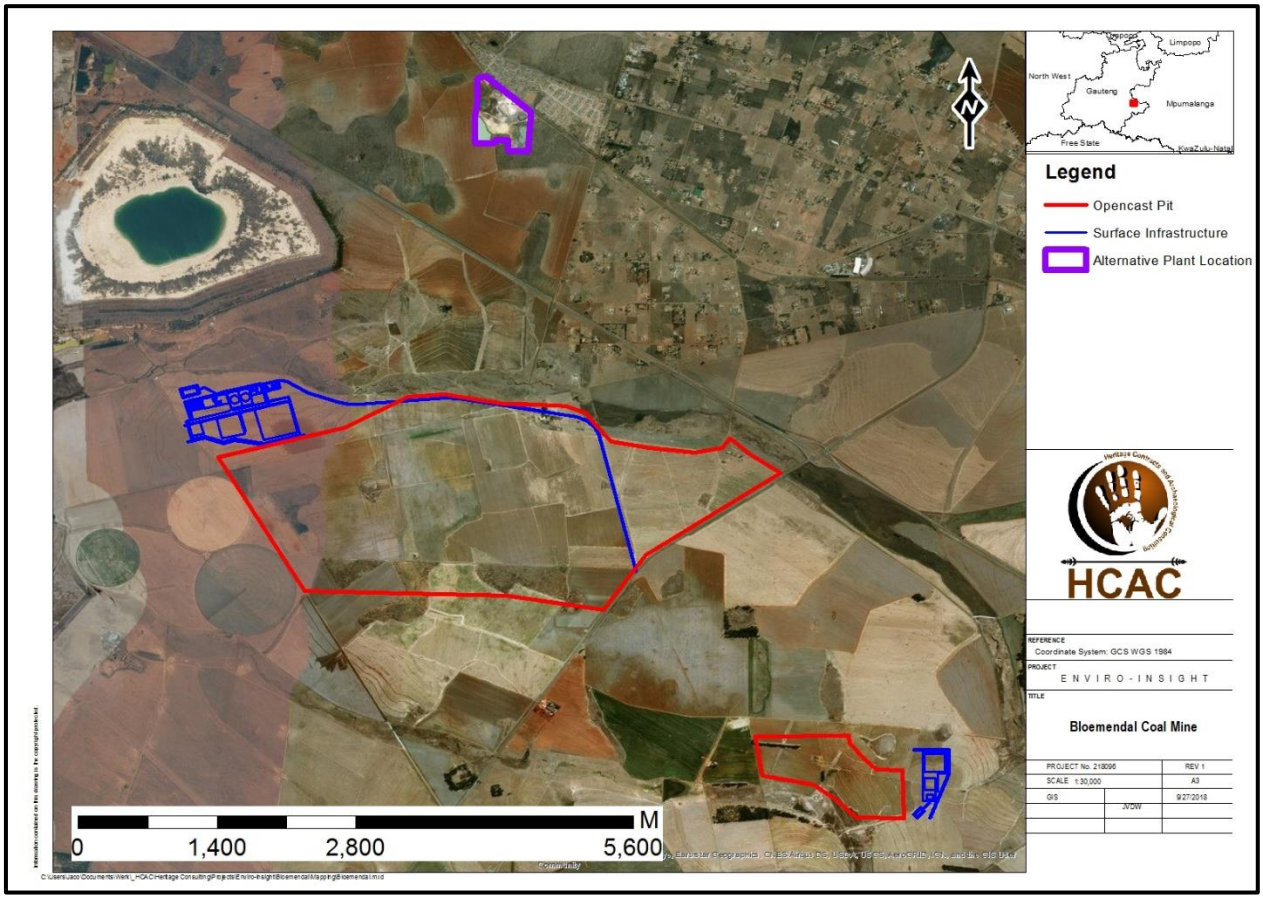

Figure 37. Location of alternative in relation to current development footprint

Table 4. Impact Assessment on known archaeological heritage resources

Nature: During the earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Due to the lack of apparent significant archaeological resources no further mitigation is required prior to construction. A Chance Find Procedure should be implemented for the project should any sites be identified during the construction process		
Cumulative impacts: Since the surrounding area is characterised by residential and road developments and due to the lack of heritage resources that will be impacted on in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

Table 5. Impact assessment on structures older than 60 years.

Nature: During earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position heritage material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**24 (Low)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: The structures (Figure 38) are of low to moderate significance, but are protected by the heritage act due to their age. It is recommended that if impacted on the sites should be assessed by a conservation architect after which a destruction permit can be applied for adhering to all legal requirements. A chance find procedure should be implemented for the project.		
Cumulative impacts: Since the surrounding area is characterised by residential and road developments and due to the lack of significant heritage resources that will be impacted on in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of heritage record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

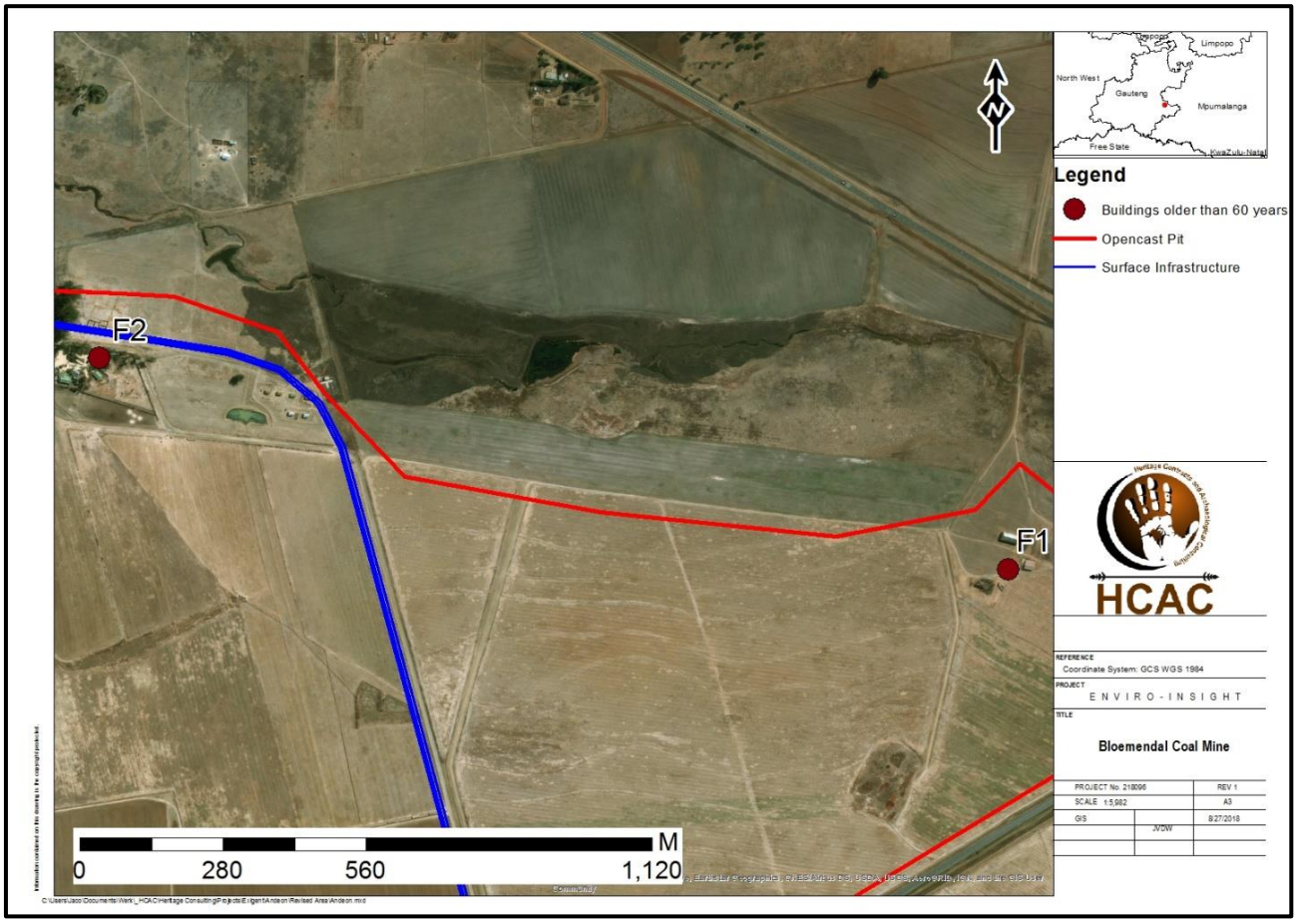

Figure 38. Feature 1 and 2 in relation to the development.

Table 6 Impact Assessment on recorded graves

Nature: During earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position graves and burial sites.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (4)	Low (2)
Probability	Probable (3)	Not probable (2)
Significance	**36 (Medium)**	**20 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: Graves and cemeteries (Figure 39, 40 and 41) are of high social significance, it is recommended that the cemeteries should be demarcated and preserved *in situ.* If this is not possible the graves can be relocated adhering to all legal requirements. A chance find procedure should be implemented for the project.		

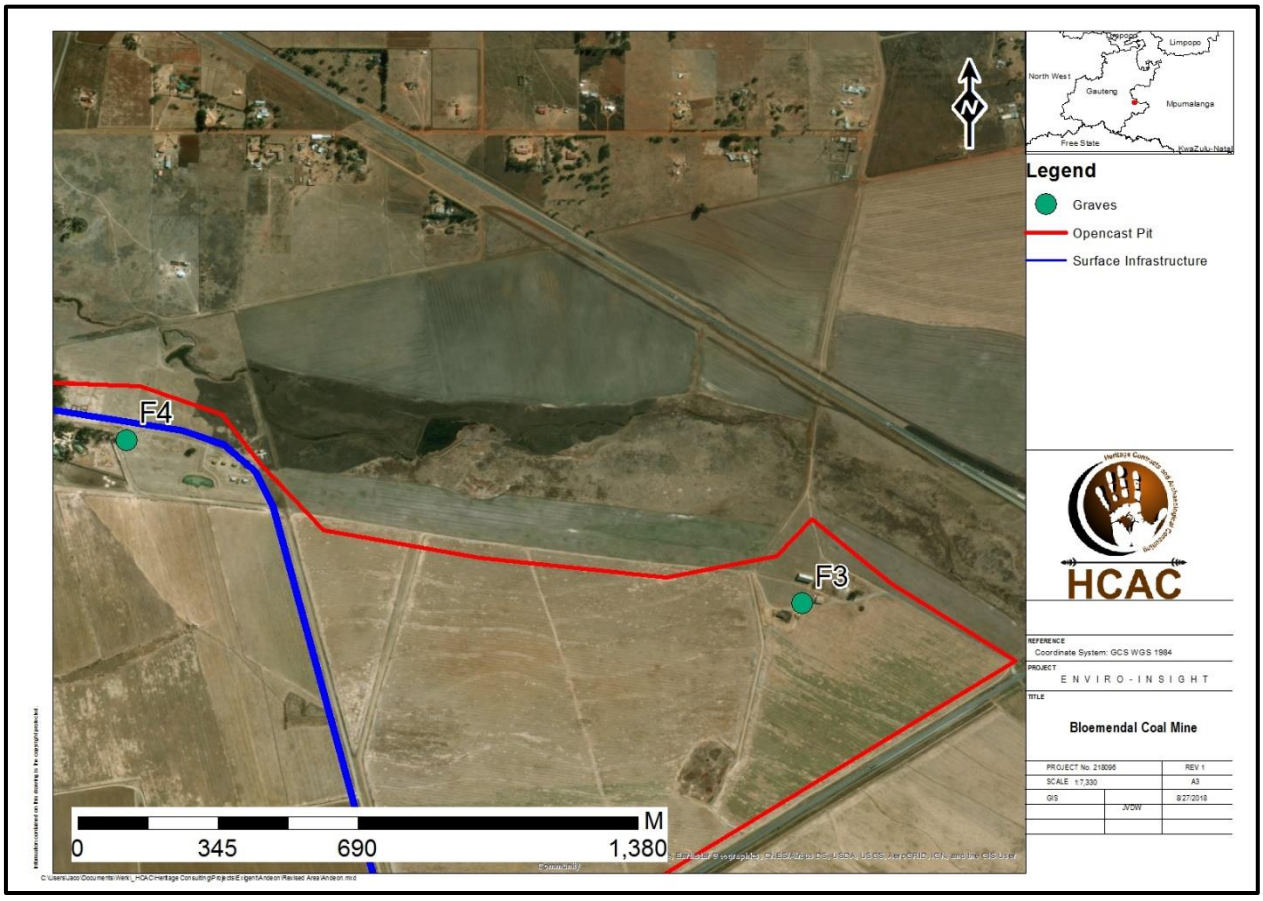

Figure 39. Feature 3 and 4 in relation to the development.

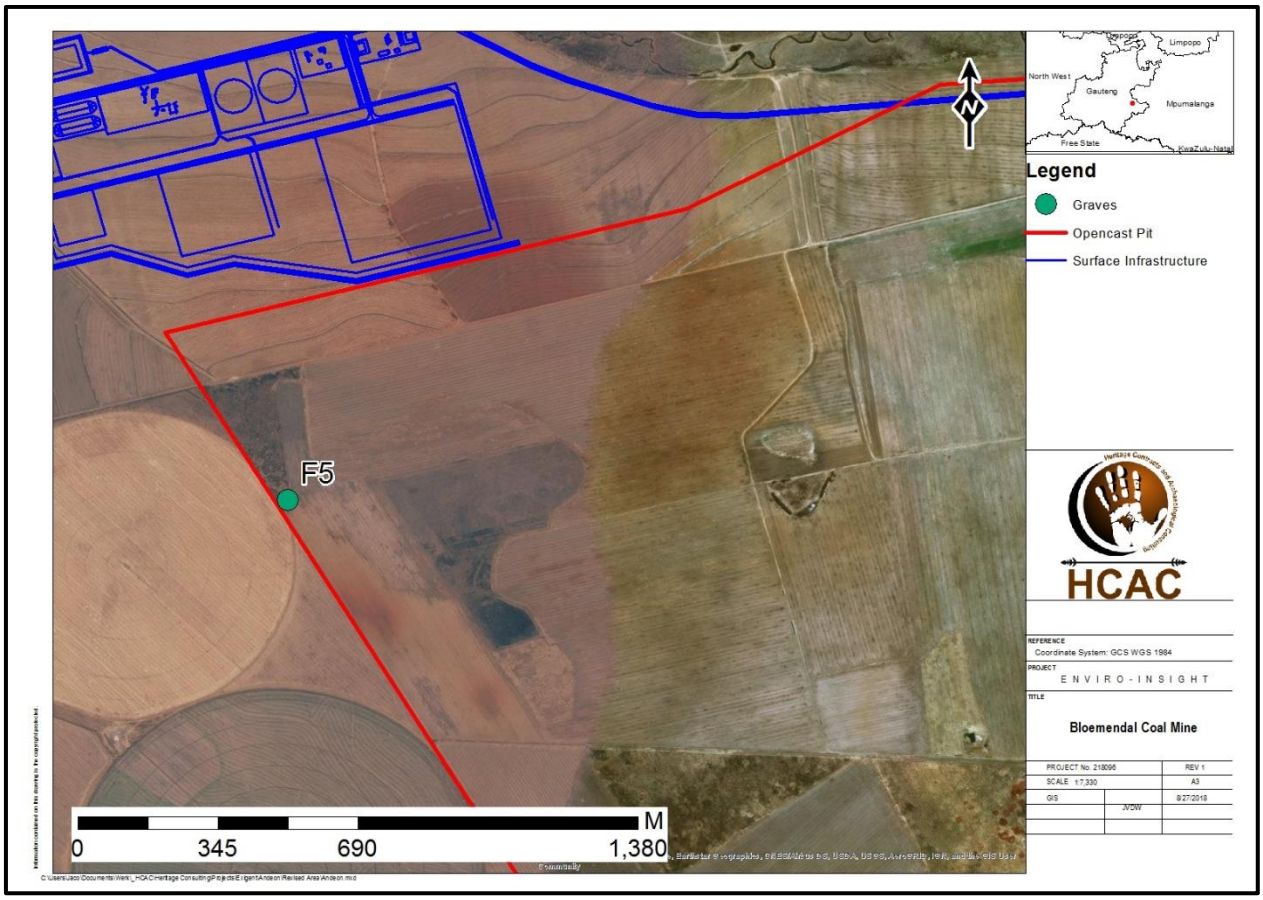

Figure 40. Feature 5 in relation to the development

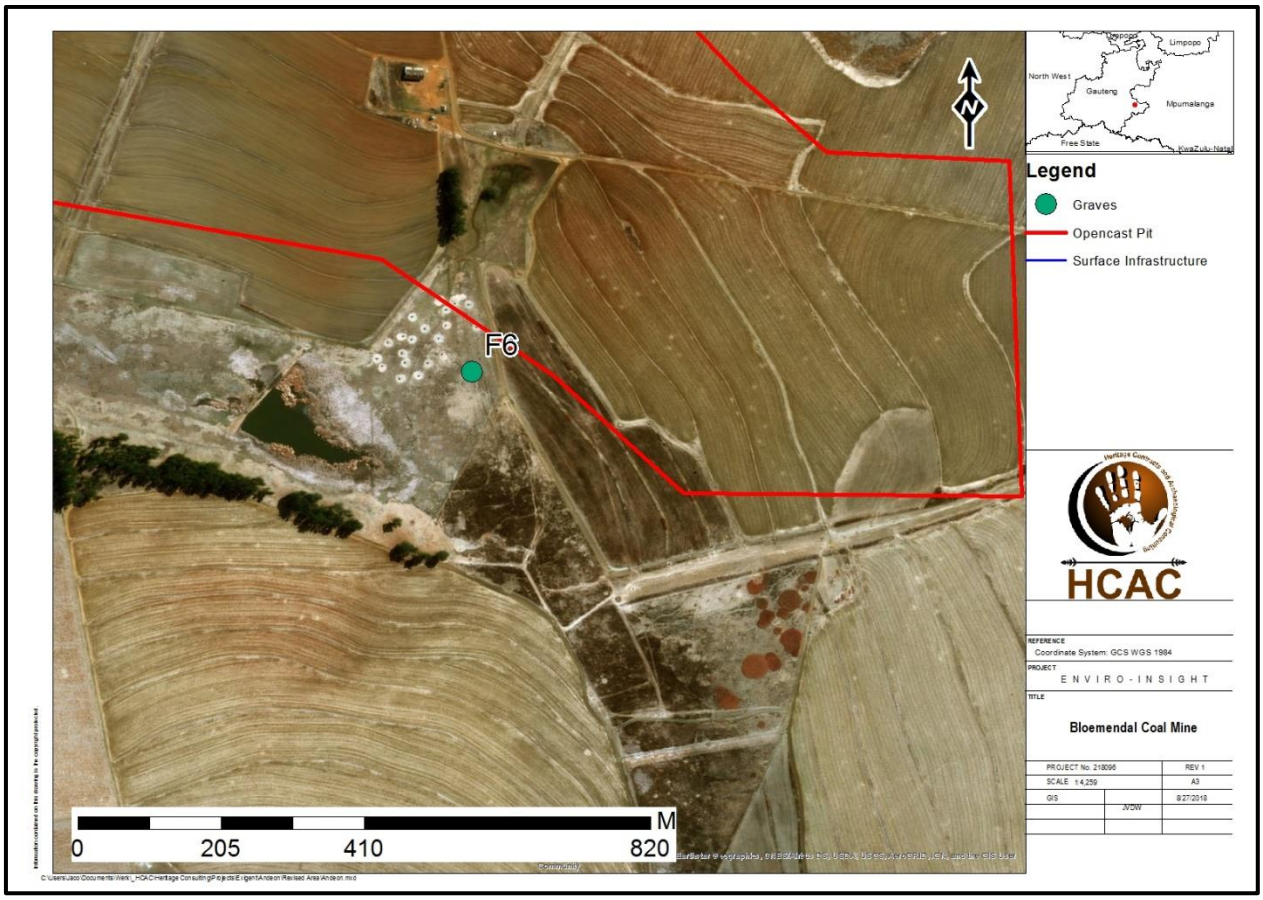

Figure 41. Feature 6 in relation to the development.

Table 7. EMPR management measures

OBJECTIVE: To preserve and mitigate non-renewable heritage resources in the study area.

Project component/s	Heritage resources can be impacted on during earth moving activities by the project.
Potential Impact	Irreplaceable loss of heritage resources and accidental damage to burial sites in the study area as well as depletion of the archaeological database of the area.
Activity/risk source	Activities such as vegetation clearing and earth moving activities could destroy recorded resources.
Mitigation: Target/Objective	A heritage site development plan incorporated into the environmental management plan that considers heritage resources in the event of any future extensions of infrastructure or identification of heritage resources in current operations. *In situ* preservation of known graves.

Mitigation: Action/control	Responsibility	Timeframe
• A Consultation process to determine if any graves or still born burials exist in and around the structures must be conducted	Social team/ Community Liaison officer	Prior to earth works
• Implement a Chance Finds Procedure to ensure that if any heritage resources are uncovered that these are reported and correctly mitigated.	ECO	Daily
• The historic structures (Feature 1 and 2) should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.	Bloemendal Coal Mine	Prior to development
• Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;	Bloemendal Coal Mine	Prior to development
• Implementation of a chance find procedure	Bloemendal Coal Mine	Life of Mine
• Implementation of paleontological protocols (Millsteed 2018)	Bloemendal Coal Mine and ECO	Life of Mine

Performance Indicator	• Graves should be retained *in situ/* relocated adhering to legal requirements.

	• Heritage impacts should be considered in any future development in the area. • Ongoing preservation of retained sites. • Implementation of a chance find procedure i.e. immediate reporting to relevant heritage authorities of any heritage feature discovered during any phase of development or operation of the facility.
Monitoring	The ECO should monitor the known heritage resources during construction and the possible occurrence of subsurface heritage resources regularly.

10 Recommendations and conclusion

HCAC was appointed to conduct a Heritage Impact Assessment for the Bloemendal Coal Mine to determine the presence of cultural heritage sites and the impact of the proposed project on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the footprint of the proposed mine.

The mining right application is for 11 166 ha and falls within an isolated coal basin at the western edges of the Springs-Witbank Coalfield. The study area falls in the Sedibeng District Municipality and Lesedi Local Municipality, Gauteng Province. It is located approximately 13 km south-east of Springs and 13.73 km north-east of Nigel. The Agricultural Holdings of Endicott and Vischkuil are located immediately north of the study area. The R42, N17 and the R550 run through the study area.

The study area is characterised by extensive maize fields that have been cultivated from prior to 1966. These agricultural activities would have impacted on surface indicators of heritage sites and during the survey no archaeological sites or artefacts of significance was recorded. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed project to proceed. An independent paleontological study (Millsteed 2018) found that the proposed mining operations pose a significant risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required (Millsteed 2018)

In terms of the built environment (Section 34 of the NHRA) two farmsteads were recorded (Feature 1 and 2), located within the mining pit. At both these locations are structures older than 60 years. Although these buildings potential to contribute to aesthetic, historic, scientific and social aspects is low to moderate, these features are protected by legislation and must be assessed by a conservation architect.

In terms of Section 36 of the Act two cemeteries (Feature 3, 4 and 5) were recorded within the pit area and will be directly impacted. A third cemetery (Feature 6) is located outside but on the periphery of the opencast pit and will be indirectly impacted on. It is recommended that these cemeteries should be retained *in situ*, with a 50 m buffer zone and demarcated with an access gate where possible. If this is not possible these cemeteries can be relocated adhering to legislation. Similarly, if any additional graves are identified they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

No public monuments are located within or close to the study area. The study area is rural in character surrounded by residential developments and road infrastructure and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. During the public participation process conducted for the project no heritage concerns were raised.

The impact of the proposed project on heritage resources is considered low to medium and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on

the condition that the following recommendations are implemented as part of the EMPr together with site specific recommendations and based on approval from SAHRA:

- The historic structures (Feature 1 and 2) should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.
- The cemeteries located in the pit area (Feature 3 and 4) will be directly impacted on. It is recommended that these cemeteries are preserved *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone. If this is not possible the cemeteries can be relocated adhering to all legal requirements.
- A Third cemetery (Feature 5) is also located in the pit area but on the western periphery and it is therefore recommended that the cemetery is preserved *in situ*, fenced with an access gate for family members, with a feasible buffer zone.
- Feature 6 is located outside of the Pit area and should be retained *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone;
- Through the social consultation process the existence of unknown and unmarked graves especially those of still born babies must be assessed.
- Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;
- Implementation of a chance find procedure

In terms of the palaeontological heritage the following recommendations apply:
It is evident that the proposed mining operations pose a significant risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required. Accordingly, it is recommended that:

- A thorough field investigation be conducted by an appropriately experienced Karoo palaeontologist prior to the commencement of the project in the area identified in the current environmental authorisation application and a Full Palaeontological Impact assessment report be submitted to SAHRA.
- This would allow a meaningful evaluation of the presence of fossil materials being present at surface.
- If fossil materials prove to be present the process would allow the identification of any scientifically significant fossils and resultant recommendations that they should be either be protected completely *in situ* or could have damage mitigation procedures emplaced (i.e., excavation by a suitability by a suitably experienced palaeontologist) to minimise negative impacts.

It was identified that the disruption of the geological strata underlying the project area will result in the complete and permanent disaggregation and destruction of the geological strata from the land surface to the complete depth of the in the mine voids. This in effect means that in the two areas identified for opencast mining The Vryheid Formation will be completely destroyed down to the base of Seam 2. It is recommended that once excavation of the pit voids begins:

- On-site checks for the occurrence of any fossils of the excavated pits and stockpiled material should be conducted every six months by an appropriately experienced Karoo palaeontologist. The frequency of these checks should be assessed after six months based on the findings and the planned mining programme.
- The Karoo palaeobotanist should submit a monitoring report to SAHRA on this work.

In addition,

- Should any fossil materials be identified, the palaeontologist should ascertain their scientific and cultural importance.
- Should the fossil prove scientifically or culturally significant the particular excavations involved should be halted and SAHRA informed of the discovery
- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist

and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

10.1 Chance Find Procedures

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 therefor 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 Reasoned Opinion

From a heritage perspective, the proposed project is acceptable. If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the development will not impact negatively on the heritage record of the area.

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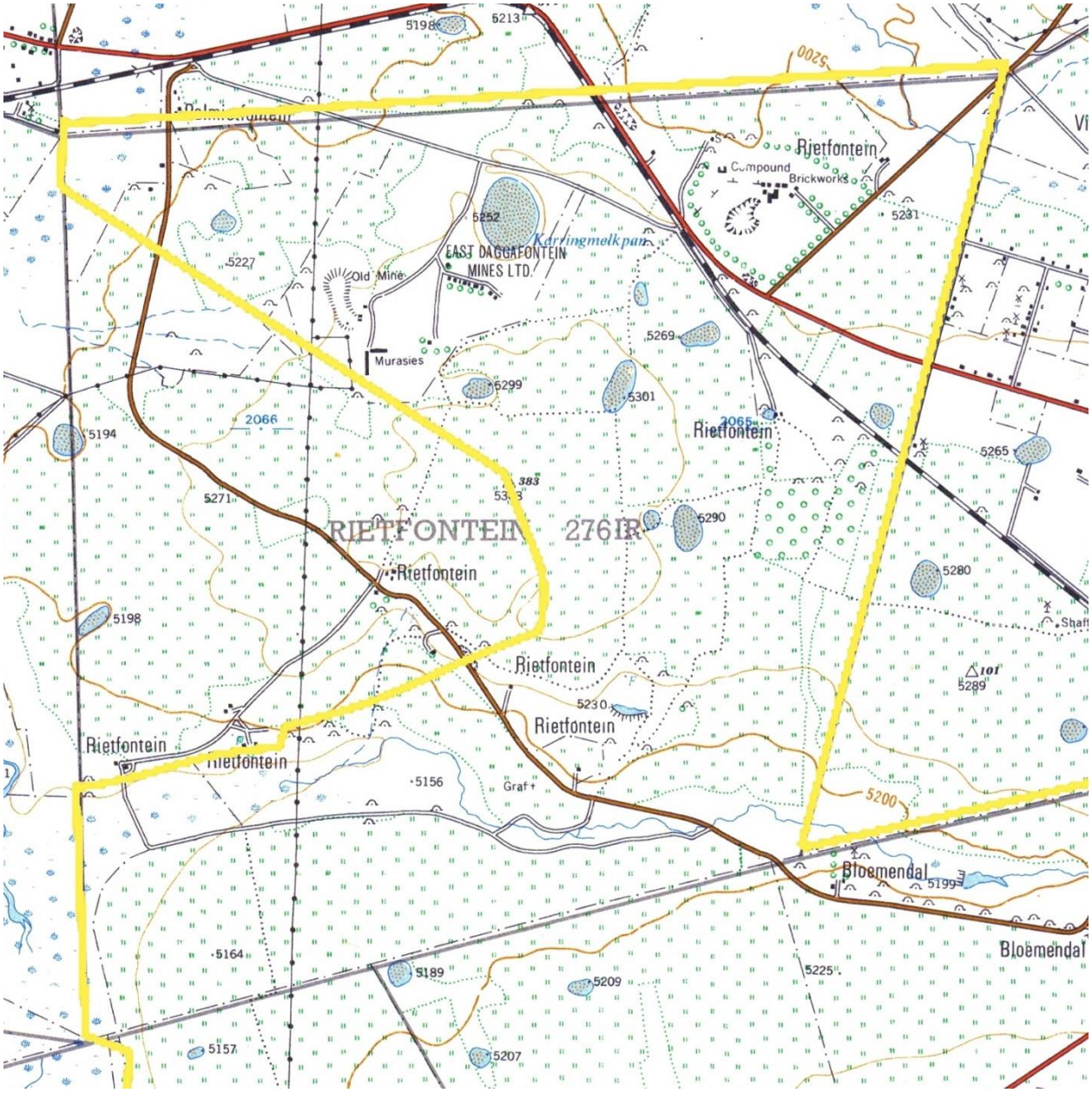
Appendix A

Archival Maps of the study areas.

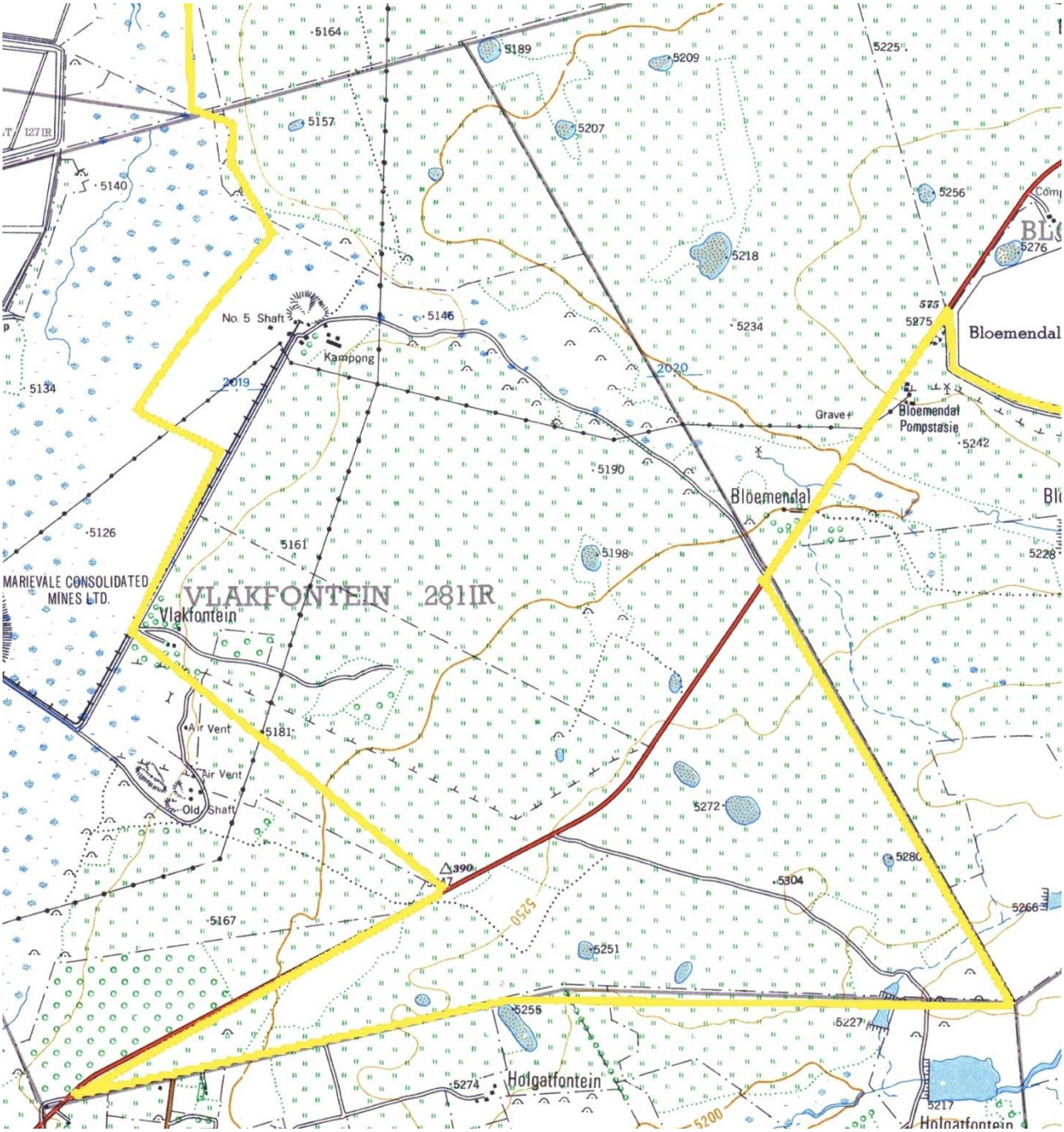
This large site is situated to the east of Daggafontein, south of Vischkuil and Endicott, about 6 kilometres to the east of Springs and 4 kilometres to the north east of Nigel in Gauteng Province.

1. 1966 Topographical map:

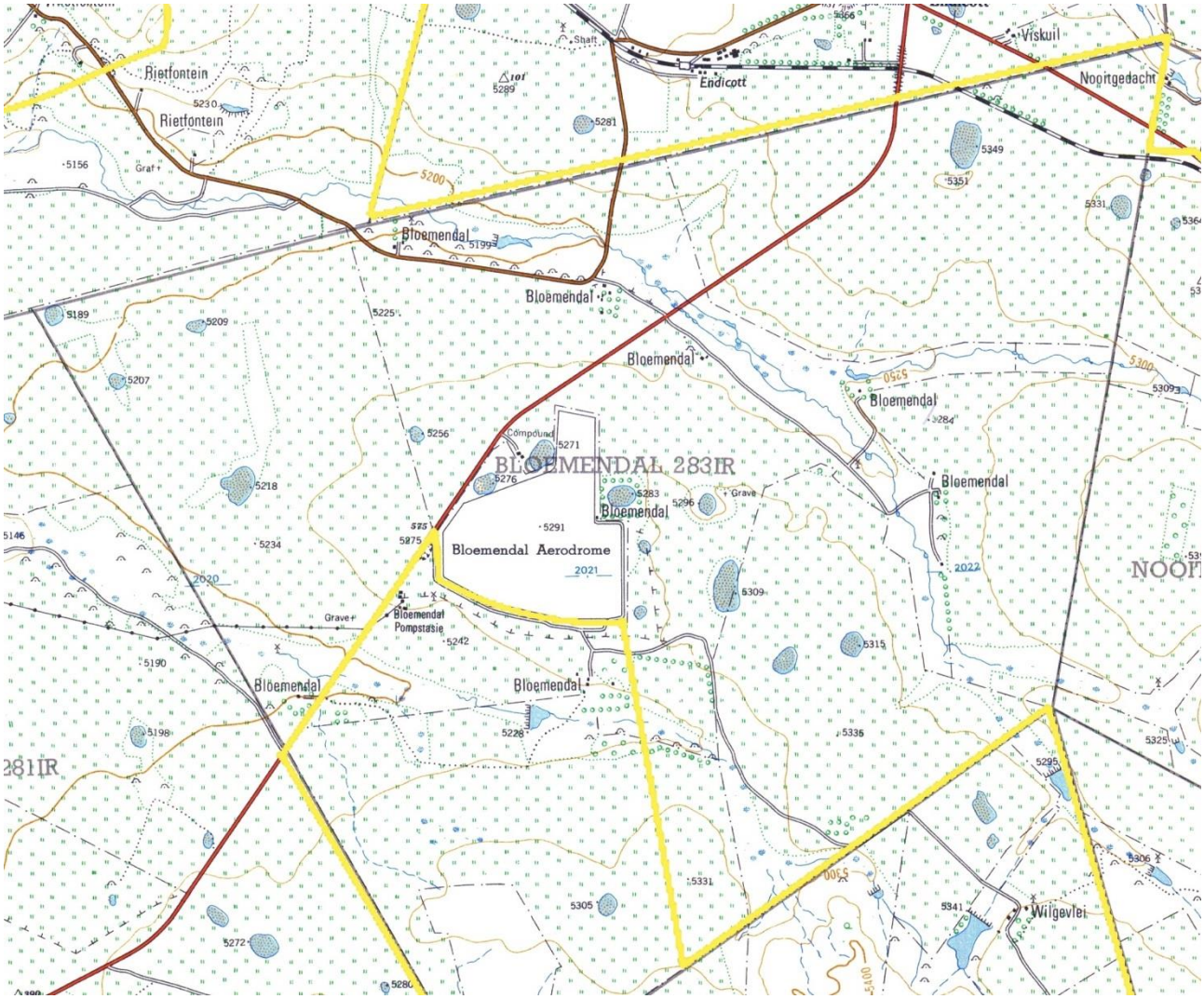
Map 1:1966 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border.



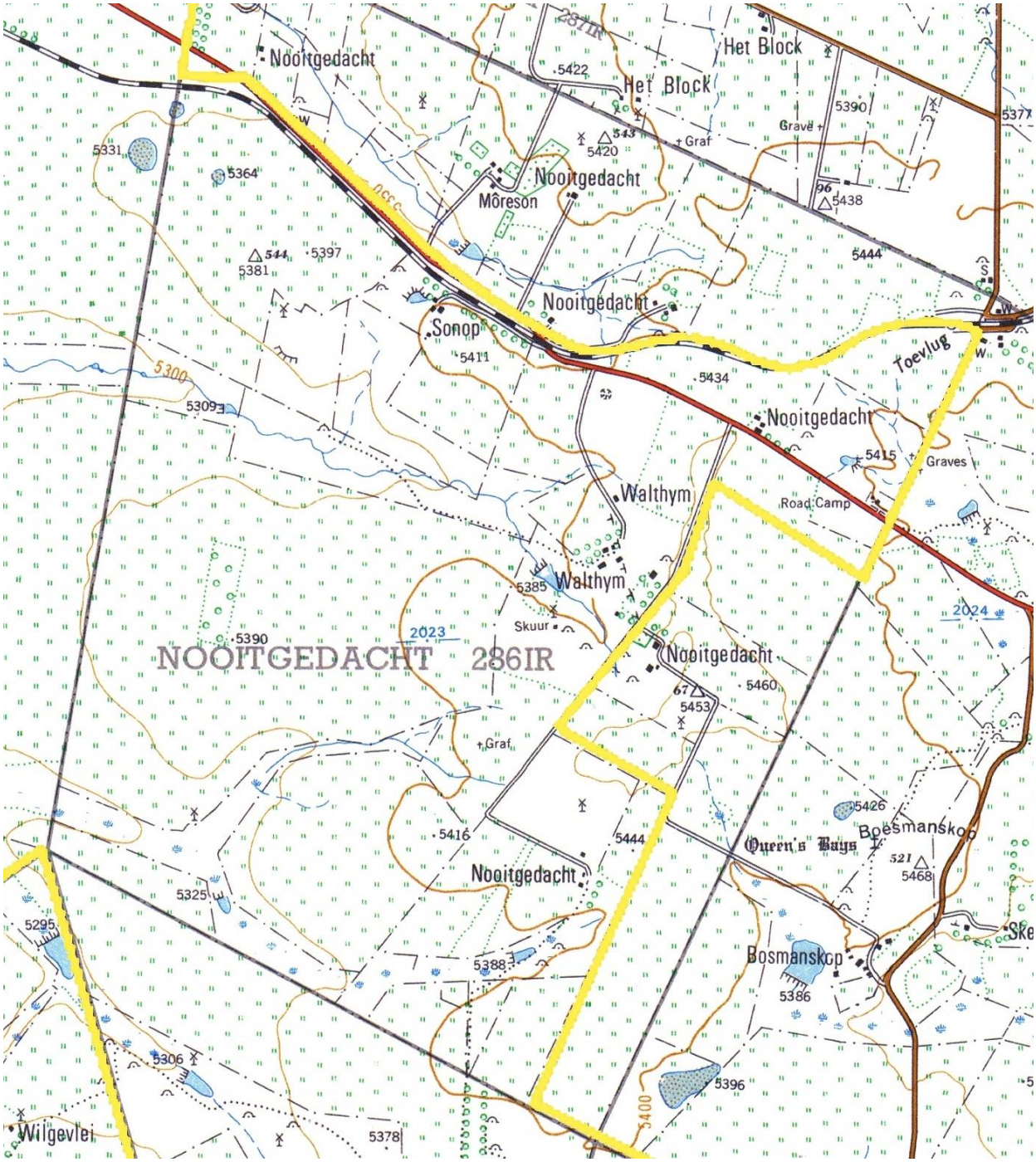
Map 2: The Rietfontein 276 IR section of the study area was mostly used as cultivated lands, and one section of land was used as an orchard. 11 Small dams can be seen in various parts of the property. The Rietfontein Compound and Brickworks are visible in the north eastern part of this portion, near a railway and adjacent to a main road and secondary road. Another secondary road went through the property, and a number of minor roads can also be seen. The East Daggafontein Mine is visible to the west of the brickworks, and one can see an old mine excavation site and ruins to the west thereof. Several huts, buildings and a grave site are also visible. (Topographical Map 1966)



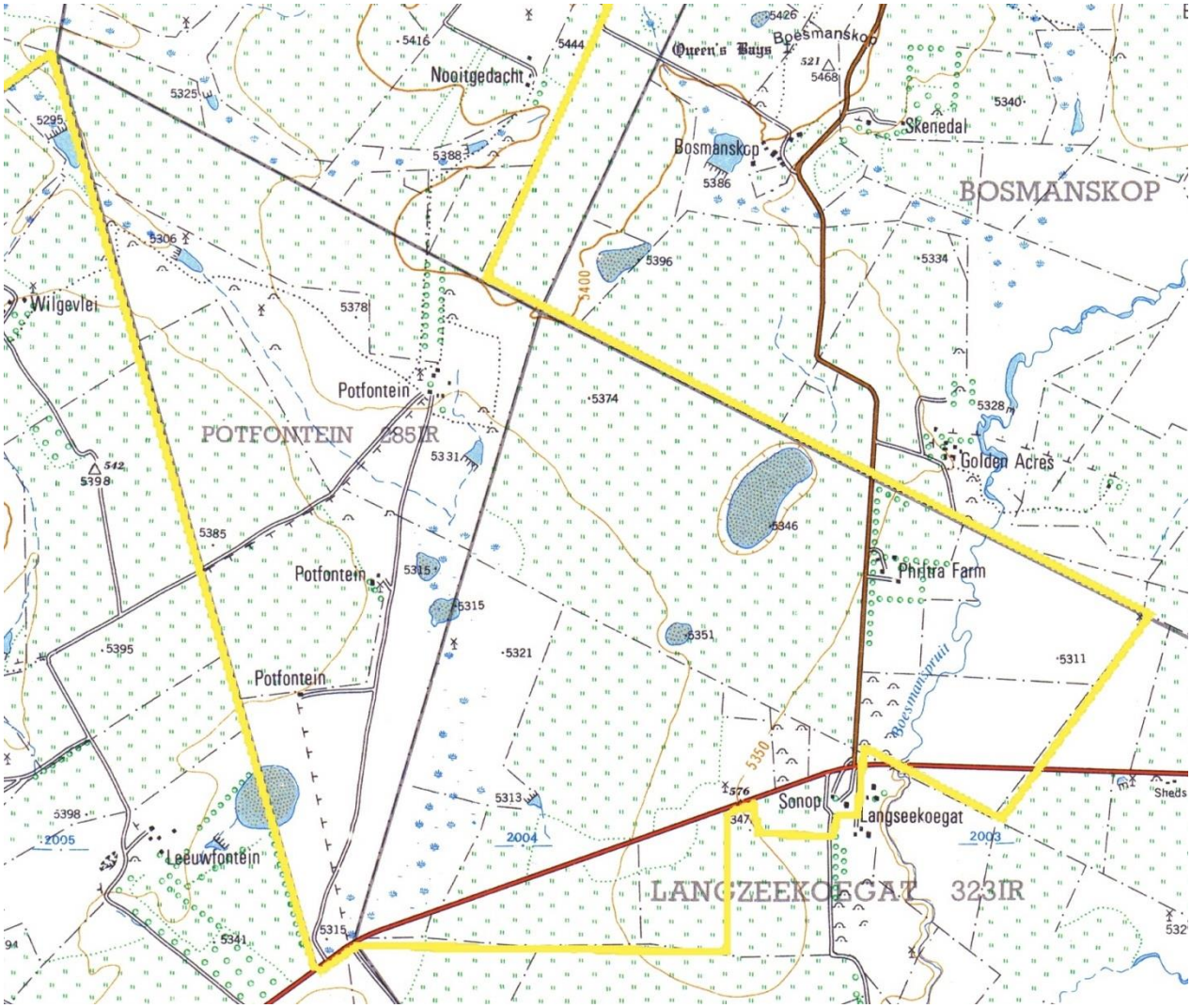
Map 3: The Vlakfontein 281 IR section of the study area was mainly used as cultivated lands. A main road went through the site and 11 small dams can be seen in various parts of the property. A number of minor roads are also visible. One can see a Compound near the No. 5 Shaft in the northern part of the property. Several huts are also visible along a minor road to the east of the compound. Three more buildings and three huts are visible elsewhere on the property. (Topographical Map 1966)



Map 4: The Bloemendal 283 IR section of the study area was mainly used as cultivated lands. A main road and a secondary went through the site and about 15 small dams can be seen in various parts of the property. A number of minor roads are also visible. The Bloemendal Aerodrome is visible near the middle of the farm, and one can see a compound close to it. Several huts can be seen to the north of the secondary roads, and groups of one to four huts can be seen in a few other places. One grave site is also visible. (Topographical Map 1966)



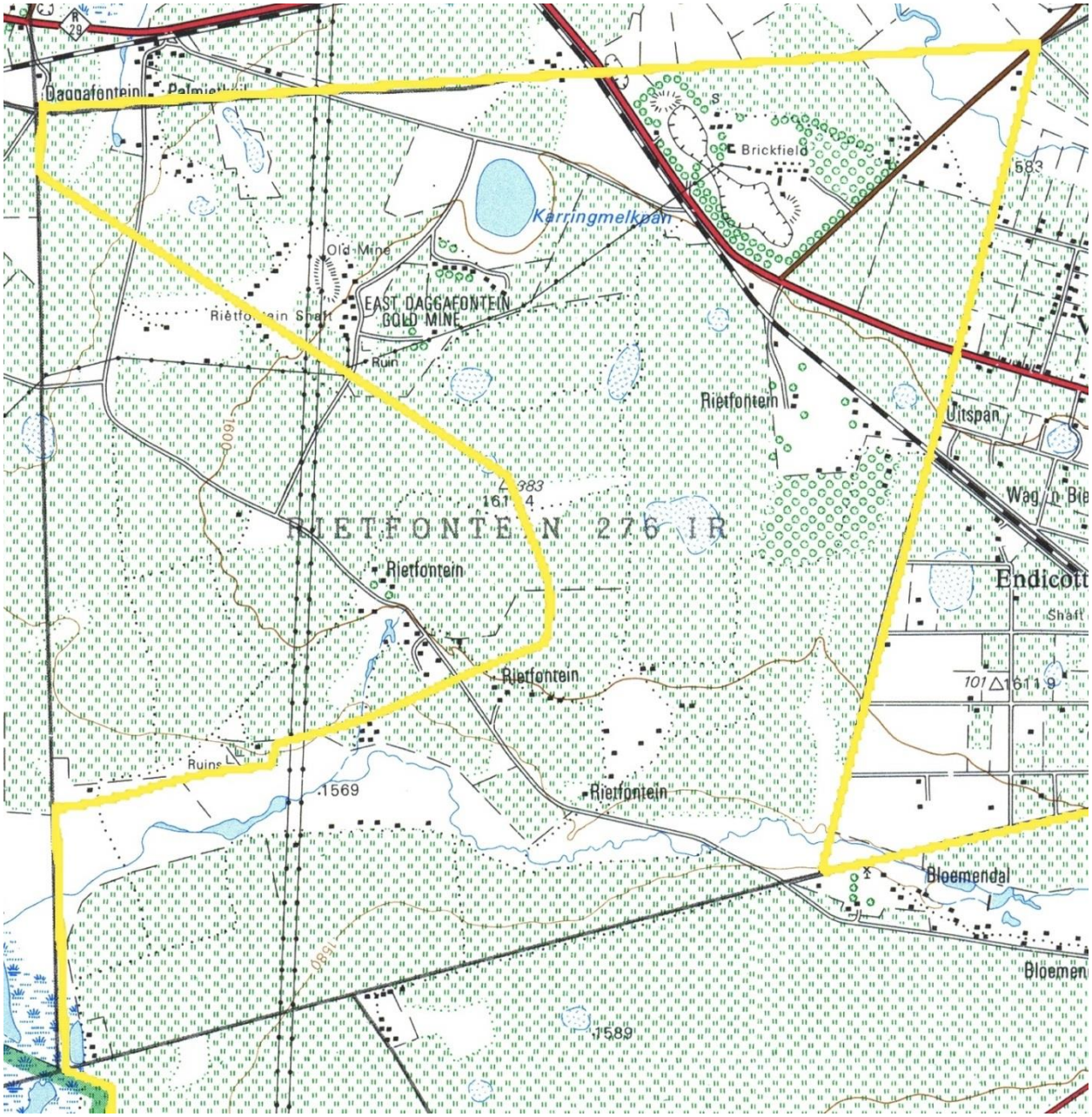
Map 5: The Nooitgedacht 286 IR section of the study area was mainly used as cultivated lands. A main road went through the site and about seven small dams can be seen in various parts of the property. A number of minor roads are also visible. A few buildings and / or huts can be seen at the Sonop, Nooitgedacht and Walthym sites, and one grave site is also visible. (Topographical Map 1966)



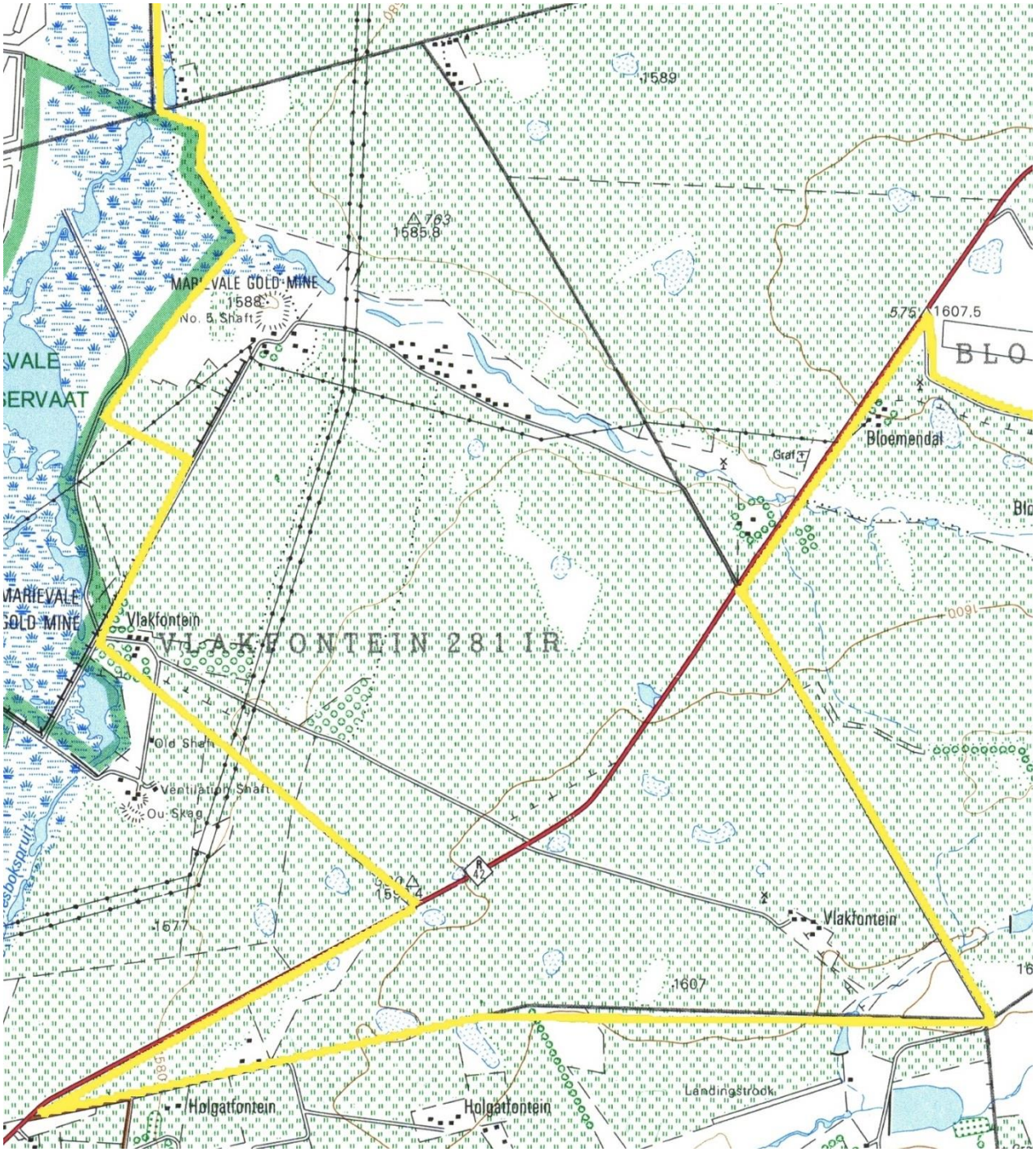
Map 6: The Potfontein 285 IR and Langzeekoegat 323 IR section of the study area was mainly used as cultivated lands. A main road went through the site and about seven small dams and one large dam can be seen in various parts of the property. A secondary road and a number of minor roads are also visible. A number of huts and buildings and two windmills can be seen in the western half of the farm, and another windmill, several huts and three buildings (at Philtra Farm) can be seen in the eastern half of the property. (Topographical Map 1966)

2. 1984 Topographical map:

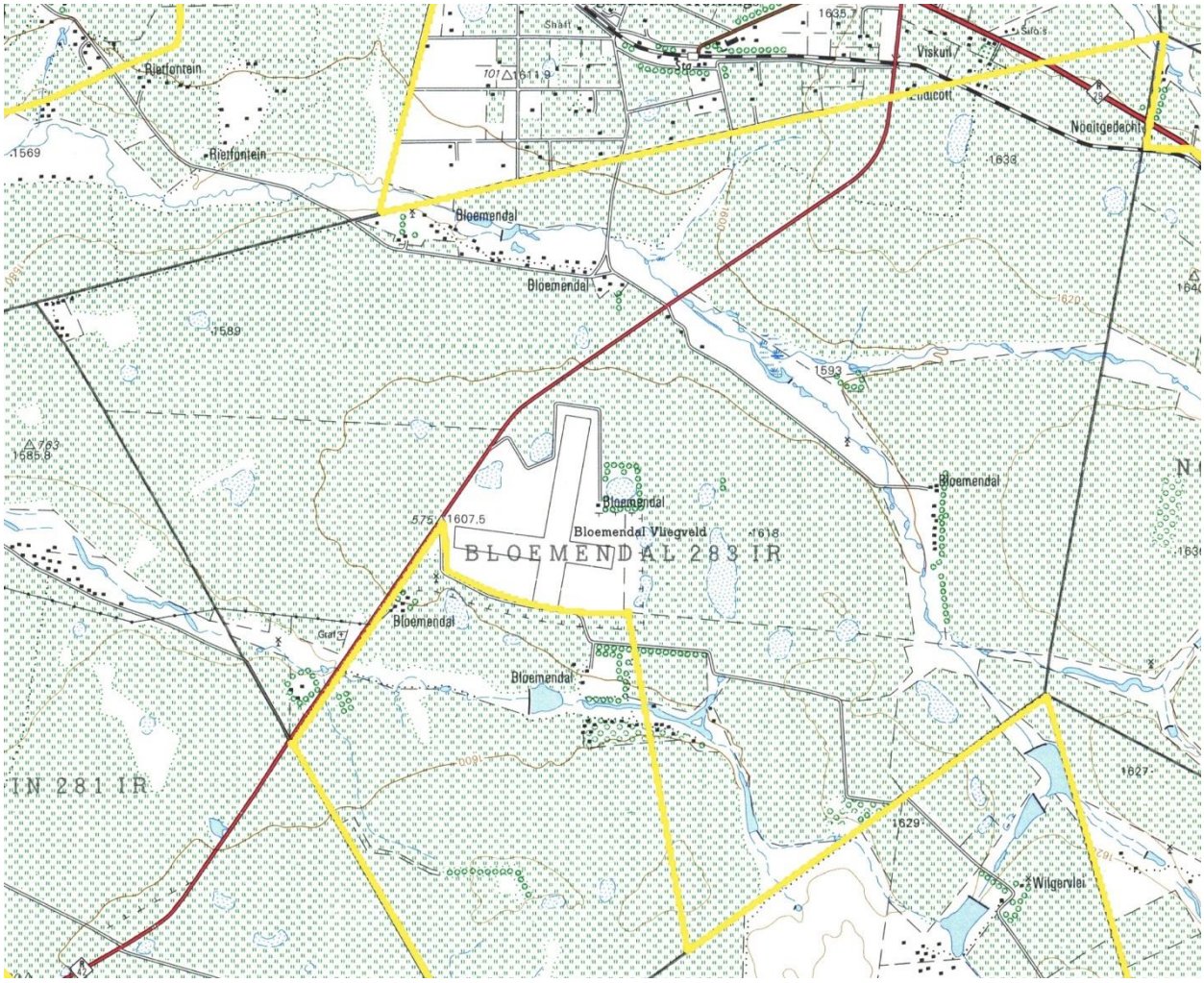
Map 1:1984 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. (Topographical Map 1984)



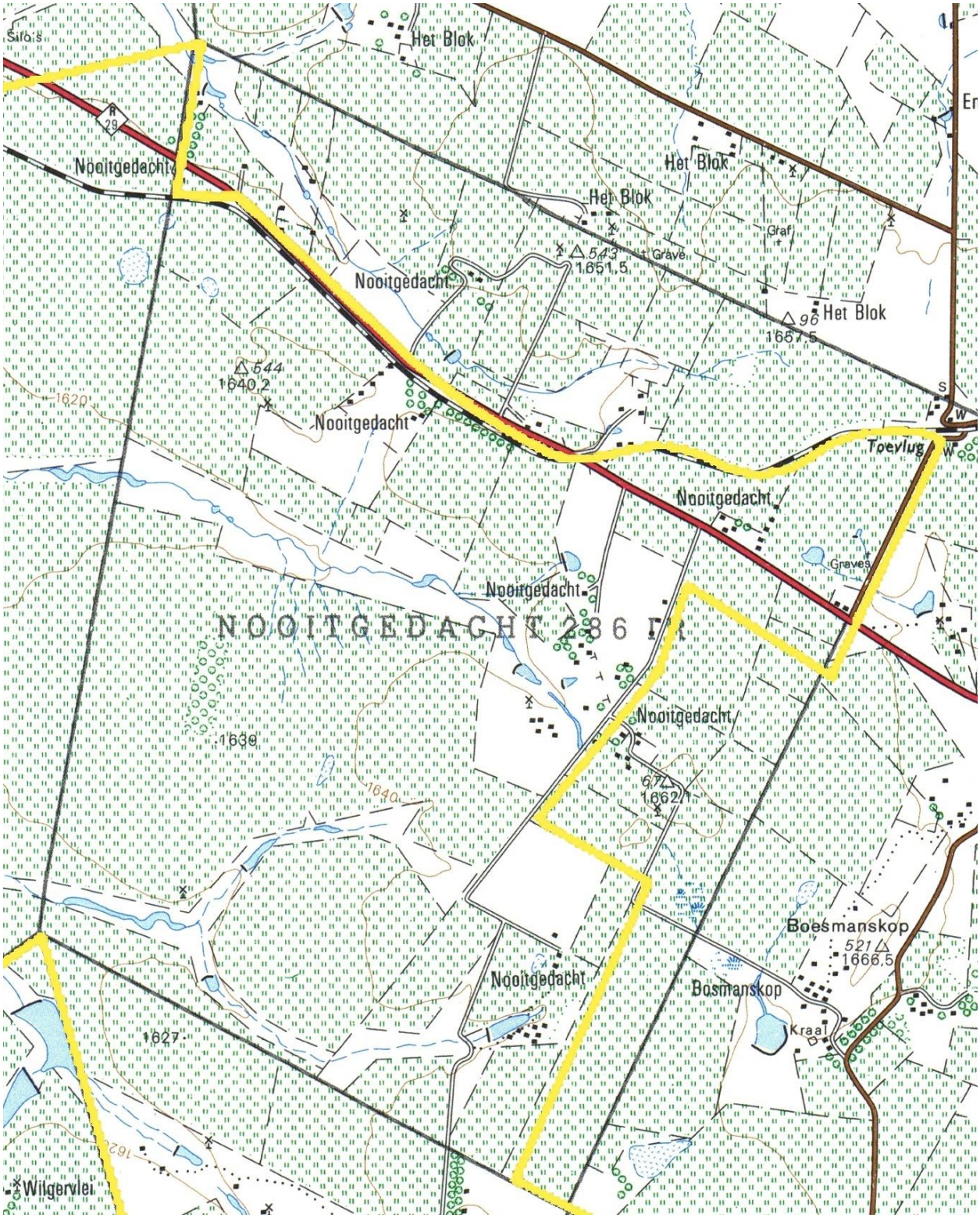
Map 2: The Rietfontein 276 IR section of the study area was mostly used as cultivated lands, and one section of land was used as an orchard. Eight small dams can be seen in various parts of the property. A Brickfield and excavation site is visible in the north eastern part of this portion, near a railway and adjacent to a main road and secondary road. A number of minor roads can be seen on the property. The East Daggafontein Gold Mine is visible to the west of the brickworks, and one can see an old mine excavation site and ruins to the west thereof. Several huts, buildings and a grave site are also visible in various parts of the farm. (Topographical Map 1984)



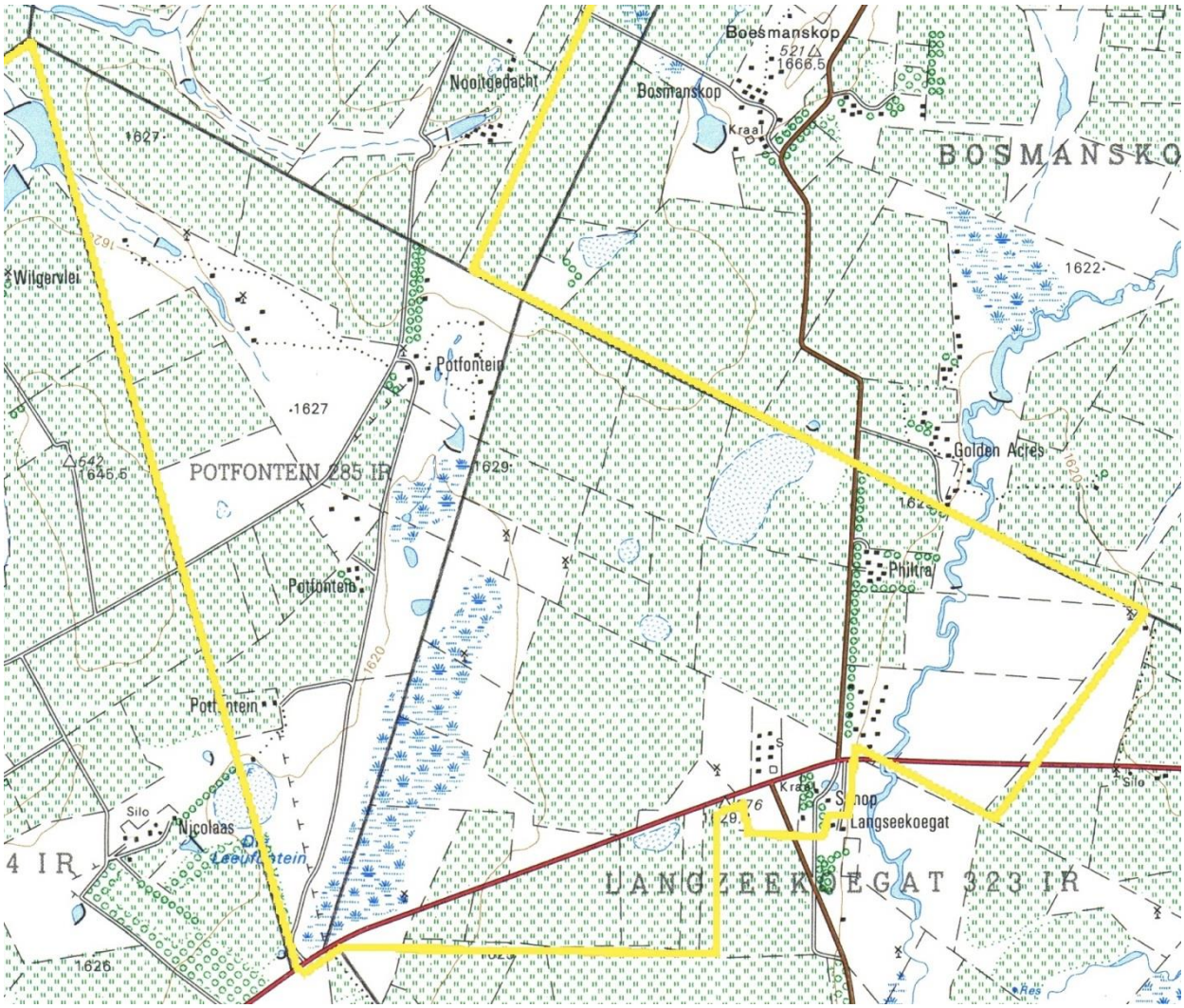
Map 3: The Vlakfontein 281 IR section of the study area was mainly used as cultivated lands. A main road went through the site and about 14 small dams can be seen in various parts of the property. A number of minor roads are also visible. The Marievale Gold Mine and No. 5 Shaft can be seen in the northern part of the property. Many buildings are visible along a minor road to the east of the mine. Three more sites containing three to six buildings each are visible elsewhere on the property. (Topographical Map 1984)



Map 4: The Bloemendal 283 IR section of the study area was mainly used as cultivated lands. A main road and a secondary went through the site and about 17 small dams can be seen in various parts of the property. A number of minor roads are also visible. The Bloemendal Aerodrome is visible near the middle of the farm. Several buildings can be seen to the north of the secondary roads, and groups of three to ten buildings can be seen in a few other places. One grave site is visible. (Topographical Map 1984)



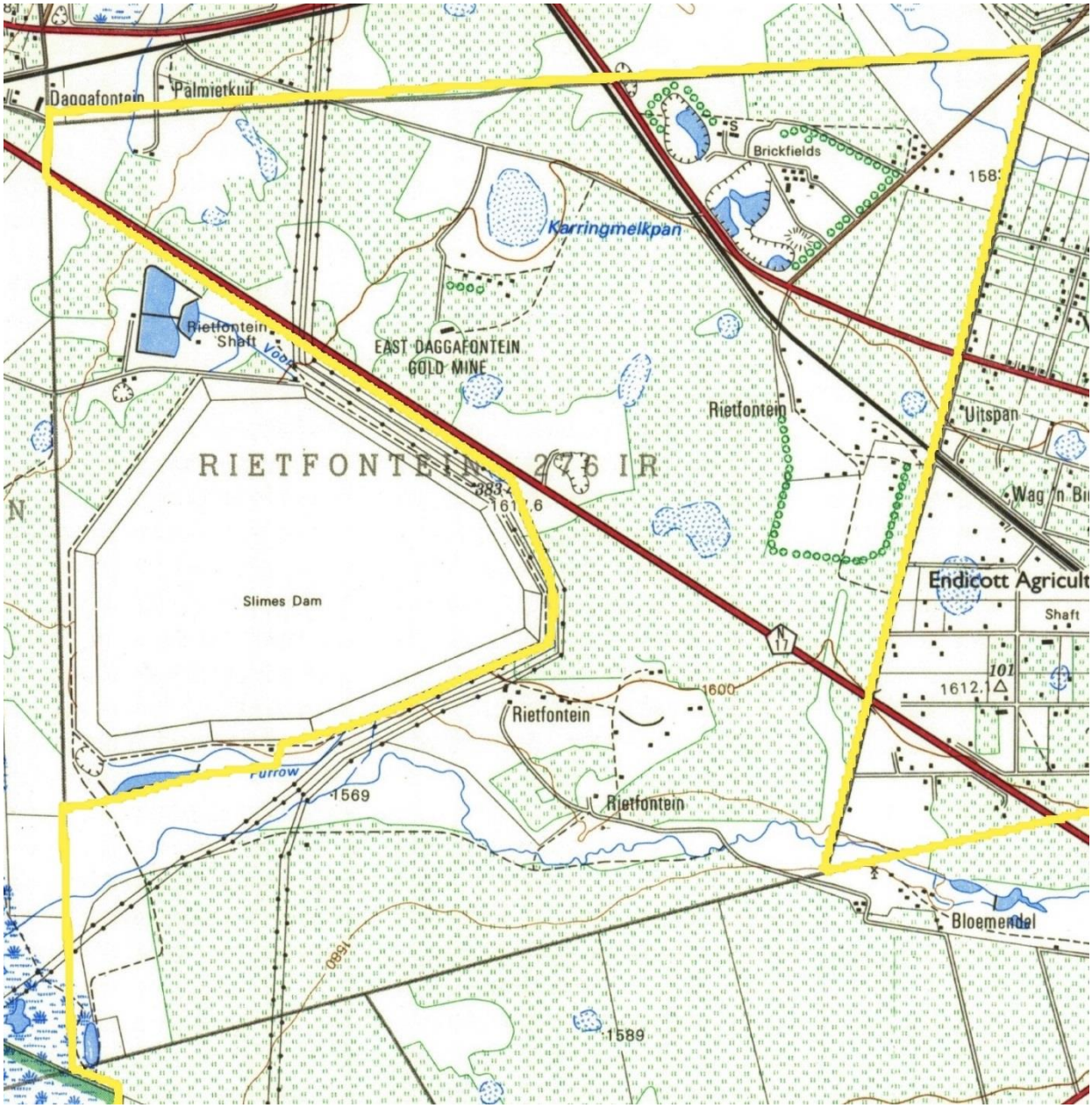
Map 5: The Nooitgedacht 286 IR section of the study area was mainly used as cultivated lands. A main road and a railway line went through the site and about ten small dams can be seen in various parts of the property. A number of minor roads are also visible. Two windmills and groups of two to nine buildings can be seen at a number of sites. A grave site can be seen near the eastern corner of the property. (Topographical Map 1984)



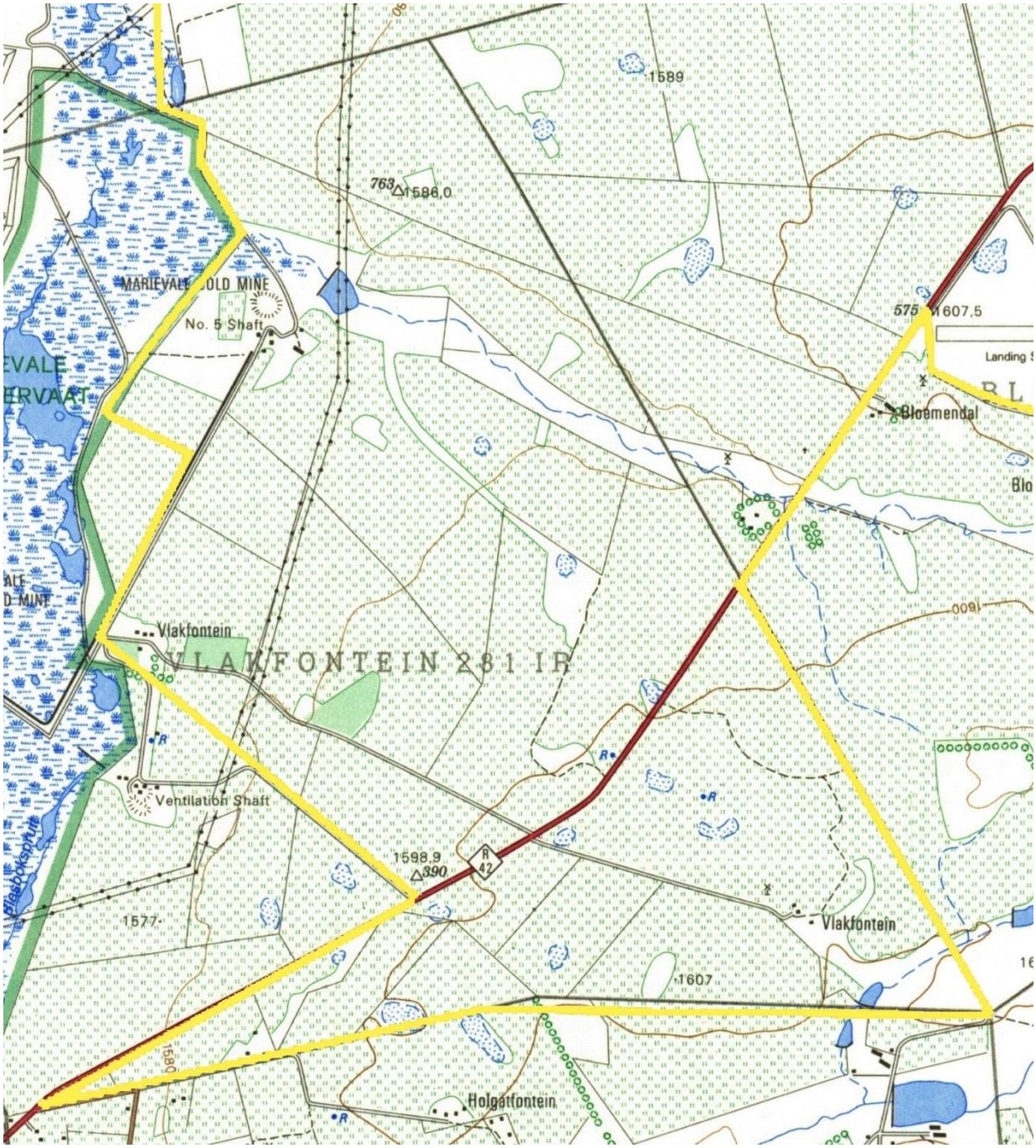
Map 6: A large part of the Potfontein 285 IR and Langzeekoegat 323 IR section of the study area was used as cultivated lands. A main road went through the site and about ten small dams and one large dam can be seen in various parts of the property. A secondary road and a number of minor roads are also visible. A number of buildings and four windmills can be seen in the western half of the farm, and two windmills, a school and several buildings (some at Philtra) can be seen in the eastern half of the property. (Topographical Map 1984)

3. 1991 Topographical map:

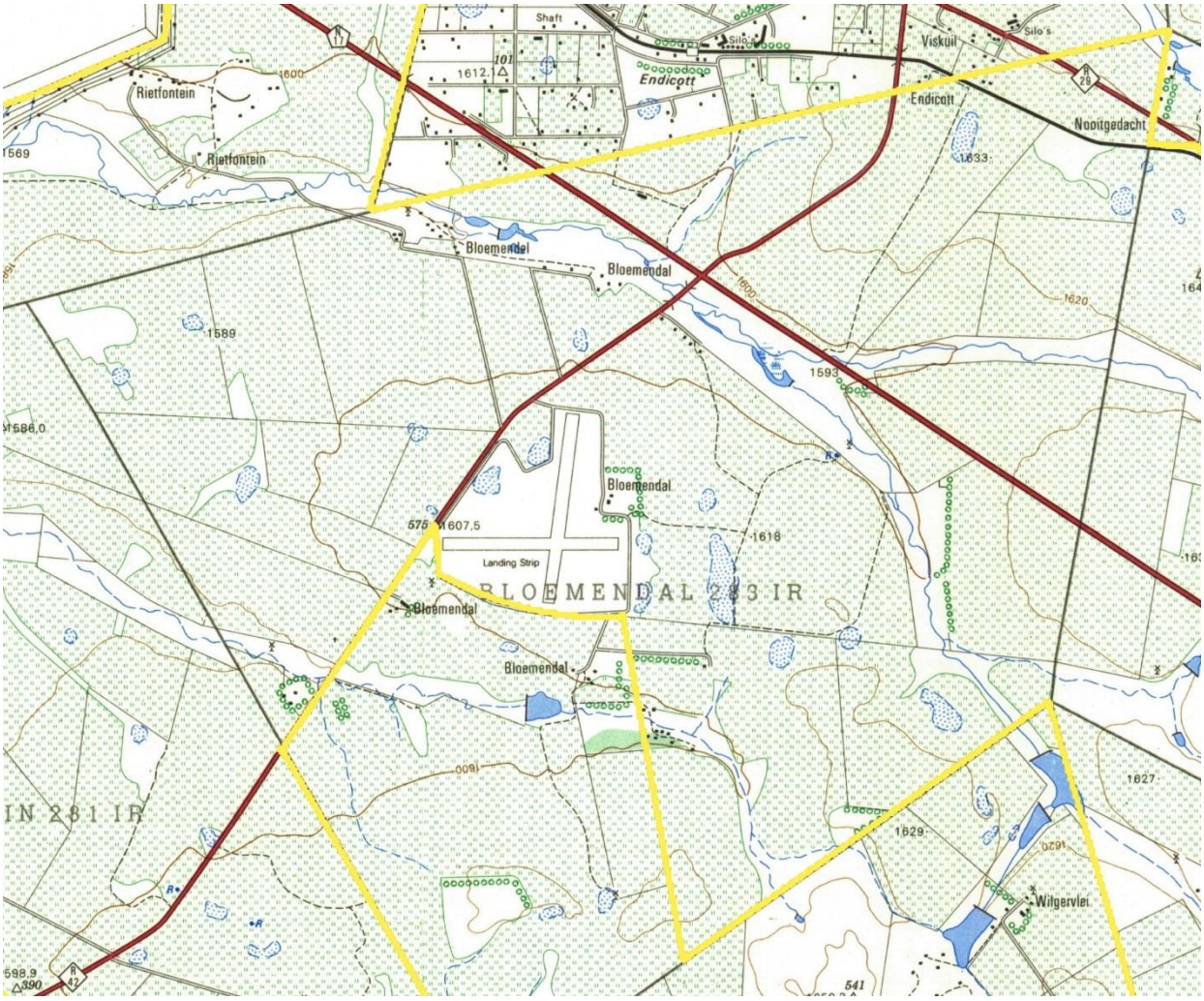
Map 1: 1991 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. (Topographical 1991)



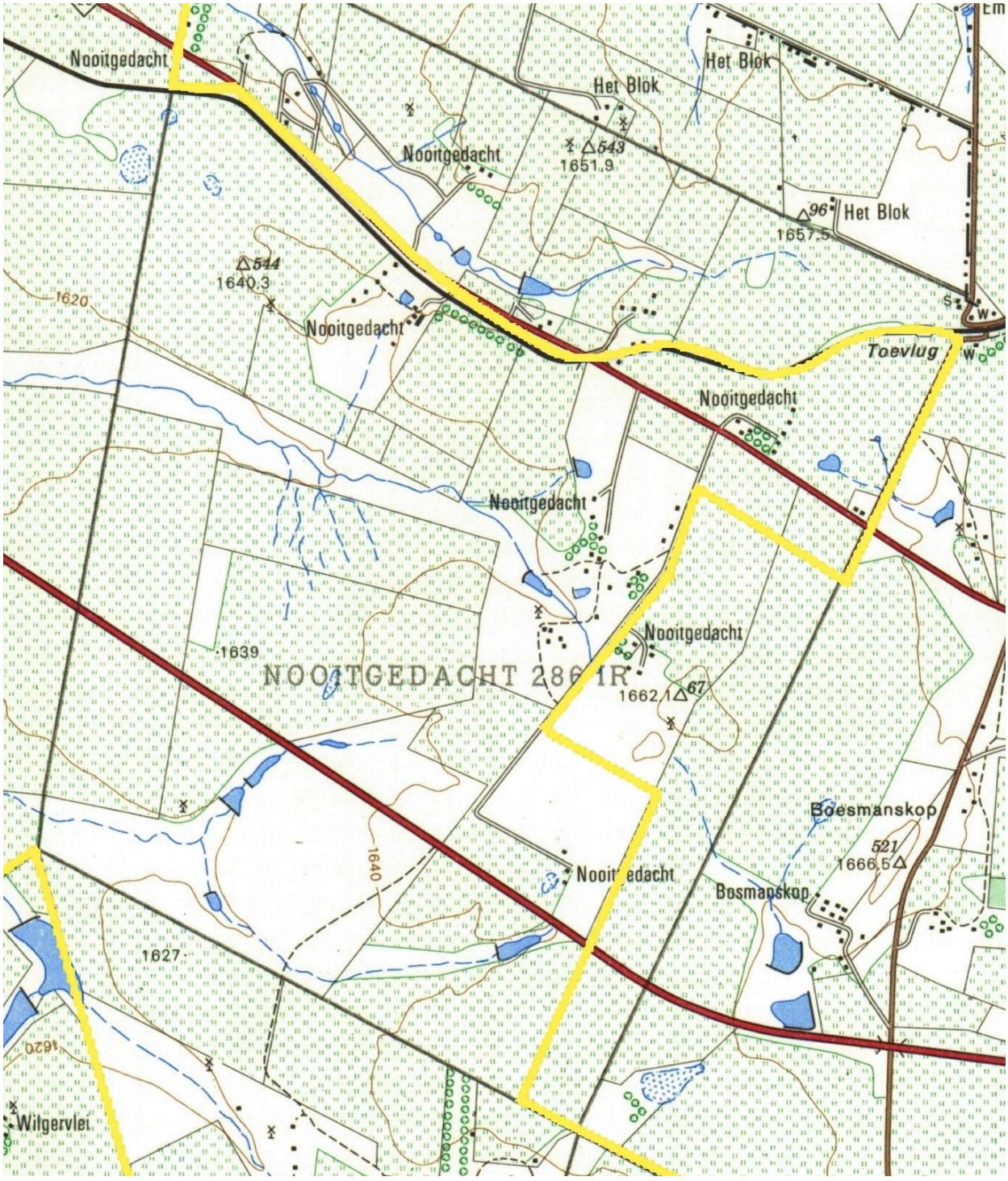
Map 2: The Rietfontein 276 IR section of the study area was mostly used as cultivated lands. About thirteen small dams can be seen in various parts of the property. A Brickfield, a school, several buildings, a mine dump and two excavation sites are visible in the north eastern part of this portion, near a railway and adjacent to a main road and secondary road. A number of minor roads can be seen on Rietfontein. The East Daggafontein Gold Mine is visible to the west of the brickworks. A number of buildings are visible in various parts of the property. (Topographical Map 1991)



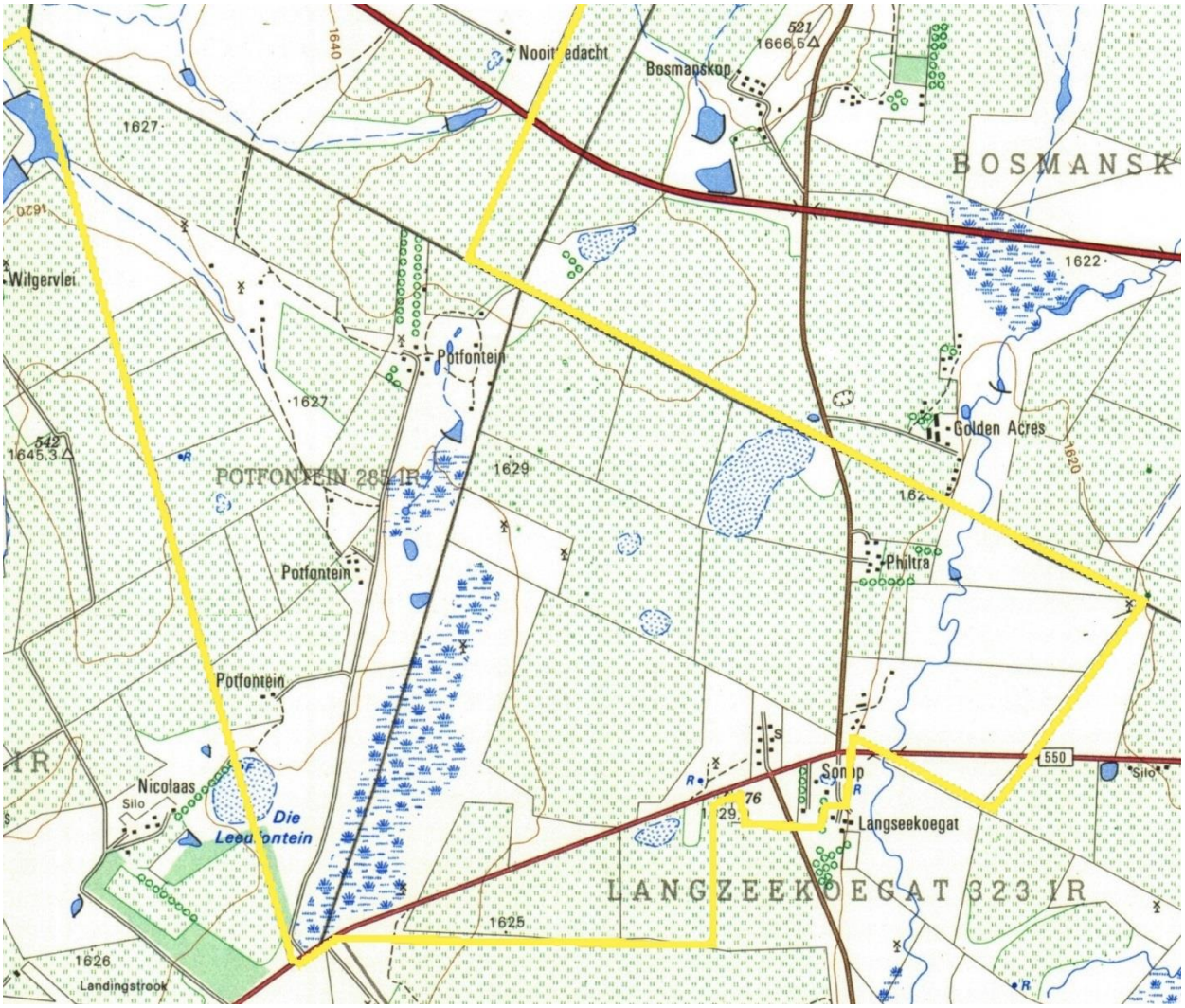
Map 3: The Vlakfontein 281 IR section of the study area was mainly used as cultivated lands. A main road went through the site and about 11 small dams and two reservoirs can be seen in various parts of the property. A number of minor roads are also visible. The Marievale Gold Mine and No. 5 Shaft can be seen in the northern part of the property. Three sites containing two to four buildings each are visible elsewhere on the property. (Topographical Map 1991)



Map 4: The Bloemendal 283 IR section of the study area was mainly used as cultivated lands. Three main roads went through the site and about 17 small dams can be seen in various parts of the property. A number of tracks / hiking trails are also visible. The Bloemendal Aerodrome is visible near the middle of the farm. Groups of three to ten buildings can be seen in a few places. (Topographical Map 1991)

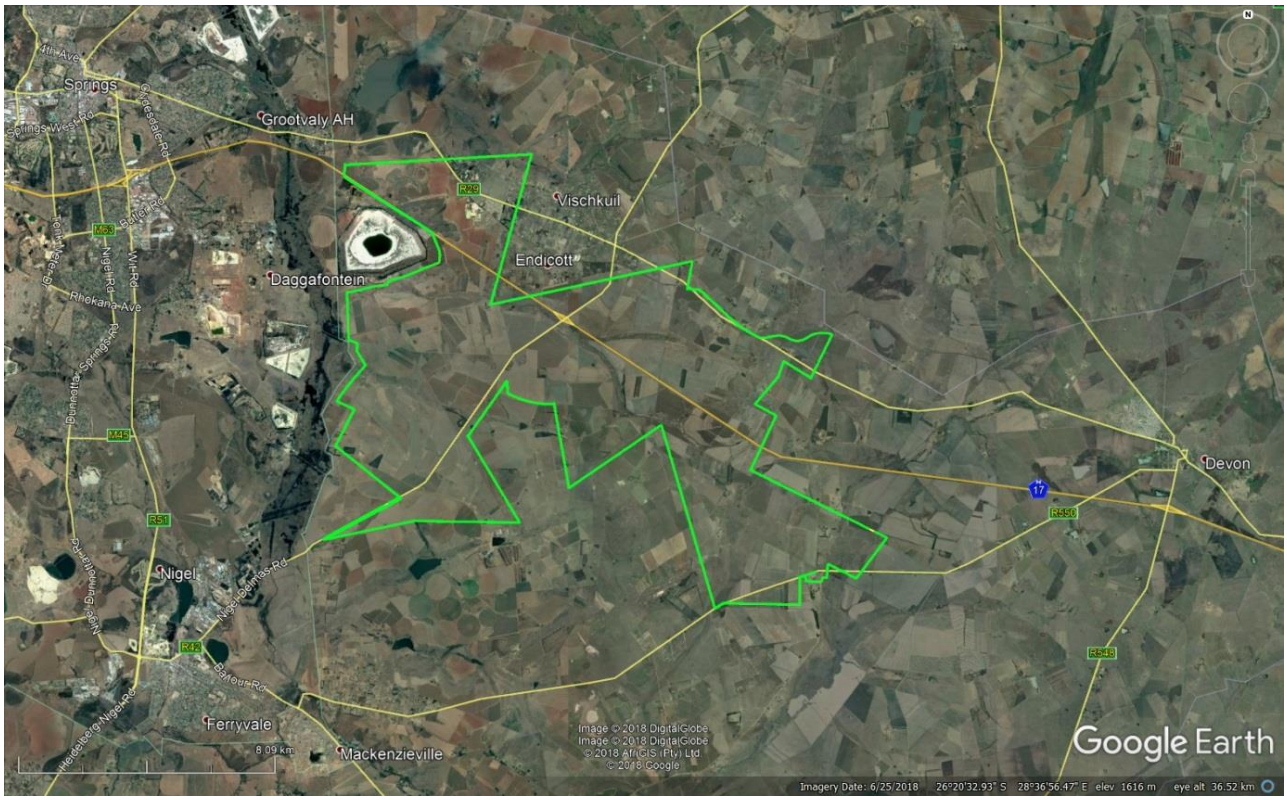


Map 5: The Nooitgedacht 286 IR section of the study area was mainly used as cultivated lands. Two main roads and a railway line went through the site and about 14 small dams can be seen in various parts of the property. A number of minor roads are also visible. Three windmills and groups of two to eight buildings can be seen at a number of sites. (Topographical Map 1991)



Map 6: A large part of the Potfontein 285 IR and Langzeekoegat 323 IR section of the study area was used as cultivated lands. A main road went through the site and about ten small dams and one large dam can be seen in various parts of the property. Two secondary roads and a number of minor roads are also visible. A number of buildings and four windmills can be seen in the western half of the farm, and two windmills, a school and several buildings (some at Philtra) can be seen in the eastern half of the property. (Topographical Map 1991)

4. Google Earth:



Map 1: 2018 Google Earth image showing the study area (green border) in relation to Springs, Nigel, Daggafontein, Endicott and other sites. (Google Earth 2018)

BIBLIOGRAPHY:

Primary Sources:

MAPS

Topographical map. 1966. *South Africa. 1:50 000 Sheet. 2628BC Endicott. First Edition.* Pretoria: Government Printer.

Topographical map. 1984. *South Africa. 1:50 000 Sheet. 2628BC Endicott. Second Edition.* Pretoria: Government Printer.

Topographical map. 1991. *South Africa. 1:50 000 Sheet. 2628BC Endicott. Third Edition.* Pretoria: Government Printer.

Electronic Sources:

Google Earth. 2018. 26°20'32.93" S 28°*36'56.47" E elev 1616 m.* [Online]. [Cited 7 September 2018].

Appendix B
Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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+27 86 691 6461

Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg

Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:
  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard — Senior Lecturer, University of Johannesburg, South Africa
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   University of the Witwatersrand
3. Alex Schoeman — University of the Witwatersrand
   E-mail:Alex.Schoeman@wits.ac.za