PHASE 1 HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED SERITI - ARNOT WATER TREATMENT PLANT PROJECT, STEVE TSHWETE LOCAL MUNICIPALITY, NKANGALA DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE

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Declaration of Independence

I, Polke Birkholtz, declare that –

- I act as the independent heritage practitioner 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 heritage impact assessments, 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 will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- 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;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

HERITAGE CONSULTANT: PGS Heritage (Pty) Ltd

CONTACT PERSON: Polke Birkholtz – Project Manager

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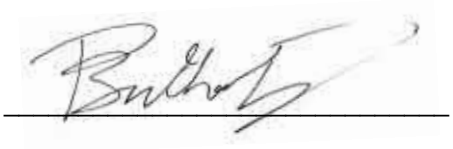
SIGNATURE: 

Report Title	Phase 1 Heritage Impact Assessment for the Proposed Seriti -Arnot Water Treatment Plant Project near Emalahleni, Mpumalanga Province		
Control	**Name**	**Signature**	**Designation**
Author	Cherene de Bruyn		Archaeologist – PGS Heritage
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DETAILS OF CLIENT:

CLIENT: **Zutari Pty (Ltd)**

CONTACT PERSON: **Ms. Noluyolo Xorile**

Noluyolo.Xorile@zutari.com

As indicated in the table below, this Heritage Impact Assessment report was compiled in accordance with the NEMA Appendix 6 requirements for specialist reports.

REQUIREMENT	STATUS
1. A specialist report prepared in terms of these Regulations must contain—	
(a) details of—	
(i) the specialist who prepared the report; and	Page iii and Appendix B
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.2 and Appendix B
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
(c) an 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
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 4 & 5
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3
(e) a 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 alternatives;	Sections 6 - 8
(g) an identification of any areas to be avoided, including buffers;	Sections 6 - 8
(h) a 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 6
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 7
(k) any mitigation measures for inclusion in the EMPr;	Sections 8 and 9

REQUIREMENT	STATUS
(l) any conditions for inclusion in the environmental authorisation;	Sections 8 and 9
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Sections 8 and 9
(n) a reasoned opinion—	
(i) whether the proposed activity, activities or portions thereof should be authorised;	Section 9
(iA) regarding the acceptability of the proposed activity or activities; and	Section 9
(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 9
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Not applicable
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not applicable
(q) any other information requested by the competent authority.	Not applicable
2. Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	-

EXECUTIVE SUMMARY

Introduction

PGS Heritage (Pty) Ltd was appointed by Zutari (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment (HIA) for the proposed Proposed Seriti – Arnot Water Treatment Plant Project near Middelburg, Mpumalanga Province. The proposed project area is located on the farms Bosmansspruit 459 IS, Kwaggafontein 460 JS, Tweefontein 458 JS, Mooifontein 448 JS, and Rietkuil 491 JS, within the Steve Tshwete Local Municipality, Nkangala District Municipality, Mpumalanga Province. The proposed development is situated on two mining operations owned by Seriti and Arnot Opco.

Project Description

Arnot Opco has recently taken over the underground mining area and two small opencast sections previously owned by Exxaro, all of which are in in the process of closing. Seriti manages care and maintenance at the large opencast section which ceased operations in 1992. The Seriti pits have been under care and maintenance since closing down. Since the ceasing of mine operations in 1992, mine-affected water decants from the mine into various locations and this water needs to be managed as part of the Seriti and Arnot Opco mine closure liabilities.

Zutari was appointed for a feasibility study for a combined Water Treatment Plant at the Arnot Closed Colliery. The feasibility study is the further definition of the integrated water management plan for the collection of excess water, treatment and discharge of reclaimed water from the mines, as well as the management of any waste material produced because of this water management plan. The outcome of the study will be to complete the basic engineering design of the water treatment system and to obtain the necessary authorisation for the construction and operation of the water treatment system.

General Desktop Study

An archaeological and historical desktop study was undertaken to provide a historical framework for the project area and surrounding landscape. This was augmented by an assessment of previous archaeological and heritage studies completed for the study area and surroundings. Furthermore, an assessment was made of the early editions of the relevant topographic maps. Refer to **Chapter 5**.

Fieldwork

The fieldwork comprised intensive field surveys of the study area undertaken primarily by foot over the course of a number of days by an experienced fieldwork team from PGS consisting of an archaeologist

and field assistant. Despite the intensive nature of the fieldwork undertaken, no evidence for any archaeological or heritage sites could be identified within the study area. While no heritage sites could be identified during the fieldwork, further desktop study work undertaken subsequent to the fieldwork, revealed that a cemetery was located within the study area. This cemetery was successfully relocated in 2017, and as a result, no evidence for it could be identified during the fieldwork. Refer **Chapter 6**.

Palaeontology

According to the SAHRIS palaeontological sensitivity map, the proposed Seriti - Arnot Water Treatment Plant Project area falls within a very high (red) sensitivity zone. As such, a field assessment and protocol for finds is required.

Impact Assessment and Mitigation

No evidence for any archaeological or heritage sites could be identified during the fieldwork. As a result, no impact assessments were undertaken and no site-specific mitigation measures are required.

General Recommendations

The following general recommendations are made:

- An archaeological watching brief must be undertaken during all excavations undertaken as part of the project; and
- Should the development footprints change or be altered in any way, these changes must be assessed in the field by a heritage specialist/archaeologist before construction commences.

Conclusions

Despite the intensive desktop study work and fieldwork undertaken for the purposes of this study, no evidence for any archaeological or heritage sites could be identified within the study area. As a result, and on the condition that the development does not extend beyond the development footprint currently assessed, the authors of this report can provide no heritage reasons for the proposed development not to continue. From a heritage perspective, both Option 2 and Option 3 are acceptable as the routes are located within areas that have previously been disturbed and which are of low heritage sensitivity.

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APPENDICES

TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil.

Early Stone Age

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and as stated under Section 3 of the NHRA, can include the following:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, and
- sites of significance relating to the history of slavery in South Africa.

Holocene

The most recent geological time period which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Table 1 – List of abbreviations used in this report

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IAIASA	International Association for Impact Assessment South Africa
IAP	Interested and Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa

SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

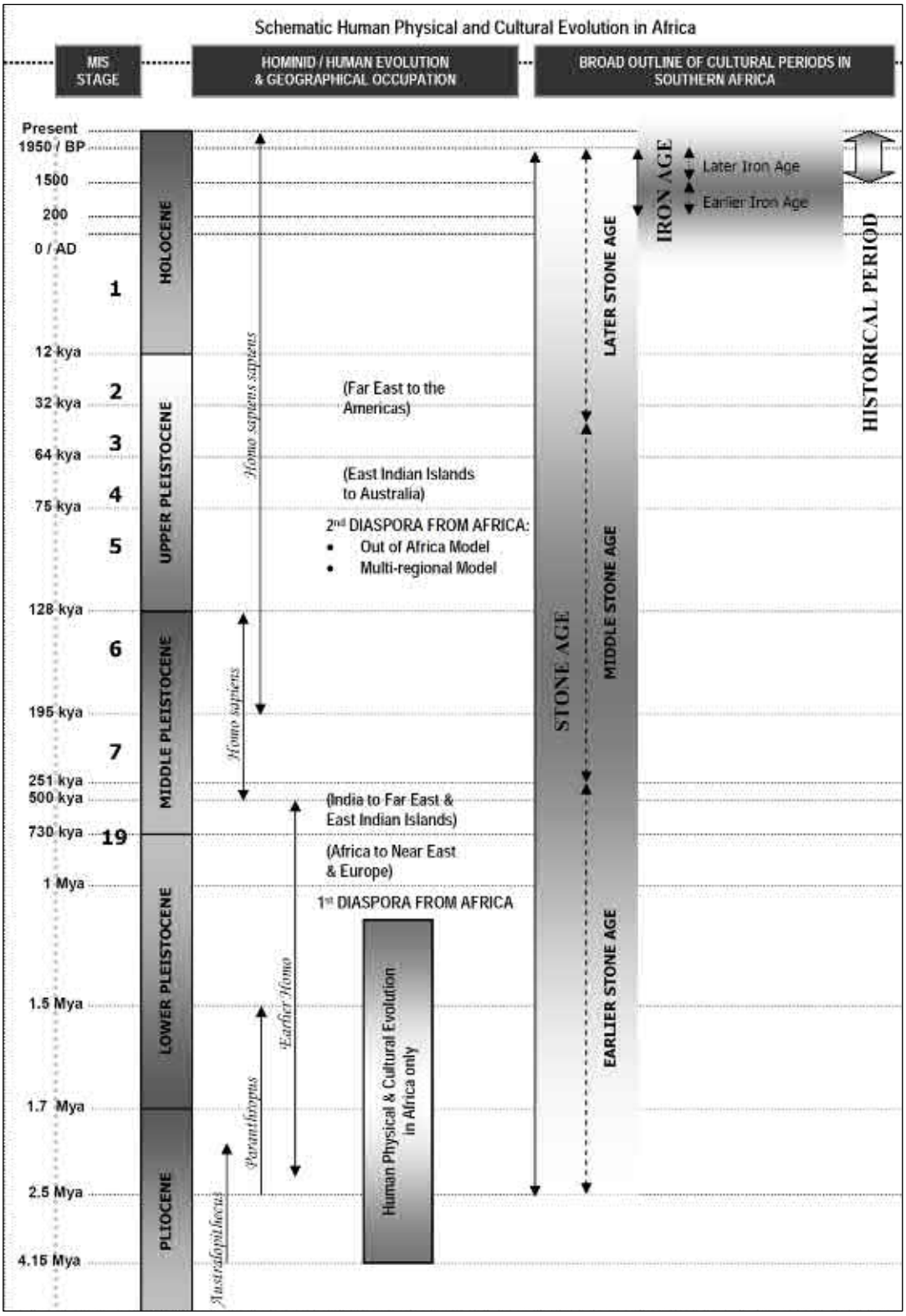

Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd was appointed by Zutari (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment (HIA) for the proposed Proposed Seriti – Arnot Water Treatment Plant Project near Middelburg, Mpumalanga Province.

The proposed project area is located on the farms Mooifontein 448 JS, Tweefontein 458 JS, Bosmansspruit 459 JS, Kwaggafontein 460 JS, Braamspruit 465 JS and Rietkuil 491 JS, within the Steve Tshwete Local Municipality, Nkangala District Municipality, Mpumalanga Province.

The proposed development is situated on two mining operations owned by Seriti and Arnot Opco Coal Mine.

1.1 Scope of the Study

This HIA aims to identify possible heritage sites and finds that may occur in the proposed development area and to assess the impact of the proposed development on these identified heritage sites. The study also aims to inform the developers to manage the identified heritage resources responsibly, to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This HIA was compiled by PGS. The staff at PGS has a combined experience of nearly 90 years in the heritage consulting industry and has extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where the staff has the relevant expertise and experience to undertake that work competently. This report was compiled by the following individuals from PGS:

- **Polke Birkholtz**, the project manager and co-author, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is also accredited with the CRM Section of the same association. He has 20 years of experience in the heritage assessment and management field and holds a B.A. (cum laude) from the University of Pretoria specialising in Archaeology, Anthropology and History and a B.A. (Hons.) in Archaeology (cum laude) from the same institution.

- **Cherene de Bruyn**, the author of this report is registered with ASAPA as a Professional Archaeologist and is accredited as a Principal Investigator and Field Director, she is further also a member of the International Association for Impact Assessment South Africa (IAIASA). She holds a MA in Archaeology from University College London, and a BSc (Hons) in Physical

Anthropology and a BA (Hons) in Archaeology from the University of Pretoria.

1.3 Assumptions and Limitations

The following assumptions and limitations regarding this study and report exist:

- Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites, as well as the density of vegetation cover found in some areas. As such, should any heritage features and/or objects not included in the present study be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way, until such time that the heritage specialist has been able to assess as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. If any graves or burial places are identified or exposed during the development, the procedures and requirements pertaining to graves and burials will apply as set out below (**Appendix A**).

- The study area boundaries and proposed development footprints depicted in this report were provided by the client. As a result, these were the areas assessed during the fieldwork. Should any additional development footprints located outside of these study area boundaries be required, such additional areas will have to be assessed in the field by an experienced archaeologist/heritage specialist before construction commences.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

1.4.1 Statutory Framework: The National Heritage Resources (Act 25 of 1999)

The NHRA has applicability, as the study forms part of an overall HIA in terms of the provisions of Section 34, 35, 36 and 38 of the NHRA and forms part of a heritage scoping study that serves to identify key heritage resources, informants, and issues relating to the palaeontological, archaeological, built environment and cultural landscape, as well as the need to address such issues during the impact assessment phase of the HIA process.

1.4.2 Section 35 – Archaeology, Palaeontology and Meteorites

According to Section 35 (Archaeology, Palaeontology and Meteorites) and Section 38 (Heritage Resources Management) of the NHRA, PIAs and AIAs are required by law in the case of developments in areas underlain by potentially fossiliferous (fossil-bearing) rocks, especially where substantial bedrock excavations are envisaged, and where human settlement is known to have occurred during prehistory and the historic period.

1.4.3 Section 36 – Burial Grounds & Graves

A section 36 permit application is made to the SAHRA or the competent provincial heritage authority which protects burial grounds and graves that are older than 60 years and must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit. SAHRA must also identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with these graves and must maintain such memorials. A permit is required under the following conditions:

Permit applications for burial grounds and graves older than 60 years should be submitted to the South African Heritage Resources Agency:

a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of the conflict, or any burial ground or part thereof which contains such graves.
b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
d) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant.

1.4.4 Section 38 - HIA as a Specialist Study within the EIA in Terms of Section 38(8)

A NHRA Section 38 (Heritage Impact Assessments) application to MP-PHRA is required when the proposed development triggers one or more of the following activities:

a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear

development or barrier exceeding 300m in length;

b) the construction of a bridge or similar structure exceeding 50 m in length;
c) any development or other activity which will change the character of a site,
    i. exceeding 5 000 m2 in extent; or
    ii. involving three or more existing erven or subdivisions thereof; or
    iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
d) the re-zoning of a site exceeding 10 000 m2 in extent; or
e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority

In this instance, the heritage assessment for the property is to be undertaken as a component of the EIA for the project. Provision is made for this in terms of Section 38(8) of the NHRA, which states that:

- An HIA report is required to identify, and assess archaeological resources as defined by the NHR Act, assess the impact of the proposal on the said archaeological resources, review alternatives and recommend mitigation (see methodology above).

Section 38 (3) Impact Assessments are required, in terms of the statutory framework, to conform to basic requirements as laid out in Section 38(3) of the NHRA. These are:

- The identification and mapping of heritage resources in the area affected;
- The assessment of the significance of such resources;
- The assessment of the impact of the development on the heritage resources;
- An evaluation of the impact on the heritage resources relative to sustainable socio/economic benefits;
- Consideration of alternatives if heritage resources are adversely impacted by the proposed development;
- Consideration of alternatives; and
- Plans for mitigation.

1.4.5 Notice 648 of the Government Gazette 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA (2016), Government Notice (GN) 648 requires sensitivity verification for a site selected on the national web-based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this GN are listed in **Table 3**

and the applicable section in this report noted.

Table 2 - Reporting requirements for GN648.

GN 648	Relevant section in report	Where not applicable in this report
2.2 (a) a desktop analysis, using satellite imagery	Section 5	-
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	Sections 4 and 5	-
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool	Section 1 and 5	-
2.3(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity	Section 4 provides a description of the current use and confirms the status in the screening report	-

An assessment of the Environmental Screening tool provides the following sensitivity ratings for archaeological as high (refer **Figure 2**) and for palaeontological resources in and surrounding the project study area as combined medium to high (refer **Figure 3**).

1.4.6 NEMA – Appendix 6 requirements

The HIA report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations (2014, and as amended in 2017). **Table 1** of this report sets out the relevant sections as listed in Appendix 6 of the EIA Regulations (2017), which describes the requirements for specialist reports. For ease of reference, this table provides cross-references to the report sections where these requirements have been addressed. It is important to note, that where something is not applicable to this HIA, this has been indicated in **Table 1**.

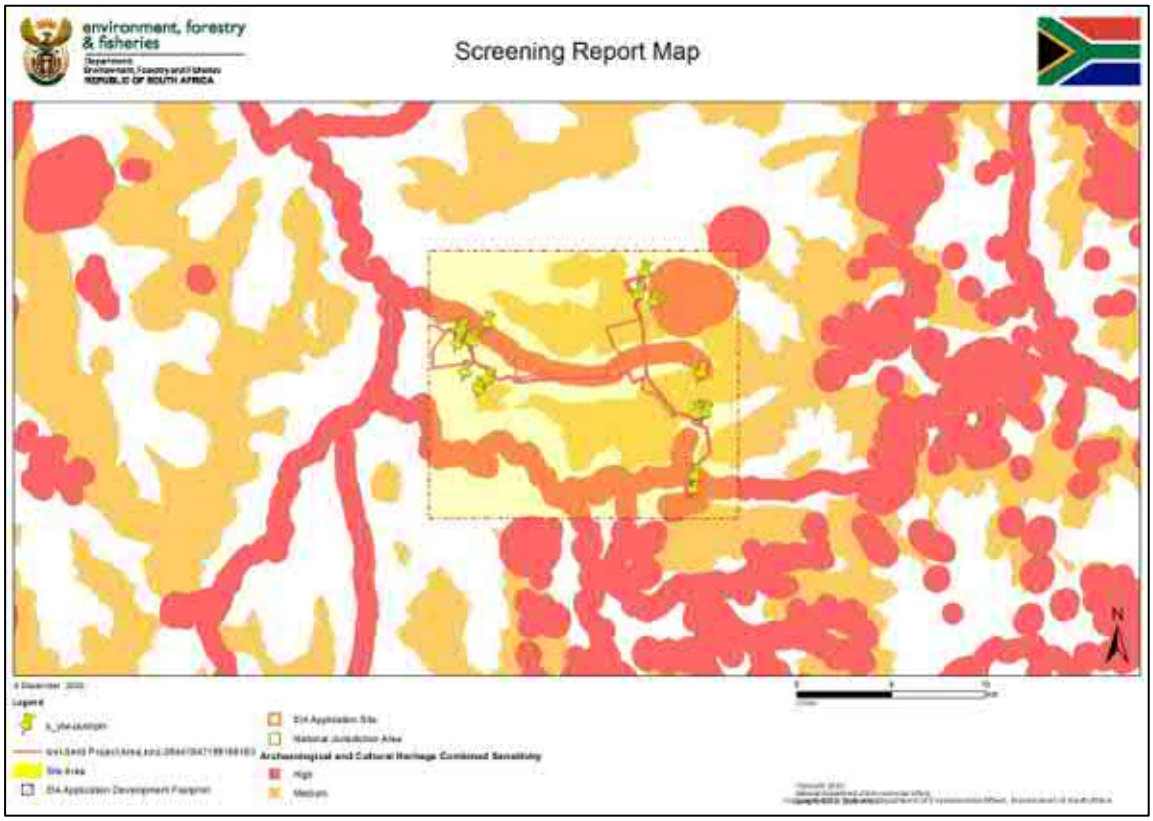

Figure 2 - Environmental screening tool - archaeological and heritage sensitivity that includes the Seriti - Arnot Water Treatment Plant project area.

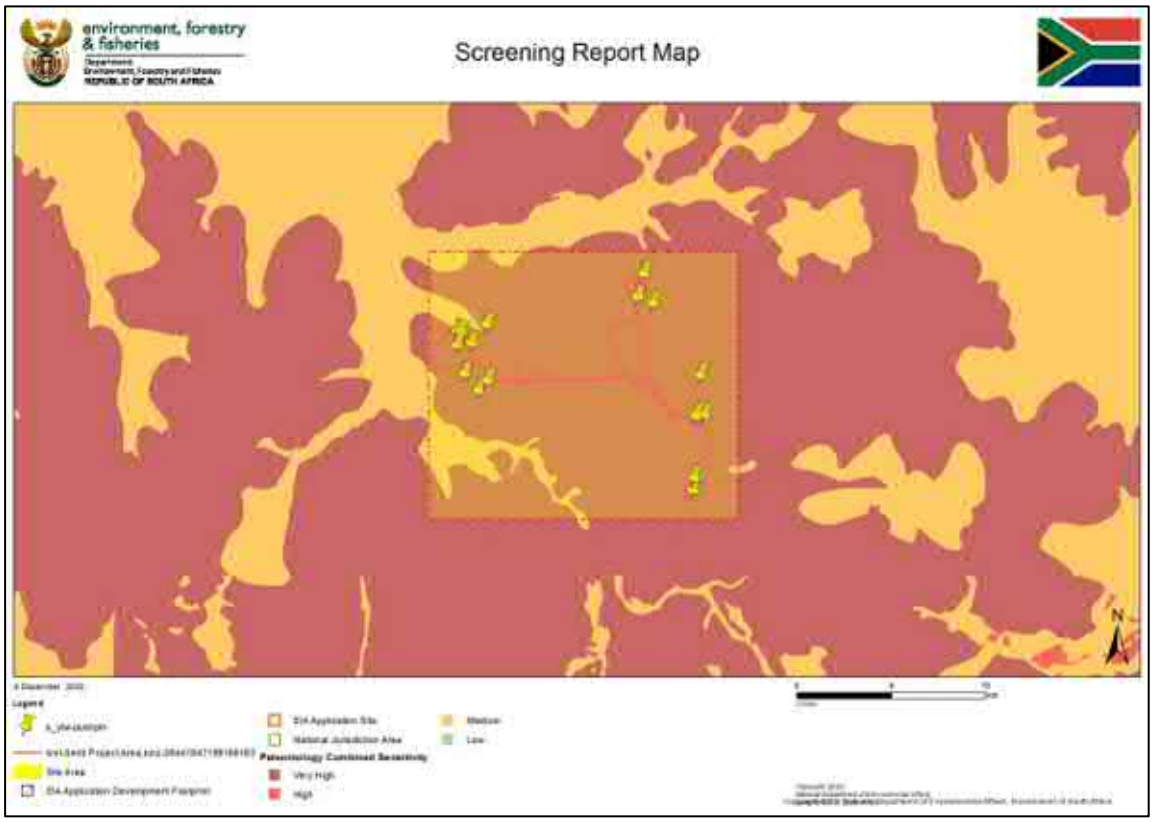

Figure 3 - Environmental screening tool - palaeontological sensitivity that includes the Seriti -Arnot Water Treatment Plant project area.

2 PROJECT DESCRIPTION

2.1 Site Location

Study Area Coordinates -	Northernmost point: S 25.871955 E 29.756740	Easternmost point: S 25.948951 E 29.785515
	Southernmost point: S 25.968206 E 29.773269	Westernmost point: S 25.912808 E 29.652665
Location	Rietkuil is located on the south-eastern end of the study area. The study area is also approximately 23.6km south-east of Middelburg and 33.8km south-west of Belfast. It is located in the Steve Tshwete Local Municipality and Nkangala District Municipality and is situated in the Mpumalanga Province.	
Property	The study area is located on the farms Mooifontein 448 JS, Tweefontein 458 JS, Bosmansspruit 459 JS, Kwaggafontein 460 JS, Braamspruit 465 JS and Rietkuil 491 JS.	
Topographic Map	2529DC and 2529DD	

2.2 Project Description

The following information was provided by Zutari.

Arnot Opco has recently taken over the underground mining area and two small opencast sections previously owned by Exxaro, all of which are in in the process of closing. Seriti manages care and maintenance at the large opencast section which ceased operations in 1992. The Seriti pits have been under care and maintenance since closing down. Since the ceasing of mine operations in 1992, mine-affected water decants from the mine into various locations and this water needs to be managed as part of the Seriti and Arnot Opco mine closure liabilities.

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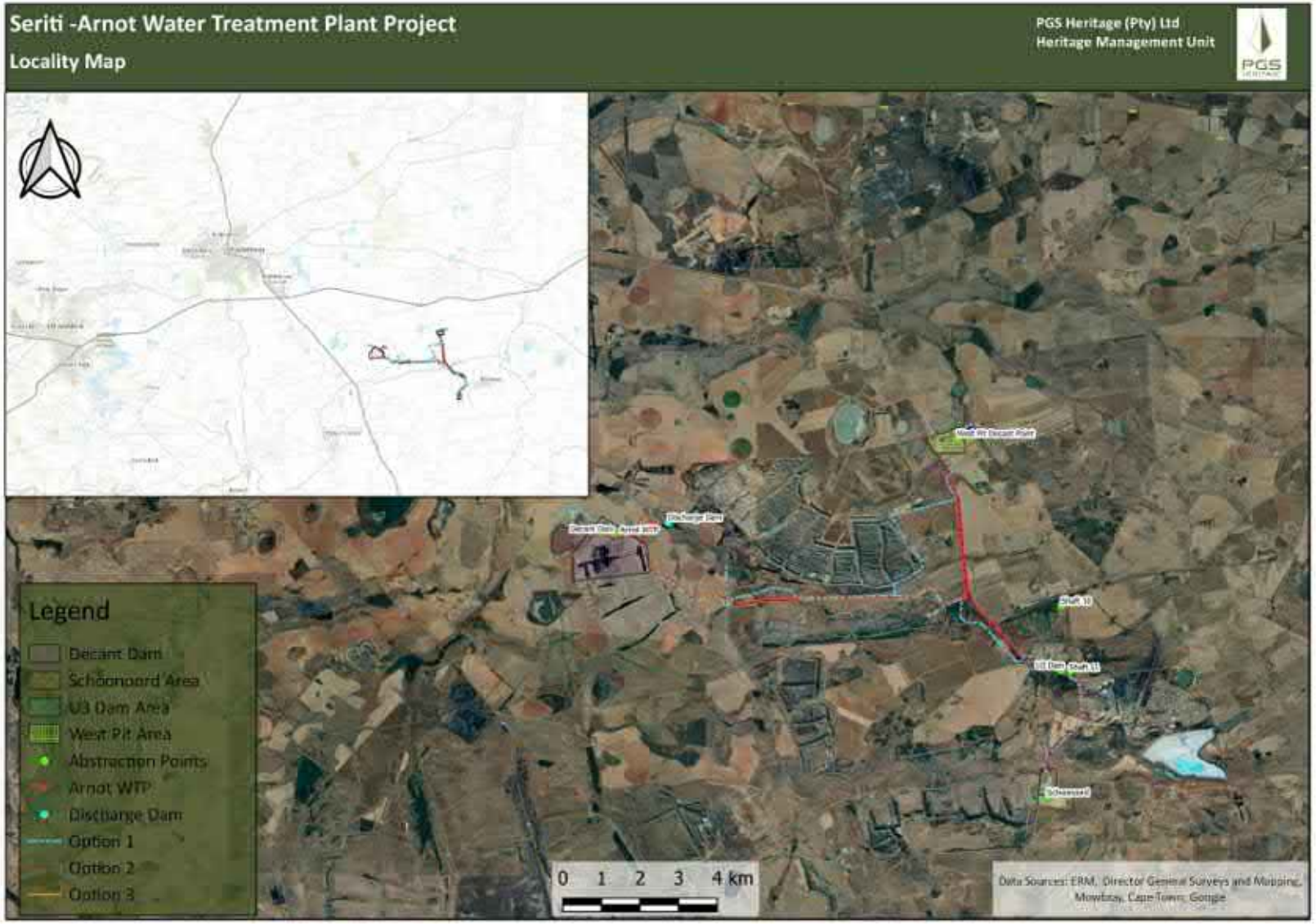


Figure 4 – General location of the proposed Seriti - Arnot Water Treatment Plant Project.

3 METHODOLOGY

3.1 Methodology for Assessing Heritage Site Significance

The HIA process consisted of three steps:

Step I – Desktop Study: An archaeological and historical background study was undertaken using available sources. Previous archaeological and heritage studies from the study area and surroundings were also accessed using inter alia the SAHRIS of SAHRA. Furthermore, an assessment was made of the early editions of the relevant topographic maps.

Step II – Physical Survey: The fieldwork comprised intensive field surveys of the study area undertaken primarily by foot over the course of a number of days by an experienced fieldwork team from PGS. This fieldwork team consisted of an archaeologist (Cherene de Bruyn) and a field assistant (Coenie Nienaber). The fieldwork was conducted from Tuesday, 1 December to Thursday, 3 December 2020.

Step III – The final step involved the recording and documentation of relevant heritage resources, the assessment of resources in terms of the heritage impact assessment criteria and report writing as well as mapping and recommendations.

The significance of heritage sites was based on five main criteria:

- site integrity (i.e. primary vs. secondary context),
- amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
    - Low - <10/50m²
    - Medium - 10-50/50m²
    - High - >50/50m²
- uniqueness and
- the potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

A - No further action necessary;
B - Mapping of the site and controlled sampling required;
C - No-go or relocate development position
D - Preserve site, or extensive data collection and mapping of the site; and
E - Preserve site

Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report (see table below).

Table 3 - Site significance classification standards as prescribed by SAHRA

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	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High/Medium	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium	Recording before destruction
Generally Protected C (GP.C)	-	Low	Destruction

3.2 Methodology for Impact Assessment

The methodology for impact assessment outlined here was provided by Zutari. The assessment of the significance of impacts for a proposed development is by its nature a matter of judgement. To deal with the uncertainty associated with judgement and ensure repeatable results, Zutari rates impacts using a standardised and internationally recognised methodology.

For each predicted impact, criteria are applied to establish the **significance** of the impact based on likelihood and consequence, both without mitigation being applied and with the most effective mitigation measure(s) in place.

The criteria that contribute to the **consequence** of the impact are **intensity** (the degree to which pre-development conditions are changed); the **duration** (length of time that the impact will continue); and the **extent** (spatial scale) of the impact. The sensitivity of the receiving environment and/or sensitive receptors are incorporated into the consideration of consequence by appropriately adjusting the thresholds or scales of the intensity, duration and extent criteria, based on expert knowledge. For each impact, the specialist applies professional judgement to ascribe a numerical rating for each criterion

according to the examples provided in **Tables 4 - 6** below. The consequence is then established using the formula:

Consequence = intensity x (+ duration + extent)

Depending on the numerical result, the impact's consequence would be defined as either extremely, highly, moderately or slightly detrimental; or neutral; or slightly, moderately, highly or extremely beneficial. These categories are provided in **Table 8**.

To determine the significance of an impact, the **probability** (or likelihood) of that impact occurring is also taken into account. In assigning probability, the specialist takes into account the likelihood of occurrence but also takes cognisance of uncertainty and detectability of the impact. The most suitable numerical rating for probability is selected from **Table 7** below and applied with the consequence according to the following equation:

Significance = consequence x probability

When assigning a **probability** to an impact, it is vitally important to distinguish this from the concepts of **frequency and confidence,** with which it is sometimes confused.

- **Probability** refers to the likelihood that an impact will occur.
- **Frequency** refers to the regularity with which an impact occurs. To illustrate the difference between frequency and probability, it must be considered that something that happens infrequently may still be a certainty (i.e. have a high probability). For instance, Halley's Comet only comes close to the sun every 75 to 76 years (i.e. it has a very low frequency), but it is still a certainty. Table 8 refers to the degree of certainty of a prediction. Confidence may be related to any of the impact assessment criteria (extent, intensity, duration or probability) and is not necessarily only related to probability. Confidence may be influenced by any factors that introduce uncertainty into a prediction.

Depending on the numerical result of this calculation, the impact would fall into a significance category of negligible, minor, moderate or major, and the type would be either positive or negative. Examples of these categories are provided in **Table 9**.

Once the significance of an impact occurring without mitigation has been established, the specialist must apply his/her professional judgement to assign ratings for the same impact after the proposed mitigation has been implemented. The tables on the following pages show the scales used to classify the above variables and define each of the rating categories.

Table 4 - Definition of Intensity Ratings.

Rating	Criteria	
	Negative impacts (-)	**Positive impacts (+)**
Very high (-/+ 4)	Very high degree of damage to natural or social systems or resources. These processes or resources may restore to their pre-project condition over very long periods of time (more than a typical human life time).	Great improvement to ecosystem or social processes and services or resources.
High (-/+ 3)	High degree damage to natural or social system components, species or resources.	Intense positive benefits for natural or social systems or resources.
Moderate (-/+ 2)	Moderate damage to natural or social system components, species or resources.	Average, on-going positive benefits for natural or social systems or resources.
Low (-/+ 1)	Minor damage to natural or social system components, species or resources. Likely to recover over time. Ecosystems and valuable social processes not affected.	Low positive impacts on natural or social systems or resources.
Negligible (0)	Negligible damage to individual components of natural or social systems or resources, such that it is hardly noticeable.	Limited low-level benefits to natural or social systems or resources.

Table 5 - Definition of Duration Ratings.

Rating	Criteria
2	**Long-term**: The impact will continue for 6-15 years.
1	**Medium-term:** The impact will continue for 2-5 years.
0	**Short-term:** The impact will continue for between 1 month and 2 years.

Table 6 - Definition of Extent Ratings.

Rating	Criteria
2	**Regional**: The impact will affect the entire region.
1	**Local:** The impact will extend across the site and to nearby properties.
0	**Site specific:** The impact will be limited to the site or immediate area.

Table 7 - Definition of Probability Ratings.

Rating	Criteria
4	**Certain/ Definite:** There are sound scientific reasons to expect that the impact will definitely occur.
3	**Very likely:** It is most likely that the impact will occur.
2	**Fairly likely:** This impact has occurred numerous times here or elsewhere in a similar environment and with a similar type of development and could very conceivably occur.
1	**Unlikely:** This impact has not happened yet but could happen.
0	**Very unlikely:** The impact is expected never to happen or has a very low chance of occurring.

Table 8 - Application of Consequence Ratings.

Rating	Consequence rating
-8	Extremely detrimental
-7 to -6	Highly detrimental
-5 to -4	Moderately detrimental
-3 to -2	Slightly detrimental
-1 to 1	Negligible
2 to 3	Slightly beneficial
4 to 5	Moderately beneficial
6 to 7	Highly beneficial
8	Extremely beneficial

Table 9- Application of Significance Ratings.

Rating	Significance rating
-4	Very high - negative
-3	High - negative
-2	Moderate - negative
-1	Low - negative
0	Very low
1	Low - positive
2	Moderate - positive
3	High - positive
4	Very high - positive

Despite attempts at ensuring objectivity and impartiality, the environmental assessment remains an act of judgement and can never escape the subjectivity inherent in attempting to define significance. The determination of the significance of an impact depends on context (spatial and duration) and intensity of that impact. Since the rationalisation of context and intensity will ultimately be prejudiced by the observer, there can be no wholly objective measure by which to judge the components of significance, let alone how they are integrated into a single comparable measure.

This notwithstanding, in order to facilitate informed decision-making, environmental assessments must endeavour to come to terms with the significance of the environmental impacts. Recognising this, Zutari has attempted to address potential subjectivity in the current ESIA process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above;
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the specialist to come to terms with the various facets that contribute to significance (thereby avoiding arbitrary assessment), but also provides the reader with a clear summary of how the specialist derived the significance;
- Wherever possible, differentiating between the significance of potential environmental impacts as experienced by the various affected parties; and
- Utilising a team approach and internal review of the assessment to facilitate a rigorous and defendable system.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

The specialists appointed to contribute to this impact assessment have empirical knowledge of their respective fields and are thus able to comment on the confidence they have in their findings based on the availability of data and the certainty of their findings. Example is provided in **Table 10** below.

Table 10 - Definition of Confidence Ratings.

Rating	Criteria
Low	Judgement is based on intuition and there some major assumptions used in assessing the impact may prove to be untrue.
Medium	Determination is based on common sense and general knowledge. The assumptions made, whilst having a degree of uncertainty, are fairly robust.
High	Substantive supportive data or evidence exists to verify the assessment.

4 CURRENT STATUS QUO

During the fieldwork, the study area was found to be located in a landscape that is generally level. The fieldwork also revealed that the vast majority of the development footprints overlay highly disturbed terrain. Overall, the accessibility of the project footprint area was fairly good. Visibility of the site was limited due to the grassy vegetation, wetlands, and previous agricultural and mining activities that have disturbed the area. The northern section of the project area is located around the Seriti water pits and dams, as well as the agricultural fields and chicken houses of Alzu. The middle section of the project area is located close to the Optimum Coal mine dump. The eastern section of the project area is characterised by several agricultural fields as well as the Arnot Opco Coal mine and the Arnot Power Station.

According to the National Vegetation Map of South Africa, the study area is located within the vegetation type known as the Eastern Highveld Grassland. This vegetation type is characterised by "…s*lightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition (Aristida, Digitaria, Eragrostis, Themeda, Tristachya etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (Acacia caffra, Celtis africana, Diospyros lycioides subsp lycioi¬des, Parinari capensis, Protea caffra, P. welwitschii and Rhus magalismontanum)"* (Mucina & Rutherford, 2006*;* Sanbi, 2020).

In terms of geology and soils, the site characterised by "…*red to yellow sandy soils of the Ba and Bb land types found on shales and sandstones of the Madzaringwe Formation (Karoo Supergroup…*" (Sanbi, 2020).

Existing surrounding land uses associated with the project area include a combination of:

- Mining infrastructure;
- Agricultural activities; and
- Electricity lines

Several photographs below provide general views of the study area and the landscape within which it is located. See **Figures 3 - 16** below.

Figure 5 - Google Street View image depicting the main access road to the site via the route to the Arnot Power Station.

Figure 6 – General view of a section of the study area. Several power lines, such as the one depicted here, are found throughout the area.

Figure 7 - Several agricultural fields are found throughout the project area. In the western section of the study area, many of the agricultural activities can be associated with Alzu.

Figure 8 – General view of a section of the study area. Several small dams are found throughout the project area.

Figure 9 – General view of a section of the study area. Several wetlands, such as the one depicted here, are found throughout the project area.

Figure 10 – General view of a section of the study area showing an area where the pipeline runs through the Optimum Mine property. No heritage significant features were observed.

Figure 11 - View of the mine dump of Optimum Coal located in the middle of the project area.

Figure 12 - View of area to the east of the Optimum Coal mine dump. As can be seen from this photograph, this area had been disturbed by mining activity. Option 1 of the proposed pipeline development will pass through here.

Figure 13 - View of the Arnot Power Station located in the southern section of the project area.

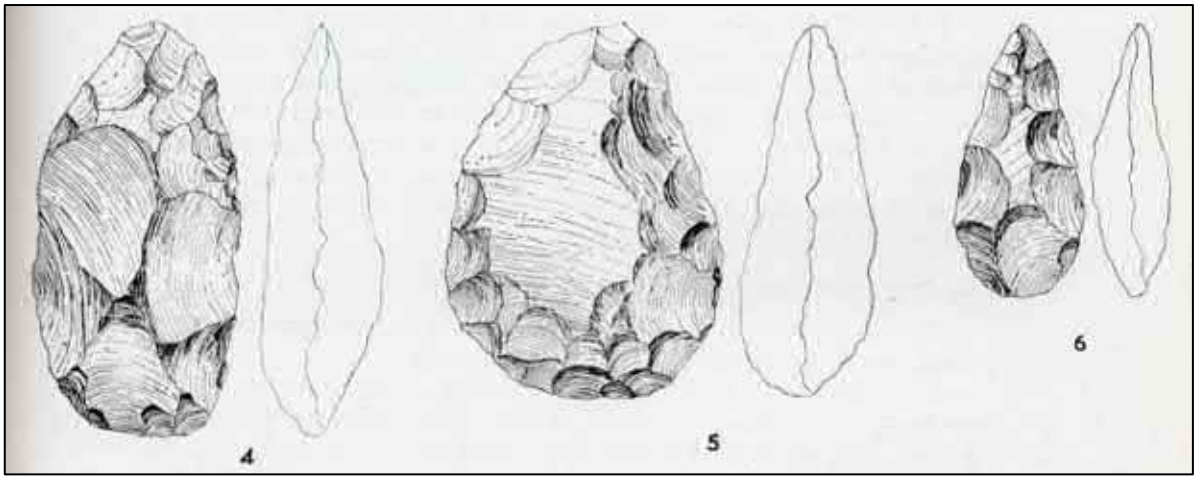
Figure 14 - In several sections, such as the area depicted on this photograph, the proposed pipelines run along existing conveyor belts.

Figure 15 - The proposed pipelines run along existing buildings and roads located within the Arnot Opco property. No heritage significant features were observed.

Figure 16 - View of the monitoring borehole located south of the Arnot Power station. No heritage features were observed.

5 DESKTOP STUDY FINDINGS

5.1 Archaeological and Early Historical Overview of the Study Area and Surroundings

DATE	DESCRIPTION
The Study Area and Surroundings during the Stone Age	
The South African Stone Age is the longest archaeologically-identified phase identified in human history and lasted for millions of years. Although this area would have been well suited for human habitation over the last 1.7 million years, very little information is known about especially the Stone Age history of the area and its surroundings. This can likely be attributed to a lack of research focus in this area over the past half a century or more and does not necessarily mean that no such sites exist here.	
2.5 million to 250 000 years ago	The Earlier Stone Age is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these technological phases is known as Oldowan which is associated with crude flakes and hammerstones and dates to approximately 2 million years ago. The second technological phase in the Earlier Stone Age of Southern Africa is known as the Acheulian and comprises more refined and better-made stone artefacts such as the cleaver and bifacial handaxe. The Acheulian phase dates back to approximately 1.5 million years ago. No information with regard to Early Stone Age sites from the surrounding area could be found. However, it seems possible for such sites to exist here.
 *Figure 17 – Example of Early Stone Age Later Acheulian handaxes. These handaxes were identified at Blaaubank near Rooiberg. Cropped section of an illustration published in Mason (1962:199).*	
250 000 to 40 000 years ago	The Middle Stone Age (MSA) dates to between 250 000 to 40 000 years BP. MSA dates of around 250 000 BP originate from sites such as Leopards Kopje in Zambia, while the late Pleistocene (125 000 BP) yields a number of important dated sites associated with modern humans (Deacon & Deacon, 1999). The MSA is characterised by flake and blade industries, the first use of grindstones, wood and bone artefacts, personal ornaments, use of red ochre, circular hearths and hunting and gathering lifestyle. While no MSA sites are known from the study area or surroundings, low-density surface scatters of MSA material are known from areas closer to Ogies and Emalahleni (CRM Africa & Matakoma, 2001) (Birkholtz & De Bruyn, 2020).
40 000 years ago to the historic past	The Later Stone Age (LSA) is the third phase identified in South Africa's Stone Age history. This phase in human history is associated with an abundance of

	very small stone artefacts or microliths. Several surface occurrences of LSA materials are likely to be found around the general vicinity of the study area. Unfortunately, these are expected to be in the form of surface material which has been eroded out of dongas and riverbeds. While no LSA sites are known from the study area and immediate surroundings, LSA sites, including rock paintings, are known from the farm Groenvlei located roughly 5km east of Carolina (Van Niekerk, 1984) (Bergh, 1999). These sites are located approximately 41km south-east of the present study area.
The Study Area and Surroundings during the Iron Age	
The arrival of early farming communities during the first Millenium heralded in the start of the Iron Age for South Africa. The Iron Age is that period in South Africa's archaeological history associated with pre-colonial farming communities who practised cultivation and pastoralist farming activities, metalworking, cultural customs such as lobola and whose settlement layouts show the tangible representation of the significance of cattle (known as the Central Cattle Pattern) (Huffman, 2007). The Southern African Iron Age can be divided into an Early Iron Age (AD 200 – AD 900), Middle Iron Age (AD 900 – AD 1300) and Late Iron Age (AD 1300 – AD 1840) (Huffman, 2007). Maggs (1976) opines that the Highveld areas of Mpumalanga were not occupied by the EIA due to the existing environment. The extensive grassland endemic to this area was of little value to their economy as they were dependent on slash-and-burn (swidden) agriculture. Radiocarbon dating from pottery places the EIA in the first millennium (Evers 1977); however, the land became valuable only when LIA populations had increased livestock numbers to the point that they formed a principal resource. It is during this time that the LIA populations would have migrated to the high grasslands of the Highveld to take advantage of the open grazing lands (Hall 1987). Delius (2007) mentions that from around the beginning of the sixteenth century, LIA communities would have migrated to Mpumalanga during times of climate shift and political instability. At around 1640, during a warmer phase within the Little Ice Age, the population growth showed a considerable increase. As the population increased, the frequency of interactions dealing with land and resources between various groups also intensified. A screening of the available Google Earth imagery was made. While no LIA stone walled settlements are evident from within the study area and its direct surroundings, large numbers of such settlements start appearing west of eMakhazeni (Belfast), approximately 26km north-east of the present study area.	
AD 1700 – AD 1840	The Buispoort facies of the Moloko branch of the Urewe Tradition is the first association of the study area's surroundings with the Iron Age. It is most likely dated to between AD 1700 and AD 1840. The key features on the decorated ceramics of this facies include rim notching, broadly incised chevrons and white bands, all with red ochre (Huffman, 2007). Buispoort can be associated with the Western Sotho-Tswana, including the Hurutshe and Kwena, and the settlement layouts of Buispoort sites are known as Molokwane-type walling (Huffman, 2007). According to the map published by Huffman (2007:203), the present study area is located on the far eastern edge of the known distribution of Buispoort facies sites and settlements.
AD 1821 – AD 1823	After leaving present-day KwaZulu-Natal the Khumalo Ndebele (more commonly known as the Matabele) of Mzilikazi migrated through the general vicinity of the study area under discussion before reaching the central reaches of the Vaal River in the vicinity of Heidelberg in 1823 (www.mk.org.za). Two different settlement types have been associated with the Khumalo Ndebele. The first of these is known as Type B walling and was found at Nqabeni in the Babanango area of KwaZulu-Natal. These walls stood in the open without any military or defensive considerations and comprised an inner circle of linked cattle enclosures (Huffman, 2007). The second settlement type associated with the Khumalo Ndebele is known as Doornspruit, and comprises

	a layout which from the air has the appearance of a 'beaded necklace'. This layout comprises long scalloped walls (which mark the back of the residential area) which closely surround a complex core which in turn comprises a number of stone circles. The structures from the centre of the settlement can be interpreted as kitchen areas and enclosures for keeping small stock. It is important to note that the Doornspruit settlement type is associated with the later settlements of the Khumalo Ndebele in areas such as the Magaliesberg Mountains and Marico and represent a settlement under the influence of the Sotho with whom the Khumalo Ndebele intermarried. The Type B settlement is associated with the early Khumalo Ndebele settlements and conforms more to the typical Zulu form of settlement. As the Khumalo Ndebele passed through the general vicinity of the study areas shortly after leaving Kwazulu-Natal, one can assume that their settlements here would have conformed more to the Type B than the Doornspruit type of settlement. It must be stressed however that no published information could be found which indicates the presence of Type B sites in the general vicinity of the study area.

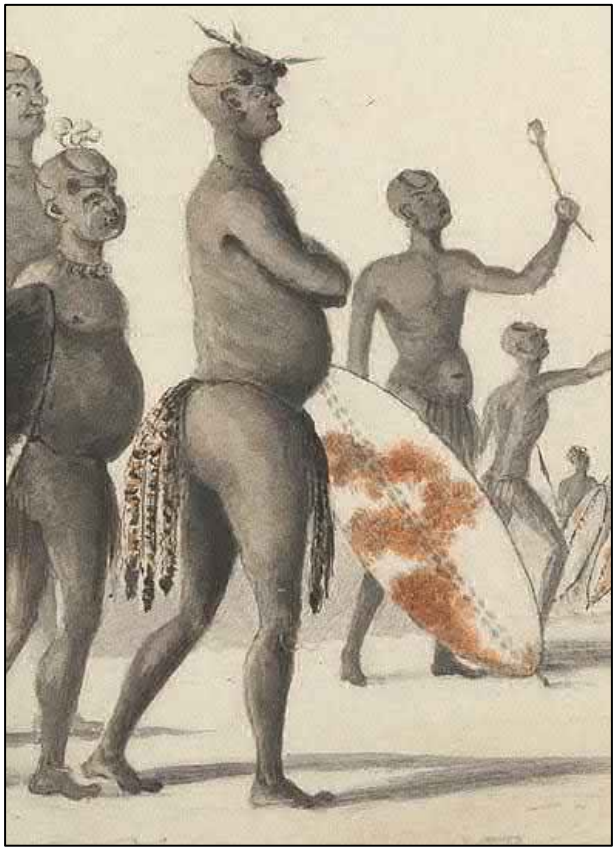


Figure 18 - King Mzilikazi of the Matabele. This depiction was made by Captain Cornwallis Harris in c. 1838 (www.sahistory.org.za).

The Study Area and Surroundings during the Early Historical Period	
The early Historical Period within the study area and surroundings were characterised by the arrival of newcomers to this area. The first arrivals would almost certainly have been travellers, traders, missionaries, hunters and fortune seekers. However, with time, this initial trickle was replaced by a flood of white immigrants during the 1830s, when mass migration of roughly 2 540 Afrikaner families (roughly 12 000 individuals) from the Cape Colony's frontier zone to the interior of Southern Africa took place. The people who took part in this Great Trek were later known as Voortrekkers (Visagie, 2011).	
1836	The first Voortrekker parties crossed over the Vaal River (Bergh, 1999).

1845	Both the district and town of Lydenburg was established in this year (Bergh, 1999). The study area fell within the Lydenburg district at the time.
The 1850s - 1860s	This period saw the early establishment of farms by white farmers in the general vicinity of the study area. The archival research undertaken for this study has shown that all the farms associated with the study area were formally inspected by SP Botha during the year 1868. It seems likely for SP Botha to have been the local *veldkornet* or commandant. Available archival references suggest that he was at one time a member of the *Volkskraad* of the Z.A.R. The archival record shows that the farms Mooifontein 448 JS and Tweefontein 458 JS were both inspected on 24 January 1868, whereas the farm Bosmansspruit 459 IS was first inspected on 17 March 1868 (National Archives, RAK, 2926). While these inspection dates indicate when these farms were officially proclaimed and registered with the government of the day, these dates do not necessarily mean that none of these farms was already settled and farmed before these inspection dates. The permanent settlement of white farmers in the general vicinity of the study area would have resulted in the proclamation of individual farms and the establishment of permanent farmsteads. Features that can typically be associated with the early farming history of the area include farm dwellings, sheds, rectangular stone kraals and cemeteries. The other sites often associated with these early farms are graves and cemeteries for farmers and farm workers, and their respective families. These sites are often all that remains of the farmsteads of the mid to late nineteenth century. This may be due to their age as well as the destruction of farmsteads by the British forces during the South African War in accordance with the so-called 'scorched earth' policy.

Figure 19 – This engraving by T. Wangeman depicts the mission station at Botshabelo during the early years of its existence (Delius & Hay, 2009:70).

1865	A Berlin Missionary Society station was established at Botshabelo (Place of Refuge) in 1865 by the Reverend Alexander Merensky (Erasmus, 2014). The mission station is located roughly 32km north-west of the present study area.
1866	Although a village had been established on the farms Klipfontein and Keerom in c. 1859, the site of this village was not popular with the local community. The village was subsequently moved to the adjoining farm Sterkfontein, where a town was formally laid out in 1866. Although the new town was named Nazareth, this name was changed to Middelburg in 1874. The name Middelburg was chosen as the new town was located between Pretoria and Lydenburg (Erasmus, 2014).
1872	The study area now fell within the district of Middelburg (Bergh, 1999). During the same year, the general surroundings of the study area were visited by a geologist from Eastern Europe, Woolf Harris. During his visit, Harris identified coal in the Van Dyksdrift area. He is also believed to have started the Maggie's Mine the following year (Falconer, 1990).
1872 – 1894	During this time a number of small coal mining operations were started in the general vicinity of the study area. With no railway line connecting this area with the coal markets further to the west, these early coal mines proved a difficult commercial undertaking. Four coal mines were in existence in the Witbank area by 1889, namely Brugspruit Adit, Maggie's Mine, Steenkoolspruit and Douglas (Falconer, 1990). Of these historic coal mines, the Douglas Mine was likely the closest to the present study area.

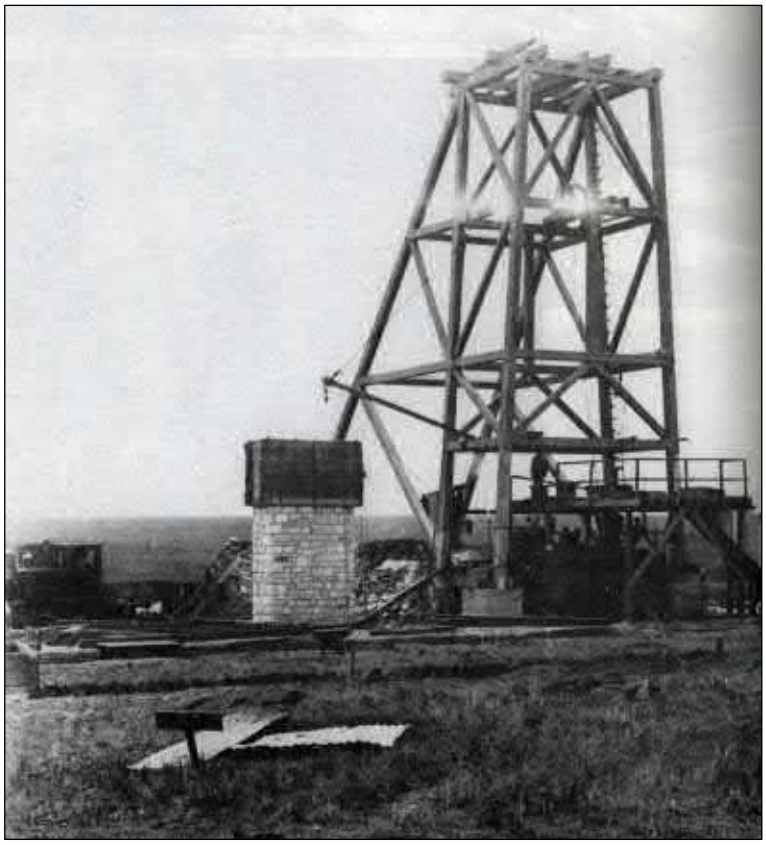


Figure 20 - Historic photograph of the coal mine at Brugspruit (Lang, 1995).

20 October 1894 – 2 November 1894	On this day the railway line between Pretoria and Delagoa Bay (present-day Maputo) was completed, with the last work on the line taking place near

	Balmoral. However, the symbolic completion of the line's construction took place at Brugspruit Station, where the last rail screw was fastened by President Paul Kruger on 2 November 1894 (De Jong, 1996). Brugspruit (later Clewer) Station was located 51km west of the present study area. The completion of the NZASM Eastern Line, as it was known, was very significant for the study area and surroundings. This is due to the fact that the vast deposits of coal known to have existed in this area since the mid 19th century, could now be commercially mined (Bulpin, 1989) and easily transported to the Witwatersrand gold mines and the populated centres of Pretoria and Johannesburg where it was most required. As a result, the completion of the Eastern Line created a massive stimulus not only for the mining of coal but also for the establishment of coal mines. As will be seen below, a number of coal mines were established in the years following on the completion of the Eastern Line.
30 June 1890	The town of Belfast (present-day Emakhazeni) was established on 30 June 1890 on the farm Tweefontein. This event followed on the late 1880s, when the numbers of farmers in the area began to increase and the need for a town was felt. During 1889, the community asked Richard Charles O'Neil to request the government of the Z.A.R. to establish a new town on his farm. When asked what the name of the new town should be, Richard Charles O'Neil proposed the name 'Belfast' in honour of his grandfather (also Richard Charles O'Neil) who was born in Belfast, Northern Ireland. According to Van der Merwe (1952), three main reasons can be given why it was decided that the farm Tweefontein would be best suited for a new town. These are: • On 16 December 1886 a monument was officially opened on the farm to commemorate the Battle of Blood River. The monument soon became the place where local farmers could gather during special events or festivals; • A strong need was felt for the establishment of a church roughly in the middle between the towns of Middelburg and Lydenburg. The farm Tweefontein fitted this requirement; and • The discovery of coal and subsequent establishment of a number of coal mines all around the farm Tweefontein meant that a town on this farm would be centrally located within this wider mining area. The first survey work for the town was undertaken in 1889 by Peter Macdonald, and on the 30 July 1890 the town was officially proclaimed by President Paul Kruger. Of the original 888 surveyed stands, 575 were given to R.C. O'Neil as the owner of the farm (Van der Merwe, 1952).
1895	According to Schalekamp (2006), the Landau Colliery was established in 1895 by the Cassel Coal Company on the farm Klipfontein to supply coal to the gold mines along the Witwatersrand. If this date is correct, it would mean that the Landau Colliery was the earliest coal mine to be established in the wider surroundings of the present study area. However, other sources such as the South African Mining Yearbook of 1911 indicate that the Cassel Coal Company was registered in August 1895 as a reconstruct of the Cassel Colliery Company Limited. According to this source, the property of the Cassel Coal Company at the time of its registration was restricted to sections of a farm near Springs. In November 1898 the Cassel Coal Company resolved to acquire the property and assets of Landau's Transvaal Colliery comprising 26 860 acres on the farms Klipfontein, Klippan,

	Kleinkopje, Wolvekrans and Blaauwkrans. This means that the Cassel Coal Company became involved in properties near Emalahleni in November 1898.
1896	Various references, including available archival sources, suggest that the Douglas Colliery was already in existence in 1896. For example, in a letter dated 18 September 1896, Mosenthal Wolff & Company requests a permit to transport dynamite to the Douglas Colliery (National Archives, SS, R12934/96). This mine was located approximately 37.6km south-west of the present study area.
The Study Area and Surroundings during the South African War	
The South African War (also known as the Anglo Boer War) between Great Britain and her allies and the Boer Republics of the Transvaal (known as the *Zuid-Afrikaansche Republiek*) and Free State took place between October 1899 and May 1902. A number of skirmishes and battles associated with the war are known from the surroundings of the study area. These will be discussed in more detail below.	
August 1900 – 14 May 1901	The compensation claims submitted by residents and owners of farms after the cessation of hostilities provide at least some indication for the movement of troops and armies across the study area and direct surroundings during the war. In the claim submitted by Jozua Francois van Eeden (CJC, 983, 384), he indicates that British troops visited the farm Bosmansspruit on two occasions. In August 1900, the farm was visited by Major General JPD (John) French's column. During the visit, one buckwagon, a chain for harnessing oxen as well as a yoke were destroyed by the troops. The next visit took place on the 14 May 1901, when troops under the command of General W. Kitchener destroyed the farmhouse and storeroom and took or destroyed numerous pieces of furniture and objects from the house. Examples of these stolen or destroyed items include a clock, telescope, medicine chest and bath. A number of farm animals were also taken. See below for more information on this date.
April – August 1901	Between April and August 1901, numerous skirmishes and engagements took place between British forces (predominantly associated with the Western Australian 5th and 6th Contingents) and Boer commandos. The movement of the British Column can be tracked through the following dates and places: • Movement of British Column from Middelburg to the farm Rondebosch (12 May 1901) (this farm is located 13.7km west of the study area); • A skirmish takes place on the farm Bosmansspruit (14 May 1901); • The Australian forces establish a camp on the farm Tweefontein; • Battle of Brakpan (16 May 1901) (approximately 6.1km south of the study area); and • Engagement at Wilmansrust (12 June 1901) (approximately 27.7km south-west of the study area) (Fourie, 2016). Two items from this list were located on farms associated with the study area. According to information that was provided by Ms. Corine de Jonge to PGS during a previous Heritage Impact Assessment (Fourie, 2016), the camp located on the farm Tweefontein was situated approximately 900m east of the closest point along any of the development footprints currently proposed. The exact position of the skirmish of 14 May 1901 is not presently known.
May 1902	According to the claim submitted by Jozua Francois van Eeden (CJC, 983, 384), a Boer commando visited the farm Bosmansspruit during May 1902. During the visit, numerous bags of maize were taken.

5.2 Farm Ownership Histories

5.2.1 Mooifontein

The farm Mooifontein 448 JS (old number 211) was first inspected on 24 January 1868 by SP Botha and was transferred to its first owner Petrus Johannes van Wijngaard on 16 July 1869. It was transferred from Van Wijngaard to Christina Johanna Hendrikz (assisted by her husband Hendrik Foke Hendrikz) on 13 September 1869. On the very same day (13 September 1869), the farm was first transferred to Samuel Christiaan George Wemmer and then to Samuel Veith Oertel. Oertel remained in possession of the farm for just under nine years when on the 26th of July 1888, it was transferred to Andries Stephanus Ecksteen. On the 23rd of July 1891, the farm was transferred from AS Ecksteen to Richard Charles O'Neil (RAK, 2926). According to his estate papers, R.C. O'Neil was still in possession of the farm when he died on the 25th of August 1922 (MHG, 49639).

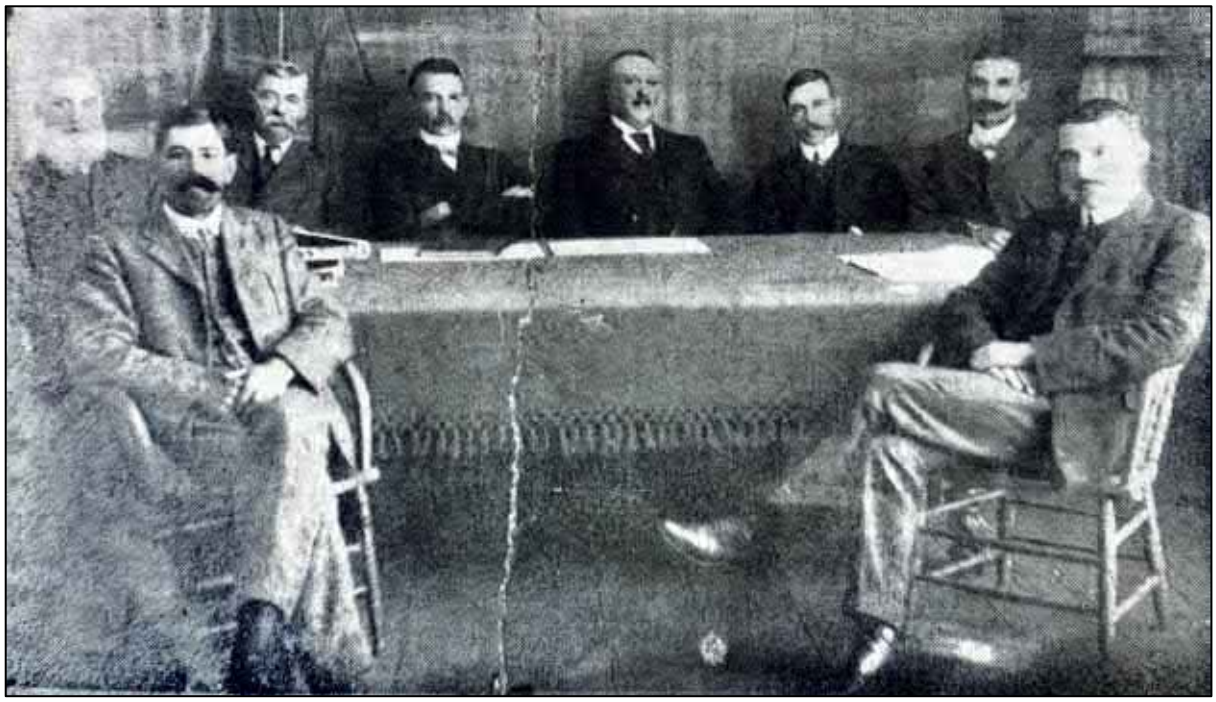


Figure 21

The top image depicts the only photograph of Richard Charles O'Neil that could be located. It was taken in 1911 and shows the Belfast Town Council in sitting. RC O'Neil is the fifth figure from the left. He is also shown in the cropped and enlarged image depicted on the left (Van der Merwe, 1952:55).

Richard Charles O'Neil was born in Smithfield (in the present-day Free State Province) on 23 August 1850. He was the second child of John James and Magdalena Catharina O'Neil. Although exact details are absent, it would appear that after leaving the Free State, the family resided for a number of years in the vicinity of Majuba Hill in present-day Kwazulu-Natal. In fact, the O'Neil family owned at least two farms in this area, namely Belfast and Mount Prospect. Incidentally, it was on the farm Mount Prospect that the farmhouse of John James O'Neil's younger brother (also named Richard Charles O'Neil) was located. This farmhouse became the infamous setting of the peace negotiations following the defeat of the British forces by the Boers at the Battle of Amajuba (26 February 1881) and is still known today as 'O'Neil's Cottage'.

In 1871, John James O'Neil decided to take his family out of Natal and travel further north into wilder more unexplored regions of Southern Africa. Rcihard Charles O'Neil was a young man of 22 at the time and accompanied his parents and siblings as they moved away from the areas surrounding Majuba Hill in present-day Kwazulu-Natal to eventually settle in present-day Mpumalanga in 1874. John James O' Neil established himself on the farm Klipfontein (exact position unknown, though it seems likely to be one of the two farms of this name directly south of Middelburg). Although he died on his farm in 1880, his children remained in the area and started acquiring their own farms. Richard Charles O'Neil was a good example of this. Between 1880 and his death in 1922, RC O'Neil accumulated large tracts of farmland and hundreds of stands in the towns of Belfast and Lydenburg. Ironically, it appears as if his first and last farm acquisitions were his most fruitful (O'Neil, n.d.) (Van der Merwe, 1952).

5.2.2 Bosmansspruit

The farm Bosmansspruit 459 JS (old number 259) was first inspected on the 17th of March 1868 by SP Botha. The farm was transferred to its first owner Jacob Stephanus Bosman on 30 December 1869. No further information with regards to the farm ownership history of Bosmansspruit could be located in the National Archives. According to Fourie (2016), the farm had been owned by the Bosman family from the date of its first registration until it was sold a few years go to Optimum Colliery.

5.2.3 Tweefontein

The farm Tweefontein 458 JS (old number 207) was first inspected on 24 January 1868 by SP Botha. The farm was transferred to its first owner Johannes Jacobus Pienaar on 16 July 1869.

5.3 General Aspects regarding the History of the Farms associated with the Study Area

5.3.1 Mooifontein and Pixley ka Isaka Seme

The archival research revealed that a person named Job Ngema rented the farm Mooifontein from

Richard Charles O'Neil for a year (Jus, 221, 3/1206/15). This lease agreement was signed on the 12th of April 1913 and stated that Ngema was to lease the farm from September 1913 to September 1914. In terms of the lease agreement, Ngema also had the option to buy the farm from O'Neil if he chose to.

On 29 October 1915, an application was lodged with the Governor-General of the Union of South Africa by the well-known Pretoria law firm Rooth & Wessels to obtain permission (in terms of Section 1 of the Natives Land Act) for Mooifontein to be bought be one P.K. Seme. After the application was refused, the applicants responded by stating that Ngema had passed his right to buy the farm (as per the lease agreement with O'Neil) on to P.K. Seme. In response to this, the Secretary for Justice, J. de Villiers Roos, compiled a legal opinion on the case and indicated that Ngema could not exercise the right of buying the farm as per his lease agreement if his lease period had already ended. According to the agreement, the lease ended on 21 September 1914. Another legal opinion was drafted by the Registrar of Deeds, Johannes Smuts. In this document, a detailed overview of the case was given. Amongst other things, this document indicated that Ngema had purchased the farm on the 20th of December 1913 for a sum of £20,079. Interestingly, this amount is considerably more than the £7,112 the farm was valued after O'Neil's death in 1922. Smuts concluded that for the farm to be registered in the deeds office in Ngema or Seme's name, approval would first be required from the Governor-General. As it is known that RC O'Neil was still in possession of Mooifontein when he died in August 1922, it can be assumed that the Governor-General never gave such an approval.

At face value, the above matter appears to be just one of many cases in which attempts by black people to own land were curtailed as a result of discriminatory policies and legislation at the time. However, the case has even more significance in that the individual referred to in the document as P.K. Seme can be none other than Pixley ka Isaka Seme (1 October 1881 – June 1951). Pixley ka Isaka Seme was a well-known lawyer and politician and a driving force behind the establishment of the South African Native National Congress and later the African National Congress.

After completing a Bachelor of Arts degree at Columbia University (April 1906), followed by a Bachelor of Civil Law at Jesus College, Oxford University (June 1909), Pixley ka Isaka Seme returned to the land of his birth South Africa in 1881. Although he started practising law, he soon became involved in politics. Due mainly to his ideas and inspiration, a meeting of black leaders and personalities from all over South Africa took place in Bloemfontein on the 8th of January 1912. At the meeting, the South African Native National Congress (SANNC) was established. Seme's influence at the meeting can be seen in the fact that he gave the keynote address and was also elected Treasurer-General. Incidentally, the South African Native National Congress changed its name to the African National Congress in 1923. In 1930 Pixley ka Isaka Seme was elected president of the African National Congress, a position he held until 1937 when he was replaced by ZR Mahabane. Pixley ka Isaka Seme died in June 1951 (www.anc.org.za).

Figure 22 - Pixley ka Isaka Seme (Reader's Digest, 1994:288).

Of more relevance for the present study is Pixley Seme's work to protect and promote black-owned farmland. In 1912 he was the driving force behind the establishment of the Native Farmer's Association of Africa Limited and became the organisation's chairman.

The main purpose of the organisation was to assist black communities in acquiring farms. Although various attempts were made to acquire properties, only three farms were eventually bought, namely Driefontein, Daggakraal and Driepan in the Wakkerstroom district of the then Eastern Transvaal (www.anc.org.za) (Delius & Hay, 2009).

It is evident that the attempt by Pixley ka Isaka Seme to buy Mooifontein from 1913 onward must have formed part of his activities as Chairman of the Native Farmer's Association of Africa Limited.

5.3.2 The Bosman and Van Eeden Families of the farm Bosmansspruit

5.3.2.1 The Bosman family

As the name suggests, the farm Bosmansspruit has always been associated with the Bosman family.

As mentioned before, the first owner of the farm was Jacob Stephanus Bosman, and the farm was transferred to him on the 30th of December 1869.

According to a Google Group on the Bosman family, Jacob Stephanus Bosman was born on 17 June 1818 at Vlaeberg near Stellenbosch. After his first wife died in 1851, Bosman married Johanna Philippina Magdalena Rossouw on the 9th of November 1852.

Although he started his farming activities at Bossiesveld near Worcester, Bosman later moved to the Transvaal with his family and settled in the place that was to be proclaimed as the farm Bosmansspruit on the 17th of March 1868. He died on the farm on 10 February 1882, and his wife passed away on 12 November 1911. Both Jacob Stephanus and Johanna Philippina Magdalena Bosman were buried on the farm (http://groups.yahoo.com/group/bosmansa/message/353).

The graves of members of the Bosman family (including the patriarch Jacob Stephanus Bosman) can be seen in a cemetery on the farm Bosmansspruit.

5.3.2.2 The Van Eeden family

The Van Eeden family also has a strong association with the farm Bosmansspruit. Tangible evidence for this can be seen in three historic cemeteries located on the farm Bosmansspruit containing the graves of members of the Van Eeden family.

Archival evidence for the association of the study area with this family also exists. The earliest archival evidence which could be found for a member of the Van Eeden family in the study area is the compensation claim for losses suffered during the South African War (1899-1902) that was submitted by Josua Francois van Eeden of the farm Bosmansspruit. In these documents, Van Eeden states that his house, storeroom, numerous pieces furniture, agricultural products as well as farm animals (including one pig, two horses and 30 sheep) were destroyed by a British force under the command of General W. Kitchener when they visited the farm on the 14th of May 1901. Van Eeden described his dwelling as a rectangular building (12m x 5m) with walls built from stone and raw (unfired) bricks. The house comprised three rooms, four doors and three windows and had a pitched corrugated iron roof. The storeroom was described as a rectangular structure (5m x 4m) with brick walls and a thatch roof (CJC, 983, 384).

Death certificates housed at the National Archives in Pretoria were obtained for a few members of the Van Eeden family whose details could be read during the study undertaken by PGS in 2016 from the headstones on Bosmansspruit. These individuals are Jozua Francois van Eeden (June 1834 - 13 October 1929) (MHG, 71091), Jacob Frederik van Eeden (January 1863 – 30 April 1952) (MHG, 379/64) and Gert Cornelius van Eeden (1881 – 15 March 1935) (MHG, 88051). From the dates associated with

these individuals, it immediately becomes apparent that numerous generations of the family were buried on the farm.

It is also interesting to note that the death certificate of Gert Cornelius van Eeden states that he was born in Potchefstroom in 1881 This seems to indicate that the Van Eeden family at the time resided in the Potchefstroom district. As with some of the other children's birth towns, this shows how the family migrated from the then Cape Colony over time and at some time before the start of the South African War in 1899 they moved to the Middelburg district.

5.3.3 The Bosmansspruit School

A farm school was established on the farm Bosmansspruit during 1897 or 1898. The school came about because of the efforts of the farm owner Jacob Stephanus Bosman, the son of the Bosman patriarch discussed above (OD, OR11490/97). In 1898, a teacher by the name of JS de Kock was appointed. This appointment was made despite the fact that De Kock had not written any Dutch exams before. De Kock felt that his ability to speak and write Dutch was sufficient to teach and also indicated that he was willing to attend extra classes (OD, OR8794/98). During 1899, De Kock started undertaking weekly visits to C.J. van Ryn, the teacher at Wonderfontein, from whom he received extra lessons (OD, OR10033/99). However, this arrangement stopped in August 1899 when Van Ryn was moved to another school (OD, OR14208/99). On the 2nd of September 1899, an attempt was made to appoint T Vorkink at the school, though this did not appear to have succeeded (OD, OR14547/99). During 1900, the name of one J Servaas also appears with that of De Kock in terms of the staff at the school (OD, OR2372/00). The last archival record for the school dates to March 1900. This date is two months before the occupation of Pretoria by the British forces (OD, OR2382/00).

During the study undertaken by PGS in 2016, Ms. Corine de Jonge, who grew up on the farm Bosmansspruit, provided a map depicting the positions of various heritage sites and features known to her (Fourie, 2016). As can be seen from the map depicted below, Ms. De Jonge was also able to indicate where the old Bosmansspruit school was located.

The map provided by Ms. De Jonge is depicted in **Figure 23** below. An overlay of this map over the corresponding Google Earth image was done using the overlay function of Google Earth (refer **Figure 24**). Subsequently, measurements were taken on Google Earth between the indicated heritage features and the proposed development footprints. These measurements indicate that the school was located approximately 269m from the closest point along the proposed development footprints. As a result, the proposed development will have no impact on the old school, even if it still existed today.

The school appears to have been destroyed by mining development between 2009 and 2010.

5.3.4 Oral Historical Information relating to the South African War

During the study undertaken by PGS in 2016, Ms. Corine de Jonge, who grew up on the farm Bosmansspruit, provided oral historical information relating to the South African War (1899-1902). The following information was provided:

- A skirmish between Boer commandos and British forces (the 6th Mounted Infantry of Western Australia) occurred on the farm Bosmansspruit on 14 May 1901;
- Boer combatants killed during the skirmish of 14 May 1901 were buried in the cemetery identified as Site 5 in the 2016 report;
- One Australian soldier, Private Clarence Chudleigh Clifford, was buried on the farm Bosmansspruit; and
- The position of a military camp used by the British forces in 1901.

During the study undertaken by PGS in 2016, Ms. Corine de Jonge provided a map depicting the positions of various heritage sites and features known to her (Fourie, 2016). As can be seen from the map depicted below, Ms. De Jonge was also able to indicate where the Australian soldier was buried and also where the military camp used by the British forces in 1901 was located.

The map provided by Ms. De Jonge is depicted in **Figure 23** below. An overlay of this map over the corresponding Google Earth image was done using the overlay function of Google Earth (refer **Figure 24**). Subsequently, measurements were taken on Google Earth between the indicated heritage features and the proposed development footprints. These measurements indicate that the grave of the Australian soldier was located approximately 200m from the closest point along the proposed development footprints. Additionally, these measurements also indicate that the military camp was located approximately 268m from the closest point along the proposed development footprints. As a result, the proposed development will have no impact on these heritage sites and features.

The position of the Australian grave as depicted on the map supplied by Ms. Corine de Jonge, is currently located in an area which had been disturbed by mining activities.

Site 5 from the 2016 study that is mentioned above, is located 685m from the nearest point along the proposed development footprints. The cemetery referred to as ‘Pretorius graves’ on the map supplied by Ms. Corine de Jonge, is located approximately 250m from the closest point along the proposed development footprints. This cemetery was relocated by PGS.

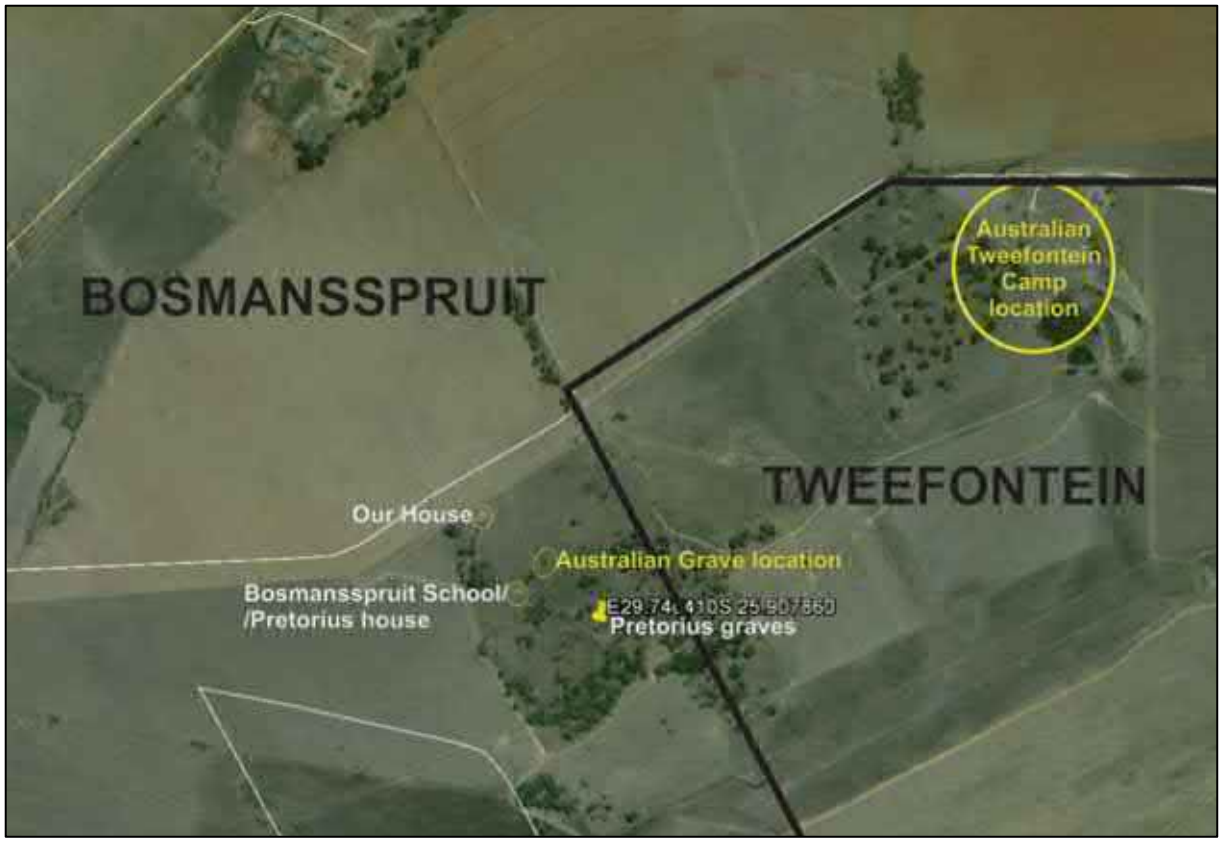


Figure 23 – Map provided by Ms. Corine de Jonge during the 2016 study by PGS (Fourie, 2016:19). This map seems to have been compiled from the 2003 satellite image available on Google Earth.

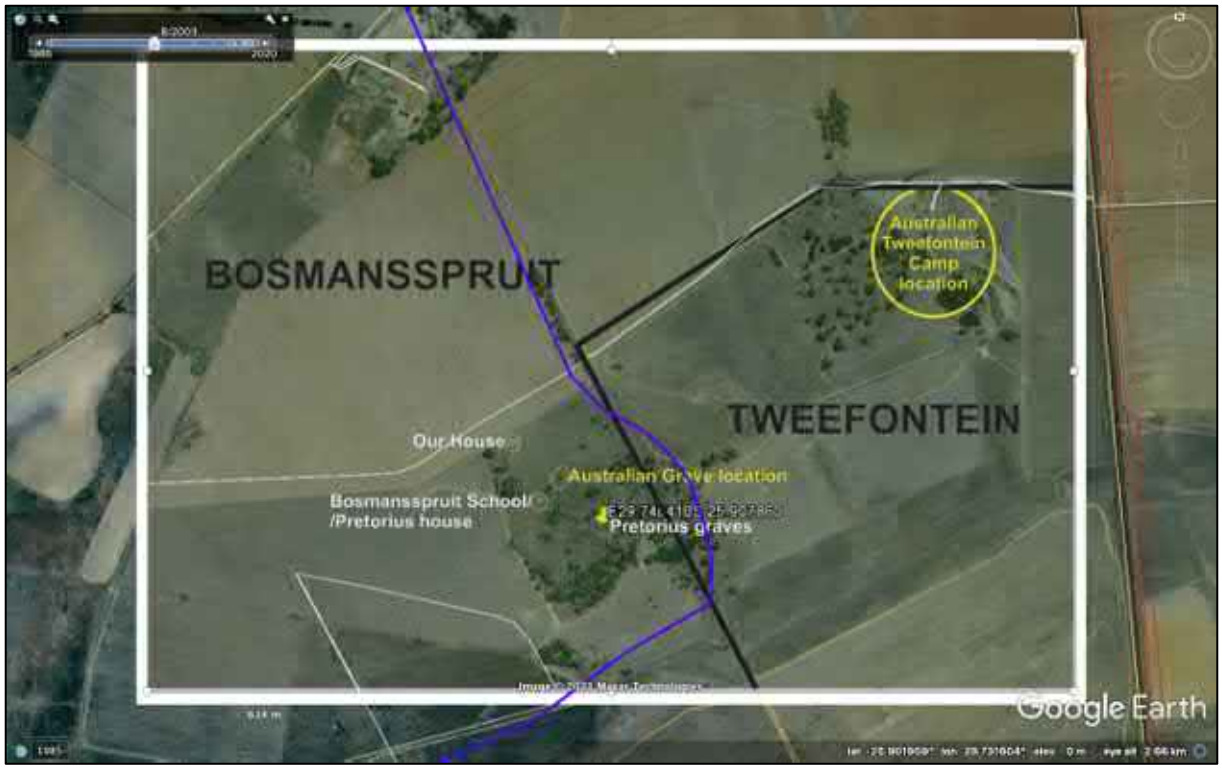


Figure 24 – Google Earth overlay showing the map that was provided by Ms. Corine de Jonge over the corresponding 2003 satellite photograph available from Google Earth. This satellite image also depicts the proposed development footprints.

Figure 25 – Google Earth image taken in 2020 that depicts the same area as shown in the previous image. This image indicates the level of mining disturbance characterising the surroundings of the proposed development footprints at present.

5.4 Historical Topographic Maps

An assessment of available archival and historical maps was undertaken as a way to establish a historic layering for the study area. These historical maps are also valuable resources in identifying possible heritage sites and features located within the study area.

Topographic maps (1:50 000) were assessed to observe the development of the area and to establish whether any possible heritage features such as historical structures and burial grounds are depicted on these maps. The maps were also used to assist with the interpretation of any identified heritage sites.

The relevant topographical maps used for this study, are as follows:

- First Edition of the 2529DC PAN map that was surveyed in 1967 and drawn in 1968 by the Trigonometrical Survey Office. It was reprinted by the Government Printer in 1979; and
- First Edition of the 2529DD WONDERFONTEIN map that was surveyed in 1967 and drawn in 1968 by the Trigonometrical Survey Office. It was printed by the Government Printer in 1969.

Figures 26 – 29 below depict overlays of the proposed development footprints over sections of the

historical topographic maps. A total of 46 features could be identified within the present study area on these topographic map overlays. These features are individually marked in the figures below and are briefly discussed with their corresponding coordinates below.

Please note that at the time that these historical topographic maps were compiled, hut symbols were used to indicate that a black homestead was located here. It seems highly likely for these hut symbols to indicate that farm worker accommodation was located here.

Table 11 - Features that were identified within the present study area from the First Edition of the 2529DC Pan and First Edition 2529DD Wonderfontein Topographical Sheet

Feature Number	Coordinates	Description
Feature 1	S 25.883081 E 29.742985	*The farm Mooifontein* A cluster of six huts is depicted south-by-southeast of the farmstead.
Feature 2	S 25.872162 E 29.760730	*The farm Mooifontein* Two huts and a kraal are shown south-east of the proposed West pit Decant Point.
Feature 3	S 25.901498 E 29.746706	*The farm Tweefontein* A hut and two structures are shown.
Feature 4	S 25.898319 E 29.745421	*The farm Tweefontein* A single hut is shown.
Feature 5	S 25.907611 E 29.739009	*The farm Bosmansspruit* A shed is located here. It is associated with six huts.
Feature 6	S 25.913180 E 29.720424	*The farm Bosmansspruit* A farmstead is located here which comprises one building. It is associated with five huts.
Feature 7	S 25.907668 E 29.692587	*The farm Bosmansspruit* A farmstead is located here and comprises one building. It is associated with four huts.
Feature 8	S 25.912500 E 29.688182	*The farm Bosmansspruit* A single hut is shown.
Feature 9	S 25.921234 E 29.725354	*The farm Bosmansspruit* A cluster of four huts are shown.
Feature 10	S 25.919183 E 29.652200	*The farm Kwaggasfontein* A farmstead is located here and is comprised of two buildings. It is associated with two huts.

Feature Number	Coordinates	Description
Feature 11	S 25.91040 E 29.656601	*The farm Kwaggasfontein* A shed is depicted near one of the dams.
Feature 12	S 25.935242 E 29.775687°	*The farm Rietkuil* A cluster of three huts is shown.
Feature 13	S 25.933093 E 29.780379	*The farm Rietkuil* A farmstead comprising of a kraal and four buildings are shown.
Feature 14	S 25.949865 E 29.785480	*The farm Rietkuil* A single hut and building are shown.
Feature 15	S 25.954589 E 29.781705	*The farm Rietkuil* A farmstead is located here and is comprised of three buildings. It is associated with two huts.
Feature 16	S 25.960820 E 29.780523	*The farm Rietkuil* A cluster of buildings is depicted here. This cluster of three buildings is referred to as the 'Feeshuis' on the map.
Feature 17	S 25.950141 E 29.777469	*The farm Rietkuil* A farmstead is located here and is comprised of three buildings and one hut.

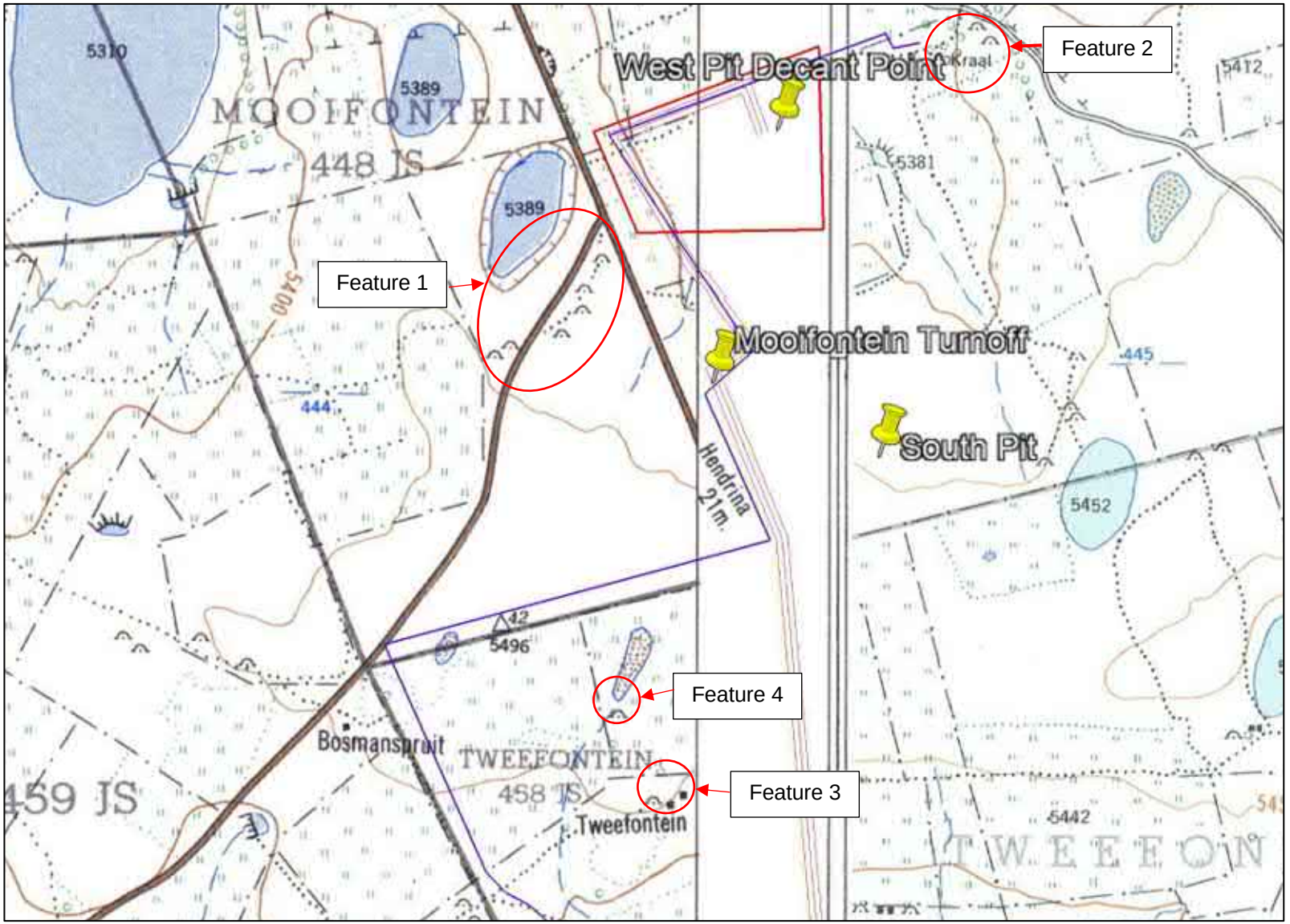


Figure 26 – Detail view of the proposed development footprints on the farms Mooifontein 448 JS and Tweefontein 458 JS as depicted on the First Editions of the 2529DC and 2529DD Topographical Sheets. The features depicted on this image correspond with the feature numbers shown in the table above.

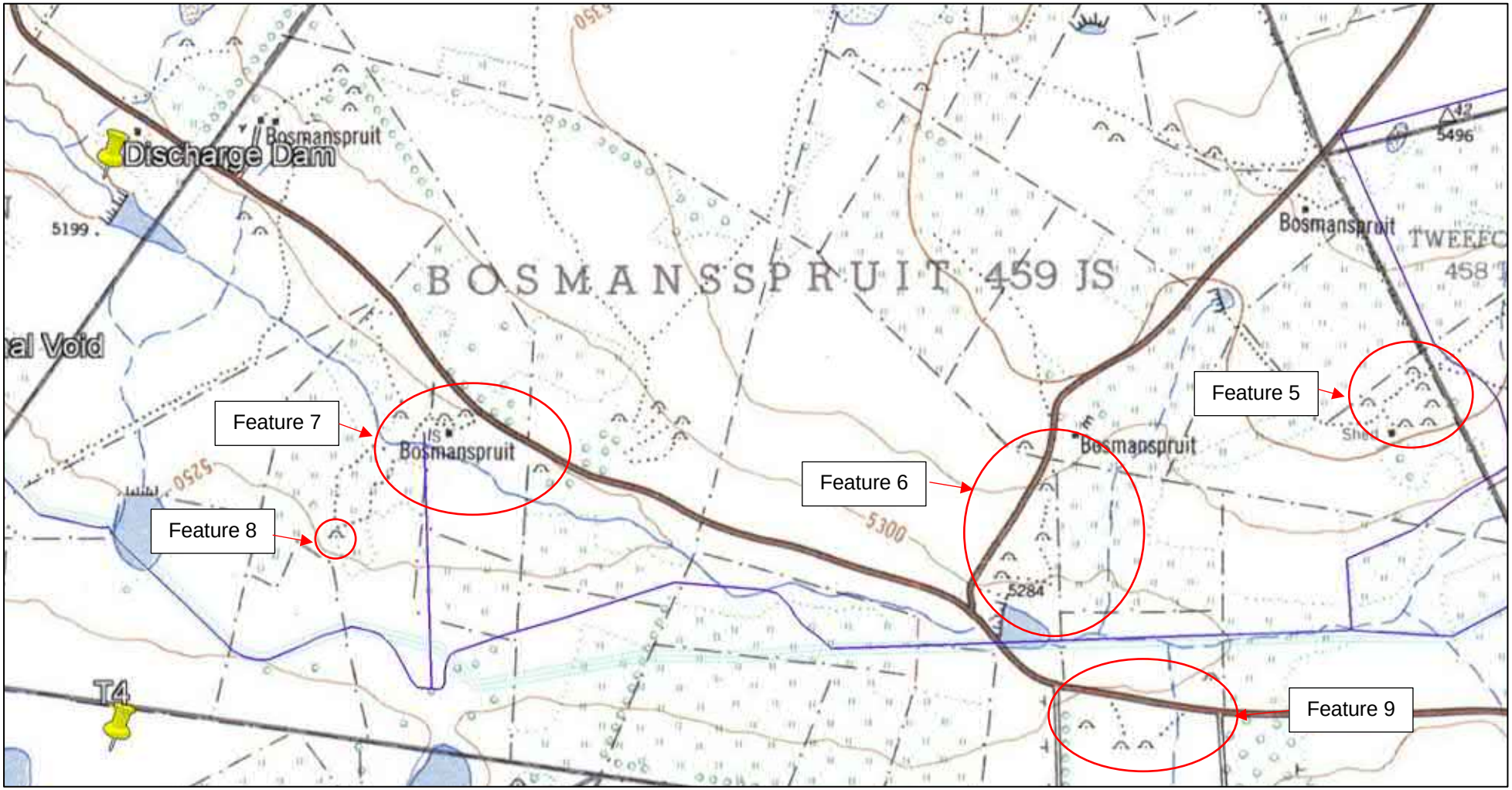


Figure 27 - Detail view of the proposed development footprints on the farm Bosmansspruit 459 JS as depicted on the First Edition of the 2529DC Topographical Sheet. The features depicted on this image correspond with the feature numbers shown in the table above.

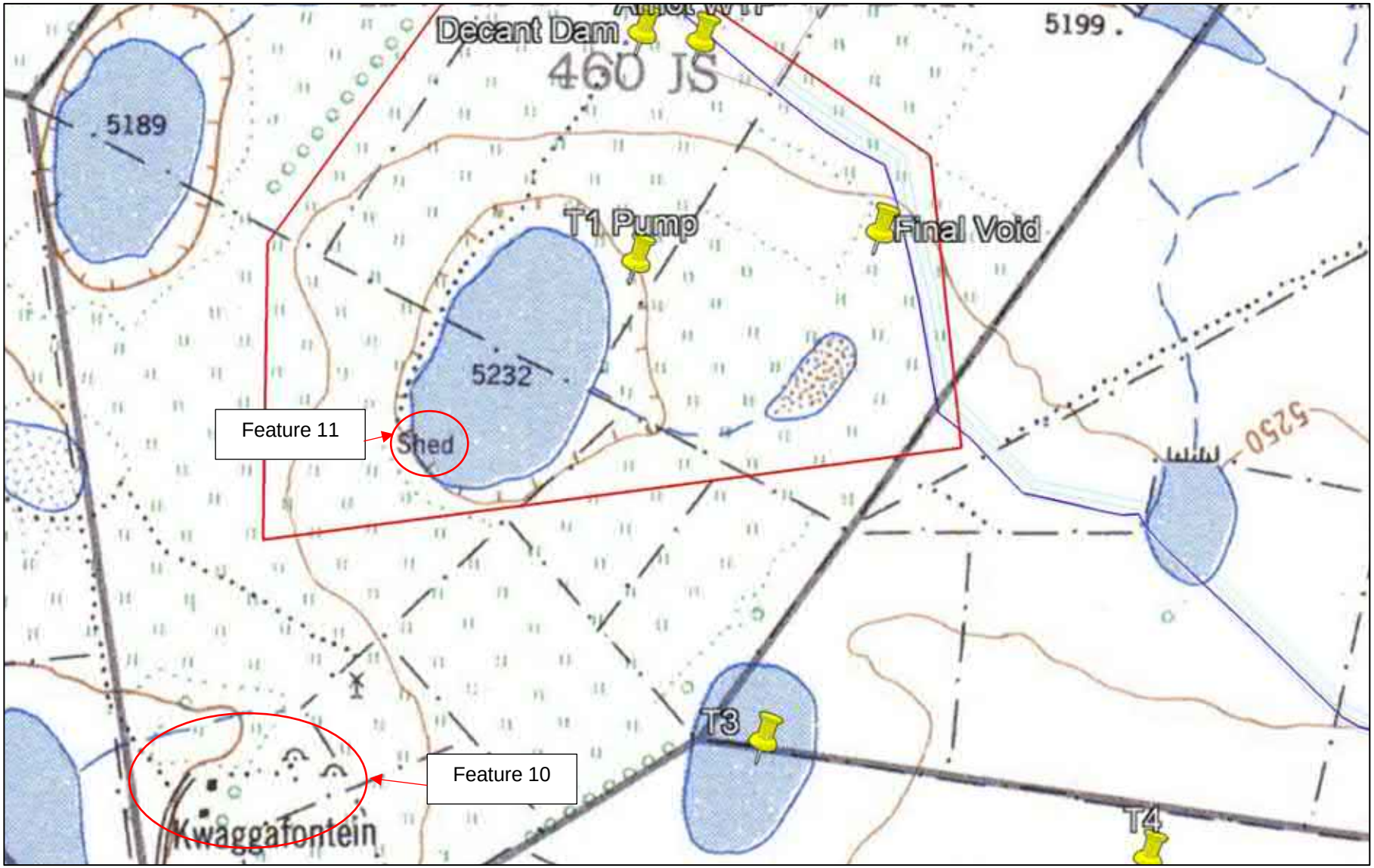


Figure 28 - Detail view of the proposed development footprints on the farm Kwaggafontein 460 JS as depicted on the First Edition of the 2529DC Topographical Sheet. The features depicted on this image correspond with the feature numbers shown in the table above.

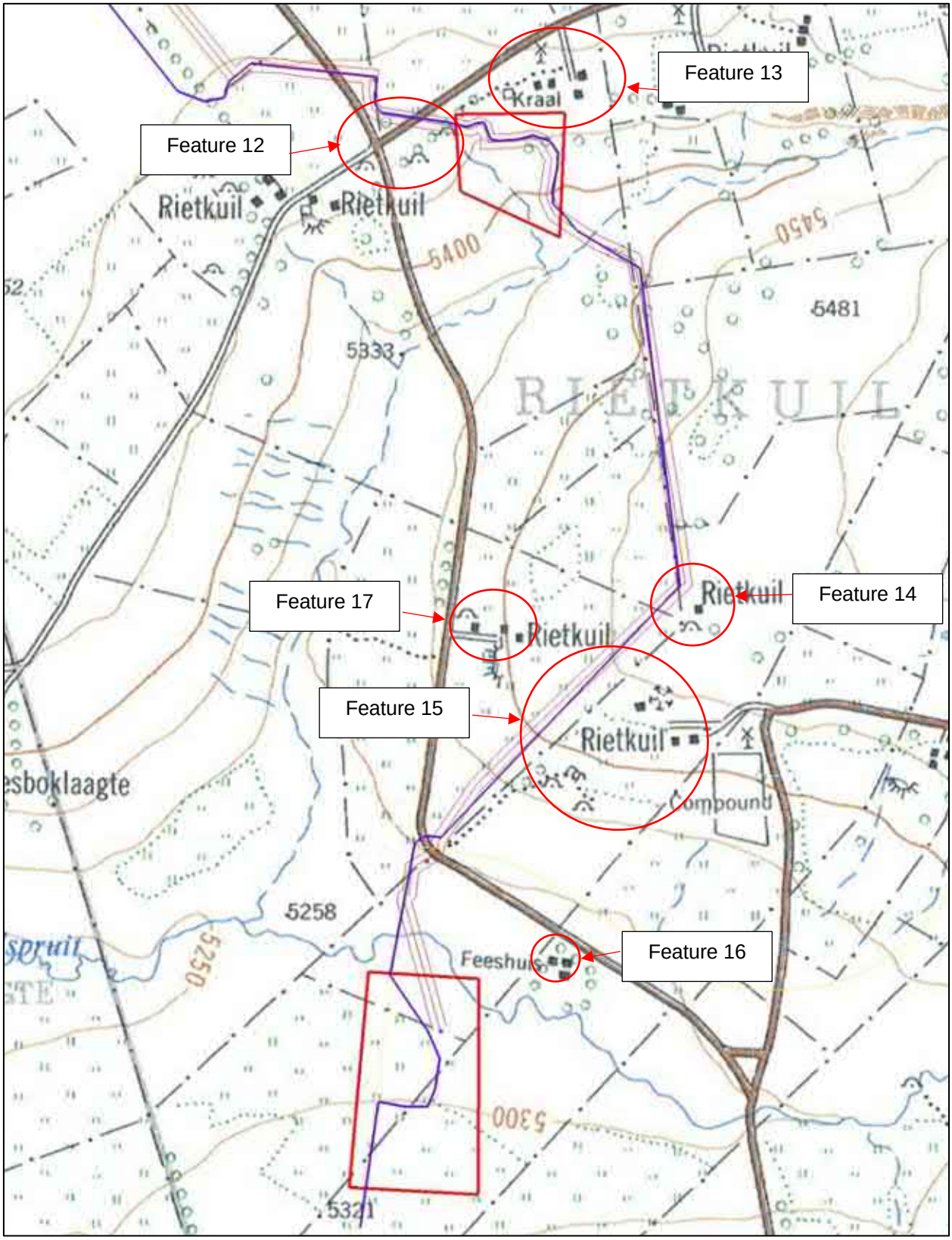


Figure 29 - Detail view of the proposed development footprints on the farm Rietkuil 491 JS as depicted on First Edition of 2529DD Topographical Sheet. The features depicted on this image correspond with the feature numbers shown in the table above

5.5 Previous Archaeological and Heritage Studies from the Study Area and Surroundings

An assessment of the South African Heritage Resources Information System (SAHRIS) of SAHRA was undertaken to establish whether any previous archaeological and heritage impact assessments had revealed archaeological and heritage sites within the present study area components.

This assessment has revealed that a number of previous studies had been undertaken in the surroundings of the study area. However, although a few sites were identified in proximity to the present study area, only one site from these studies was located within the present development footprint areas. As will be discussed in **Chapter 6** below, this site is a cemetery that was successfully relocated in 2017. As a result, no evidence for the site was identified during the present fieldwork.

All previous studies that were located on the SAHRIS system will be briefly discussed in chronological order below. In each case, the results of each study are briefly shown in bold.

- VAN SCHALKWYK, J. 1998. A Survey of Cultural Resources at Arnot Colliery Pit 3 West and Shaft 10, Middelburg District, Mpumalanga. **No significant cultural resources were identified.**

- VAN SCHALKWYK, J. 2002. A Survey of Cultural Resources for the Arnot Mining Development, Middelburg District, Mpumalanga Province. **A few cemeteries were identified.**

- FOURIE, W. 2009. Archaeological Impact Assessment. Arnot Colliery Mine Project of Exxaro on Portions 4 and 5 of the farm Mooifontein 448 JS and Portions 3 and 4 of the farm Tweefontein 458 JS, District Middelburg, Mpumalanga. **The study identified a total of 11 cemeteries, the Cass family homestead and the remains of other homesteads.**

- VAN VOLLENHOVEN, A. C. 2015. A Report on an Archaeological and Built Environment Heritage Impact Assessment for Proposed Chicken Houses on the farms Kopermyn 435 JS and Kwaggafontein 460 JS, close to Middelburg, Mpumalanga Province. **No sites of cultural heritage significance were identified during the study.**

- FOURIE, W. 2009. Heritage Assessment for the Kwagga North Project, Optimum Coal, Arnot, Mpumalanga. **During the survey, a total of 36 sites of heritage significance were identified. The heritage sites consist of 29 cemeteries (approximately 350 graves in total), six farmsteads and one quarry site.**

- PISTORIUS, J. C. C. 2011. A Phase I Heritage Impact Assessment (HIA) Study for the

Consolidated Environmental Management Programme Report (Consolidated EMPR) for Arnot Coal on the Eastern Highveld in the Mpumalanga Province. **The study identified historical farmstead complexes, historical structures and graves.**

- PELSER, A. 2012. A Report on a Heritage Assessment for the Proposed Arnot-Gumeni 400 KV Powerline Project, in the Middelburg/Belfast Area, Mpumalanga Province. **The sites identified include stone walled Iron Age sites, possible Stone Age sites, historical homesteads/farmsteads, historical Anglo-Boer War (1899-1902) battlefield sites as well as graveyards and cemeteries.**

- FOURIE, W. 2016. Updated Heritage Impact Assessment for the Kwagga North Project, Optimum Coal, Arnot, Mpumalanga. **During the survey, a total of 37 sites of heritage significance were identified.**

- VAN SCHALKWYK, J. 2017. Phase 1 Cultural Heritage Impact Assessment for the Construction of a 132kv Chikadee Power Line on the farm Tweefontein 458 JS, southeast of Middelburg, Steve Tshwete Local Municipality, Mpumalanga Province. **No sites, features or objects of cultural heritage significance were identified in the development area.**

- HARDWICK, S. & DU PIESANIE, J. 2018. Basic Assessment and Environmental Management Plan for the Proposed Pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province - Heritage Basic Assessment Report. **No heritage resources were identified.**

- FOURIE, W. 2018. Heritage Scoping Report for inclusion in the Environmental Scoping Report for the proposed Arnot New Ash Disposal Facility, Mpumalanga. **A total of six heritage resources were identified during the study.**

5.6 Palaeontology

This section was not undertaken by palaeontological specialists and is based on available information on SAHR|S

According to the palaeontological sensitivity map available on SAHRIS, the proposed Seriti - Arnot project area falls within a very high (red) sensitivity zone. As such, a field assessment and protocol for finds are required.

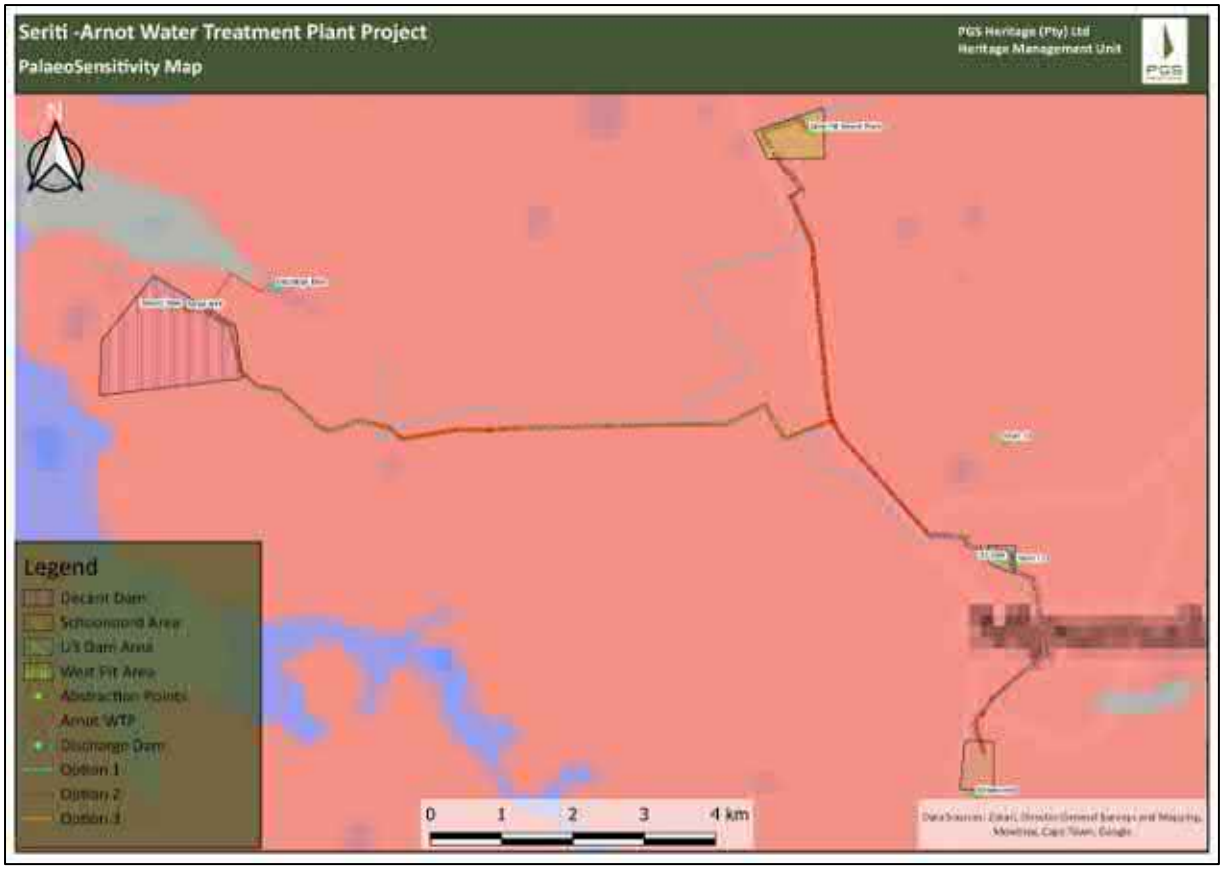


Figure 30 - Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences). Approximate location of the proposed development is indicated by the red, blue and orange polylines.

Table 12 - SAHRIS Palaeosensitivity Ratings Table.

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

6 FIELDWORK FINDINGS

6.1 Fieldwork undertaken for the Present Study

The fieldwork comprised intensive field surveys of the study area undertaken primarily by foot over the course of a number of days by an experienced fieldwork team from PGS. This experienced fieldwork team consisted of an archaeologist (Cherene de Bruyn) and a field assistant (Coenie Nienaber). The fieldwork was conducted from Tuesday, 1 December to Thursday, 3 December 2020.

During the fieldwork, hand-held GPS devices were used to record tracklogs. These recorded track logs show the routes followed by the fieldwork team on site. The recorded tracklogs are depicted on the map in **Figure 32** below.

Despite the intensive fieldwork undertaken for the purposes of this study, no evidence for any archaeological or heritage sites could be identified within the study area.

6.2 Previously Identified Heritage Sites

During the heritage surveys for the Kwagga North Project, PGS identified a total of 37 heritage sites within the wider surroundings of the present study area (Fourie, 2009) (Fourie, 2016). Only one of these sites, labelled as Site 16 in the previous reports, is located closer than 50m from the development footprints currently proposed. This site, which is located approximately 16m from the closest point alongf the proposed development footprint area, will be briefly discussed below.

SITE 16

GPS Coordinates:

S 25.89690
E 29.73574

Type: Cemetery

Description:

The site description that included here is from Fourie (2016) and Pelser (2017).

A small informal, fenced family cemetery was identified at this location. The graves belonged to the Van Eeden family who lived on the farm. The graves were orientated from east to west and all had formal

granite dressings. The cemetery was well maintained.

According to Pelser (2017), the cemetery contained six graves of the Booijse/Booyse/Bosman/Van Eeden families.

- Catharina Magdalena Booyse (died 18.02.1935)
- Johanna Phillipina Magdalena van Eeden (died 01.06.1960)
- Gert Cornelius van Eeden (died 15.03.1935)
- Elsje Catharina van Eeden (died 01.04.1960)
- Nicolaas Johannes Rudolph van Eeden (died 02.11.1975), and finally
- Jozua Francois van Eeden (died 30.12.1963)

The six graves were exhumed by Anton Pelser and colleagues in February and March 2017 and relocated to the Middelburg Golfsig Cemetery.

No evidence for this cemetery could be observed during the fieldwork undertaken in 2020.

Site Extent:

Approximately 15m x 15m

Figure 31 – General view of the cemetery before relocation (Fourie, 2016:28).

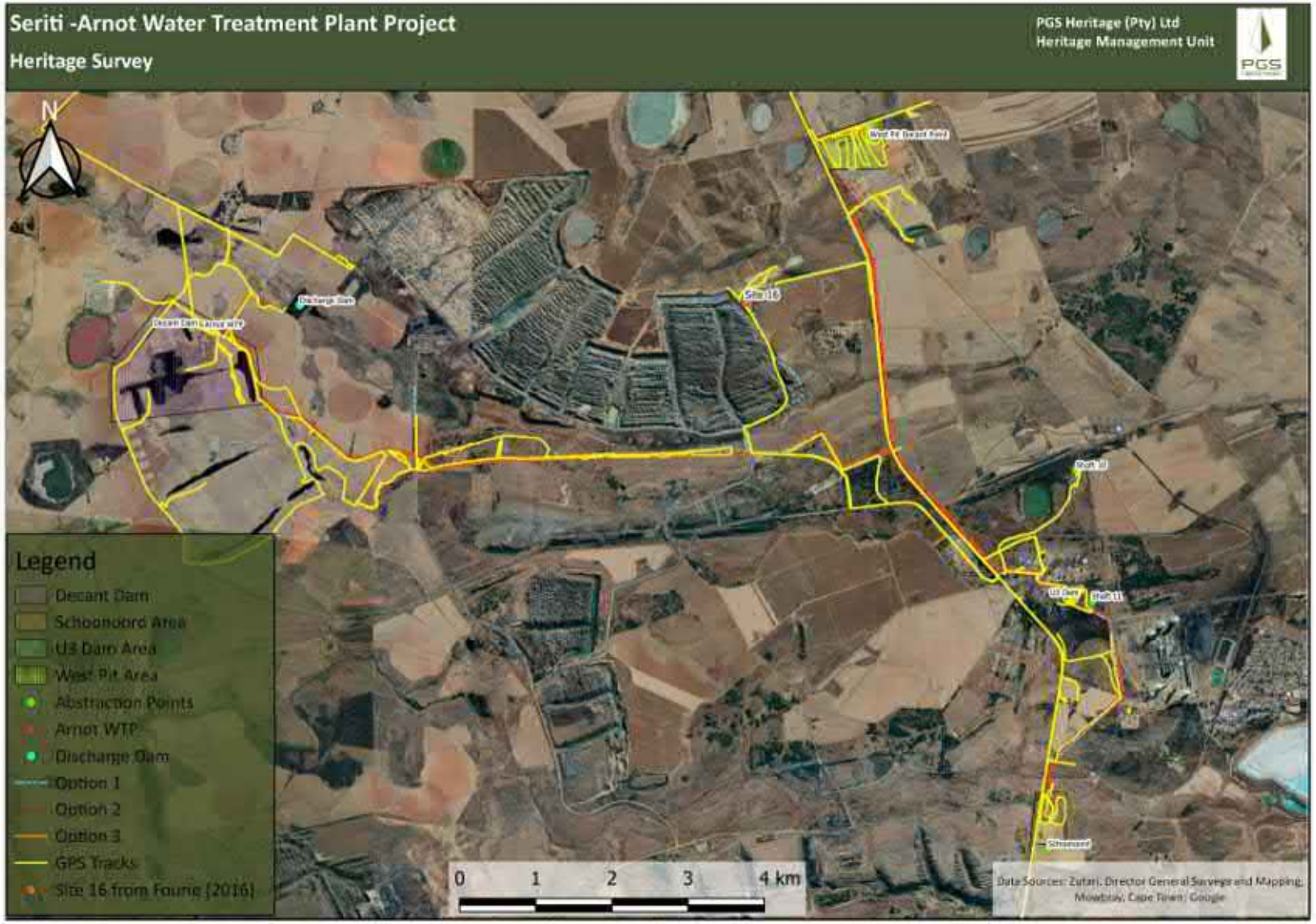


Figure 32 - Google Earth image depicting the proposed pipelines with the recorded tracklogs in yellow. The position of Site 16 is also shown.

7 ASSESSMENT OF IMPACT OF PROPOSED DEVELOPMENT

7.1 Introduction

In this section, an assessment will be made of the impact of the proposed development on the identified heritage sites.

7.2 Assessment of Impact of Proposed Development on Identified Heritage Sites

Despite an intensive walkthrough of the project area, no evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage.

7.3 Assessment of Impact of Proposed Development on Previously Identified Heritage Sites

As discussed above, a total of 37 heritage sites were identified within the wider surroundings of the present study area during the heritage surveys for the Kwagga North Project (Fourie, 2009) (Fourie, 2016). Only one of these sites, labelled as Site 16 in the previous reports, is located closer than 50m from the development footprints currently proposed. This site, which is located approximately 16m from the closest point alongf the proposed development footprint area, was comprised of a cemetery. The cemetery was successfully relocated in 2017. With the site already relocated, no impact is expected on the site from the proposed development.

8 REQUIRED MITIGATION MEASURES

Despite an intensive walkthrough of the project area, no evidence for any archaeological or heritage sites could be identified. Additionally, although one of the previously identified sites is located approximately 16m from the proposed development footprints, this site was successfully relocated in 2017. As a result, no impact is expected from the proposed development on heritage and no site-specific mitigation measures are required.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

PGS Heritage (Pty) Ltd was appointed by Zutari (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment (HIA) for the proposed Proposed Seriti – Arnot Water Treatment Plant Project near Middelburg, Mpumalanga Province. The proposed project area is located on the farms Bosmansspruit 459 IS, Kwaggafontein 460 JS, Tweefontein 458 JS, Mooifontein 448 JS, and Rietkuil 491 JS, within the Steve Tshwete Local Municipality, Nkangala District Municipality, Mpumalanga Province. The proposed development is situated on two mining operations owned by Seriti and Arnot Opco.

9.2 Project Description

Arnot Opco has recently taken over the underground mining area and two small opencast sections previously owned by Exxaro, all of which are in in the process of closing. Seriti manages care and maintenance at the large opencast section which ceased operations in 1992. The Seriti pits have been under care and maintenance since closing down. Since the ceasing of mine operations in 1992, mine-affected water decants from the mine into various locations and this water needs to be managed as part of the Seriti and Arnot Opco mine closure liabilities.

Zutari was appointed for a feasibility study for a combined Water Treatment Plant at the Arnot Closed Colliery. The feasibility study is the further definition of the integrated water management plan for the collection of excess water, treatment and discharge of reclaimed water from the mines, as well as the management of any waste material produced because of this water management plan. The outcome of the study will be to complete the basic engineering design of the water treatment system and to obtain the necessary authorisation for the construction and operation of the water treatment system.

9.3 General Desktop Study

An archaeological and historical desktop study was undertaken to provide a historical framework for the project area and surrounding landscape. This was augmented by an assessment of previous archaeological and heritage studies completed for the study area and surroundings. Furthermore, an assessment was made of the early editions of the relevant topographic maps. Refer to **Chapter 5**.

9.4 Fieldwork

The fieldwork comprised intensive field surveys of the study area undertaken primarily by foot over the course of a number of days by an experienced fieldwork team from PGS consisting of an archaeologist and field assistant. Despite the intensive nature of the fieldwork undertaken, no evidence for any

archaeological or heritage sites could be identified within the study area. While no heritage sites could be identified during the fieldwork, further desktop study work undertaken subsequent to the fieldwork, revealed that a cemetery was located within the study area. This cemetery was successfully relocated in 2017, and as a result, no evidence for it could be identified during the fieldwork. Refer **Chapter 6**.

9.5 Palaeontology

According to the SAHRIS palaeontological sensitivity map, the proposed Seriti - Arnot Water Treatment Plant Project area falls within a very high (red) sensitivity zone. As such, a field assessment and protocol for finds is required.

9.6 Impact Assessment and Mitigation

No evidence for any archaeological or heritage sites could be identified during the fieldwork. As a result, no impact assessments were undertaken and no site-specific mitigation measures are required.

9.7 General Recommendations

The following general recommendations are made:

- An archaeological watching brief must be undertaken during all excavations undertaken as part of the project; and
- Should the development footprints change or be altered in any way, these changes must be assessed in the field by a heritage specialist/archaeologist before construction commences.

9.8 Conclusions

Despite the intensive desktop study work and fieldwork undertaken for the purposes of this study, no evidence for any archaeological or heritage sites could be identified within the study area. As a result, and on the condition that the development does not extend beyond the development footprint currently assessed, the authors of this report can provide no heritage reasons for the proposed development not to continue. From a heritage perspective, both Option 2 and Option 3 are acceptable as the routes are located within areas that have previously been disturbed and which are of low heritage sensitivity.

10 PREPARERS

This Heritage Impact Assessment was written by the following preparers:

- Polke Birkholtz – Project Manager / Archaeologist - Co-Author
- Cherene de Bruyn – Archaeologist - Author

11 REFERENCES

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11.3 National Archives Documents

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OD, OR2382/00

11.4 Historical Topographic Maps

All the historic topographical maps used in this report were obtained from the Directorate: National Geo-spatial Information of the Department of Rural Development and Land Reform in Cape Town.

11.5 Internet

www.sahistory.org.za

www.sanbi.org

11.6 Google Earth

At least some of the aerial depictions of the study área were obtained using Google Earth.

Appendix A

HERITAGE MANAGEMENT GUIDELINES

1. General Management Guidelines

1. The National Heritage Resources Act (Act 25 of 1999) states that, any person who intends to undertake a development categorised as-

    (a) the construction of a road, wall, transmission line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
    (b) the construction of a bridge or similar structure exceeding 50m in length;
    (c) any development or other activity which will change the character of a site-

        (i) exceeding 5 000 m^2 in extent; or
        (ii) involving three or more existing erven or subdivisions thereof; or
        (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
        (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

    (d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
    (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In the event that an area previously not included in an archaeological or cultural resources survey is to be disturbed, the SAHRA needs to be contacted. An enquiry must be lodged with them into the necessity for a Heritage Impact Assessment.

2. In the event that an additional heritage assessment is required, it is advisable to utilise a qualified heritage practitioner, preferably registered with the Cultural Resources Management Section (CRM) of the Association of Southern African Professional Archaeologists (ASAPA). This survey and evaluation must include:

    (a) The identification and mapping of all heritage resources in the area affected;
    (b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7 of the National Heritage Resources Act;
    (c) An assessment of the impact of the development on such heritage resources;
    (d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
(f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

3. In the event that a possible find is discovered during construction, the following steps must be taken:

(a) All activities must be halted in the area of the discovery and a qualified archaeologist contacted;
(b) The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures;
(c) If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA; and
(d) After mitigation, an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.

4. In the case where a grave is identified during construction, the following measures must be taken:

(a) Upon the accidental discovery of graves, a buffer of at least 20 meters should be implemented;
(b) If graves are accidentally discovered during construction, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find;
(c) To remove the remains, a permit must be applied for from SAHRA and other relevant authorities. The local South African Police Services must immediately be notified of the find; and
(d) Where it is recommended that the graves be relocated, a full grave relocation process that includes a comprehensive social consultation must be followed. Such a grave relocation process must include the following:

(i) A detailed social consultation process that aims to trace the next-of-kin and obtain their consent for the relocation of the graves, that will be at least 60 days in length;
(ii) Site notices indicating the intent of the relocation;
(iii) Newspaper notices indicating the intent of the relocation;
(iv) Permits from the relevant permitting authorities, including the local authority; the Provincial Department of Health; the South African Heritage Resources Agency

(SAHRA) (if the graves are older than 60 years or unidentified and thus presumed older than 60 years) etc.

(vii) An exhumation process that keeps the dignity of the remains intact;

(viii) The whole process must be done by a reputable company that is well versed in relocations; and

(ix) The exhumation process must be conducted in such a manner as to safeguard the legal rights of the families as well as that of the mining company.

PGS Heritage can be contacted on the way forward in this regard.

Table 13: Roles and responsibilities of archaeological and heritage management

ROLE	RESPONSIBILITY	IMPLEMENTATION
A responsible specialist needs to be allocated and should attend all relevant meetings, especially when changes in design are discussed, and liaise with SAHRA.	The client	Archaeologist and a competent archaeological support team
If chance finds and/or graves or burial grounds are identified during construction or operational phases, a specialist must be contacted for evaluation.	The client	Archaeologist and a competent archaeological support team
Comply with defined national and local cultural heritage regulations on management plans for identified sites.	The client	Environmental Consultancy and the Archaeologist
Consult the managers, local communities and other key stakeholders on mitigation of archaeological sites.	The client	Environmental Consultancy and the Archaeologist
Implement additional programs, as appropriate, to promote the safeguarding of our cultural heritage.	The client	Environmental Consultancy and the Archaeologist
If required, conservation or relocation of burial grounds and/or graves according to the applicable regulations and legislation.	The client	Archaeologist, and/or competent authority for relocation services
Ensure that recommendations made in the Heritage Report are adhered to.	The client	The client
Provision of services and activities related to the management and monitoring of significant archaeological sites.	The client	Environmental Consultancy and the Archaeologist
After the specialist/archaeologist has been appointed, comprehensive feedback reports should be submitted to relevant authorities during each phase of development.	Client and Archaeologist	Archaeologist

Appendix B

CURRICULUM VITAE

PROFESSIONAL CURRICULUM
FOR POLKE DOUSSY BIRKHOLTZ

Name: *Polke Doussy Birkholtz*

Date & Place of Birth: *9 February 1975 – Klerksdorp, North West Province, South Africa*

Place of Tertiary Education & Dates Associated:

Institution: University of Pretoria
Qualification: BA (Cum Laude) - Bachelor of Arts Specializing in Archaeology, History & Anthropology
Date: 1996

Institution: University of Pretoria
Qualification: BA Hons (Cum Laude) - Bachelor of Arts with Honours Degree Specializing in Archaeology
Date: 1997

Qualifications:

BA	-	Degree specialising in Archaeology, History and Anthropology
BA Hons	-	Professional Archaeologist

Memberships:

Association of Southern African Professional Archaeologists (ASAPA)
Professional Member of the CRM Section of ASAPA

Overview of Post Graduate Experience:

1997 – 2000 – Member/Archaeologist – Archaeo-Info
2001 – 2003 – Archaeologist/Heritage Specialist – Helio Alliance
2000 – 2008 – Member/Archaeologist/Heritage Specialist – Archaeology Africa
2003 - Present – Director / Archaeologist / Heritage Specialist – PGS Heritage

Languages: English: Speak, Read & Write & Afrikaans: Speak, Read & Write

Total Years' Experience: 19 Years

Experience Related to the Scope of Work:

- Polke has worked as a **HERITAGE SPECIALIST / ARCHAEOLOGIST / HISTORIAN** on more than 300 projects and acted as **PROJECT MANAGER** on almost all of these projects. His experience includes the following:

    - Development of New Sedimentation and Flocculation Tanks at Rand Water's Vereeniging Pumping Station, Vereeniging, Gauteng Province. Heritage Impact Assessment for *Greenline*.
    - EThekwini Northern Aqueduct Project, Durban, KwaZulu-Natal. Heritage Impact Assessment for *Strategic Environmental Focus*.
    - Johannesburg Union Observatory, Johannesburg, Gauteng Province. Heritage Inventory for *Holm Jordaan*.
    - Development at Rand Water's Vereeniging Pumping Station, Vereeniging, Gauteng Province. Heritage Impact Assessment for *Aurecon*.
    - Comet Ext. 8 Development, Boksburg, Gauteng Province. Phase 2 Heritage Impact Assessment for *Urban Dynamics*.
    - Randjesfontein Homestead, Midrand, Gauteng Province. Baseline Heritage Assessment with Nkosinathi Tomose for Johannesburg City Parks.
    - Rand Leases Ext. 13 Development, Roodepoort, Gauteng Province. Heritage Impact Assessment for *Marsh*.
    - Proposed Relocation of the Hillendale Heavy Minerals Plant (HHMP) from Hillendale to Fairbreeze, KwaZulu-Natal. Heritage Impact Assessment for *Goslar Environmental*.
    - Portion 80 of the farm Eikenhof 323 IQ, Johannesburg, Gauteng Province. Heritage Inventory for *Khare Incorporated*.
    - Comet Ext. 14 Development, Boksburg, Gauteng Province. Heritage Impact Assessment for *Marsh*.
    - Rand Steam Laundries, Johannesburg, Gauteng Province. Archival and Historical Study for *Impendulo* and *Imperial Properties*.
    - Mine Waste Solutions, near Klerksdorp, North West Province. Heritage Inventory for *AngloGold Ashanti*.
    - Consolidated EIA and EMP for the Kroondal and Marikana Mining Right Areas, North West Province. Heritage Impact Assessment for *Aquarius Platinum*.
    - Wilkoppies Shopping Mall, Klerksdorp, North West Province. Heritage Impact Assessment for the *Center for Environmental Management*.
    - Proposed Vosloorus Ext. 24, Vosloorus Ext. 41 and Vosloorus Ext. 43 Developments, Ekurhuleni District Municipality, Gauteng Province. Heritage Impact Assessment for *Enkanyini Projects*.

- Proposed Development of Portions 3, 6, 7 and 9 of the farm Olievenhoutbosch 389 JR, City of Tshwane Metropolitan Municipality, Gauteng Province. Heritage Impact Assessment for *Marsh*.
- Proposed Development of Lotus Gardens Ext. 18 to 27, City of Tshwane Metropolitan Municipality, Gauteng Province. Heritage Impact Assessment for *Pierre Joubert*.
- Proposed Development of the site of the old Vereeniging Hospital, Vereeniging, Gauteng Province. Heritage Scoping Assessment for *Lekwa*.
- Proposed Demolition of an Old Building, Kroonstad, Free State Province. Phase 2 Heritage Impact Assessment for *De Beers Consolidated Mines*.
- Proposed Development at Westdene Dam, Johannesburg, Gauteng Province. Heritage Impact Assessment for *Newtown*.
- West End, Central Johannesburg, Gauteng Province. Phase 1 Heritage Impact Assessment for the *Johannesburg Land Company*.
- Kathu Supplier Park, Kathu, Northern Cape Province. Heritage Impact Assessment for *Synergistics*.
- Matlosana 132 kV Line and Substation, Stilfontein, North West Province. Heritage Impact Assessment for *Anglo Saxon Group* and *Eskom*.
- Marakele National Park, Thabazimbi, Limpopo Province. Cultural Resources Management Plan for *SANParks*.
- Cullinan Diamond Mine, Cullinan, Gauteng Province. Heritage Inventory for *Petra Diamonds*.
- Highveld Mushrooms Project, Pretoria, Gauteng Province. Heritage Impact Assessment for *Mills & Otten*.
- Development at the Reserve Bank Governor's Residence, Pretoria, Gauteng Province. Archaeological Excavations and Mitigation for the *South African Reserve Bank*.
- Proposed Stones & Stones Recycling Plant, Johannesburg, Gauteng Province. Heritage Scoping Report for *KV3*.
- South East Vertical Shaft Section of ERPM, Boksburg, Gauteng Province. Heritage Scoping Report for *East Rand Proprietary Mines*.
- Proposed Development of the Top Star Mine Dump, Johannesburg, Gauteng Province. Detailed Archival and Historical Study for *Matakoma.*
- Soshanguve Bulk Water Replacement Project, Soshanguve, Gauteng Province. Heritage Impact Assessment for *KWP*.
- Biodiversity, Conservation and Participatory Development Project, Swaziland. Archaeological Component for *Africon*.
- Camdeboo National Park, Graaff-Reinet, Eastern Cape Province. Cultural Resources Management Plan for *SANParks*.
- Main Place, Central Johannesburg, Gauteng Province. Phase 1 Heritage Impact Assessment for the *Johannesburg Land Company*.

- Modderfontein Mine, Springs, Gauteng Province. Detailed Archival and Historical Study for *Consolidated Modderfontein Mines.*
- Proposed New Head Office for the Department of Foreign Affairs, Pretoria, Gauteng Province. Heritage Impact Assessment for *Holm Jordaan Group*.
- Proposed Modification of the Lukasrand Tower, Pretoria, Gauteng Province. Heritage Assessment for IEPM.
- Proposed Road between the Noupoort CBD and Kwazamukolo, Northern Cape Province. Heritage Impact Assessment for *Gill & Associates*.
- Proposed Development at the Johannesburg Zoological Gardens, Johannesburg, Gauteng Province. Detailed Archival and Historical Study for *Matakoma.*

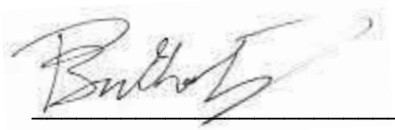
- Polke's **KEY QUALIFICATIONS:**

  - Project Management
  - Archaeological and Heritage Management
  - Archaeological and Heritage Impact Assessment
  - Archaeological and Heritage Fieldwork
  - Archival and Historical Research
  - Report Writing

- Polke's **INFORMATION TECHNOLOGY EXPERIENCE:**

  - *MS Office – Word, Excel, & Powerpoint*
  - *Google Earth*
  - *Garmin Mapsource*
  - *Adobe Photoshop*
  - *Corel Draw*

I, Polke Doussy Birkholtz, hereby confirm that the above information contained in my CV is true and correct.



PD Birkholtz

4 January 2021

Date

PROFESSIONAL CURRICULUM FOR CHERENE DE BRUYN

Professional Archaeologist for PGS Heritage

EDUCATION:

Name of University or Institution	:	University of Pretoria
Degree obtained:	:	BA
Major subjects	:	Archaeology and Anthropology
Year	:	2010-2012
Name of University or Institution	:	University of Pretoria
Degree obtained	:	BA (Hons)
Major subjects	:	Archaeology
Year	:	2013
Name of University or Institution	:	University of Pretoria
Degree obtained	:	BSc (Hons)
Major subjects	:	Physical Anthropology
Year	:	2015
Name of University or Institution	:	University College London
Degree obtained	:	MA
Major subjects	:	Archaeology
Year	:	2016/2017

Professional Qualifications:

Association of Southern African Professional Archaeologists - Professional Member (#432)

International Association for Impact Assessment South Africa - Member (#6082)

Association of Southern African Professional Archaeologists - CRM Accreditation

- Principal Investigator: Grave relocation
- Field Director: Colonial period archaeology, Iron Age archaeology
- Field Supervisor: Rock art, Stone Age archaeology
- Laboratory Specialist: Human Skeletal Remains

Languages:

Afrikaans & English

KEY QUALIFICATIONS

Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Physical Anthropology, Grave Relocations, Fieldwork and Project Management including *inter alia*

Summary of Experience

Involvement in various grave relocation projects and grave "rescue" excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa

- Heritage Impact Assessments for various projects

HERITAGE ASSESSMENT PROJECTS

Below a selected list of Heritage Impact Assessments (HIA) Projects involvement:

- Heritage Impact Assessment for the upgrade of road d4407 between Hluvukani and Timbavati, road d4409 at Welverdiend and road d4416/2 between Welverdiend and road P194/1 in the Bohlabela region of the Mpumalanga Province.
- Heritage Impact Assessment for the proposed Piggery on Portion 46 of the farm Brakkefontien 416, within the Nelson Mandela Bay Municipality, Eastern Cape.
- Heritage Impact Assessment for proposed development On Erf 30, Letamo Town, Farm Honingklip 178 Iq, Mogale Local Municipality, Gauteng Province.
- Heritage Impact Assessment for the proposed Prospecting Right Application on the Farm Reserve No 4 15823 And 7638/1, near St Lucia, within the jurisdiction of the Mfolozi Local Municipality in the King Cetshwayo District Municipality, KwaZulu-Natal Province.
- Heritage Impact Assessment for the proposed mining rights on the Farm Waterkloof 95 located between Griekwastad and Groblershoop in the Pixley Ka Seme District Municipality within the Northern Cape Province.
- Heritage Impact Assessment for the proposed East Coast Gas 400 Kv Power Lines, located in Richards Bay, within the Umhlathuze Local Municipality in the King Cetshwayo District Municipality in the Kwazulu-Natal Province.
- Heritage Impact Assessment for the mining right application for the Farm Woodlands 407, situated in the Free State Province.
- Heritage Impact Assessment for the refurbishments of Lyttelton Primary School, Lyttelton Manor, Centurion, Gauteng Province.
- Heritage Impact Assessment for the amendment of an existing prospecting right and environmental authorization for Bothaville NE Ext A, situated in the Free State Province.
- Heritage Impact Assessment and Integrated Cultural Resources Management Study for The Proposed Mfolozi-Mbewu 765kv Transmission Line, Zululand And King Cetshwayo District Municipality, KwaZulu-Natal.
- Heritage Impact Assessment for the proposed for the Construction of the Bulk Water Supply Pipeline and Feeder Pipes in Dunnottar, Gauteng Province.
- Heritage Impact Assessment the prospecting right and environmental authorisation application for Kroonstad South situated in the Free State Province.
- Archaeological impact assessment for a mining permit application for portion 19 of the farm

Syferfontein 303 IP within the city of Matlosana Local Municipality in the North West Province.

GRAVE RELOCATION PROJECTS

Below, a selection of grave relocation projects involvement:

- Report on the relocation of graves. Relocation of four stillborn graves from the Farm Wonderfontein 428 Js, Belfast, Mpumalanga Province.
- Report on the relocation of graves. Relocation of approximately 6 graves from Kwaqubuka Tribal Area, Mtubatuba Local Municipality, Kwa-Zulu Natal Province.Grave exhumation and relocation of 19 graves on erf 3 of Holding 87 North Riding Agricultural Holdings, City of Johannesburg, Gauteng Province.
- Report on the exhumation and reburial report of 16 graves from Doornkop, to Voortrekker Cemetery in Middelburg, Mpumalanga Province
- Report on rescue excavations and skeletal analyses of two archaeological graves inadvertently uncovered in Boitekong, North-West Province.
- Rescue excavation of an unmarked graveyard at Diamond Park, Greenpoint, Kimberley, Northern Cape Province.
- Report on Follow-up site visit excavation and physical anthropological analyses of archaeological human remains transferred from SAPA Victim Identification Centre to Department of Anatomy. Mamelodi East Phase 2 House 566.
- Excavation of human remains from Marulaneng village, Bakenberg Limpopo Province.
- Follow up site visit on human remains found at Bothlokwa (Ramatjowe & Mphakahne), Limpopo Province.
- Follow up site visit on human remains found in Waterpoort, Soutpansberg, Limpopo Province.

EMPLOYMENT SUMMARY:

Positions Held

- 2020 – to date: Archaeologist - PGS Heritage (Pty) Ltd
- 2019: Manager of the NGT ESHS Heritage Department – NGT Holdings (Pty) Ltd
- 2018 – 2019: Archaeologist and Heritage Consultant – NGT Holdings (Pty) Ltd
- 2015-2016: Archaeological Contractor - BA3G, University of Pretoria
- 2014 – 2015: DST-NRF Archaeological Intern, Forensic Anthropological Research Centre

I, Cherene de Bruyn, hereby confirm that the above information contained in my CV is true and correct.

_____ 4 January 2021

C de Bruyn Date