HERITAGE IMPACT ASSESSMENT

PROPOSED KAREERAND TSF EXPANSION PROJECT, LOCATED ON CERTAIN PORTIONS OF THE FARMS KROMDRAAI 420 IP, HARTEBEESTFONTEIN 422 IP, WILDEBEESTPAN 442 IP, BUFFELSFONTEIN 443 IP, UMFULA 575 IP AND MEGADAM 574 IP, EAST AND SOUTH-EAST OF KLERKSDORP, CITY OF MATLOSANA AND POTCHEFSTROOM LOCAL MUNICIPALITIES, NORTH WEST PROVINCE

Project Number: HIA459

Date of Report: 2 June 2020

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Reg No 2003/008940/07

Declaration of Independence

The report has been compiled by PGS Heritage (Pty) Ltd, an appointed Heritage Specialist for GCS Water & Environmental Consultants. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in the Heritage Impact Assessment.

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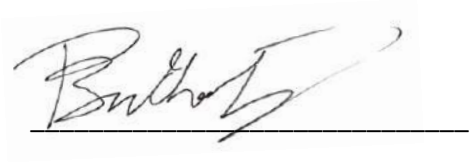
SIGNATURE: 

DETAILS OF CLIENT:

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Report Title	Heritage Impact Assessment for the Proposed Kareerand TSF Expansion Project located on certain portions of the farms Kromdraai 420 IP, Hartebeestfontein 422 IP, Wildebeestpan 442 IP, Buffelsfontein 443 IP, Umfula 575 IP and Megadam 574 IP, east and south-east of Klerksdorp, City of Matlosana and Potchefstroom Local Municipalities, North West Province.		
Control	**Name**	**Signature**	**Designation**
Author	**Polke Birkholtz**		**Project Manager / Heritage Specialist & Archaeologist**

Input by Specialists:

- **Ms Elize Butler** was commissioned as Palaeontologist to carry out a Palaeontological Desktop Study. This report is attached under **Appendix C**.

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	Included at beginning of report
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Included in Appendix B
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Included at beginning of report
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Included in Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Included in Section 5
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Included in Sections 4 & 7
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Included in 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;	Included in 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;	Included in Section 6 - 8
(g) an identification of any areas to be avoided, including buffers;	Included in Section 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;	Included in Section 6
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Included in Section 1
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Included in Section 7
(k) any mitigation measures for inclusion in the EMPr;	Included in Sections 8 and 9

REQUIREMENT	STATUS
(l) any conditions for inclusion in the environmental authorisation;	Included in Sections 8 and 9
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Included in Sections 8 and 9
(n) a reasoned opinion—	
(i) whether the proposed activity, activities or portions thereof should be authorised;	Included in Section 9
(iA) regarding the acceptability of the proposed activity or activities; and	Included in 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;	Included in 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

PGS Heritage (Pty) Ltd was appointed by GCS Water & Environmental Consultants to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Kareerand TSF Expansion Project, located on certain portions of the farms Kromdraai 420 IP, Hartebeestfontein 422 IP, Wildebeestpan 442 IP, Buffelsfontein 443 IP, Umfula 575 IP and Megadam 574 IP, to the east and south-east of Klerksdorp, within the City of Matlosana and Potchefstroom Local Municipalities, North West Province.

An archival and historical desktop study was undertaken to provide a historic framework for the project area and surrounding landscape. This was augmented by a study of available historical topographical maps and an assessment of previous archaeological and heritage studies completed for the study area and surrounding landscape. The desktop study revealed that the study area is located in surroundings characterised by a long and significant history.

The study area was assessed in the field by way of intensive walkthroughs that were augmented by vehicle surveys. The fieldwork was undertaken by experienced fieldwork teams comprising one heritage specialist/archaeologist and one fieldwork assistant. A total of four fieldwork trips were undertaken by experienced fieldwork teams between 2017 and 2018. During all these fieldwork trips these teams comprised one heritage specialist/archaeologist and one fieldwork assistant. The fieldwork resulted in the identification of 48 archaeological and heritage sites. These identified sites comprise the following:

- Six Cemeteries (see sites AGA-MWS-WBP-6, AGA-MWS-WBP-12, AGA-MWS-UMF-4, AGA-MWS-MGD-2, AGA-MWS-MGD-3 and AGA-MWS-BFF-7);
- Eight Possible Graves (see sites AGA-MWS-HBF-5, AGA-MWS-WBP-15, AGA-MWS-WBP-18, AGA-MWS-WBP-19, AGA-MWS-KRD-1, AGA-MWS-MGD-7, AGA-MWS-MGD-8, AGA-MWS-MGD-9);
- One Historic Black Homestead containing Confirmed Graves (AGA-MWS-MGD-5);
- Twenty Historic Black Homesteads (AGA-MWS-WBP-1, AGA-MWS-WBP-2, AGA-MWS-WBP-3, AGA-MWS-WBP-4, AGA-MWS-WBP-7, AGA-MWS-WBP-8, AGA-MWS-WBP-9, AGA-MWS-WBP-10, AGA-MWS-WBP-11, AGA-MWS-WBP-13, AGA-MWS-WBP-14, AGA-MWS-WBP-16, AGA-MWS-UMF-5, AGA-MWS-MGD-4, AGA-MWS-MGD-6, AGA-MWS-BFF-9, AGA-MWS-BFF-10, AGA-MWS-BFF-11, AGA-MWS-BFF-12 and AGA-MWS-BFF-13);

- Three Recent Structures (see sites AGA-MWS-HBF-6, AGA-MWS-UMF-1 & AGA-MWS-MGD-1);
- Two Historic Farmsteads (see sites AGA-MWS-WBP-17 & AGA-MWS-UMF-3);
- Seven Stone Age sites (see sites AGA-MWS-WBP-5, AGA-MWS-UMF-2, AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18); and
- One old lane of trees (AGA-MWS-BFF-8).

The impact of the proposed development on the located heritage sites was assessed in Chapter 7 of this report. For this purpose, an overlay of the identified archaeological and heritage sites over the proposed development footprint areas was made. This overlay revealed that four sites are located within, or in proximity to, these proposed development footprint areas. These four sites are AGA-MWS-WBP-2, AGA-MWS-MGD-5, AGA-MWS-MGD-6 AND AGA-MWS-MGD-7. Assessments of the impact before and after mitigation were undertaken.

Mitigation measures are outlined in Chapter 8 of this report. The mitigation measures required for sites AGA-MWS-WBP-2, AGA-MWS-MGD-5 and AGA-MWS-MGD-6 will be outlined first. The following initial mitigation measure is required for the four sites:

- A social consultation process to assess whether any local residents or the wider public is aware of the presence of graves here.

Depending on the outcome of the social consultation process, three different outcomes would be the result, namely:

- Outcome 1: The social consultation absolutely confirms that no graves are located here.
- Outcome 2: The social consultation absolutely confirms that graves are located here.
- Outcome 3: The social consultation does not yield any confident results.

The following mitigation measures would be required for sites falling under Outcome 1:

- No further mitigation with regards to the unmarked stillborn graves would be required.

The following mitigation measures would be required for sites falling under Outcome 2:

- A grave relocation process must be undertaken.

- A detailed social consultation process, at least 60 days in length, comprising the attempted identification of the next-of-kin in order to obtain their consent for the relocation.
- Bilingual site and newspaper notices indicating the intent of the relocation.
- Permits from all the relevant and legally required authorities.
- An exhumation process that keeps the dignity of the remains and family intact.
- An exhumation process that will safeguard the legal rights of the families as well as that of the mining company.
- The process must be done by a reputable company well versed in the mitigation of graves.

The following mitigation measures would be required for sites falling under Outcome 3:

- Test excavations to physically confirm the presence or absence graves.
- If no evidence for graves are found, the site will fall within Outcome 1 as outlined above. This means that no further mitigation measures would be required.
- If evidence for stillborn babies are found, the site will fall within Outcome 2 as outlined above. This means that a full grave relocation process must be implemented.

Additionally, the following general mitigation measures must be undertaken for all four these sites:

- All structures and site layouts from each site must be recorded using standard survey methods and/or measured drawings. The end result would be a site layout plan.
- A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report.
- The completed mitigation report must be submitted to the relevant heritage authorities.

The following mitigation measures are required for site AGA-MWS-MGD-7:

- The site must be fenced before construction commences. This fencing must be undertaken in such a way that the closest distances between the possible graves and the fence are at all times at least 2m.
- Signposts must be erected that clearly indicate the fenced area as containing possible graves.
- The position of the possible graves must be shown on all the construction and operation maps to ensure that all individuals associated with construction and mining activities are aware of

the presence of these sites.

Ms. Elize Butler of Banzai Environmental (Pty) Ltd was commissioned to undertake a desktop Palaeontological Impact Assessment. Her report and findings are attached in full in **Appendix C**. Ms. Butler found that the proposed development area is "*…is underlain by the Hekpoort-; Daspoort and Strubenkop Formations of the Pretoria Group within the Transvaal Supergroup as well as the igneous intrusion diabase. According to the PalaeoMap of SAHRIS the Palaeontological Sensitivity of the Hekpoort Formation is moderate, Strubenkop Formation is Low, Daspoort Formation is High, while diabase is igneous rocks and thus unfossiliferous (Almond et al, 2013; Groenewald et al 2014; SAHRIS website). Since the area has already been disturbed with mining activities in the past the sensitivity is regarded as low."*

It is therefore considered that the construction and operation of the development footprint and associated infrastructure is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. Although fossils are rare in this biozone a single fossil can have a huge scientific importance as many fossil taxa are known from only one fossil.

The following mitigation measures would be required for palaeontology:

- In the unlikely event that fossil remains are discovered during any phase of construction, on the surface or exposed by excavations the Chance Find Protocol outlined in the palaeontological report must be implemented by the ECO in charge of these developments. These discoveries ought to be protected (*in situ*) and the ECO must report to SAHRA (contact details provided in the specialist report) so that correct mitigation (recording and collection) can be carry out.

- Preceding any collection of fossil material, the palaeontologist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

The following general mitigation measures are required:

- An archaeological and heritage monitoring process must be implemented for three sites containing cemeteries and possible graves located approximately 50m from the proposed development footprint areas. Although these sites are not expected to be directly impacted

upon by the proposed development, this monitoring process will ensure that no peripheral impacts take place. These four sites are AGA-MWS-MGD-2, AGA-MWS-MGD-3 and AGA-MWS-MGD-8.

- All the sites listed in this report with a heritage significance of Medium and higher, must be included in a heritage management plan. Such a management plan would allow for the future management and protection of these sites.

While the unmitigated impact of the proposed development is expected to result in a relatively high negative impact in terms of the identified archaeological and heritage sites located here, these impacts can be suitably mitigated to acceptable levels by way of a range of mitigation measures outlined in this report. As a result, on the condition that the recommendations made in this report are adhered to, no heritage reasons can be given for the development not to continue.

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1 INTRODUCTION

PGS Heritage (Pty) Ltd was appointed by GCS Water & Environmental Consultants to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Kareerand TSF Expansion Project, located on certain portions of the farms Kromdraai 420 IP, Hartebeestfontein 422 IP, Wildebeestpan 442 IP, Buffelsfontein 443 IP, Umfula 575 IP and Megadam 574 IP, to the east and south-east of Klerksdorp, within the City of Matlosana and Potchefstroom Local Municipalities, North West Province.

1.1 Scope of the Study

The aim of this HIA is 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 discovered heritage resources in a responsible manner, in order 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 Heritage (Pty) Ltd. The staff at PGS Heritage (Pty) Ltd has a combined experience of nearly 70 years in the heritage consulting industry and have 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. Polke Birkholtz, the project manager and 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 19 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.

1.3 Assumptions and Limitations

The following assumptions and limitations to this study 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 inventory 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 make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.

- The present fieldwork did no assess any part of the fenced-off area which encloses the existing Kareerand TSF. The reason for this is that this fenced-off area would have been assessed as part of the HIA undertaken for the original TSF development (Pistorius, 2011).

- In terms of the fieldwork undertaken on the overall study area, the farm Buffelsfontein 443 IP was not surveyed as intensively as the other properties forming part of the overall study area. The reason for this is that at the time of the fieldwork a number of breeding ostriches were observed within this property. As a result, only limited walkthroughs of this area could be undertaken.

- Please note that the only development footprints that were assessed as part of this report, are depicted on Figure 6. The existing pipelines that are also depicted on this map, did not form part of the present study's development footprints.

1.4 Legislative Context

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

i. National Environmental Management Act (NEMA) Act 107 of 1998
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. GNR 982 (Government Gazette 38282, 14 December 2014) promulgated under the National Environmental Management Act (NEMA) Act 107 of 1998

    a. Basic Assessment Report(BAR) – Regulations 19 and 23
    b. Environmental Scoping Report (ESR) – Regulation 21
    c. Environmental Impacts Assessment (EIA) – Regulation 23
    d. Environmental Management Programme (EMPr) – Regulations 19 and 23

ii. National Heritage Resources Act (NHRA) Act 25 of 1999

    a. Protection of Heritage Resources – Sections 34 to 36
    b. Heritage Resources Management – Section 38

iii. MPRDA Regulations of 2014

    a. Environmental reports to be compiled for application of mining right – Regulation 48
    b. Contents of scoping report – Regulation 49
    c. Contents of environmental impact assessment report – Regulation 50
    d. Environmental management programme – Regulation 51
    e. Environmental management plan – Regulation 52

iv. The Regulations relating to the Management of Human Remains (GNR 363 of 2013 in Government Gazette 36473) promulgated under the National Health Act (Act No. 61 of 2003)

    a. Exhumation and Reburial of Human Remains – Regulations 26, 27 and 28

The NHRA stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that "*no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by*

the relevant provincial heritage resources authority…".

The NEMA (No 107 of 1998) states that an integrated EMP should (23:2 (b)) "*…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage*".

In accordance with legislative requirements and EIA rating criteria, the regulations of SAHRA and ASAPA have also been incorporated to ensure that a comprehensive and legally compatible HIA report is compiled.

1.5 Terminology and Abbreviations

Archaeological resources

i. 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;
ii. 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;
iii. 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;
iv. 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

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. These may include:

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

Early Stone Age

The earliest archaeological phase identified in South Africa. It refers to the archaeology of the Stone Age, dating to between roughly 700 000 and 2 500 000 years ago.

Heritage

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

Heritage Resources

This means any place or object of cultural significance

Later Stone Age

The archaeology of the last 20 000 years, associated with fully modern people.

Late Iron Age

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

Middle Stone Age

The archaeology of the Stone Age, dating to between 20 000-300 000 years ago, associated with early modern humans.

Palaeontology

The study of 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 of any site which contains such fossilised remains or trace.

Study Area

The term study area refers to the overall area that was assessed during the fieldwork. A number of development footprint areas are proposed within the overall study area (see below).

Development Footprint Areas

Development footprint areas represent the actual project areas that will be developed. Examples of development footprint areas for this project include the Pollution Control Dams and River Diversion. The development footprint areas assessed for the purposes of this report, are depicted on Figure 6.

Table 1 - Abbreviations

ABBREVIATION	*DESCRIPTION*
AIA	**Archaeological Impact Assessment**
ASAPA	**Association of South African Professional Archaeologists**
CRM	**Cultural Resources Management**

DEA	**Department of Environmental Affairs**
EAP	**Environmental Assessment Practitioner**
ECO	**Environmental Control Officer**
EIA	**Environmental Impact Assessment / Early Iron Age**
EMPr	**Environmental Management Programme Report**
ESA	**Early Stone Age**
GPS	**Global Positioning System**
HIA	**Heritage Impact Assessment**
I&AP	**Interested & Affected Party**
LSA	**Later Stone Age**
LIA	**Late Iron Age**
MIA	**Middle Iron Age**
MSA	**Middle Stone Age**
NEMA	**National Environmental Management Act**
NHRA	**National Heritage Resources Act**
PHRA	**Provincial Heritage Resources Authority**
SAHRA	**South African Heritage Resources Agency**
SAHRIS	**South African Heritage Resources Information System**

Refer to **Appendix A** for further discussion on heritage management guidelines.

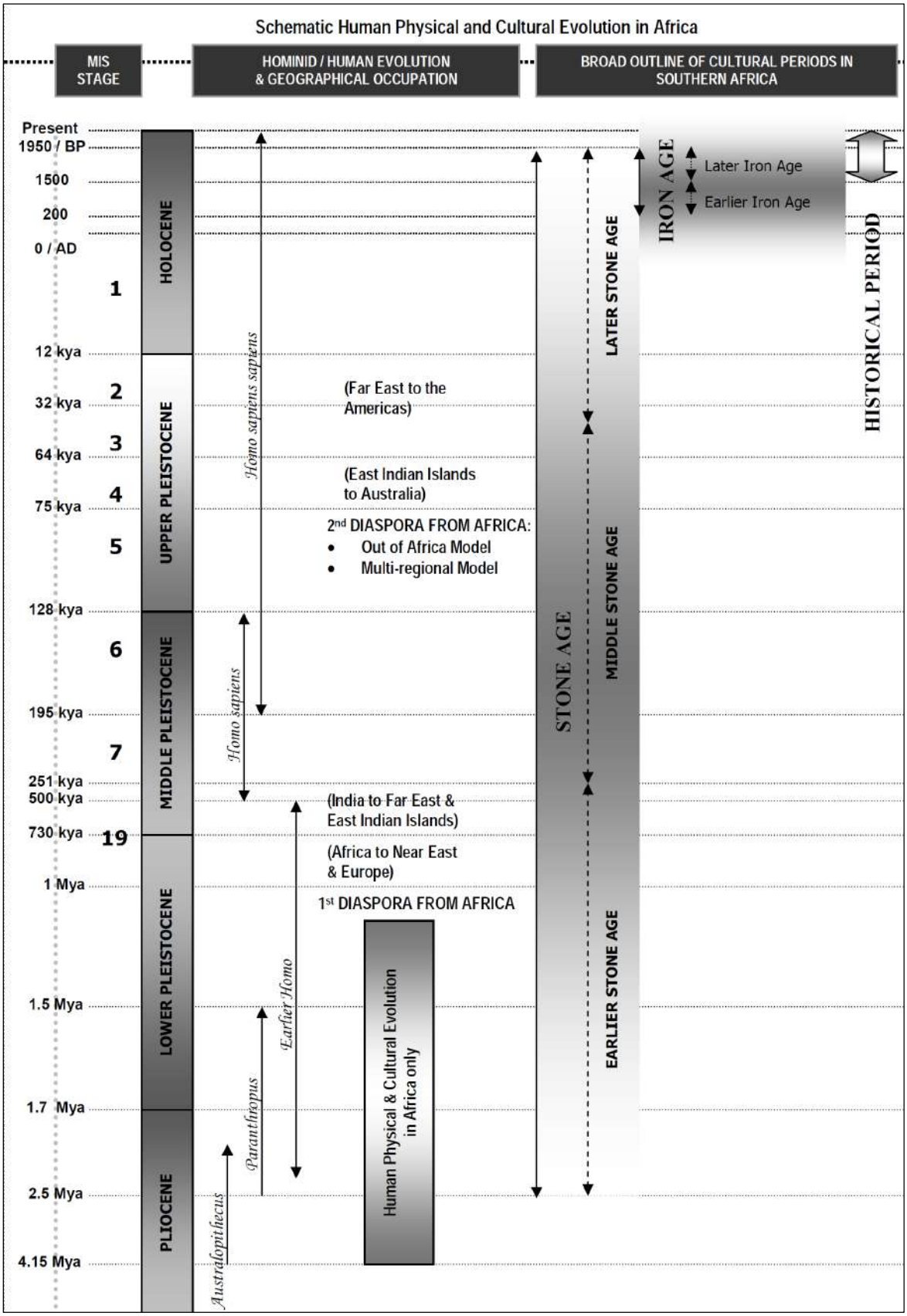


Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008).

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Site Location

Coordinates	Northernmost point: S 26° 50' 59.67" E 26° 53' 11.95"	Easternmost point: S 26° 53' 28.30" E 26° 55' 28.93"
	Southernmost point: S 26° 56' 10.95" E 26° 50' 59.15"	Westernmost point: S 26° 55' 27.34" E 26° 49' 43.26"
Location	The proposed development area is located south of the R502 between Orkney and the N12 between Klerksdorp-Potchefstroom and north of the Vaal River. The nearest town is Khuma, which is located 3km to the north.	
Property	Portions of the farms Kromdraai 420 IP, Hartebeestfontein 422 IP, Wildebeestpan 442 IP, Buffelsfontein 443 IP, Megadam 574 IP and Umfula 575 IP.	
Map Sheet	2626DD Stilfontein	
Extent	The entire study area is approximately 3,941 hectares in extent.	

Figure 2 – Google Earth image depicting the regional context of the study area.

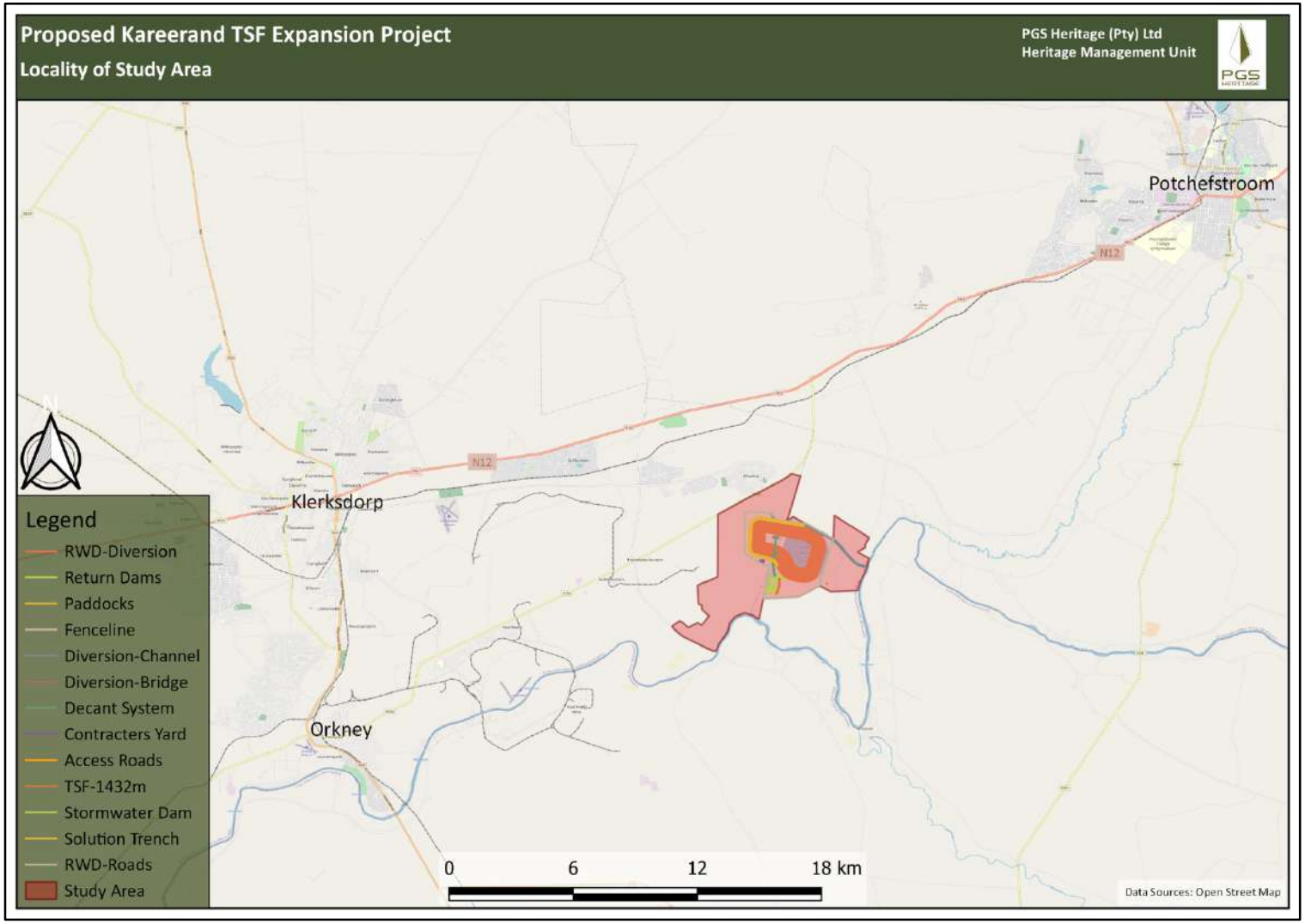


Figure 3 – Locality plan depicting the study area within its surrounding landscape.

2.2 Technical Project Description

2.2.1 Background

Mine Waste Solutions (MWS), also known as Chemwes (Pty) Ltd (Chemwes), has been in business since 1964, and conducts its operations over a large area of land to the east of Klerksdorp, within the area of jurisdiction of the City of Matlosana and JB Marks Local Municipalities (LM), which fall within the Dr Kenneth Kaunda District Municipality (DM) in the North-West Province. The MWS Operations are located primarily to the south of the N12, east of the town of Stilfontein. The closest town is Khuma, located about 3km northwest of the facility, and other nearby towns include Stilfontein (10 km from facility) and Klerksdorp (19 km from facility).

The operations at MWS entail the collection and reprocessing of mine tailings that were previously deposited on tailings storage facilities (TSFs) in order to extract gold and uranium. High pressure water cannons are used to slurry the tailings on the Source TSFs, then slurry is pumped by a number of pump stations and pipelines to the MWS Processing Plant (indicated in dark green in Figure 4), and the residues from the Processing Plants are pumped to the Kareerand TSF (indicated in yellow in Figure 4). Once an old Source TSF has been completely recovered, it is cleaned-up and rehabilitated. See Figure 4 for an overview of the existing infrastructure used for this process.

The Kareerand TSF was designed with an operating life of 14 years, taking the facility to 2025, and total design capacity of 352 million tonnes. Subsequent to commissioning of the TSF, MWS was acquired by AngloGold Ashanti and tailings production target has increased by an additional 485 million tonnes, which will require operations to continue until 2042. The additional tailings therefore require expansion of the design life of the TSF.

This project entails the expansion of the current Kareerand TSF to accommodate the increased tailings and final design capacity, along with additional pump stations and pipelines. The TSF expansion is proposed on the western edge of the current facility, and the final height of the combined facility (both expansion and current) will be 122m. The expansion footprint will add 380 hectares (ha) to the TSF and approximately 93 additional ha will be cleared for supporting infrastructure. Figure 5 depicts the site layout of all additional infrastructure across the operational footprint, while Figure 6 depicts the TSF expansion and its associated infrastructure.

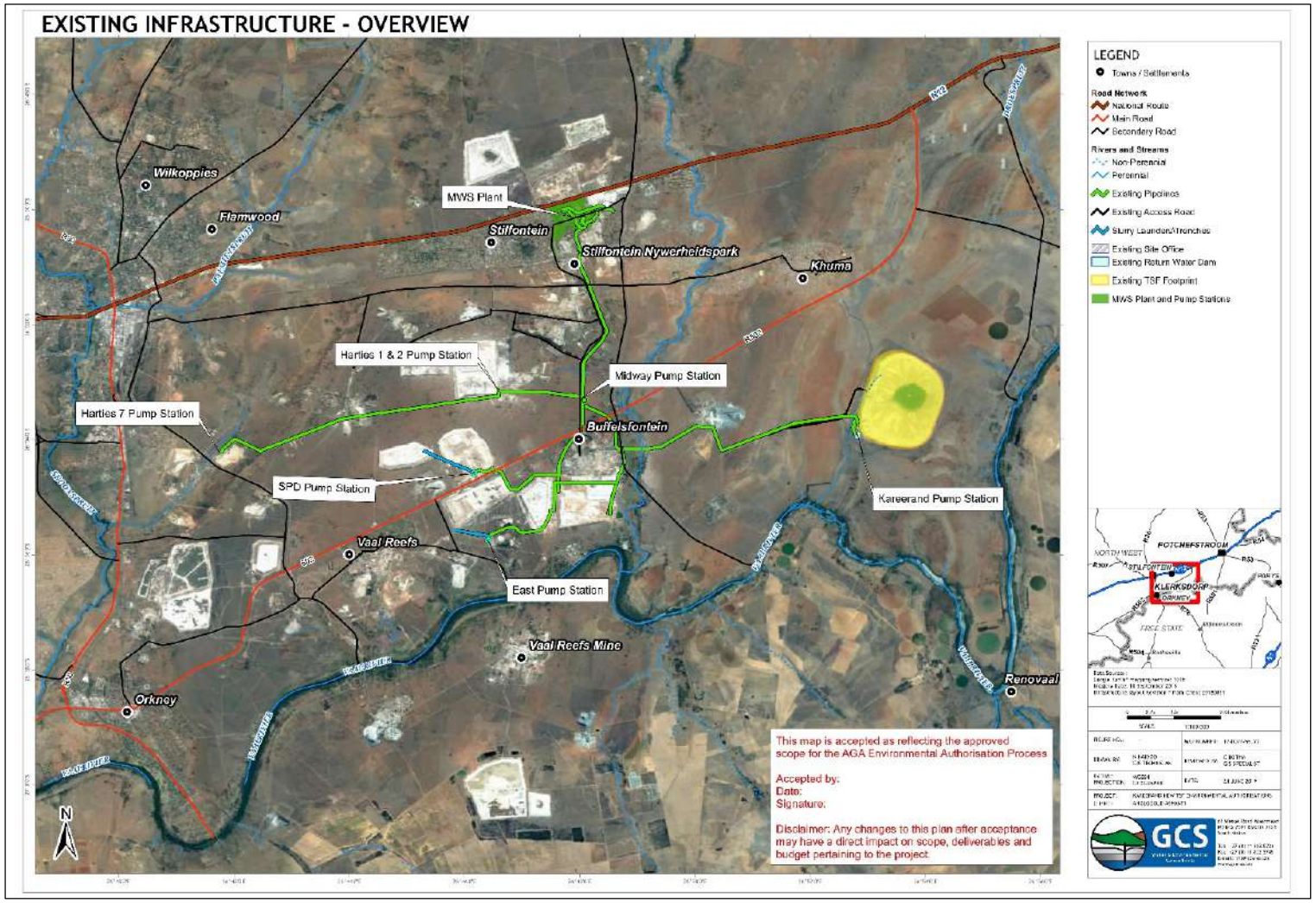


Figure 4 – Existing infrastructure. Map supplied by GCS Water & Environmental Consultants.

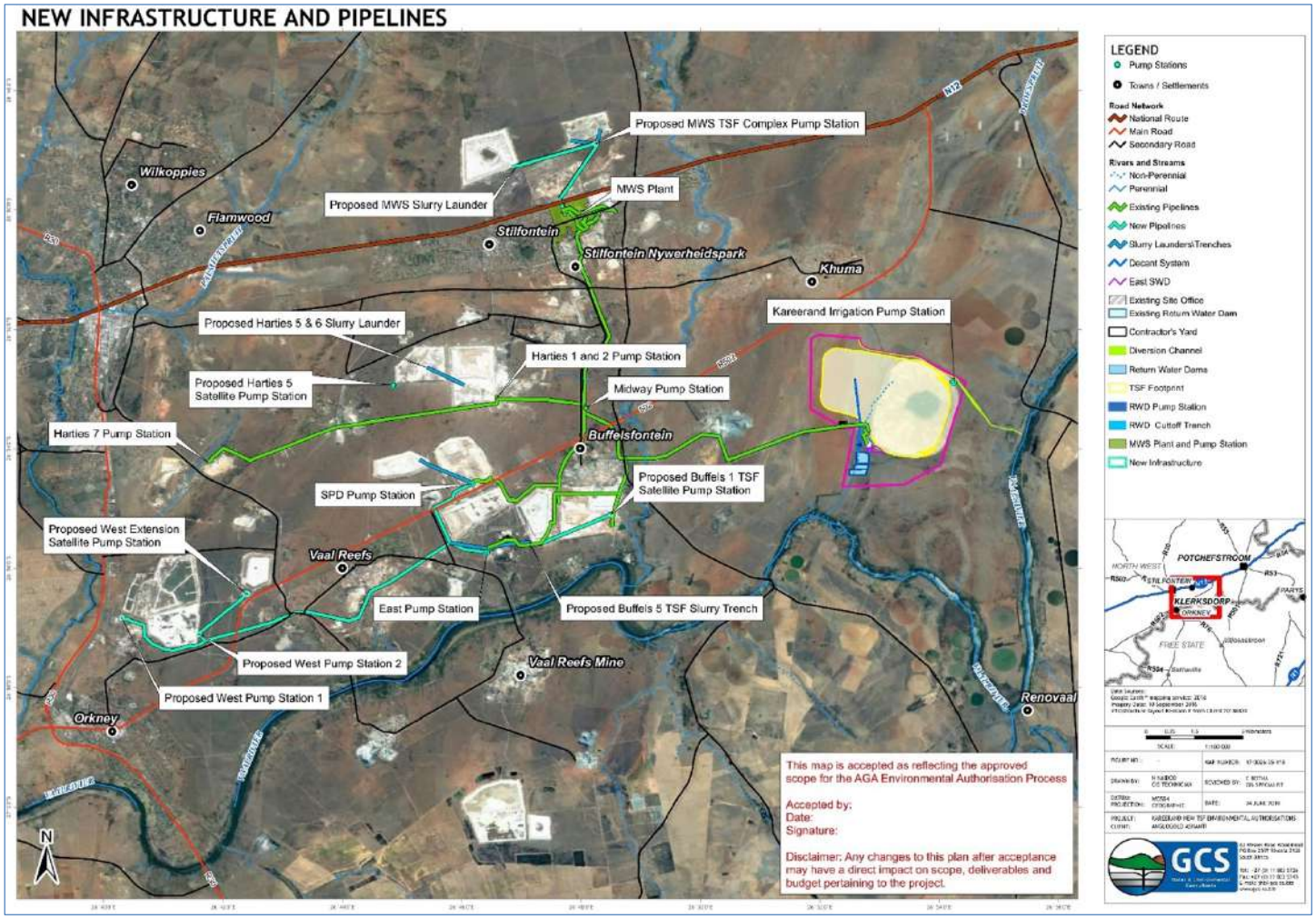


Figure 5 – Site layout across operational footprint and TSF expansion footprint. The new infrastructure is noted by the word "proposed", and the new pipelines are indicated in bright blue (as opposed to existing pipelines indicated in green). Map supplied by GCS Water & Environmental Consultants. Please note that for the purposes of this report, the only development footprints assessed were directly associated with the Kareerand TSF (see next map for detail).

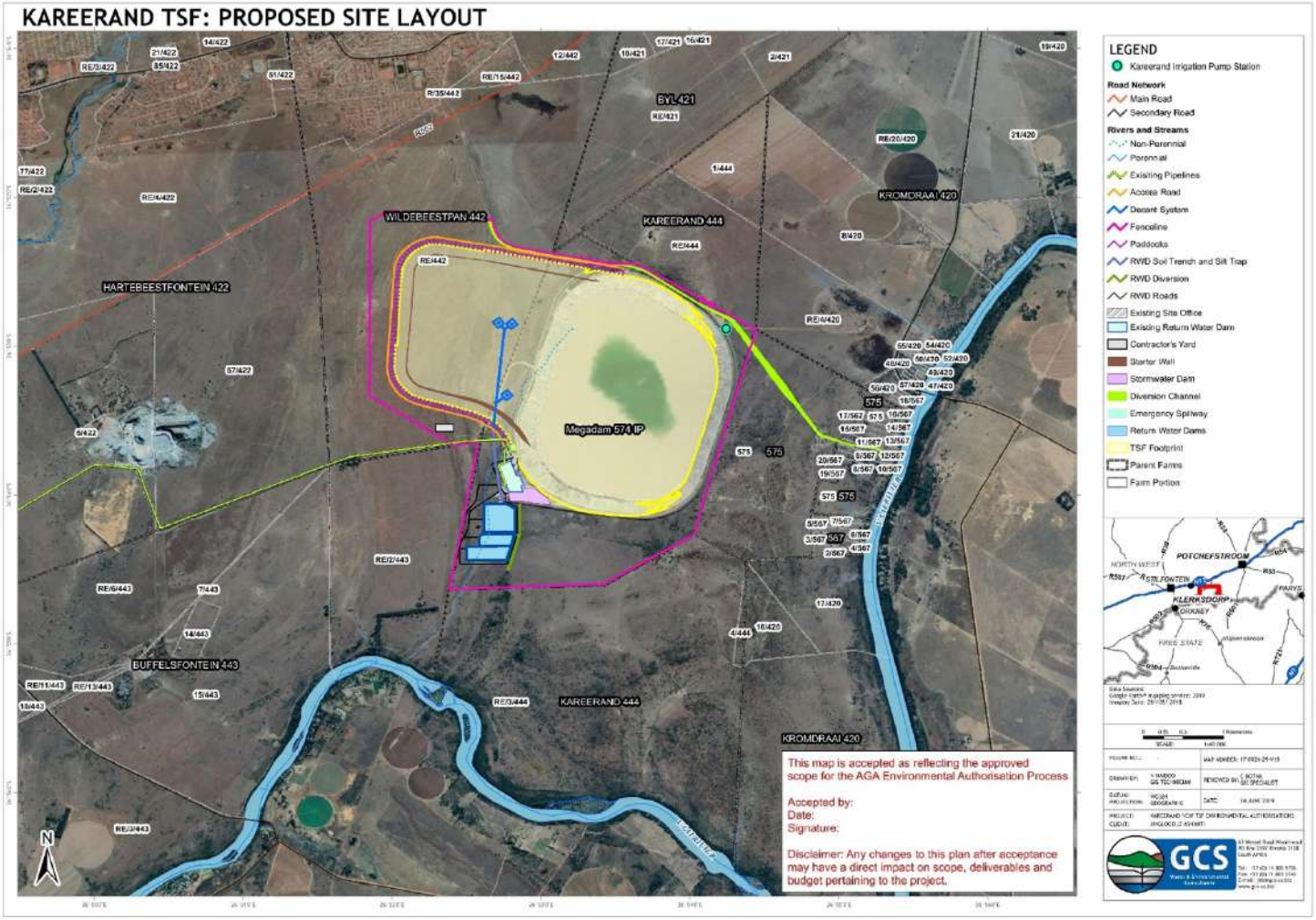


Figure 6 – TSF expansion site layout in detail, including associated infrastructure. Map supplied by GCS Water & Environmental Consultants. Please note that all the development footprints depicted on this map, with the exception of the existing infrastructure such as the pipelines, represent the only development footprints that were assessed as part of this report.

2.2.2 New Infrastructure

The proposed project will make use of the existing facilities as well as additional supporting infrastructure.

The details of the infrastructure which forms part of the expansion of the TSF are as follows:

- TSF expansion TSF Footprint
    - TSF will be expanded by 380 ha
    - The expanded footprint will be lined as per requirements of the regulator
- Fences Fenceline
    - 2.4 m high game fence with appropriate signage will be installed around the perimeter of the new TSF (length of new fence = 7 km)
    - This will tie into the existing fence and is the same type of fence
- New main access road and perimeter access road Access Road
    - 8 m wide gravel access road around perimeter of TSF, to the RWDs (return water dams), pump stations (western perimeter of TSF expansion) and offices
    - Total combined distance of new roads will be 11 km
    - Access ramps provide access onto tailings dam
- Topsoil bund wall
    - A bund wall will be constructed around the TSF, next to the access road
    - The wall will be 6 m at highest point and 2 m at lowest point, crest width is 8 m
    - The bund wall will also be used as access road on northern side of TSF
- Stormwater diversion channels Diversion Channel RWD Diversion
    - A trench on the northern side of the TSF, 6 km in length, to divert clean storm water running from the north, towards the east in the direction of the Vaal River
        - Trapezoidal in shape with side slopes of 1v:2h and base width varying from 4 m to 9m.
        - Designed to accommodate the 1:50 year storm event
        - Peak flow velocity will be 125 m^3/s during 1:50 year storm events
    - A second unlined trench next to the RWD will divert clean storm water runoff away from the RWD and solution trench and prevent it from mixing with the dirty water
    - Diversion channels will assist to minimise the water quality impact from the TSF
- Delivery pipeline

- Three steel 500 mm tailings delivery pipes located at the toe of the facility (western edge); 13.5 km in total length
- Will deliver slurry to the northern, western and southern side of the TSF expansion

- Solution trench
  - Trench lined with 100 mm thick mesh reinforced concrete
  - Around northern, western and southern side of TSF
  - Will convey decant water and storm water from the side slopes, filter discharge (seepage water) from the outer drains and surface runoff from the side slopes to the RWD.
- Seepage and dirty water collector sump
  - Constructed on northern side of TSF
  - Will collect seepage water and dirty storm water running off the TSF walls from solution trench before it is pumped back to the north-western corner
- Catchment paddocks 

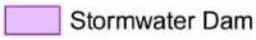
  - Constructed around perimeter of facility at final outer wall toe location
  - Constructed using material from solution trench excavations and paddock basins; will be nominally compacted
  - Paddocks will be 50 m long and 20 m wide
  - Designed to contain run-off from a 1:50 year storm event
- Starter wall 

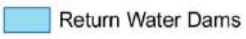
  - The starter wall will contain tailings deposition during early development of TSF
  - Constructed using clay-based material from basin or other construction areas
- Drainage system
  - Under drainage system located within TSF footprint, consisting of toe, intermediate and central drains and drain outlets
  - Drain outlets constructed at approximately 50-100m intervals to collect seepage water from filter drains and convey it to solution trench
  - The existing drain outlets will connect to a collector drain system then discharge into the solution trench on the southern flank where the two facilities connect.
- Decant system
  - Gravity pipe decant system to ensure water does not accumulate on top of TSF
  - Includes permanent double intake structure and intermediate intake structures
  - Intermediate penstock intake structures positioned at different elevations along the

penstock outlet pipeline

  - Ensure effective decanting of supernatant water during the development phase of TSF
  - Minimise delay in water returned to the reclamation sites

- Catwalk
  - Timber catwalk and floating walkway structure for access from pool wall to penstock intermediate and permanent intake structures respectively
- Silt trap 

  - Concrete-lined silt trap with twin compartments between penstock outlet and RWD
  - Should reduce volume of suspended solids flowing into RWD
- Storm water dam 

  - Storm water dam will be located between TSF and RWDs and will contain dirty water running off the TSF
  - Capacity will be 155 000 m^3 and will cover 6.6 Ha
- RWD and related infrastructure 

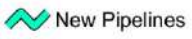
  - New RWDs with a combined capacity of 837 000 m^3 (area of 60 Ha), south of the TSF and existing RWD complex
  - RWD will have three compartments (one for operation, the other two for dirty water containment)
  - Will be lined with double HDPE liner system and leakage-detection material (Hi-drain); double liner will consist of 2 mm geomembrane and 1.5 HDPE geomembrane
- Contractors yard 

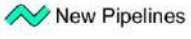
  - Contractor's yard will be located on the south western side of the TSF extent on the right of the access road travelling south.
  - Contractor's yard will include the following infrastructure: site office, workshop, fuel storage facilities, wash bays, change houses, septic tanks.

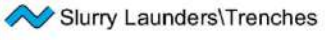
The additional infrastructure required across the operational footprint will include new pump stations, new satellite pump stations, slurry launders and connecting slurry and process water pipelines. Please note that none of the footprints associated with these additional infrastructural elements formed part of the present study. As indicated in Figure 5, in the centre of operations, existing infrastructure (pump stations and main slurry and process water pipelines) will be utilised to process adjacent resources. Buffels 5 TSF will be connected to the East Complex Pump Station via a

new slurry trench and Buffels 1 TSF will be pumped via a satellite pump station to the Buffels 5 TSF slurry trench feed. At the Harties 1 & 2 Pump Station, located centre to north of Figure 5, Harties 5 & 6 TSF will be directed via a slurry launder to the pump station and may require, at a later date, a satellite pump station to aid in reclamation of tailings that cannot be gravity fed. In the west, three new pump stations (West Pump Station 1, West Pump Station 2 and a satellite pump station) will be constructed, with main slurry and process water pipelines extended from the existing SPD and East Complex Pump Stations in the east to the west, allowing for the use of the SPD and East Complex Pump Stations as booster pump stations. In the north, the MWS 4 & 5 TSF's will be reclaimed and directed to a new pump station via slurry launders. New process water and slurry piping will be installed between the MWS 4 & 5 Pump Station and the MWS plant. In total, three new main pump stations and three new satellite pump stations will be built.

The details of the supporting infrastructure for the TSF expansion are as follows:

- Pump Stations
    - Three main pump stations: one at the MWS complex, two at the outlying western TSFs
    - Three satellite pump stations: one at the Harties TSFs (probably at a later stage), one at the outlying western TSFs and one at the Buffels TSFs
- Process water pipelines 

    - Extended from the existing SPD and East Complex pump stations to the western outlying TSFs
    - Connecting MWS TSFs and MWS plant
- Slurry pipelines 

    - Extended from the existing SPD and East Complex pump stations to the western outlying TSFs
    - Connecting MWS TSFs and MWS plant
- Slurry launders 

    - Connecting the Buffels TSF to the East Complex pump station
    - Connecting Harties TSFs with the Harties 1 & 2 pump station
    - Connecting MWS TSFs to the proposed MWS pump station

3 ASSESSMENT METHODOLOGY

3.1 Methodology for Assessing Heritage Site Significance

The HIA process consisted of the three steps outlined below.

Step I – Desktop Study: An archaeological and historical background study was undertaken using available sources. This was augmented by an assessment of historic topographical maps, which allowed for the historic layering of the study area. Previous archaeological and heritage studies from the study area and surroundings were also accessed using inter alia the South African Heritage Resources Information System (SAHRIS) of the South African Heritage Resources Agency (SAHRA). A palaeontological desktop study was also undertaken during the overall desktop study component.

Step II – Physical Survey: Intensive field surveys of the study area were undertaken on foot and by vehicle and were undertaken by experienced fieldwork teams comprising one heritage specialist/archaeologist and one fieldwork assistant. For all the fieldwork undertaken for this project, the fieldwork assistant was Derrick James. With the exception of the fieldwork undertaken on 21 May 2018, the heritage specialist/archaeologist responsible for all the fieldwork was Polke Birkholtz. On 21 May 2018, the heritage specialist/archaeologist was Ilan Smeyatsky. The fieldwork was aimed at locating and documenting sites falling within the overall study area and was undertaken on the following days:

- Monday, 4 September to Friday, 8 September 2017
- Monday, 21 May 2018
- Monday, 18 June 2018 to Thursday, 21 June 2018
- Monday, 5 November 2018 to Friday, 9 November 2018

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 3**).

Table 2 - 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 following methodology was used to rank these impacts. Clearly defined rating and rankings scales (refer **Tables 4** to **10**) were used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation were combined into a single impact rating table for ease of assessment.

Each impact identified was rated according the expected magnitude, duration, scale and probability of the impact (refer **Table 11**).

To ensure uniformity, the assessment of potential impacts will be addressed in a standard manner so that a wide range of impacts is comparable. For this reason, a clearly defined rating scale will be provided to the specialist to assess the impacts associated with their investigation.

Each impact identified will be assessed in terms of scale (spatial scale), magnitude (severity) and duration (temporal scale). Consequence is then determined as follows:

Consequence = Severity + Spatial Scale + Duration

The Risk of the activity is then calculated based on frequency of the activity and impact, how easily it can be detected and whether the activity is governed by legislation. Thus:

Likelihood = Frequency of activity + frequency of impact + legal issues + detection

The risk is then based on the consequence and likelihood.

Risk = Consequence x likelihood

In order to assess each of these factors for each impact, the ranking scales in **Table 4** – **Table 10** were used.

Table 3 - Severity

Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful / within a regulated sensitive area	5

Table 4 – Spatial Scale: How big is the area that the aspect is impacting on?

Area specific (at impact site)	1
Whole site (entire surface right)	2
Local (within 5km)	3
Regional / neighboring areas (5km to 50km)	4
National	5

Table 5 - Duration

One day to one month (immediate)	1
One month to one year (Short term)	2
One year to 10 years (medium term)	3
Life of the activity (long term)	4
Beyond life of the activity (permanent)	5

Table 6 – Frequency of the activity: How often do you do the specific activity?

Annually or less	1
6 monthly	2
Monthly	3
Weekly	4
Daily	5

Table 7 – Frequency of the incident/impact: How often does the activity impact on the environment?

Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

Table 8 – Legal Issues: How is the activity governed by legislation?

No legislation	1
Fully covered by legislation	5

Table 9 – Detection: How quickly/easily can the impacts/risks of the activity be detected on the environment, people and property?

Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

Environmental effects will be rated as either of high, moderate or low significance on the basis provided in **Table 11** below.

Table 10 – Impact Ratings

RATING	**CLASS**
1 – 55	(L) Low Risk
56 – 169	M) Moderate Risk
170 – 600	(H) High Risk

4 CURRENT STATUS QUO

The study area is located south of the R502 between Orkney and the N12 between Klerksdorp-Potchefstroom and is also situated north of the Vaal River. The nearest town is Khuma, which is located 250m north of the present study area. Topographically speaking, the study area comprises for the most part a relatively level portion of land, with the only prominent natural ridge comprising a prominant Chert ridge on its western and north-western boundaries. The current study area components is located in proximity to the existsing Kareerand TSF.

For the most part, the study area is located within the Rocky Highveld Grassland vegetation type. This vegetation type is characterised by a "…*highly variable landscape with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. Most common grasses on the plains belong to the genera Themeda, Eragrostis, Heteropogon and Elionurus. High diversity of herbs, many of which belong to the Asteraceae, is also a typical feature. Rocky hills and ridges carry sparse (savannoid) woodlands with Protea caffra subsp. caffra, P. welwitschii, Acacia caffra and Celtis africana, accompanied by a rich suite of shrubs among which the genus Rhus (especially R. magalismonata) is most prominent*." In terms of geology, the Rocky Highland Grassland vegetation type is associated with Quartzite ridges of the Witwatersrand Supergroup and the Pretoria Group as well as the Selons River Formation of the Rooiberg Group (last two are of the Transvaal Supergroup) (www.sanbi.org). Such a Quartize ridge was observed during the fieldwork, and cuts through the proposed TSF expansion area.

Only the western edge of the present study area, is located within the Vaal Reefs Dolomite Sinkhole Woodland vegetation type. This component of the study area is associated with a charachteristic geomorphological feature of this vegetation type, namely a prominent Chert ridge. This vegetation type "…*occurs almost exclusively on the dolomites of the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup), where underground dissolution of the rock causes sinkholes*." (www.sanbi.org).

A clump of camelthorn trees (*Acacia erioloba*) was observed near the boundary of this vegetation type with the Rocky Highveld Grassland one, with isolated smaller trees and shrubs found sporadically across the study area.

Despite the location of the study area within these two vegetation types, significant components of the site comprise fallow agricultural land. As shown elsewhere, an assessment of the available historical maps revealed that sections of the study area had been used for crop farming for a very long time. A number of extensive and prominant heaps of stones found across the study area support this assertion and point to large scale clearing of stones and rocks from the land to make it suitable for ploughed farming.

All these sections of the study area that had been used for intensive crop farming, can be described as largely disturbed. A number of brick-built reservoirs were also identified within the study area and its immediate surroundings. The presence of these reservoirs allude to the use of the study area for livestock farming as well. Other elements of disturbance identified within the study area include farm and provincial roads, fences, buildings etc. A number of mechanically made heaps of large boulders were also observed within the eastern burrow pit area.

Figure 7 - General view of a section of the study area. This image was taken from the chert ridge on the western end of the study area towards the existing Kareerand TSF, visible in the back.

Figure 8 – Another view of a section of the study area. The existing Kareerand TSF can again be seen.

Figure 9 – This photograph depicts the clump of Acacia erioloba trees observed within the study area.

Figure 10 – A section of a chert ridge observed on the western end of the study area.

Figure 11 – A section of a quartzite ridge that cuts through the proposed TSF expansion area.

Figure 12 – An example of the extensive and prominent stone heaps found across the study area. These heaps are the result of the clearing of stones and rocks from the land as preparation for ploughing activities.

Figure 13 – This broken shank of an old farming implement (likely a cultivator or harrow) was observed on the surface of the study area during one of the transects through the proposed expansion area. Its presence attests to the long-term use of the study area for agricultural crop farming. Scale in 1cm increments.

Figure 14 – Another general view of the study area showing the overgrown state of the areas which had been used for pivot irrigation. These areas were avoided during the fieldwork.

Figure 15 – This farmhouse was identified on the farm Kromdraai. An assessment of the available aerial photographs has revealed that it was built between 1961 and 1967, and as a result is not older than 60 years. This farmhouse is therefore not included in this report.

5 DESKTOP STUDY FINDINGS

5.1 Archaeological and Historical Overview of the Study Area and Surroundings

DATE	DESCRIPTION
2.5 million - 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 is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago.
250 000 to 40 000 years ago	The Middle Stone Age is the second oldest phase identified in South Africa's archaeological history. This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique.
40 000 years ago to the historic past	The Later Stone Age is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths. A well-known feature of the Later Stone Age is rock art in the form of rock paintings and engravings.
AD 1500 - AD 1700	The Olifantspoort facies of the Moloko Branch of the Urewe Ceramic Tradition is the first Iron Age facies to be identified within the surroundings of the study area. The key features of the decoration used on the ceramics from this facies include multiple bands of fine stamping or narrow incision separated by colour (Huffman, 2007).
AD 1700 – AD 1840	The Thabeng facies of the Moloko Branch of the Urewe Tradition is the next Iron Age period to be identified within the surroundings of the study area. The decoration on the ceramics associated with this facies is characterised by incised triangles, coloured chevrons and arcades (Huffman, 2007).
AD 1700 – AD 1840	The Buispoort facies of the Moloko branch of the Urewe Ceramic Tradition is the next phase to be identified within the study area's surroundings. The key features on the decorated ceramics include rim notching, broadly incised chevrons and white bands, all with red ochre (Huffman, 2007).
1823 - 1827	During the Difaqane the Khumalo Ndebele (or Matabele) of Mzilikazi established themselves along the banks of the Vaal River (Bergh, 1999). In c. 1827 the Matabele moved further north and settled along the Magaliesberg Mountain and five years later in 1832 settled along the Marico River.
1836 - 1840	The first Voortrekkers started crossing over the Vaal River (Bergh, 1999) and in terms of the direct surroundings of the study area established themselves along the banks of the Schoonspruit during this time. One of the first Voortrekkers to arrive in the area was C.M. du Plooy, Shortly thereafter a group consisting of twelve families under the leadership of H.J. van der

	Merwe also established themselves in the general vicinity (Du Plessis, 1952).
1839	The district of Potchefstroom was established in this year (Bergh, 1999). The study area fell within this district at the time.
16 December 1841	The farm Hartebeestfontein (known at the time as Stinkhoutboom) was inspected by G.J. Kruger on this day (RAK, 2875). Kruger was to become the Commandant-General of the Zuid-Afrikaansche Republiek during the 1850s and must have held an official position during this time. The farm was inspected for Christiaan Theunissen but this was opposed by Marthinus Wessel Koekemoer. On the same day the farm Buffelsfontein was also inspected by G.J. Kruger (RAK, 2876).
1850	Although the exact date for the establishment of the town of Klerksdorp is not known, the first depiction of a town on the banks of the Schoonspruit was on an archival map dated to 1850.

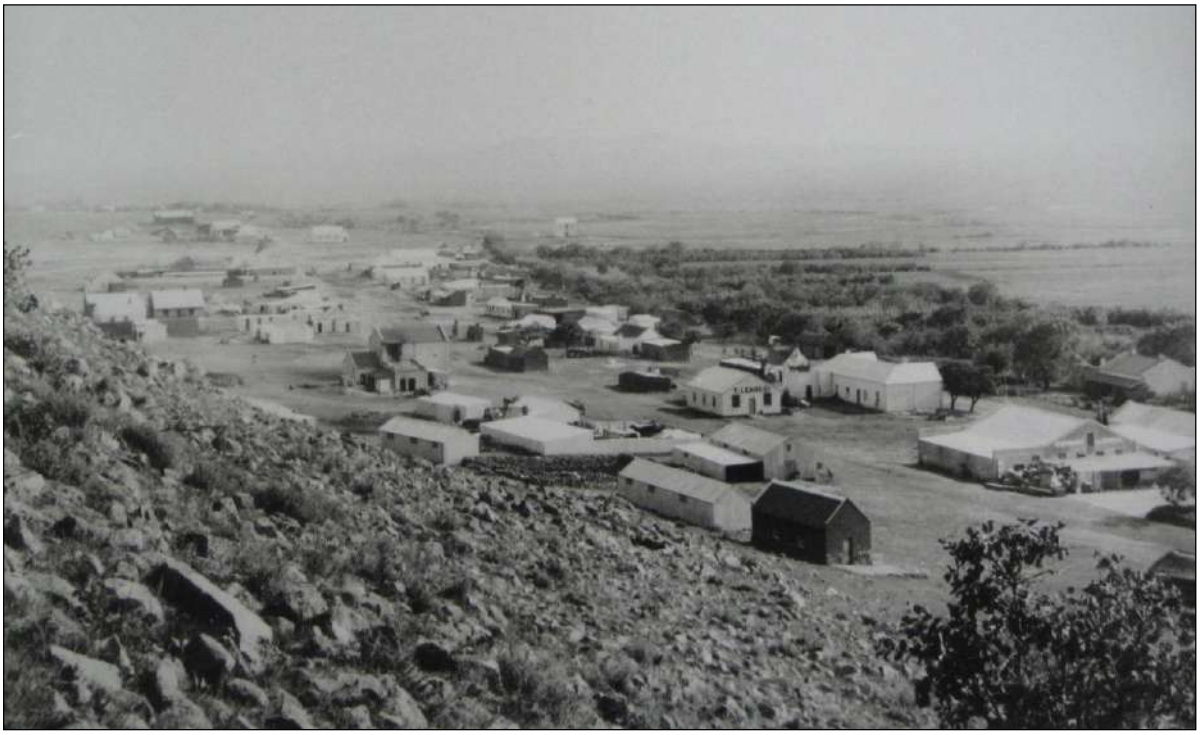


Figure 16 –Early photograph depicting Klerksdorp's Oudorp (National Archives, Photographs, 16342).

14 December 1853	The farm Hartebeestfontein was officially transferred to Marthinus Wessel Koekemoer (RAK, 2875). Koekemoer owned the farm for nearly 20 years until 21 July 1871. Local place names such as Koekemoer Station and the Koekemoer Spruit were named after him.
12 May 1859	The farm Buffelsfontein was transferred to Johannes Petrus Pretorius (RAK, 2876). Pretorius was a Voortrekker who was born on 25 December 1782 on

	his farm in Tulbagh in what is today known as the Western Cape. He died on 8 June 1861 at his farm Buffelsfontein (Visagie, 2000). A portion of the farm was transferred from Pretorius to Petrus Johannes Vermaas and William John Dunn with the remaining portion transferred to Gerhardus Dirk Pretorius after the death of Johannes Petrus Pretorius. Vermaas owned his portion of the farm until 1875 (RAK, 2876). It is evident that the Vermaas Drift over the Vaal River situated adjacent to the farm Buffelsfontein was named after Petrus Johannes Vermaas.
1865	Messrs. James Taylor and Thomas Leask established the first business in Klerksdorp in this year.

Figure 17 – The shop that Taylor and Leask established in Klerksdorp's Oudorp (Marx, 1987:15).

November 1885	During this time Martinus Gerhardus Jansen van Vuuren of the farm Ysterspruit wrote a letter to President S.J.P. Kruger indicating that he had discovered gold on his farm. He also submitted samples of what he had discovered with the letter for analysis. The government of the Zuid-Afrikaansche Republiek wrote back to state that the samples that he submitted were rich in gold and silver (Marx, 1987). This discovery at Ysterspruit can therefore be seen as the first discovery of gold in the neighbourhood of Klerksdorp. The farm Ysterspruit is located 37km south-west of the study area.
1887	The second important discovery of gold in the Klerksdorp area, and the discovery that is more commonly known, is the gold discovered by A.P. Roos on a low hill known as Town or Railway Hill (Guest, 1938).

Figure 18

Marthinus Gerhardus Jansen van Rensburg (Marx, 1987:17).

1887 - 1888	During this time Thomas Leask was prospecting for gold on the farms Roodepoort (also known as Strathmore) and Nooitgedacht. He found the results so promising that he ordered a five stamp mill from England and erected it on the banks of the Schoonspruit, not far from the homestead on Strathmore. During these early years this mill was used by various mining companies from the surrounding area, with the ore transported by ox wagon to the mill site (Guest, 1938).
1889	This year saw a flurry of gold mining companies being established. These include a number of mines on the farm Nooitrgedacht such as the Ariston, Nooitgedacht and Wilkinson Mines (Guest, 1938). The Buffelsdoorn Estate and Gold Mining Company was also established in 1889. At the time the mining company controlled portions of the farms Buffelsdoorn, Rietfontein, Request, Eleazar, Rietkuil East, Palmietfontein and also a portion of the farm Stilfontein. Furthermore, the company also owned coal rights on the farm Hartebeestfontein which it had acquired from the Klerksdorp Coal Syndicate. This latter coal mine was located near the Koekemoer Station and was known as the Buffelsdoorn Collieries (Guest, 1938).
1895	Jack Scott, who with his father Charles, had undertaken prospecting and mining operations on their farm Strathmore (Roodepoort), obtained an option on the farm Stilfontein in 1895 (Erasmus, 2004).
1896	From the information provided above it is evident that the present study

	area did not focus strongly in the early development of mining in the vicinity of Klerksdorp. A map that was published in Charles Sydney Goldmann's South African Mines: Their Position, Results and Developments (1895/1896) supports this and indicates that none of the farms forming part of the present study area were part of the Klerksdorp (Schoonspruit) Goldfields.

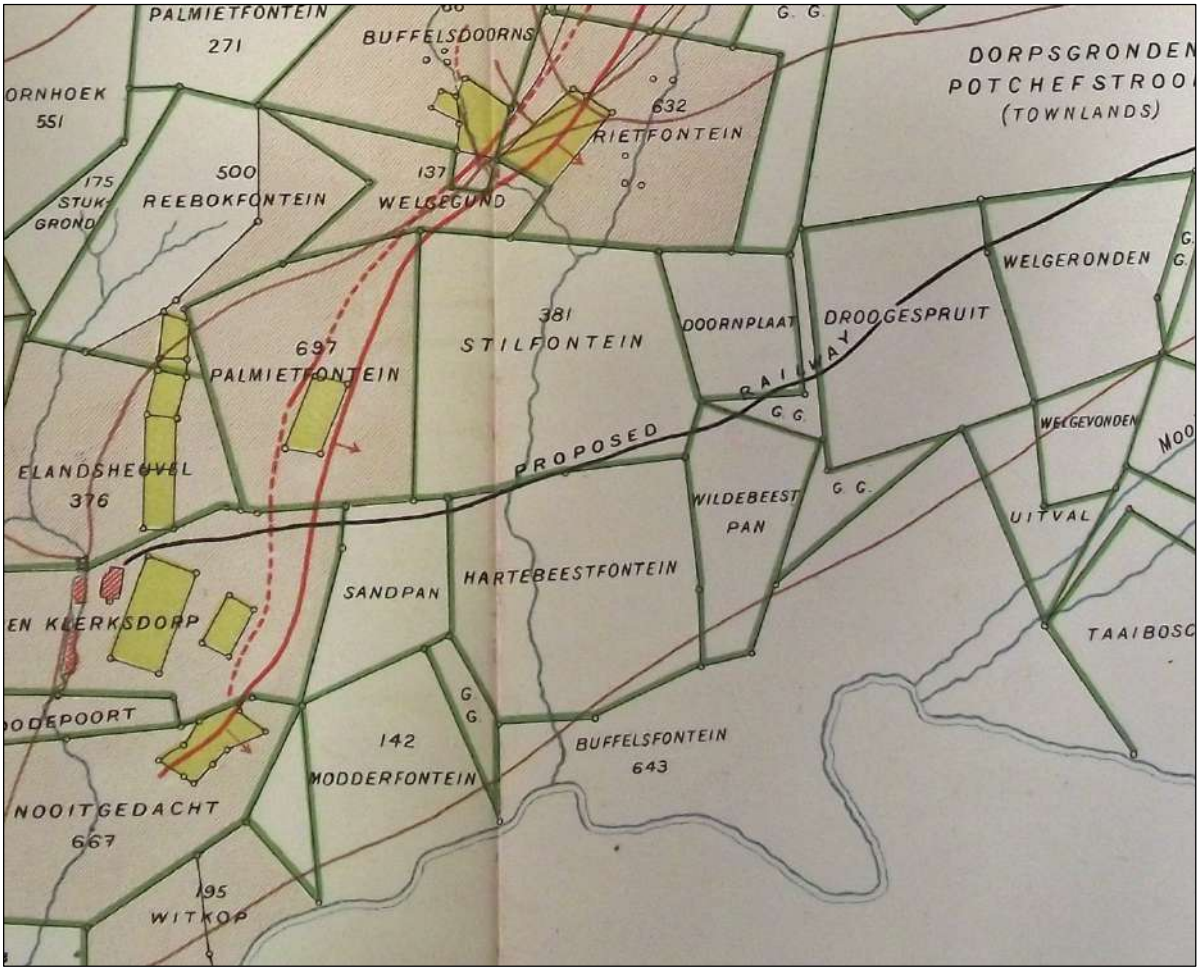


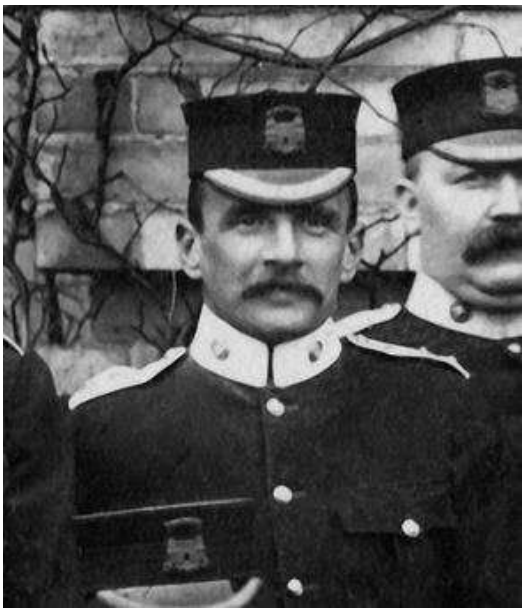
Figure 19 – Section of a map that appeared in the 1895/1896 publication by Charles Sydney Goldmann. The map provides one with an understanding of the development of gold mines in the general surroundings of the study area. The shaded areas formed part of the Klerksdorp Goldfields, whereas the yellow areas were registered mynpachts. From this it is evident that the present study did not form part of the early mining development in the vicinity of Klerksdorp at the time.

1897	The Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij (NZASM) completed the so-called South-Western Line in 1897 thereby linking the Witwatersrand with Klerksdorp. The line was opened to traffic in August 1897 and comprised the following stations: Randfontein, Bank, Welverdiend, Frederikstad, Potchefstroom, Machavie, Koekemoer and Klerksdorp (De Jong et.al., 1988). The railway line is still located a short distance north of the study area with Koekemoer Station the closest of the stations along this line to the present study area. Koekemoer Station is located 5.2km north-west of the study area.

1897	Drilling operations by Jack Scott on the farm Stilfontein dissected the Strathmore Reef which his father had identified in 1888 (Erasmus, 2004).
1899-1902	During the South African War (1899-1902) a number of battles and skirmishes were fought in the wider area, though none inside the present development area. Examples of battles from the surrounding landscape include a Boer attack on Klerksdorp on 29 January 1901 that was repulsed by the Northamptonshire regiment (Gurney and Jervois, 1935). Klerksdorp is located roughly 19.3km west of the study area. However, a number of events associated with the Boer War took place either in closer proximity to the study area. At the onset of hostilities town of Klerksdorp was naturally in Boer hands. On 8 June 1900 it was occupied by Captain Lambart and a small British force. Less than two months later, on 25 July 1900, the town was retaken by a Boer Commando under General Liebenberg. On 16 November 1900 Klerksdorp was occupied again by the British, and in this instance by a force under the command of General Douglas. For the remainder of the war the town would remain in British hands (Marx, 1987). The significance of the Vaal River as a natural barrier for the movement of troops resulted in the drifts along the river becoming of strategic importance. The side which could control the drifts could naturally also control the movement of their enemies. This was especially true for the British Army who wanted to control the mobility of the Boer Commandos. Three drifts are known to have existed in the general vicinity of the study area, including Vermaas Drift (located immediately south-east of the overall study area boundary and adjacent to the farm Buffelsfontein), Wolmaran's Drift (located 4.5km south of the present study area on the farm Kromdraai) and Kromdraai Drift (located roughly 300m from the study area). It is known that on 2 August 1900 Colonel Younghusband with the 3rd Battalion Imperial Yeomanry and a section of the Northamptons were ordered to Vermaas Drift. This force stayed at the drift until 6 August 1900 when they were ordered to join the main body further to the east (Amery, 1909). Other references to these drifts during the war years include a report in the Sydney Morning Herald of 15 December 1900 that Privates F.W. Mohr and A. Moran of the New South Wales Regiment of the Imperial Bushmen went missing after a skirmish at Wolmaran's Drift on (or before) 14 December 1900. Both individuals later returned to their unit (The Advertiser, 19 December 1900). Between December 1900 and March 1901 the 58th Northamptonshire Regiment was placed in defensive positions around Klerksdorp. While its headquarters comprising A and G Companies under the command of Colonel H.C. Denny were at Klerksdorp, D and E Companies under the command of Captains Skinner and Ripley were placed at Coal Mine Bridge (at present-day Orkney) with F and H Companies under the command of Major Fawcett positioned at Koekemoer Station, B Company commanded by Captain A.A. Lloyd at Wolmaran's Drift and C Company under the command of Captain C.S. Pritchard at Vermaas Drift (Gurney and Jervois, 1935).

Figure 20

Captain Arthur Athelwold Lloyd (left) and Major Charles Steward Pritchard (below) were the respective commanding officers at Wolmaran's Drift and Vermaas Drift between December 1900 and March 1901 (Northampton Museum Service).



1899-1902 continued	Further evidence for the presence of British forces within the surroundings of the study area during the war was found in archival documents relating to compensation claims submitted after the war. In a claim submitted by the New Ariston Gold Mines (National Archives, CJC, 35, 656) it is indicated that a column under General Elliot and Colonel Byng had been encamped on the farm Nooitgedacht in the vicinity of the New Ariston Gold Mine for some time during the war. According to another document there also were a number of blockhouses manned by British troops in the area during the war (CJC, 128, 2493). Furthermore, according to the compensation claim submitted by Izak Johannes Koekemoer (National Archives, CJC, 994, 925), the Koekemoer farmstead on the farm Hartebeestfontein was destroyed by members of C Squadron Imperial Light Horse under the command of Captain Nommand on or about 30 November 1900. Apart from the farmhouse that was destroyed, a number of livestock and other farm animals were also taken away or destroyed. At the time this unit under Captain Nommand was holding Koekemoer Station. From a collection of photographs that was put up for sale on the internet (www.antiquarianauctions.coms), it is evident that a blockhouse was located at Koekemoer Station during the war. A black concentration camp was also located near Koekemoer Station (see for example Warwick, 1983). It is not presently known exactly where this camp was located, but in all likelihood it would have been situated in close proximity to the station itself. It is possible

	that the intensive mining and related development which have taken place in the vicinity of Koekemoer Station would have destroyed the camp. On 9 and 10 April 1902 representatives of the Transvaal Republic (Z.A.R.) and the Republic of the Orange Free State met on the banks of the Schoonspruit at Klerksdorp. The Transvaal delegation comprising Vice-President Schalk Burger, State Secretary F.W. Reitz, Commandant-General Louis Botha, General Koos de la Rey, General L.J. Meyer and General J.C. Krogh were accommodated in the Nieuwe Dorp. The Free State delegation comprising President Steyn, Commandant-General Christiaan de Wet, State Secretary J.W.C. Brebner, General J.B.M. Hertzog and General C.H. Olivier was accommodated in the Oude Dorp. The meeting was conducted with the knowledge of the British High Command. The aim of the meeting was for the representatives of the two Boer Republics to discuss the status of the war and to establish whether peace should be negotiated with the British (Raath, 2007). The meeting was the first step toward the final peace settlement on 31 May 1902 at Vereeniging.

Figure 21 – This photograph was taken during the peace negotiations at Vereeniging and show three members of the Free State delegation at the Klerksdorp meeting of April 1902 namely (from left to right) State Secretary J.W.C. Brebner, Commandant-General C.R. de Wet and General J.B.M. Hertzog (Van Schoor, 2007).

21 December 1914	During the early years of mining in the area the mining of alluvial diamonds was just as important as early gold mining activities and became even more

	so during the second decade of the twentieth century. On 17 November 1911, for example, the part of Goedgenoeg farm located between Dean Station and Vaalsig was proclaimed alluvial diggings. The Goedgenoeg diggings resulted in the extraction of a total of 94, 75 carats of diamonds to the value of just over £355 during 1914. On 21 December 1914 the so-called Eastleigh diggings were proclaimed. Although the reference Orkney Diary (1990) indicates that these diggings were located west of the Schoonspruit, on a government owned portion of the farm Goedgenoeg, Marx (1987) in turn states that the Easleigh diggings were located on both sides of the Klerksdorp-Orkney road, on land formerly owned by Eastleigh Mines. Initially only 332 claim licences were issued in terms of the Eastleigh diggings, but with the proclamation of the north-eastern section of Goedgenoeg, approximately 1 000 alluvial diamond miners were active in the area. Although these alluvial mining activities continued in earnest for the next number of decades, by 1937 its significance waned and the mining of gold became increasingly significant.
 *Figure 22 – Diamond miners at what is believed to be the Eastleigh Diggings (Marx, 1987).*	
1930s	During the 1930s a person by the name of Alexander Bisset Lucas put together a parcel of mineral right options known as Lucas Block. This parcel of mineral right options would become very significant in the later mining history of the landscape within which the study area is located (Antrobus, 1986), with mines such as Stilfontein, Buffelsfontein and Hartebeestfontein established on this block. Interestingly, Lucas had acquired a portion of the farm Buffelsfontein in 1917 from one Mark Donaldson (RAK, 2876) and named it Shenfield after the farm near Grahamstown where he grew up. The portion of the farm Buffelsfontein which Lucas had obtained was located directly north of the Vaal River on the section of the farm situated to the west of Vermaas Drift and outside of the present study area.

1935	The Klerksdorp District was established and the study area now fell within this district (Bergh, 1999). At the time the eastern section of the present study area still fell within the Potchefstroom District.
18 March 1940	The town of Orkney was officially proclaimed on 18 March 1940 by the Administrator of the Transvaal, Mr. J.J. Pienaar. This proclamation was subsequently also published in the Government Gazette.
c. 1945	During the latter stages of the Second World War (1939 – 1945) the American and British scientists working on the production of nuclear weapons as part of the Manhattan Project realised that although they were able to obtain enough uranium for their immediate uses from places such as the Belgian Congo and Canada, more uranium would be required from other places as well (Groves, 1962). One of the scientists on the Manhattan Project was Professor G.W. Bain of the Amherst College, Massachusetts (Jones, 1995). During this time Professor Bain remembered that he had ore samples from the Witwatersrand in his private collection which he had collected during a visit to South Africa in 1941. He conducted tests on these samples and to his excitement realised that they emitted beta rays which in turn meant that the Witwatersrand gold mines could become another source for uranium (Jones, 1995) (Groves, 1962). This was the start of the uranium industry of South Africa and by 1959 the country had become a major world producer in uranium (Bhushan & Katyal, 2002). A number of gold mines in the Klerksdorp that were established during the 1950s such as Buffelsfontein and Hartebeestfontein were significantly associated with the production and export of uranium.
1949	The Stilfontein Gold Mining Company was registered and a town of the same name was also laid out (Erasmus, 2004). The mine was established and owned by the Strathmore Group of Jack Scott and was established on sections of the Lucas Block of mineral right options. According to an article which appeared in the Mining Mirror of June 2013, the first two shafts at the mine were named after Jack Scott's twin son and daughter, Charles and Margaret. The sinking of these shafts commenced in April and May 1949 respectively. Interestingly, the Margaret Shaft holds the record for the first ever concrete headgear to be built in South Africa (South African Mining and Engineering Journal, 1982) (Mining Mirror, June 2013).
1952	Production at the Stilfontein Gold Mining Company commenced during this year (Erasmus, 2004). During the same year the Buffelsfontein Gold Mining Company was established by the Strathmore group on sections of the Lucas Block (The Mining Magazine, 1952). The mine had a number of vertical shafts, including Pioneer Shaft, Eastern Shaft, Southern Shaft and Orangia Shaft. From the available cartographical and aerial photograph evidence, it is clear that the mine's first shaft was the Pioneer Shaft (c. 1952) followed by the Eastern Shaft (before 1961). The Southern Shaft was established between 1961 and 1967 whereas the Orangia Shaft was built after 1967.

1953	The Hartebeestfontein Gold Mine was established in 1953 (Golosinski & Yuguang, 1996) and was owned by Anglovaal (Marx, 1987). This is confirmed by Hocking (1987) who indicates that Anglovaal commenced shaftsinking at Hartebeestfontein during 1953.
1954	In 1954 a merger took place between Jack Scott's Strathmore Consolidated Investment Company and the General Mining and Finance Corporation which meant that the latter company now controlled the Buffelsfontein and Stilfontein mines (Standard Encyclopaedia of Southern Africa, 1972).
1960	The township of Khuma was established in 1960, and its name is derived from the Setswana word 'Khumo' which means 'Wealth' (www.nwpg.gov.za). At its closest distance, Khuma is located approximately 250m north of the present study area.

Figure 23 – This aerial photograph of Khuma Township was taken in 1961, roughly one year after it was established (NGI, Aerial Photographs, 425_021_02738).

28 February 1986	According to a document titled 'Catalogue of Heritage Sites' by the Matlosana Municipality (n.d.), Khuma is associated with a significant struggle history. A memorial in Khuma commemorates the life and sacrifice of MK Cadre Mfana Majova who operated in Angola and South Africa and was killed during a mission in South Africa. Furthermore, a number of landmarks in the township are also associated with the struggle history of its people. The municipal cemetery at Khuma also holds the graves of four individuals who were killed by the police on 28 February 1986 (Matlosana Municipality, n.d.).

5.2 Previous Heritage Impact reports (SAHRIS)

A search of known previous archaeological and heritage impact assessments, as well as previous heritage studies, was made using available resources. These previous studies were for the most part identified using the South African Heritage Resources Information System (SAHRIS) database. A selection of previous studies for the area is listed in ascending chronological order below:

Dreyer, K. 2005. Archaeological and Historical Investigation of the Proposed Residential Developments on Subdivision 13 of the farm Pretoriuskraal 53, Viljoenskroon, Free State.

The project area for this study is located on subdivision 13 of the farm Pretoriuskraal 53, Viljoenskroon District, Free State Provice. During this fieldwork, only the area around the house was surveyed on foot. The cleaned area around the house did not produce any archaeological or cultural remains. This 2005 study area was located roughly 7 km south of the current study area.

Pistorius, J.S.S. 2011. A Phase I Heritage Impact Assessment (HIA) Study for a Proposed Tailings Reclamation Project near the Mine Village of Stilfontein in the North West Province of South Africa. For Ground Water Consulting Services.

The study area for this project comprised two options for the proposed development, namely a property north-east of the town of Stilfontein (listed as Proposed Tailings Dam Option - Site 1 in the report) as well as the general area where the Kareerand Tailings Storage Facility is currently located (listed as Proposed Tailings Dam Option - Site 2 in the report).

During the fieldwork, three cemeteries were identified within and in proximity to the Proposed Tailings Dam Option - Site 1 whereas five cemeteries and seven historical structures (in the form of black homesteads) were identified within and in proximity to the Proposed Tailings Dam Option - Site 2. Only the group of sites identified at the latter development option is located in proximity to the present study area, with nine of these 12 identified sites located very close to the present development footprint areas. Sites GY03 and GY04 from this 2011 report are included in the current report as sites AGA-MWS-MGD-2 and AGA-MWS-MGD-3, whereas sites HR01 to HR07 from this 2011 report are included in the current report as site AGA-MWS-MGD-5.

Coetzee, F. 2012. Cultural Heritage Survey of the Proposed Kabi Vaalkop PV Solar Facility, near Orkney, Dr Kenneth Kaunda District, North West Province. For Savannah Environmental (Pty) Ltd.

The site for this 2012 study was situated 5km east of Orkney. The survey area consisted of three portions which are associated with three phases of the project. A fourth phase consisted of a substation and power line. The combined survey area was situated on the following farm portions: a portion of the farm Vaalkop 439 IP, Portion 7 of the farm Vaalkop 439 IP, a portion of Portion 3 of the farm Vaalkop 439 IP and a portion of Portion 200 of the farm Nooitgedacht 434 IP. No archaeological sites or material and no graves were identified. Two demolished historical structures were identified but these were assessed to be less than 60 years old. The study area for this 2012 project was located roughly 20 km south-west of the current study area.

Birkholtz, P.D. 2014. Heritage Inventory of the Mines Waste Solutions (MWS) Areas located on certain portions of the farms Stilfontein 408 IP, Kromdraai 420 IP, Hartebeestfontein 422 IP, Modderfontein 440 IP, Buffelsfontein 443 IP and Kareerand 444 IP, to the east and south-east of Klerksdorp, North West Province. For AngloGold Ashanti Limited.

This heritage inventory was aimed at compiling a database of known heritage sites from within the Mine Waste Solutions (MWS) areas. As such, a field survey was undertaken of these areas. It must be noted that this field survey was not aimed at a walkthrough of the entire study area, but rather to visit known sites for inclusion in the heritage inventory. The significance of each site was established and general mitigation and conservation recommendations made.

During the fieldwork, a total of 34 heritage sites were identified. These included cemeteries, historic structures (such as farmsteads, farm buildings and farm worker homesteads), a mining accident monument as well as a Stone Age site. Due to the extent of the study area, these sites were identified over a reasonably extensive area which ranged from the surroundings of Stilfontein to the current study area.

In terms of the development footprint areas currently proposed, a number of the sites identified in 2014 are located within or in close proximity to these footprint areas. These include the sites that are included in this report as AGA-MWS-MGD-5 and AGA-MWS-MGD-6.

Miller, S. 2015. Cultural Heritage Impact Assessment for Shafts #1 to #7, Orkney, Northwest Province, South Africa. For CAPM Gold.

The seven sites and shafts that were investigated by the specialist were procured by CAPM Gold from the Pamodzi Gold Company. It was the intent of the new owners to reinstate gold mining on the sites procured. As part of the environmental impact assessment it was therefore necessary to conduct a heritage impact assessment. A total of seven sites were investigated, all of which were sites of mine shafts. Three of these sites contained traditional riveted steel headgear, which was dated to the end of the 1930's. The remaining four sites had modern concrete headgear which was dated to the period after c. 1960. The study area for this 2015 project is located roughly 17 km south-west of the current study area.

Van der Walt, J. 2016. Archaeological Impact Assessment for the Proposed Buffels Solar 1 Solar Energy Facility, North West province. For Savannah Environmental (Pty) Ltd.

The proposed Buffels Solar 1 project area was located on Portion 1 of the farm Hartebeestfontein 422 IP, close to Orkney and Stilfontein, North West province. At the time of the study, the land was owned by the Buffelsfontein Gold Mine Limited. No graves or burial grounds or sites of archaeological significance or structures of historical significance were recorded in the study area, except for some demolished mining architecture. The study area for this 2016 project was located almost immediately adjacent to the current study area close to its western boundary.

Van der Walt, J. 2016. Archaeological Impact Assessment for the Proposed Buffels Solar 2 Solar Energy Facility, North West province. For Savannah Environmental (Pty) Ltd.

The proposed Buffels Solar 2 project will be located on Portion 57 of the farm Hartebeestfontein 422 IP, close to Orkney and Stilfontein, North West province. At the time of the study, the land was owned by the Buffelsfontein Gold Mine Limited. No graves or burial grounds or sites of archaeological significance or structures of historical significance were recorded in the study area, except for some demolished mining architecture. The study area for this 2016 project is located almost immediately adjacent to the current study area close to its western boundary.

6 FIELDWORK FINDINGS

6.1 Introduction

An intensive field assessment was undertaken by way of walkthroughs that were augmented by vehicle surveys. This field assessment was not only undertaken of the proposed development footprint areas, but also covered a much wider study area defined by the mine in proximity to the Kareerand TSF. As a result of the intensive fieldwork, a total of 48 heritage sites were identified. The identified heritage sites will be individually discussed in this chapter and their respective locations are shown on the maps depicted on the subsequent pages.

It is worth noting here that the author of this report has developed a standardized site numbering system for the archaeological and heritage sites identified on AngloGold Ashanti properties. This system was originally used on the mining company's Vaal River and MWS properties. The aim of a standardized system is to avoid confusion between identified sites over time. The site numbering system used in this report will adhere to the numbering system used before, and will comprise an acronym for the mining company (in this case AGA for AngloGold Ashanti), followed by the mining area (MWS for Mine Waste Solutions), followed by an acronym representing the farm name (HBF for Hartebeestfontein) and then the numerical site number. As the entire farms in proximity to the Kareerand TSF are not included within the present study area, the numbering used for sites included in this report may not necessarily follow numerically on each other.

During the fieldwork, a hand-held GPS device was used to record track logs. These recorded track logs show the routes followed by the fieldwork team on site. The recorded track logs and study area boundaries are depicted in the image below.

As mentioned in the Assumptions and Limitations, the present fieldwork did no assess any part of the fenced-off area which encloses the existing Kareerand TSF. The reason for this is that this fenced-off area would have been assessed as part of the HIA undertaken for the original TSF development (Pistorius, 2011). Furthermore, in terms of the fieldwork undertaken on the overall study area, the farm Buffelsfontein 443 IP was not surveyed as intensively as the other properties forming part of the overall study area. The reason for this is that at the time of the fieldwork a number of breeding ostriches were observed within this property. As a result, only limited walkthroughs of this area could be undertaken.

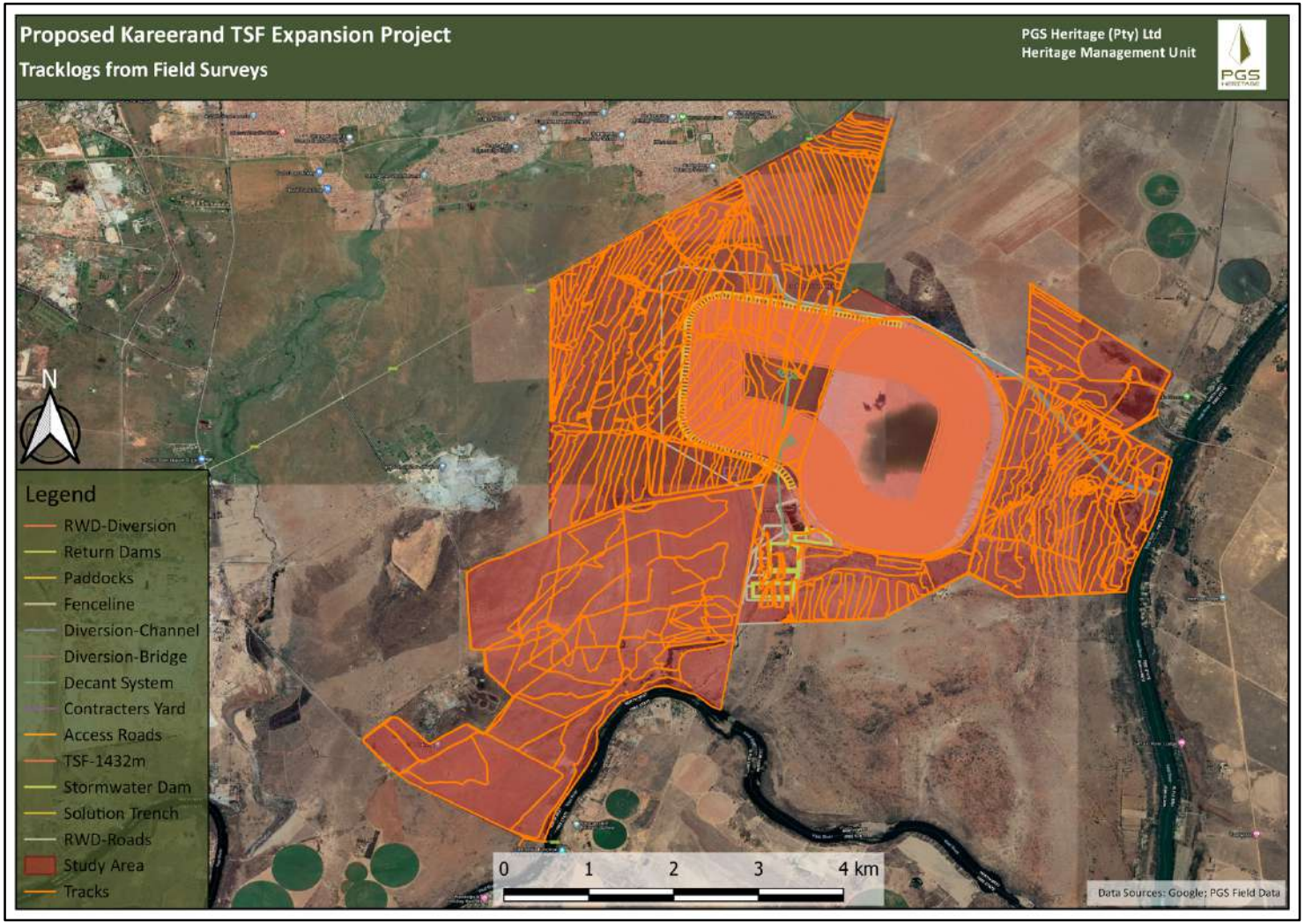


Figure 24 – An overlay of the recorded track logs over the proposed development footprint areas. The recorded track logs are depicted in orange line.

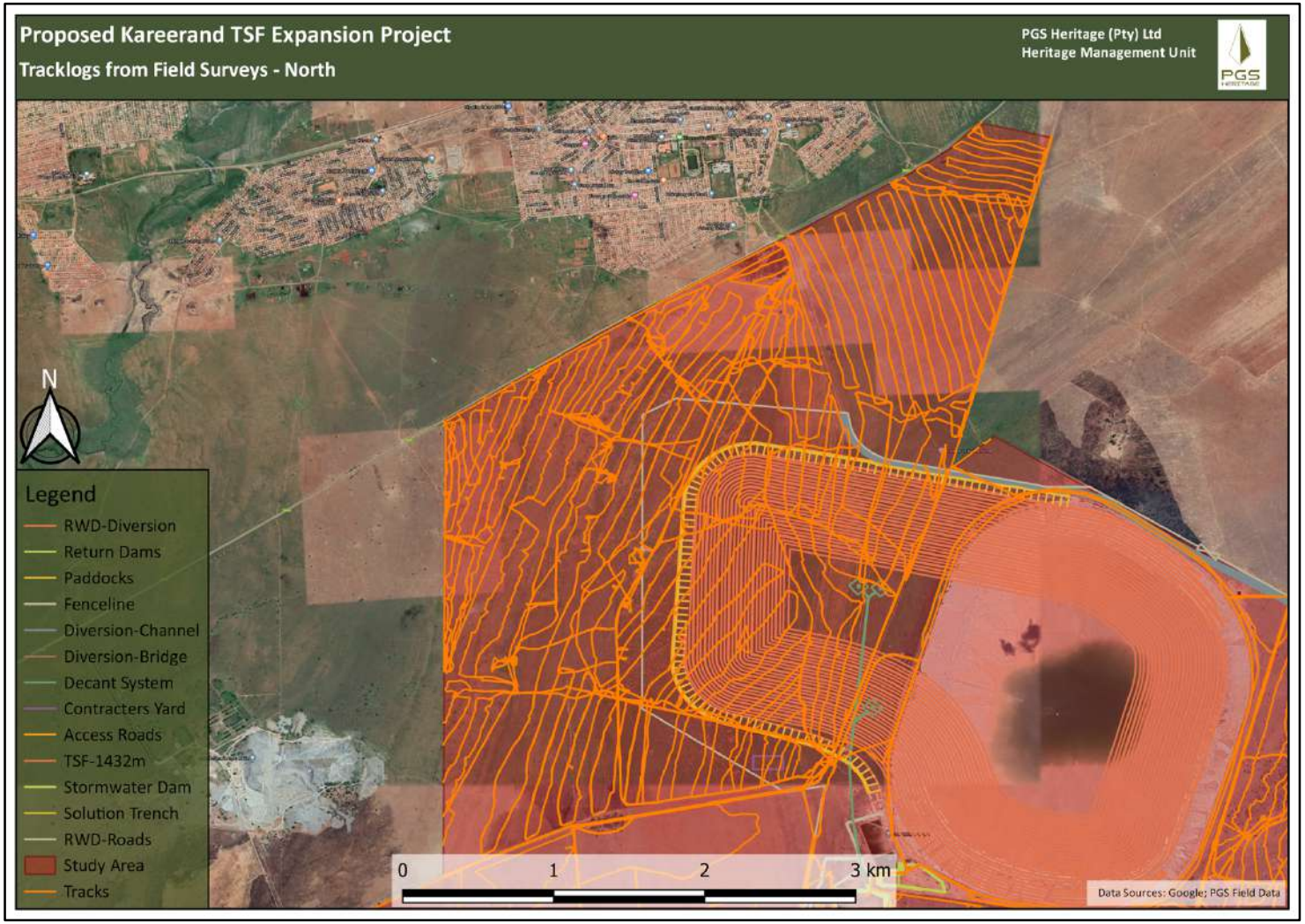


Figure 25 – A closer view of the northern section of the study area, showing an overlay of the recorded track logs over the proposed development footprint areas. The recorded track logs are depicted in orange line.

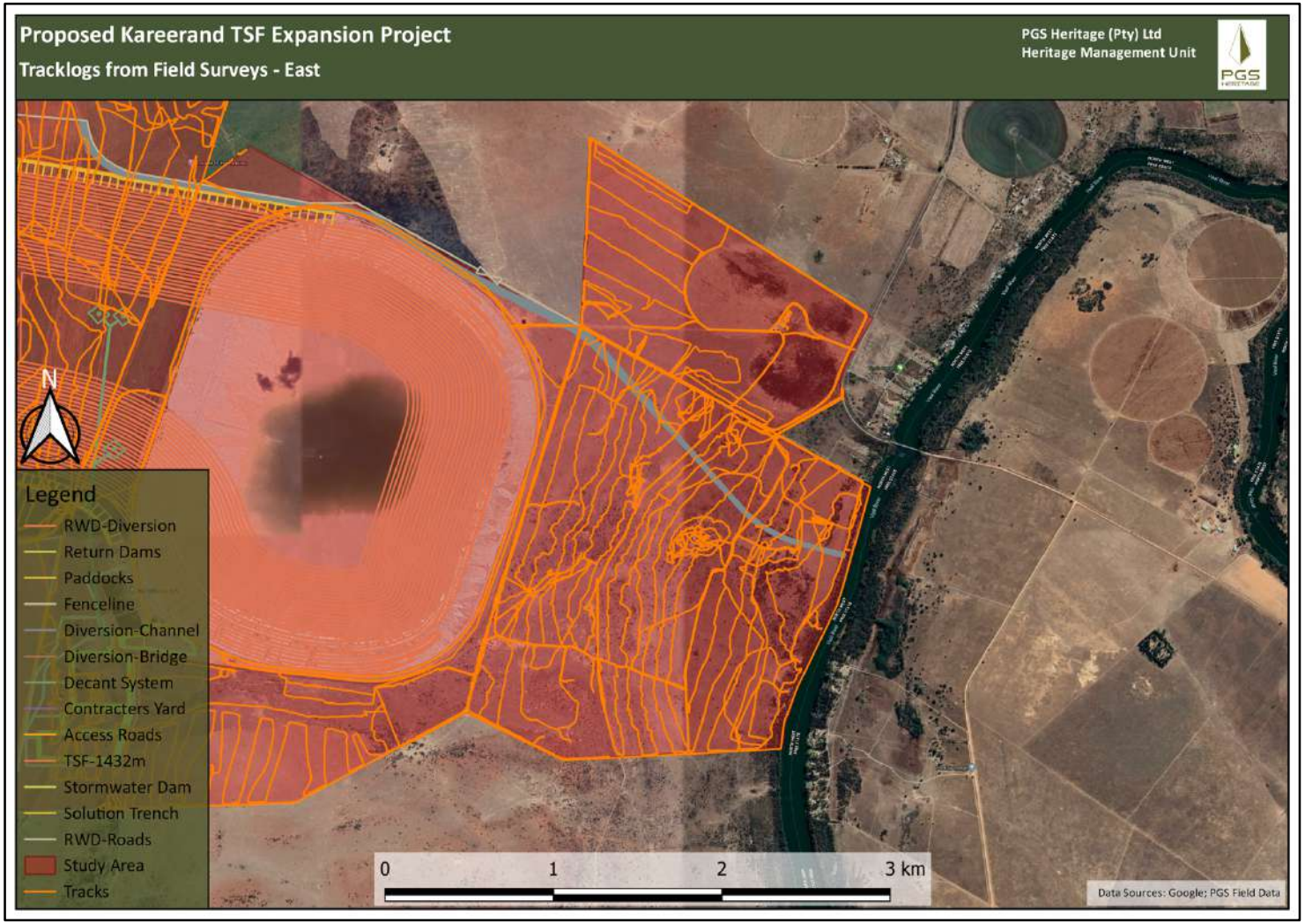


Figure 26 – A closer view of the eastern section of the study area, showing an overlay of the recorded track logs over the proposed development footprint areas. The recorded track logs are depicted in orange line.

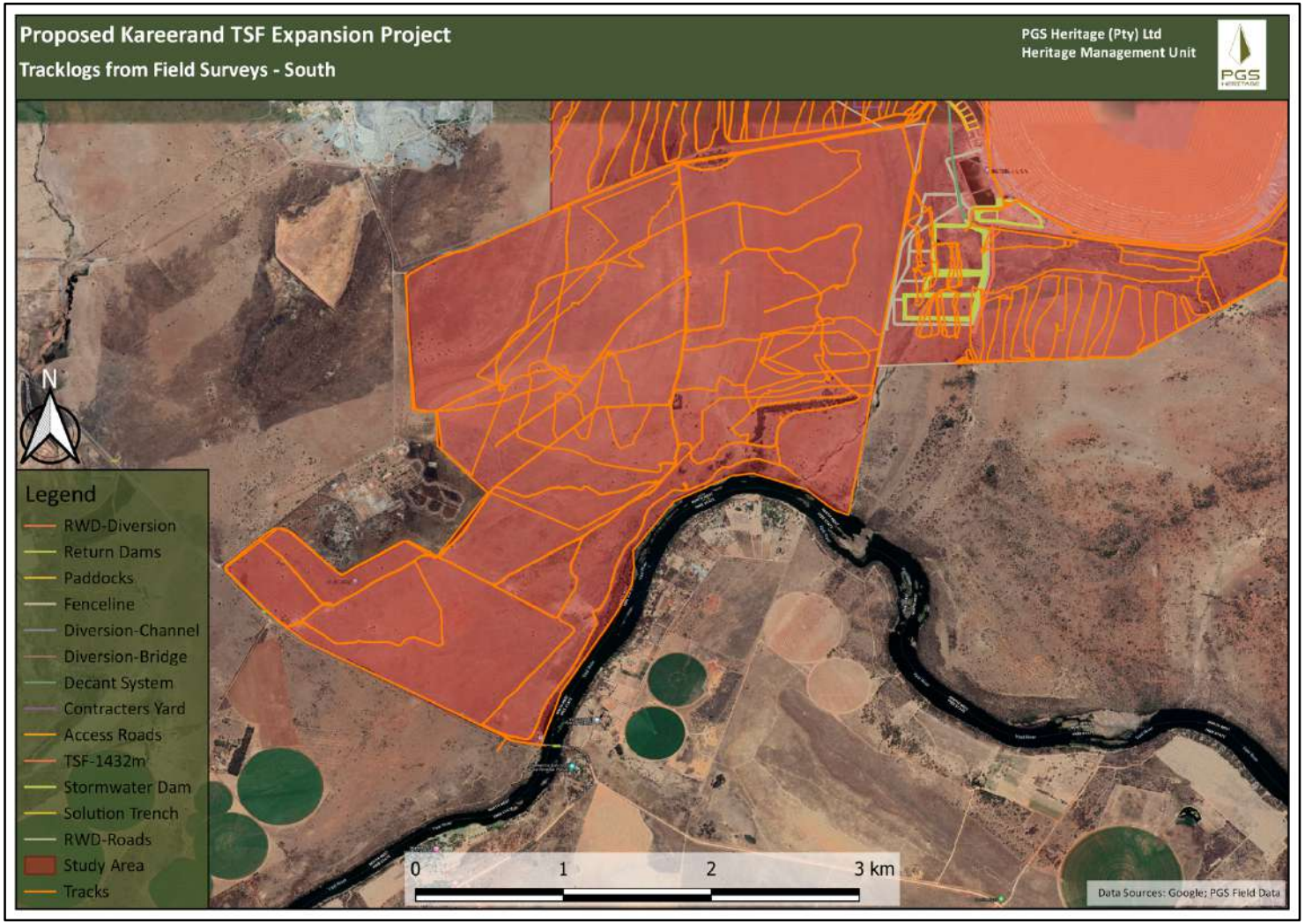


Figure 27 – A closer view of the southern section of the study area, showing an overlay of the recorded track logs over the proposed development footprint areas. The recorded track logs are depicted in orange line.

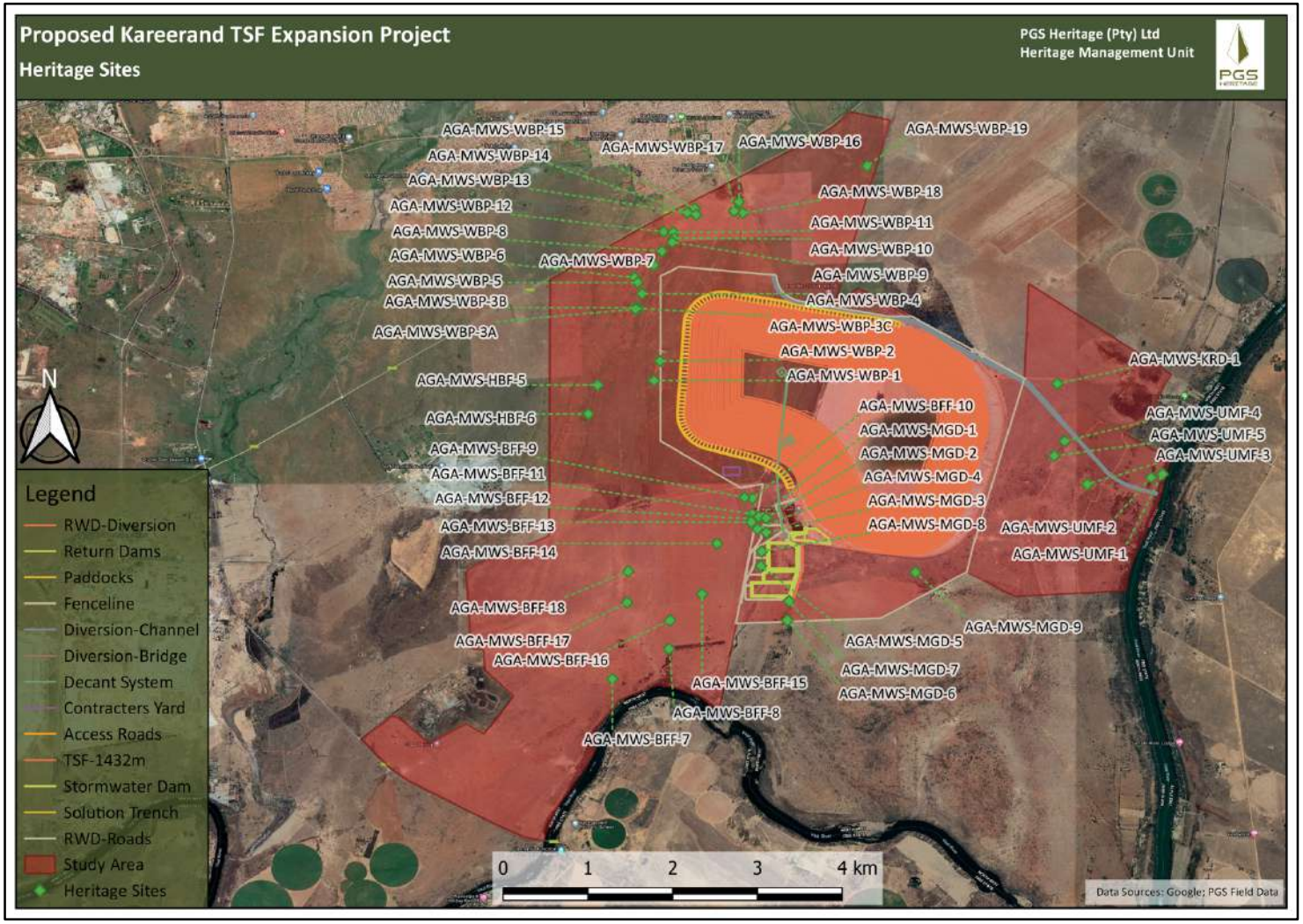


Figure 28 – An overlay of the identified archaeological and heritage sites over the proposed development footprint areas.

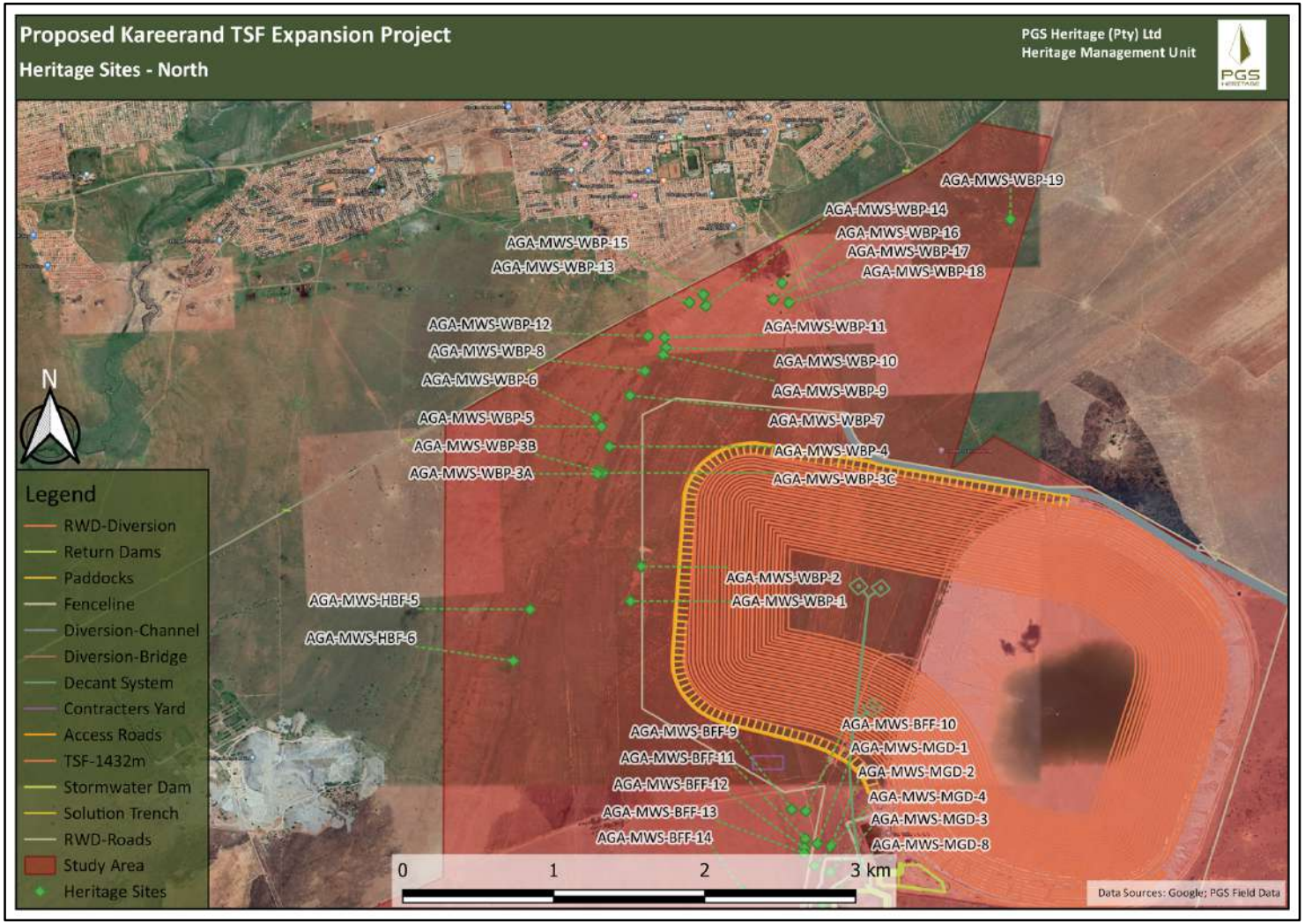


Figure 29 – A closer view of the northern section of the study area, showing an overlay of the identified archaeological and heritage sites over the proposed development footprint areas.

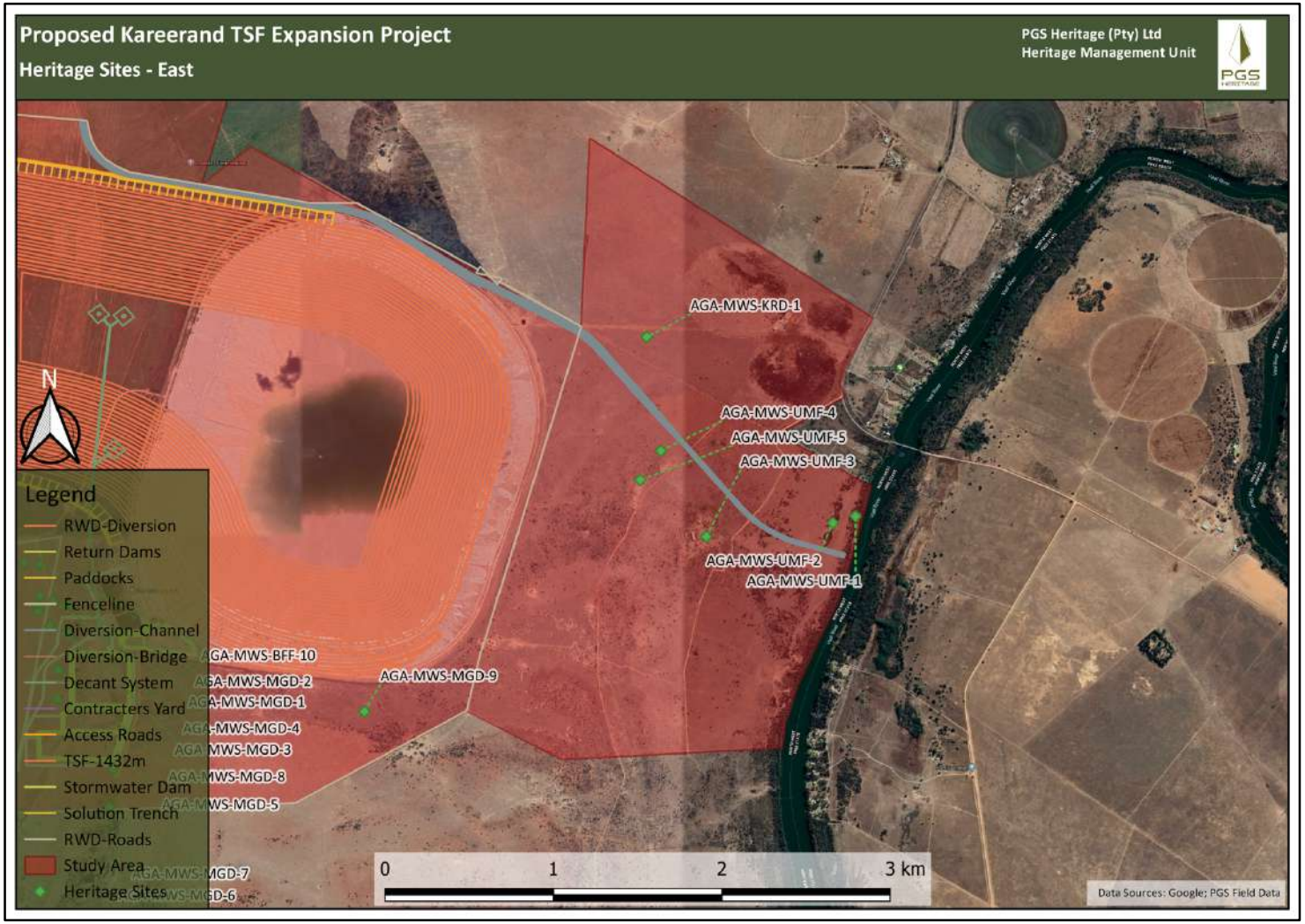


Figure 30 – A closer view of the eastern section of the study area, showing an overlay of the identified archaeological and heritage sites over the proposed development footprint areas.

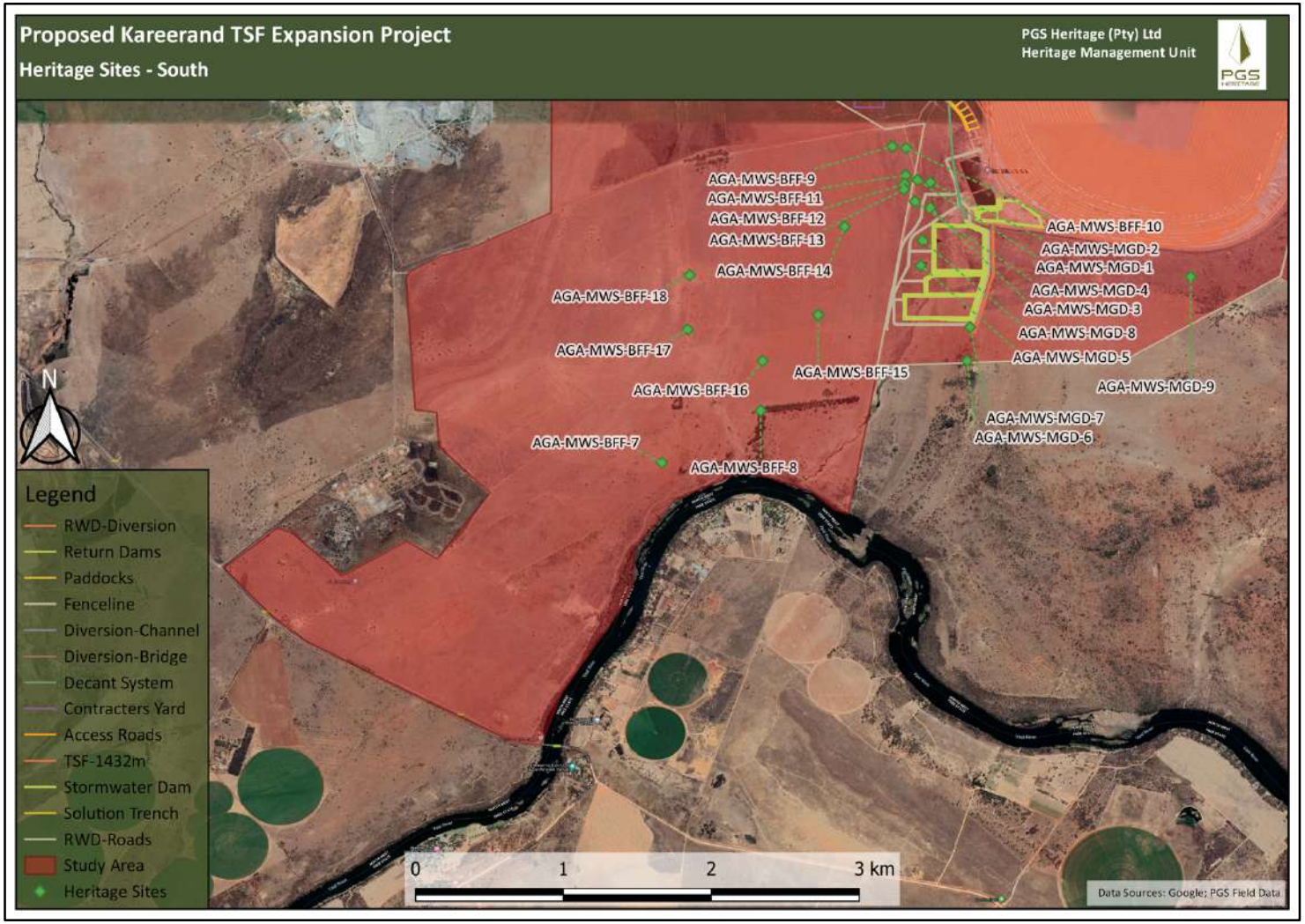


Figure 31 – A closer view of the southern section of the study area, showing an overlay of the identified archaeological and heritage sites over the proposed development footprint areas.

6.2 Fieldwork Findings

6.2.1 Fieldwork Findings for the Farm Hartebeestfontein 422 IP

Please note that sites AGA-MWS-HBF-1 to AGA-MWS-HBF-4 were identified during fieldwork not related to the present study, and as these four sites are located far away from the present study area boundaries, these four sites are not included here.

6.2.1.1 AGA-MWS-HBF-5

Site Coordinates:

S 26° 52' 56.09"
E 26° 51' 23.98"

Site Description:

A single possible grave was identified at the eastern foot of a low ridge. The site comprises a rectangular stone concentration which is roughly 2m by 1m in extent. The stone concentration is orientated along the north-south axis. No cultural material could be observed at the site.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967.

Site Extent:

The site is roughly 2m by 1m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 32 – *General view of the possible grave at site AGA-MWS-HBF-5. Scale in 10cm increments.*

6.2.1.2 AGA-MWS-HBF-6

Site Coordinates:

S 26° 53' 08.54"
E 26° 51' 19.72"

Site Description:

A rectangular stone structure was identified here. It is located at the eastern foot of a low ridge.

The site comprises a rectangular stone-lined structure which is roughly 15m by 15m in extent. The structure comprises a single line of stones, which suggests that what is currently visible is the remains of stones packed along the base of a now missing jackal proof fenced camp. A brick-built reservoir is located 78m south-west of the structure.

Neither the structure nor the reservoir are depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. None of the structures from the site are believed to be older than 60 years.

Site Extent:

The site is roughly 100m by 50m in extent.

Site Significance:

None of the structure from the site are believed to be old or particularly unqiue. As such the site is of Generally Protected C (GP. C) or Low Significance.

Impact Assessment and Mitigation:

See Chapter 7 fot impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 33 – General view of the stone-lined structure at AGA-MWS-HBF-6.

Figure 34 – General view of a section of the stone-lined structure at AGA-MWS-HBF-6.

6.2.2 Fieldwork Findings for the Farm Wildebeestpan 442 IP

6.2.2.1 AGA-MWS-WBP-1

Site Coordinates:

S 26° 52' 54.12"
E 26° 51' 48.07"

Site Description:

The site comprises a rectangular cement foundation structure that is associated with a clump of camelthorn trees (*Vachellia erioloba*).

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967 respectively. None of the structures from the site are believed to be older than 60 years.

Although the rectangular cement foundation is believed to have been a dwelling, very limited cultural material could be observed on the surface of the site. The cultural material that could be observed on the surface of the site, comprise a few relatively modern glass fragments. Approximately 24m north-west of the cement structure, a cattle loading ramp was observed.

If the above-mentioned suggestion that the site may have contained homesteads holds true, it is possible for stillborn babies to have been buried in association with these former dwellings. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 100m by 80m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

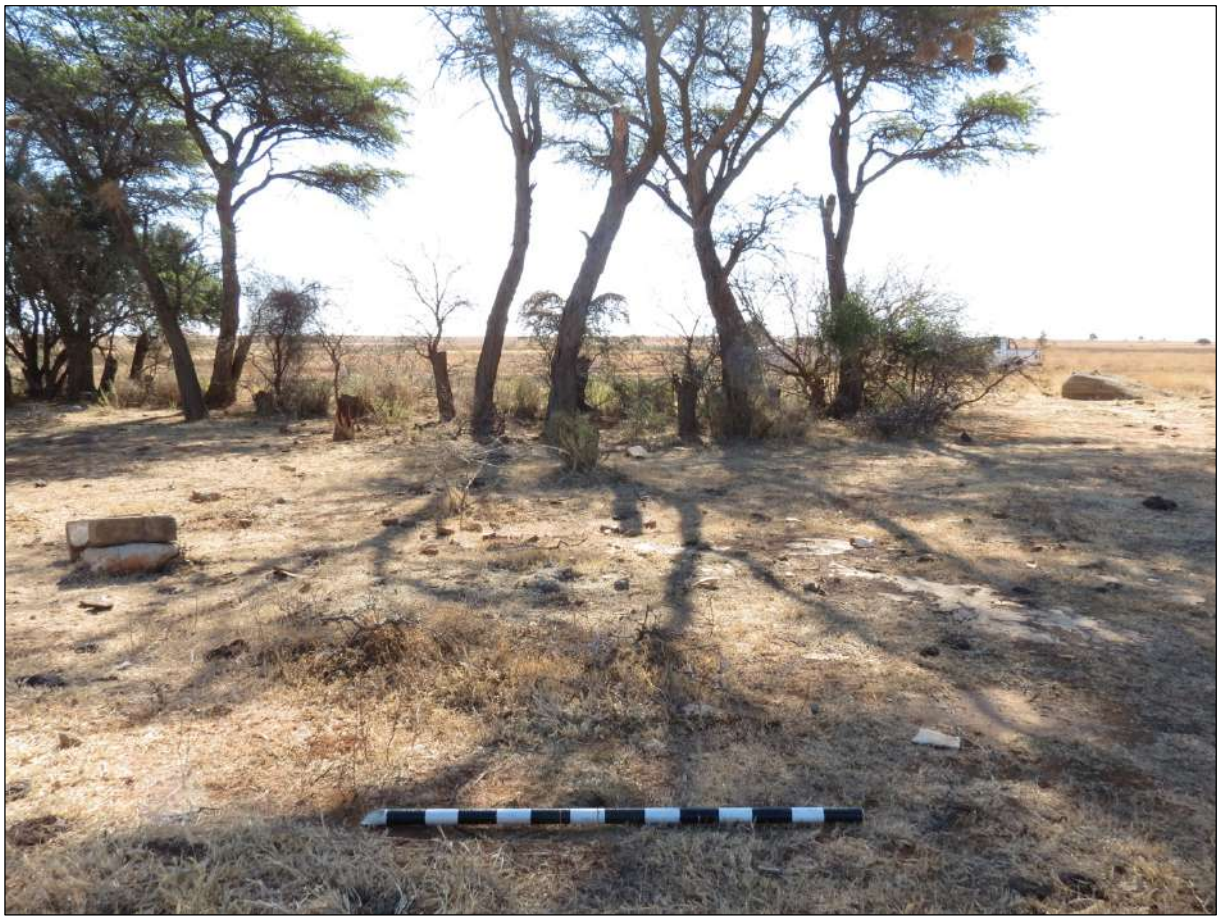


Figure 35 – General view of the rectangular cement structure at site AGA-MWS-WBP-1. In the background, a section of the clump of camelthorn trees can be seen. Scale is in 10cm increments.

Figure 36 – Another view of the rectangular cement structure at site AGA-MWS-WBP-1.

Figure 37 – The cattle loading ramp at site AGA-MWS-WBP-1. Scale in 10cm increments.

6.2.2.2 AGA-MWS-WBP-2

Site Coordinates:

S 26° 52' 42.37"
E 26° 51' 50.92"

Site Description:

A brick-built reservoir with a drinking trough around its base, was identified here.

The brick-built reservoir is depicted on an aerial photograph taken in 1961 (NGI, Aerial Photographs, 425_021_02738). As a result, it is at least 56 years old, and may in fact be older than 60 years.

A number of irregularly shaped structures were identified at distances of between 50m and 150m west, south-west and south of the brick-built reservoir. While two of these structures appear to be the poorly preserved circular foundation remains of huts, the origin or function of the other five or six structures are not presently known. While neither the old aerial photographs nor the old topographical sheets shed any light on the identification of these structures, they appear to be the poorly preserved remains of homesteads that were associated with the reservoir. This interpretation is supported by the presence of bricks (a number of these bore the name Bonnieburn), broken glass bottle and container fragments, metal bolts and at least one metal pull tab.

In terms of establishing a date for the site, the available aerial photograph taken in 1961 shows only the brick-built reservoir and none of the associated structures. The company Bonnieburn Brickworks appears to have already existed in 1948, and may have been in business for the subsequent three or more decades. This brick manufacturing company was located at Stilfontein. The metal pull tab, as found on the surface of the site, was used on cold drink and beer cans between approximately the 1960s and the 1980s. The information presently available seem to suggest that the site is older than 60 years, and may have existed for a number of decades. Furthermore, it is certainly not older than 100 years.

If the above-mentioned suggestion that the site may have contained homesteads holds true, it is

possible for stillborn babies to have been buried in association with these former dwellings. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 200m by 200m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 38 – General view of the brick-built reservoir at site AGA-MWS-WBP-2. The existing Kareerand TSF can be seen in the background on the right. Scale is in 10cm increments.

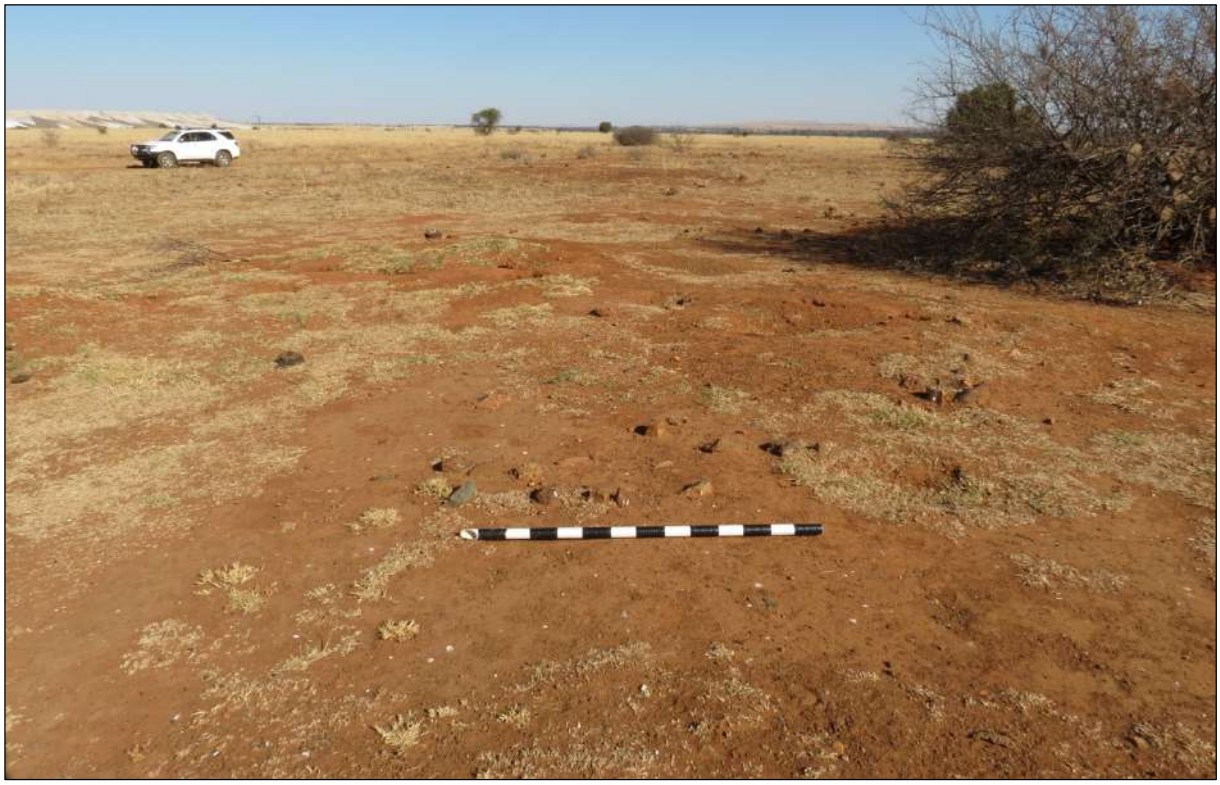


Figure 39 – One of the poorly preserved structures can be seen in the foreground. Scale is in 10cm increments.

Figure 40 – A number of the bricks identified on the surface of the site contain the name Bonnieburn, as does this bullnose brick. Scale in 1cm increments.

Figure 41 – Sample of cultural material observed on the surface of the site. These include a rim fragment of what appears to be a food preservative jar, the base fragment of a glass bottle, reinforced glass fragment, an old metal bolt, imported ceramic fragment, a metal pull tab as well as a metal lid for a Coke bottle. Scale in 1cm increments.

6.2.2.3 AGA-MWS-WBP-3

Site Coordinates:

Structure (WBP 3A)	Two Possible Graves (WBP 3B)	One Possible Grave (WBP 3C)
S 26° 52' 23.53" E 26° 51' 40.16"	S 26° 52' 22.90" E 26° 51' 40.33"	S 26° 52' 23.53" E 26° 51' 40.16"

Site Description:

A historic black homestead was identified here. It is located at the eastern foot of a low ridge.

The site comprises a rectangular stone structure (WBP 3A) which is roughly 5m by 3m in extent. It consists of only one room and the structure comprises the stone foundation remains of what appears to have been a dwelling. Roughly 20m to the north-east, two rectangular stone concentrations were identified (refer WBP 3B). One of these is orientated along the east-west axis, with the other orientated along the north-south axis. It is possible that both these concentrations are graves but this cannot be stated for certain. A circular stone concentration, which may also be a grave, is located 30m east by north-east of the rectangular structure (refer WBP 3C).

No concentrations of cultural material could be observed on the surface of the site. However, a spent .577/.450" Martini - Henry Mark II solid-drawn cartridge was observed at the site. The headstamp of the cartridge contains the letters "K" and "II", which indicates that it is Mark II ammunition that was manufactured by the company Kynoch & Co. George Kynoch of Witton (near Birmingham) was one of the primary suppliers of arms and ammunition to the *Zuid-Afrikaansche Republiek* in the decades leading up to the South African War (1899-1902). Ammunition such as the one observed on the surface of the site, were extensively used during the war, and especially so by the Boer forces. The same ammunition had been used at Boer war battlefields such as Paardeberg and the Brandwater Basin (Bester, 2003). This said, the spent cartridge observed at the site does not mean that the site is necessarily associated with the war. Large numbers of Boer farmers had Martini-Henry rifles before and after the war, and the cartridge found at the site may have been used in hunting. The presense of the cartridge here also suggests that the site may be older than 100 years.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on any of these sheets, the site is certainly older than 60 years and quite possibly older than 100 years as well.

Apart from the possible graves that were identified at the site, it is also possible for stillborn babies to have been buried in association with the rectangular dwelling structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 40m by 30m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 42 – *General view of the structure at site AGA-MWS-WBP-3A. The existing Kareerand TSF can be seen in the back. Scale in 10cm increments.*

Figure 43 – *One of the possible graves at site AGA-MWS-WBP-3B. Scale in 10cm increments.*

Figure 44 – *General view of the possible grave at site AGA-MWS-WBP-3C. Scale in 10cm increments.*

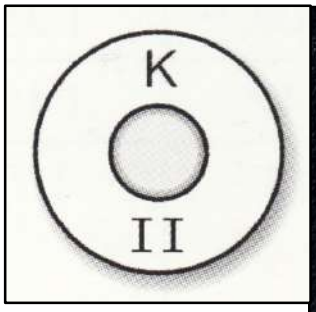


Figure 45

This Martini-Henry cartridge was observed on the surface of the site. Scale in 1cm increments. A diagram of the headstamp found on the cartridge, is shown above (Bester, 2003).

6.2.2.4 AGA-MWS-WBP-4

Site Coordinates:

S 26° 52' 17.02"
E 26° 51' 42.97"

Site Description:

A historic black homestead was identified here. It is located at the eastern foot of a low ridge.

The site comprises a rectangular stone structure which is roughly 10m by 5m in extent. It has two square rooms of roughly the same extent on the outsides with a smaller rectangular room in the centre. The structure comprises the stone foundation remains of what appears to have been a dwelling.

No concentrations of cultural material could be observed on the surface of the site.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on any of these sheets, the structure is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 46 – *General view of the structure at site AGA-MWS-WBP-4. The discard dump at the Buffelsfontein Gold Mine can be seen in the background on the right. Scale in 10cm increments.*

6.2.2.5 AGA-MWS-WBP-5

Site Coordinates:

S 26° 52' 12.23"
E 26° 51' 41.09"

Site Description

The site comprises a low density surface occurrence of Middle and Later Stone Age lithics identified in proximity to two natural depressions on top of a low ridge. Lithics were observed over an area roughly 100m by 100m in extent, with a moderate number of lithics observed across the surface of the site. The highest density observed at the site is four lithics per/ $m^{2.}$

Site Extent:

The site is roughly 100m by 100m in extent.

Site Significance:

The site comprises a low density surface scatter of lithics, with a highest density of four lithics per square meters. As a result, the site is of Medium Significance and is rated as Generally Protected B (GP.B). This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 47 – General view across the surface of a section of AGA-MWS-WBP-5.

Figure 48 – A selection of lithics identified at site AGA-MWS-WBP-5. The scale bar shown in this photograph is 5cm in length.

6.2.2.6 AGA-MWS-WBP-6

Site Coordinates:

S 26° 52' 10.07"
E 26° 51' 39.78"

Site Description:

The site comprises a small cemetery located on top of a low ridge. It is associated with a small number of trees, with some of the trees growing out of some of the grave dressings.

A total of eight graves were identified here. This said, it is likely for additional unmarked graves to also be present at the site. Seven of the eight graves from the cemetery are located adjacent to each other, with the eighth grave located a short distance further east. The surface dressing of this latter grave is quite disturbed.

All the graves dressings are stone packed and are orientated along the east-west axis. Only four of the graves from the cemetery possess headstones. Interestingly, two of these headstones were placed on the eastern end of the grave dressings and not on the customary western end. All the headstones are informal and unmarked and comprise natural stones that were placed in an upright position. No grave goods were evident.

The cemetery is quite likely associated with the historic black homesteads found along the eastern foot of the same ridge on which this site was identified.

Site Extent:

The site is roughly 40m by 30m in extent.

Site Significance:

All graves have high levels of emotional, religious and in some cases historical significance. As such

the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 49 – General view of a section of the cemetery at AGA-MWS-WBP-6. The graves extend beyond the trees in the back. Scale is in 10cm increments.

Figure 50 – One of the smaller grave dressings from the cemetery identified at AGA-MWS-WBP-6. Scale is in 10cm increments.

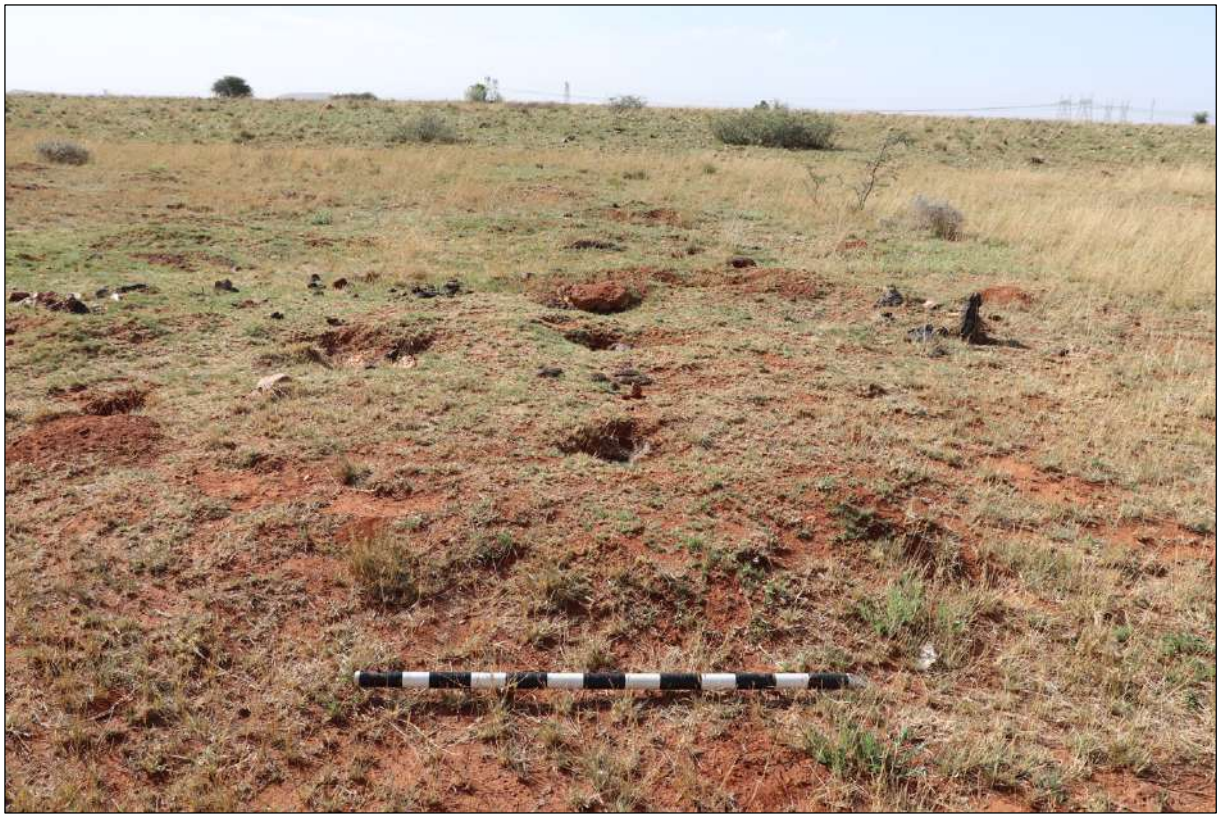


Figure 51 – This area which had been extensively disturbed by burrowing animals, may also contain graves. Scale in 10cm increments.

6.2.2.7 AGA-MWS-WBP-7

Site Coordinates:

S 26° 52' 04.76"
E 26° 51' 47.98"

Site Description:

A historic black homestead was identified on the eastern foot of a low ridge and comprises a rectangular stone structure some 5m by 4m in extent. The structure comprises the foundation remains of a dwelling. No cultural material could be observed here. The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets, the structure is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 52 – *General view of the structure at site AGA-MWS-WBP-7. Scale in 10cm increments.*

Figure 53 – *Closer view of one of the corners of the structure. Scale in 10cm increments.*

6.2.2.8 AGA-MWS-WBP-8

Site Coordinates:

S 26° 51' 58.86"
E 26° 51' 51.55"

Site Description:

A historic black homestead was identified on the eastern foot of a low ridge and comprises a rectangular stone structure some 5m by 4m in extent. The structure comprises the foundation remains of a dwelling. No cultural material could be observed here. The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets, the structure is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 54 – *General view of the structure at site AGA-MWS-WBP-8. Scale in 10cm increments.*

Figure 55 – *Closer view of a section of walling from the structure. Scale in 10cm increments.*

6.2.2.9 AGA-MWS-WBP-9

Site Coordinates:

S 26° 51' 54.93"
E 26° 51' 55.85"

Site Description:

A historic black homestead was identified on the eastern foot of a low ridge. The site is located a short distance west of a brick reservoir, and may be associated with it.

The site comprises a rectangular stone structure some 6m by 4m in extent. The structure comprises the foundation remains of a dwelling. No cultural material could be observed here.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets, the structure is almost certainly older than 60 years.

A stone-packed feature was identified a few meters south of the structure. Although this feature is orientated along the north-south axis, without the presence of a headstone, it has the appearance of a grave.

Apart from the above-mentioned possible grave located a short distance south of the structure, it is also possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

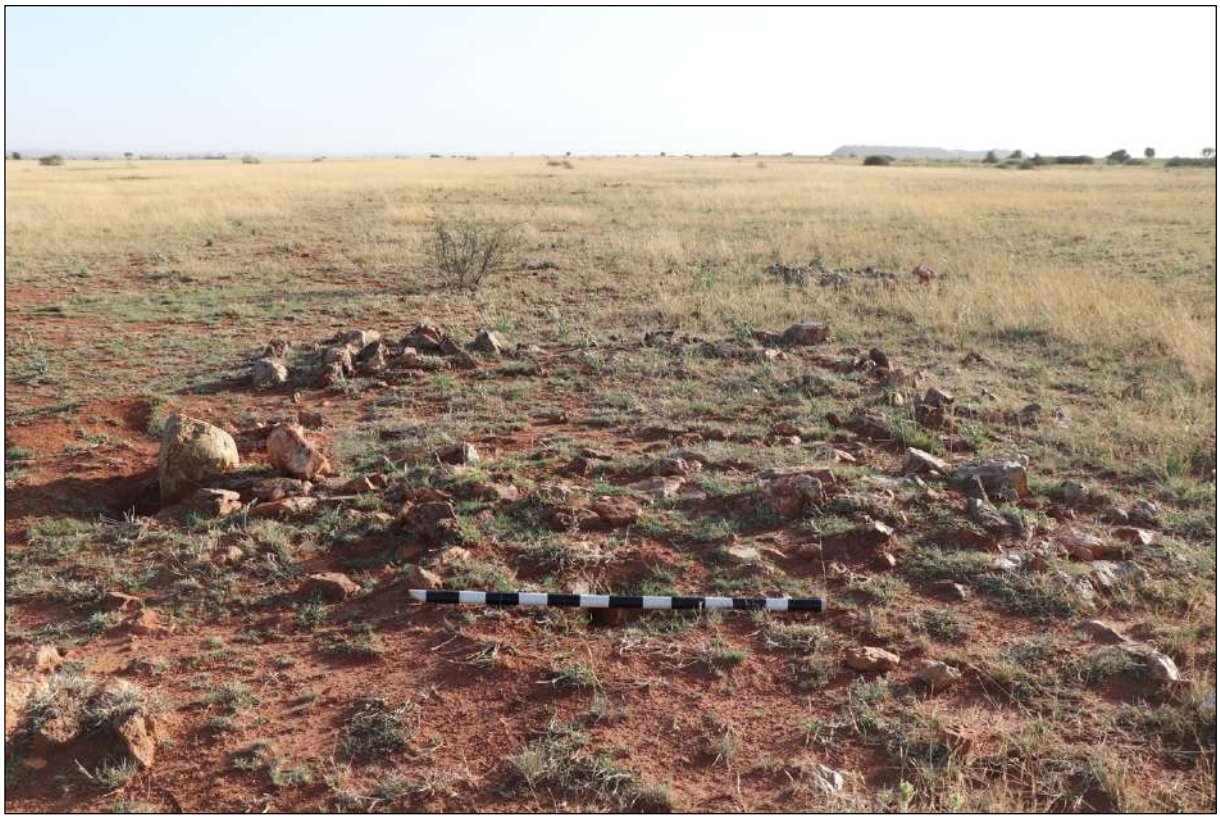


Figure 56 – *General view of the structure at site AGA-MWS-WBP-9. The possible grave can be seen in the back. Scale in 10cm increments.*

Figure 57 – *Closer view of one corner of the structure. Scale in 10cm increments.*

Figure 58 – *Closer view of the possible grave from site AGA-MWS-WBP-9. Scale is in 10cm increments.*

6.2.2.10 AGA-MWS-WBP-10

Site Coordinates:

S 26°51'53.27"
E 26°51'56.57"

Site Description:

A historic black homestead was identified on the eastern foot of a low ridge. It is located a short distance north of the previous one, and was likely directly associated with it. The site comprises a rectangular stone structure some 4m by 3m in extent, which comprises the foundation remains of what may have been a dwelling. No cultural material could be observed. The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets the structure is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 59 – *General view of the structure at site AGA-MWS-WBP-10. Scale in 10cm increments.*

Figure 60 – *Closer view of a section of walling from the structure. Scale in 10cm increments.*

6.2.2.11 AGA-MWS-WBP-11

Site Coordinates:

S 26° 51' 50.77"
E 26° 51' 56.25"

Site Description:

A historic black homestead was identified higher up the eastern slope of a low ridge. The site comprises a rectangular stone structure approximately 6m by 4m in extent, which is subdivided into two rooms. It is therefore clear that this structure comprises the foundation remains of a multi-roomed a dwelling.

A small stone-packed feature was identified a few meters south-east of the structure. This stone-packed feature is small and has the appearance of an infant's grave.

No concentrations of cultural material could be observed on the surface of the site in proximity to the structure. However, one glass fragment was observed.

The site is not depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944. However, it appears to be depicted on the second edition surveyed in 1967. This means that the site is likely between 52 and 75 years old, and as a result is almost certainly older than 60 years.

Apart from the possible grave located a short distance south-east of the structure, it is also possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 61 – *General view of the structure at site AGA-MWS-WBP-11. Scale in 10cm increments.*

Figure 62 – *Closer view of one of the corners of the structure. Scale in 10cm increments.*

Figure 63 – *Closer view of the possible baby grave associated with the site. Scale in 10cm increments.*

6.2.2.12 AGA-MWS-WBP-12

Site Coordinates:

S 26° 51' 50.52"
E 26° 51' 52.33"

Site Description:

The site comprises a small cemetery located on top of a low ridge. It is associated with a small number of trees, with some of the trees growing out of some of the grave dressings.

The site comprises four stone packed graves. One of these graves is oval-shaped while the other three are more irregularly shaped. None of the grave dressings possess any formal headstones. The grave dressings are all orientated along the east-west axis.

The cemetery is quite likely associated with the historic black homesteads found along the eastern foot of the same ridge on which this site was identified.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 64 – General view of the cemetery at AGA-MWS-WBP-12. Scale in 10cm increments.

Figure 65 – Closer view of some of the grave dressings. Scale is in 10cm increments.

6.2.2.13 AGA-MWS-WBP-13

Site Coordinates:

S 26° 51' 42.41"
E 26° 52' 02.21"

Site Description:

A historic black homestead was identified higher up the eastern slope of a low ridge. The site comprises a rectangular stone structure some 10m by 5m in extent. This stone structure comprises the foundation remains of a dwelling. No cultural material could be observed. The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets the structure is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 66 – *General view of the structure at site AGA-MWS-WBP-13. Scale in 10cm increments.*

Figure 67 – *Closer view of a section of walling from the structure. Scale in 10cm increments.*

6.2.2.14 AGA-MWS-WBP-14

Site Coordinates:

S 26° 51' 43.28"
E 26° 52' 06.14"

Site Description:

A historic black homestead was identified near the foot of the eastern slope of a low ridge. The main feature of the site comprises a rectangular stone structure some 10m by 4m in extent. This stone structure comprises the foundation remains of a dwelling. Interestingly, a high number of bricks were found to be associated with the rectangular structure, which may suggest that the structure's walls were of brick. Additionally, two sections of cylindrical cement pillars were found near the structure. These pillars would have been used to support the roof over a verandah. It is therefore likely that the homestead at this site was more elaborate than the other homesteads found all along this low ridge. The reason for this is not presently clear.

A raised midden was identified a short distance north of the structure. This midden contain cultural material in the form of glass fragments, imported ceramics, metal items and pieces of bone. While this cultural material is certainly reasonably old, it is certainly not older than 100 years.

The site is not depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944. However, it appears to be depicted on the second edition surveyed in 1967. This means that the site is between 52 and 75 years old, and as a result is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 30m by 30m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

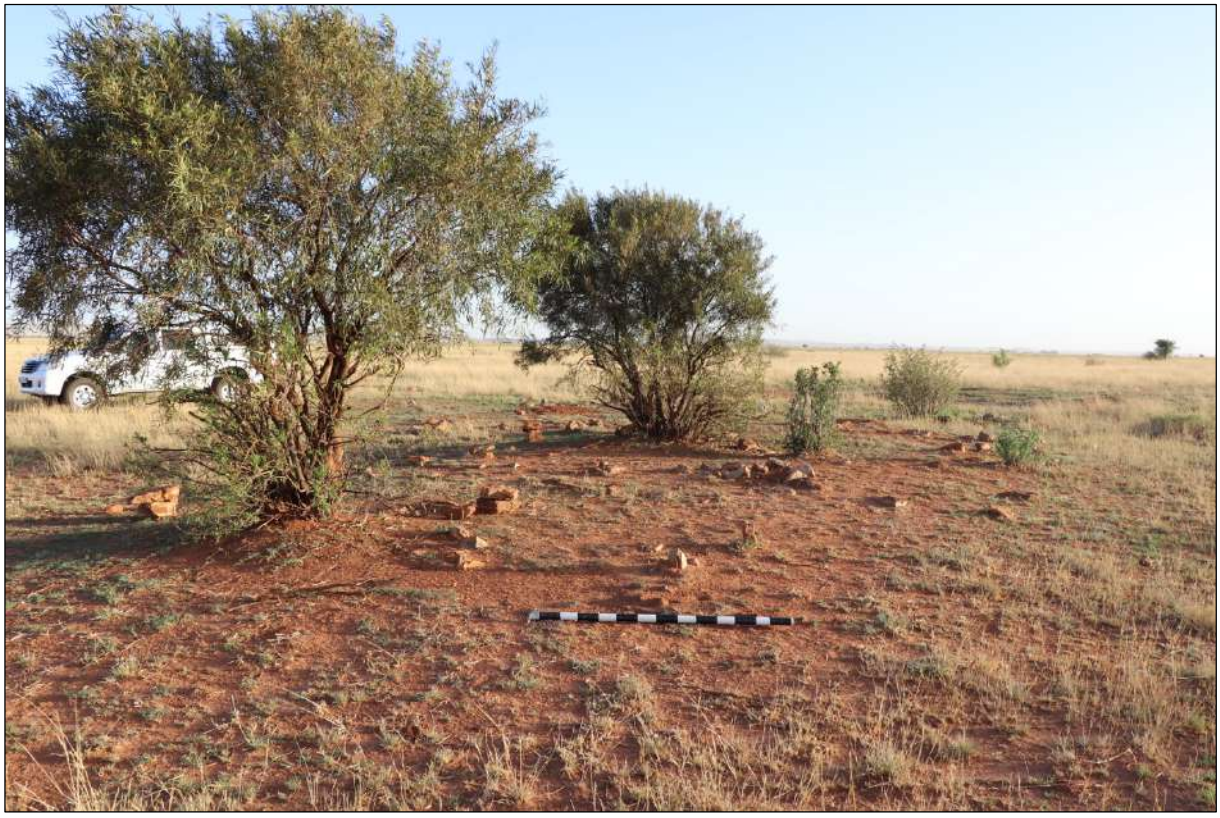


Figure 68 – *General view of the area where the remains of the structure at site AGA-MWS-WBP-14 are located. Scale in 10cm increments.*

Figure 69 – *General view of the midden area located a short distance north of the structure. Scale in 10cm increments.*

Figure 70 – *Sample of cultural material observed on the midden. Scale in 1cm and 5cm increments.*

6.2.2.15 AGA-MWS-WBP-15

Site Coordinates:

S 26° 51' 40.55"
E 26° 52' 05.56"

Site Description:

A single possible grave was identified on top of a low ridge. The site comprises a stone concentration which is roughly 2m by 1m in extent. The stone concentration is orientated along the east-west axis. No cultural material could be observed at the site.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967.

Site Extent:

The site is roughly 10m by 10m in extent.

Site Significance:

Untill such time that the presence of a grave here has been proven or disproven, the site will be considered to contain a grave.

All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 71 – General view of the possible grave at AGA-MWS-WBP-15. Scale in 10cm increments.

6.2.2.16 AGA-MWS-WBP-16

Site Coordinates:

S 26° 51' 37.74"
E 26° 52' 24.42"

Site Description:

Two rectangular stone foundation structures were identified adjacent to one another, and immediately north-east of a large eucalyptus tree. The two adjoining structures are of similar extent, with each measuring approximately 6m by 4m. The eastern structure has a clear opening (entrance) on its southern wall, with no openings visible on the western structure. It is possible for the two structures to have been formed part of a single, larger structure.

These two structures appear to have been dwellings associated with what appears to have been a farmstead at AGA-MWS-WBP-17 (see below). It is likely that these structures were the dwellings of black farmworkers. No concentration of cultural material could be observed in proximity to the structures.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967. Despite not being depicted on these sheets, the structures from this site is almost certainly older than 60 years.

It is possible for stillborn babies to have been buried in association with this structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 72 – *General view of AGA-MWS-WBP-16 showing the two adjoining structures. Scale in 10cm increments.*

Figure 73 – *General view of AGA-MWS-WBP-16 showing the one of the two structures. The eastern structure is depicted. Scale in 10cm increments.*

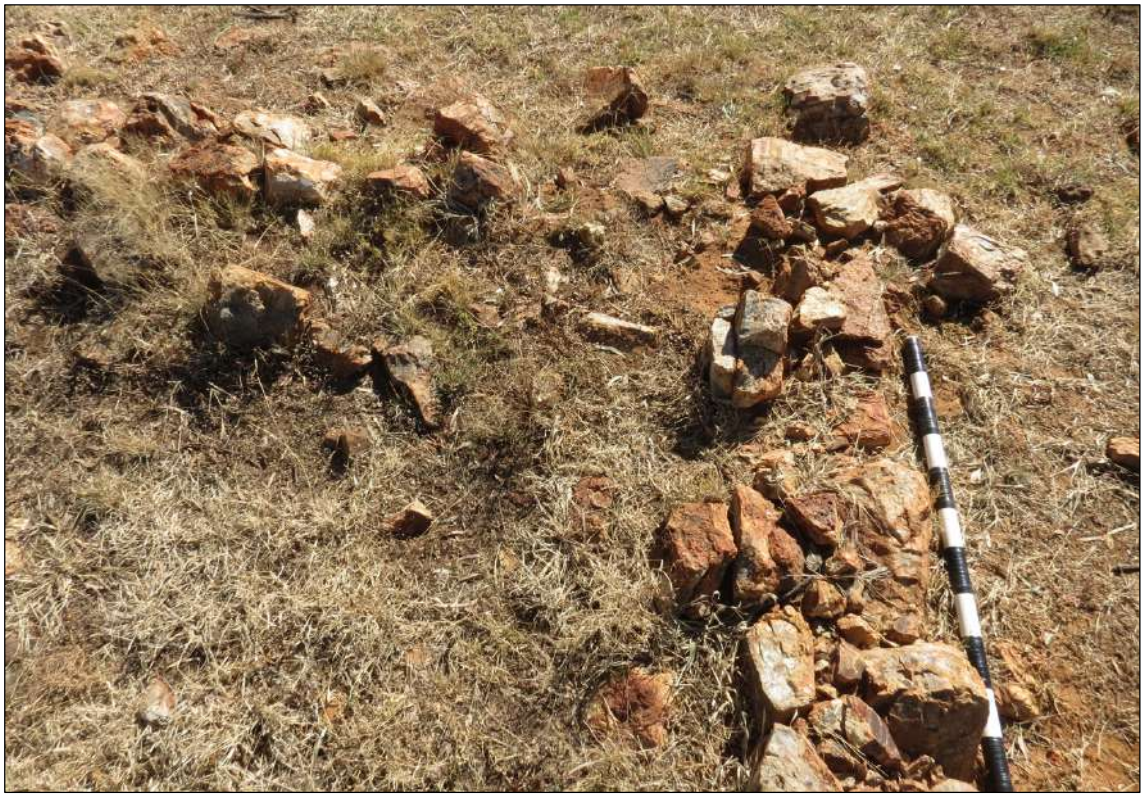


Figure 74 – *General view of AGA-MWS-WBP-16 showing a closer view of a section of stonewalling. Scale in 10cm increments.*

6.2.2.17 AGA-MWS-WBP-17

Site Coordinates:

S 26° 51' 41.72"
E 26° 52' 22.36"

Site Description:

The poorly preserved remains of a farmstead is located here. It would appear that the farmstead was demolished some time ago and apart from heaps of boulders and building rubble, all that remains is a large structure of stone and brick (10m x 7m) and a roughly rectangular area (15m x 11m) which includes sections of mud brick walling and which appears to have been the farm dwelling. To the north-west, cattle loading structures are still located. No concentration of cultural material could be observed in proximity to the site.

In terms of establishing a date for the site, it is not depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944. However, it appears to be depicted on the second edition surveyed in 1967. This means that the site is between 52 and 75 years old, and as a result is almost certainly older than 60 years. Furthermore, it is certainly not older than 100 years.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Although the site may very well have been older than 60 years, it is in a very poor state of preservation. As such the site is of Generally Protected C (GP. C) or Low Significance.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 75 – *General view of the area where the farm dwelling is believed to have stood. A section of mud brick walling can be seen in the foreground. Scale in 10cm increments.*

Figure 76 – *General view of the stone and brick structure at AGA-MWS-WBP-17. Scale in 10cm increments.*

6.2.2.18 AGA-MWS-WBP-18

Site Coordinates:

S 26° 51' 42.50"
E 26° 52' 26.09"

Site Description:

The site comprises four formally built stone features which may be graves. The site is located approximately 107m east by south-east of the farmstead at AGA-MWS-WBP-17 and must have been associated with it.

The site comprises two larger stone features and two smaller stone features, which may be the dressings of two adult graves and two child graves. All the stone features are orientated along the NE-SW axis. No grave goods or headstones could be observed on the stone features. The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967.

Site Extent:

The site is roughly 30m by 20m in extent.

Site Significance:

Untill such time that the presence of a grave here has been proven or disproven, the site will be considered to contain graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 77 – General view of the possible cemetery at AGA-MWS-WBP-18.

Figure 78 – General view of one of the possible graves at AGA-MWS-WBP-18. Scale in 10cm increments.

6.2.2.19 AGA-MWS-WBP-19

Site Coordinates:

S 26° 51' 22.44"
E 26° 53' 19.29"

Site Description:

The site comprises three possible graves enclosed by a rectangular structure (6m x 4m). The rectangular structure has a rudimentary appearance and comprises a line of loosely packed stone. What appears to be low 'stone towers' are located on some of the corners of the structure. The three possible graves also have a rudimentary appearance. The only cultural material evident at the site is a rusted iron pot observed on the surface of one of the possible graves.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Untill such time that the presence of a grave here has been proven or disproven, the site will be considered to contain graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

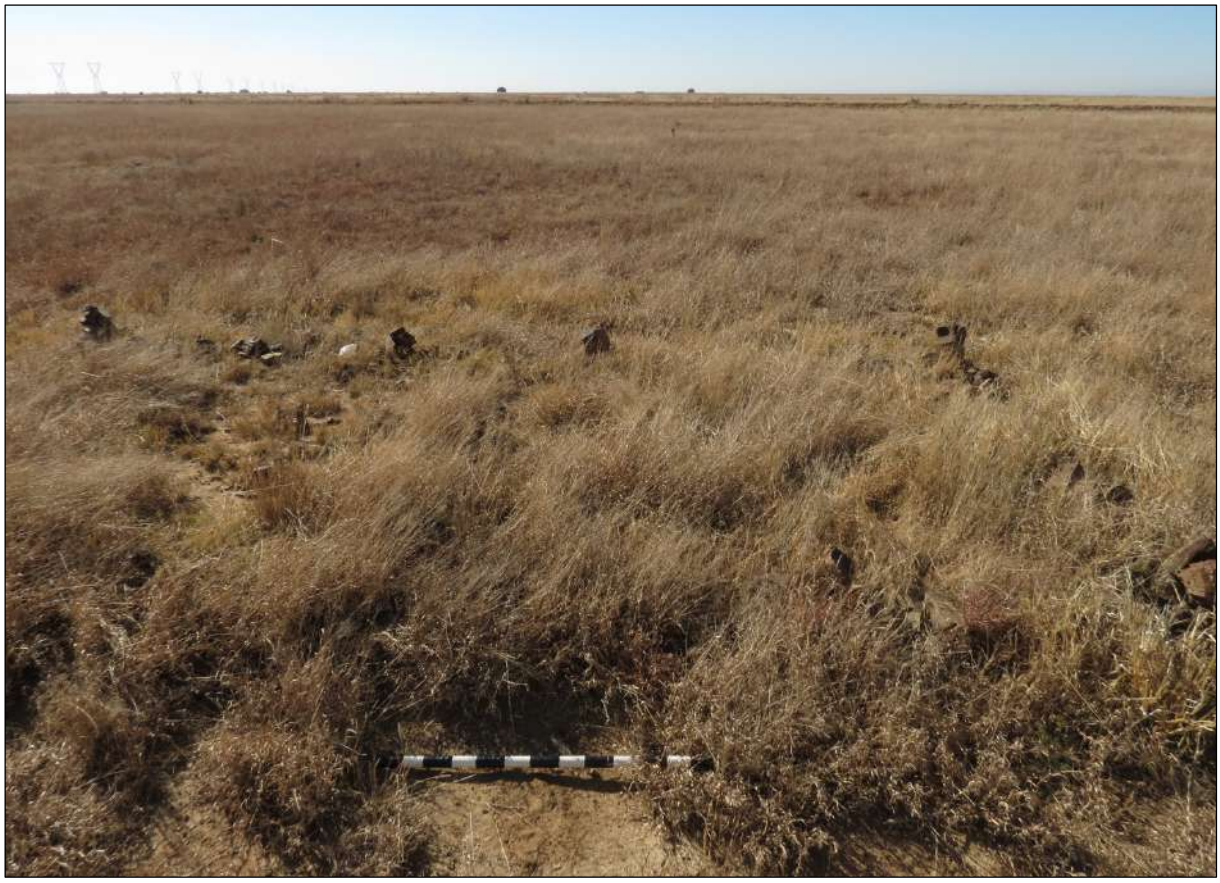


Figure 79 – General view of AGA-MWS-WBP-19. Scale in 10cm increments.

Figure 80 – Closer view of some of the features at MWS-WBP-19. Scale in 10cm increments.

6.2.3 Fieldwork Findings for the Farm Kromdraai 420 IP

6.2.3.1 AGA-MWS-KRD-1

Site Coordinates:

S 26° 52’ 55.50”
E 26° 54’ 40.70”

Site Description:

This site was first identified during a heritage inventory undertaken of the Mine Waste Solutions (MWS) areas undertaken by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014).

The site comprises a rectangular fenced area which includes a tree which appears to have a stone concentration at its base. The tree that was included in the fenced area is a White Stinkwood (*Celtis Africana*). On the surface of the fenced area a number of corrugated iron fragments were also observed.

It is impossible to state whether a grave is located here, although the presence of a fenced area suggests that the stone concentration at the base of the tree might be a grave. However, no absolute evidence for a grave was identified and as a result the site should simply be left undisturbed.

Site Extent:

The site is roughly 15m by 15m in extent.

Site Significance:

The site must be viewed as containing a grave until such time that it can be conclusively proven otherwise. All graves possess high levels of religious, cultural, emotional and legislative significance.

As such, the site is of **Generally Protected A (GP. A)** or **High/Medium Significance**. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 81 – General view of the rectangular fenced area at site AGA-MWS-KRD-1.

6.2.4 Fieldwork Findings for the Farm Umfula 575 IP

6.2.4.1 AGA-MWS-UMF-1

Site Coordinates:

S 26° 53' 34.07"
E 26° 55' 25.62"

Site Description

A rectangular stone foundation was identified on the western bank of the Vaal River, approximately 40m from the river. The structure is quite large without any subdivisions, and is approximately 14m by 11m in extent. While the structure is too big for a single-roomed dwelling, its exact origin and function are not presently known. No cultural material could also be observed on the surface of the site.

The site is not depicted on the first or second editions of the 2626DD Topographical Sheet surveyed in 1944 and 1967.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

The structure does not appear to be very old and is also not very well preserved. As a result, the site is of **Low Significance** and is rated as **Generally Protected C (GP.C)**. No heritage mitigation measures or permits are therefore required before the site is destroyed.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 82 – General view across the site. The scale is in 10cm increments.

Figure 83 – Closer view of a section of walling from the site. The scale is in 10cm increments.

6.2.4.2 AGA-MWS-UMF-2

Site Coordinates:

S 26° 53' 35.51"
E 26° 55' 20.77"

Site Description

The site comprises a low density surface occurrence of Later Stone Age and Middle Stone Age lithics which were identified approximately 170m west by north-west of the Vaal River. The site is large with lithics observed over an area roughly 100m by 100m in extent. The highest density observed at the site is three lithics per/ m^2. The lithics observed here include flakes, hammerstones and cores. The presence of both cores and hammerstones suggest that lithics manufacturing may have taken place here.

Site Extent

Lithics were observed over an area roughly 100m x 100m in extent.

Site Significance

The site represents one of the better exemples of Later Stone Age and Middle Stone Age low density surface scatters from the study area. As a result, the site is of **Medium Significance** and is rated as **Generally Protected B (GP.B)**. Mitigation measures and permits would therefore required before the site is destroyed.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 84 – General view across the area where the highest concentration of lithics was observed.

Figure 85 – Sample of lithics observed on the surface of the site. Scale is in 1cm and 5cm increments.

6.2.4.3 AGA-MWS-UMF-3

Site Coordinates:

S 26° 53' 38.44"
E 26° 54' 53.49"

Site Description

A historic farmstead is located here and comprises a number of structures and features. The farmstead was utilised over a relatively long period of time, with both old historic and more recent structures present. The farmstead is in a relatively poor condition, and was evidently abandoned some time ago.

The main component of the site is a poorly preserved farmhouse, the walls of which were all built with bricks. It is a multi-roomed homestead, with a verandah on its northern and eastern ends. Several of the doors have wooden lintels. Sections of the house are older, and the brickwork on these older sections of the house were executed in the English Bond style. A large fireplace was evidently situated in the sitting room. At present all that remains of this fireplace is a large opening and sections of the brick chimney.

A rectangular stone built kraal is located approximately 110m north by north-west of the farm dwelling. The kraal was well built, with thick walls on a cement base. Its current preservation is not very good and several sections of the wall have since fallen over. Other features identified at the site include a poorly preserved brick-built silo and a reservoir.

The site is depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944 by 45 Survey Company of the South African Engineering Corps. This map sheet depicts two buildings, one of which must be the farm dwelling still located on site. The kraal and silo are not shown on this map depiction. Furthermore, the same two farm buildings as depicted on the previous sheet are also depicted on the second edition of the 2626DD Topographical Sheet that was surveyed in 1967. It is therefore clear that the site is older than 60 years. However, the site is not believed to be older than 100 years.

Site Extent

The site covers an area roughly 200m by 200m in extent.

Site Significance

The site represents a poorly preserved farmstead. Although certainly older than 60 years, the farm dwelling appears to have been modified and altered over time. The buildings from the site are certainly not older than 100 years. As a result, the site is of **Low Significance** and is rated as **Generally Protected C (GP.C)**. No mitigation measures and permits would therefore required before the site is destroyed.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 86 – Eastern façade of the farm dwelling identified at site AGA-MWS-UMF-3. Scale is in 10cm increments.

Figure 87 – Closer view of one of the walls of the dwelling showing the use of English Bond.

Figure 88 – General view of the cattle kraal identified at the site.

6.2.4.4 AGA-MWS-UMF-4

Site Coordinates:

S 26° 53' 19.98"
E 26° 54' 43.74"

Site Description:

The site was identified by Dr. J.C.C. Pistorius in his heritage impact assessment undertaken in 2008 for a proposed tailings reclamation project (Pistorius, 2008). The site comprises a medium-sized cemetery containing a total of 24 graves. The site is located approximately 230m north by north-east of the farmworker accommodation at site AGA-MWS-UMF-5 and must have been associated with it.

The grave dressings are all stone-packed, oval in shape and orientated along the East-West axis. A number of the dressings have small upright natural stones placed on their western ends as headstones. Two of the graves have larger natural stones placed on their western ends. No inscriptions could be seen on any of these headstones.

Site Extent:

The site is approximately 50m x 40m in extent.

Site Significance:

All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of **Generally Protected A (GP. A)** or **High/Medium Significance**. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 89 – General view of the cemetery. Scale is in 10cm increments.

Figure 90 – Another view of the cemetery. Scale is in 10cm increments.

6.2.4.5 AGA-MWS-UMF-5

Site Coordinates:

S 26° 53' 26.26"
E 26° 54' 39.28"

Site Description:

The site comprises an extensive area which had been used as farm worker accommodation for a long period of time. The older components of the site consist of rectangular stone structures, some with subdivisions inside. These structures are associated with middens where glass, metal and imported ceramic artefacts are visible. Lower grinders were also observed near these older structures.

The more recent component of the site consists of at least three concrete and cement structures which had been demolished. Cultural material in the form of metal and glass artefacts are also associated with these structures.

Three huts are depicted in proximity to the site on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944 by 45 Survey Company of the South African Engineering Corps. This means that the older component of the site consisting of the rectangular stone structures are at least 75 years old. However, the site is not believed to be older than 100 years, and was evidently associated with the farmstead at AGA-MWS-KRD-4. The site is also depicted on the second edition of the same map sheet that was surveyed in 1967.

It is possible for stillborn babies to have been buried in association with especially the older stone structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 350m by 100m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such, the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 91 – General view of one of the older structures from the site. Scale is in 10cm increments.

Figure 92 – Closer view of one of the corners from the same structure. Scale is in 10cm increments.

Figure 93 – This general view of the site depicts one of the older stone-packed structures in the front with one of the more recent brick structures in the back. Scale is in 10cm increments.

6.2.5 Fieldwork Findings for the Farm Megadam 574 IP

6.2.5.1 AGA-MWS-MGD-1

Site Coordinates:

S 26° 53’ 52.3”
E 26° 52’ 32.9”

Site Description:

This site was first identified during a heritage inventory undertaken of the Mine Waste Solutions areas by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014). The site comprises three rectangular stone enclosures situated on a ridge overlooking the non-perennial stream to the east. A large rectangular structure is located in the centre of the site and is roughly 5m by 5m in extent. This structure has an opening/entrance on its southern side. Two smaller rectangular structures were identified to the north-east and south-east of the larger enclosure. These smaller enclosures are roughly 3m by 3m in extent. The site extends over an area roughly 20m by 20m in size. All three components of the site had been fenced by the mine in an attempt to conserve it. One possible interpretation for the site is that the three structures were used as livestock enclosures.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are small and as a result would be difficult to identify on the aerial photograph. Due to the geographic association of the site with the nearby sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 it seems likely that the site is older than 60 years as well.

Site Significance:

The site has some historical significance. However, better examples of this site type are found at the nearby sites. The site is of General Protection C (G.P.C.) which represents a Low Significance.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 94 – General view of the large rectangular enclosure from the site. This photograph was taken during the fieldwork undertaken in 2014.

Figure 95 – One of the smaller enclosures from the site. Again, this image was taken in 2014.

6.2.5.2 AGA-MWS-MGD-2

Site Coordinates:

S 26° 53’ 52.9”
E 26° 52’ 36.1”

Site Description:

The site was identified by Dr. J.C.C. Pistorius as GY03 in his heritage impact assessment undertaken in 2008 for a proposed tailings reclamation project (Pistorius, 2008). Later, it was included in the heritage inventory undertaken of the Mine Waste Solutions (MWS) areas by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014).

Densely overgrown stone concentrations were identified here. No clearly evident graves could be found, although intensive burrowing activities by warthogs may have resulted in extensive disturbance to any grave dressings located here. The site must have been associated with the nearby structures such as AGA-MWS-MGD-3 and AGA-MWS-MGD-4.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

All graves possess high levels of religious, cultural, emotional and legislative significance. As such, the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 96 – General view of the site. This photograph was taken in 2014.

6.2.5.3 AGA-MWS-MGD-3

Site Coordinates:

S 26° 53’ 59.1”
E 26° 52’ 36.1”

Site Description:

The site was identified by Dr. J.C.C. Pistorius as GY04 in his heritage impact assessment undertaken in 2008 for a proposed tailings reclamation project (Pistorius, 2008). Later it was included in a heritage inventory undertaken of the Mine Waste Solutions (MWS) areas by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014).

A cemetery is located here and comprises four graves. The graves are all stone packed and are oval or rectangular in shape and in some cases upright stones were observed on the western ends of some of the graves. All of the graves are orientated along the east-west axis. The cemetery is densely overgrown which suggests that the graves are not visited by the family of the deceased. This is supported by the complete lack of surface grave goods observed on the graves.

At a distance of roughly 27m north-west of the cemetery two circular stone structures were identified. The two structures are roughly 40m apart and are roughly 2m by 2m in extent. It is not clearly evident exactly what the structures were, although they may have been small livestock enclosures.

The characteristics of the site conform to a cemetery and associated structures forming part of a larger black settlement. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Site Extent:

The site is roughly 70m by 50m in extent.

Site Significance:

All graves possess high levels of religious, cultural, emotional and legislative significance. As such, the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

The structures are of little historical or scientific significance and can be deemed to be of Generally Protected C (GP. C) or Low Significance.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 97 – General view of the area where the graves are located. Again, this photograph was taken in 2014.

Figure 98 – This general photograph of the area where the graves are located, was taken in 2017.

Figure 99 – One of the small circular structures from the site. Scale is in 10cm increments.

6.2.5.4 AGA-MWS-MGD-4

Site Coordinates:

S 26° 53’ 57.6”
E 26° 52’ 32.3”

Site Description:

This site was first identified during a heritage inventory undertaken of the Mine Waste Solutions (MWS) areas by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014). The foundation remains of two stone structures were identified on a ridge overlooking a non-perennial stream. The two structures are rectangular and situated in close proximity to one another. One of the two structures is larger (5m x 4m) and was in all likelihood a dwelling. The second structure is smaller (4m x 4m) and may have been a kitchen area associated with the dwelling.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are relatively small and as a result would be difficult to identify on the aerial photograph. It seems likely that the site is older than 60 years as well.

No graves could be identified in the direct vicinity of the site. However, if the structures are the remains of black homesteads as suggested above it is possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 70m by 50m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 100 – One of the structures from the site is located here. Scale is in 10cm increments.

6.2.5.5 AGA-MWS-MGD-5

Site Coordinates:

S 26° 54’ 13.3”
E 26° 52’ 33.8”

Site Description:

The site was identified by Dr. J.C.C. Pistorius as HR01 to HR07 in his heritage impact assessment undertaken in 2008 for a proposed tailings reclamation project (Pistorius, 2008). Later it was included in a heritage inventory undertaken of the Mine Waste Solutions (MWS) areas by the author of this report for AngloGold Ashanti Limited in 2014 (Birkholtz, 2014).

An extensive historic black homestead is located here. It is located on a reasonably level plateau on the western bank of a stream. The site comprises the foundation remains of at least four dwellings, a rectangular kraal with associated structures as well as at least two possible graves. The site has a lane of eucalyptus trees near it northern end and these trees must have been planted as a wind break when the site was originally established. All components of the site had been fenced by the mine in an attempt to conserve it.

The four homestead areas comprise multi-roomed rectangular structures of which only the foundation stones remain. While no ash middens were observed in association with these features, a small number of glass and metal fragments were identified.

The stone-packed kraal is located on the eastern end of the site near the western bank of a stream. It is rectangular in shape and roughly 20m by 15m in extent. The kraal has an entrance on its northern end and the entrance is defined by two monolith-like upright stones. A second rectangular structure roughly 7m by 8m in extent is located directly to the south-west of the main kraal. This structure also has an opening on its northern end and appears to have been used to keep calves apart from the cows to allow milking. A third elongated rectangular stone enclosure is located a short distance north of the large kraal and may have been used as an enclosure for other domestic animals such as sheep, goats or pigs.

Two possible graves were identified near the centre of the site. The one possible grave comprises a rectangular stone-lined structure with an upright stone on its western end. This structure is also orientated along the east-west axis. The second possible grave has a small circular structure.

As indicated above a lane of eucalyptus trees was planted as a wind break at the time when the the site was established.

The site is depicted as a ruin on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944. This said, a total of three homesteads are depicted here on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). The only discrepancy identified on this aerial photograph in terms of the tangible remains identified during the fieldwork, is that only three homesteads are shown at the time. This indicates that the fourth homestead must have been built after this photograph was taken. Nonetheless, the depiction of the site on this aerial image indicates that it is at least 75 years old. The possibility also exists for the site to be older than that and as a result could even be older than 100 years. However, this is simply stated as a possibility and cannot be considered as absolute.

Apart from the two possible graves that were identified at the site, it is also possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 200m by 180m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium

Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Without the presence of graves, the site would have historical and some scientific significance. As a result, the homestead without the presence of graves can be considered to be of General Protection B (G.P.B.) which represents a Medium Significance.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 101 – General view of one of the homesteads from the site. This photograph was taken during the 2014 fieldwork.

Figure 102 – A section of walling forming part of the kraal can seen. Note the upright stone on the corner of the structure visible on the left. This photograph was taken during the 2014 fieldwork.

Figure 103 – The entrance on the northern end of the kraal defined by two upright stones. This photograph was taken during the 2014 fieldwork.

Figure 104 – One of the possible graves from the site. This image was taken during the 2014 fieldwork.

Figure 105 – The lane of trees on the northern end of the site. This image was taken in 2014.

Figure 106 – The site as depicted on a contemporary Google Earth image.

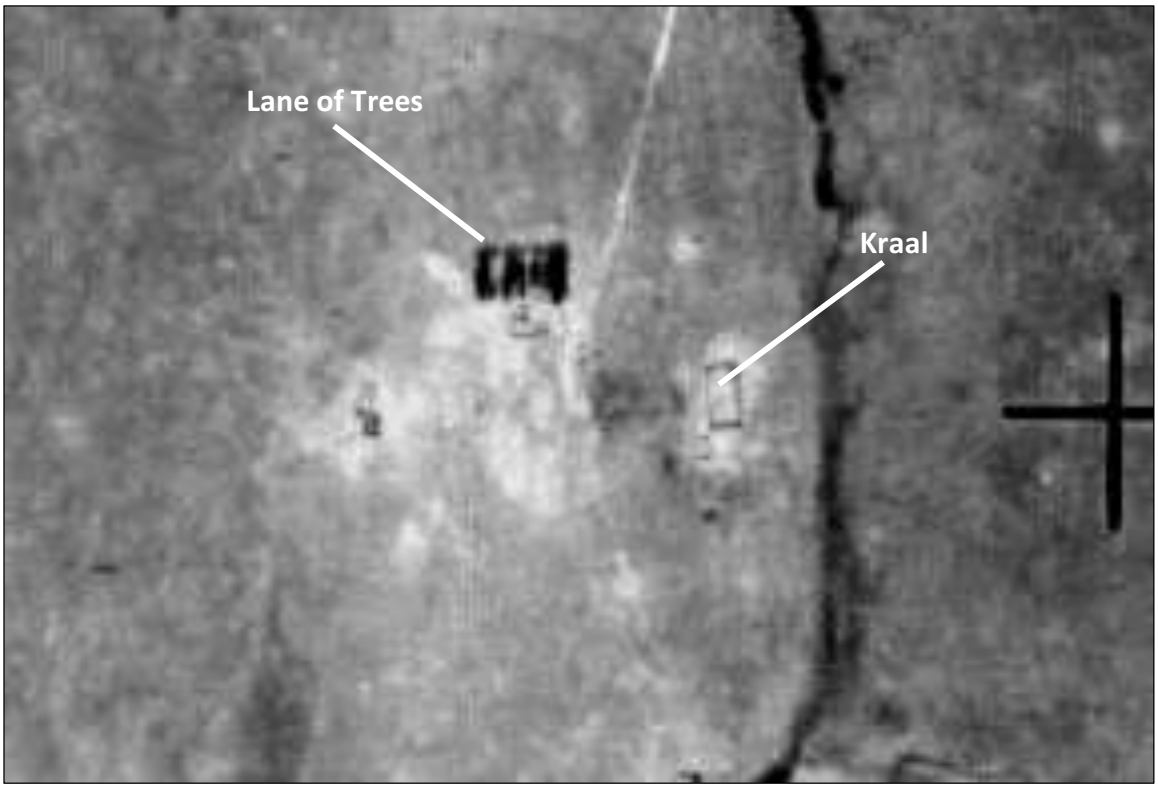


Figure 107 – The site as depicted on an aerial photograph that was taken in 1944.

6.2.5.6 AGA-MWS-MGD-6

Site Coordinates:

S 26° 54' 36.62"
E 26° 52' 45.12"

Site Description:

A historic black homestead was identified here. The site comprises a number of structures and features, including a smaller rectangular homestead-type structure as well as a larger livestock enclosure. Furthermore, an oval-shaped stone concentration identified at the site may also be a grave. No cultural material could be observed on the surface of the site.

While the site is not depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944, it is depicted on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). This indicates that the site is at least 75 years old. The possibility also exists for the site to be older than that and as a result could even be older than 100 years. However, this is simply stated as a possibility and cannot be considered as absolute.

Apart from the one possible grave feature identified at the site, It is also possible for stillborn babies to have been buried in association with this site. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents' dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 150m by 100m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be

viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of **Generally Protected A (GP. A)** or **High/Medium Significance**. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 108 – General view of the smaller rectangular structure identified at site AGA-MWS-MGD-6.

Figure 109 – Closer view of the larger stone enclosure which appears to have been a livestock enclosure.

Figure 110 – Stone concentration from the site which may be a grave. Scale is in 10cm increments.

6.2.5.7 AGA-MWS-MGD-7

Site Coordinates:

S 26° 54' 28.37"
E 26° 52' 45.85"

Site Description:

Two attached stone concentrations were identified here. Despite no formal headstones or grave goods observed here, these concentrations have the appearance of graves.

Site Extent:

The site is roughly 10m by 10m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 111 – General view of the two attached stone concentrations that were identified at site AGA-MWS-MGD-7. Scale is in 10cm increments.

6.2.5.8 AGA-MWS-MGD-8

Site Coordinates:

S 26° 54' 07.12"
E 26° 52' 34.17"

Site Description:

A rectangular stone-packed feature was identified here. The feature is orientated along the East-West axis, and can potentially be a grave.

Site Extent:

The site is roughly 10m by 10m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 112 – General view of the possible grave at site AGA-MWS-MGD-8. Scale in 10cm increments.

Figure 113 – Closer view of a section of the stone feature. Scale is in 10cm increments.

6.2.5.9 AGA-MWS-MGD-9

Site Coordinates:

S 26° 54' 16.06"
E 26° 53' 39.93"

Site Description:

A small stone-packed enclosure is located here. While the exact origin and fuction of this structure is not presently certain, it is possible for graves to be located here.

Site Extent:

The site is roughly 10m by 10m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 114 – General view of the structure identified at site AGA-MWS-MGD-9.

Figure 115 – Another view of the same structure. Scale is in 10cm increments.

6.2.6 Fieldwork Findings for the Farm Buffelsfontein 443 IP

Please note that sites AGA-MWS-BFF-1 to AGA-MWS-BFF-6 were identified during fieldwork not related to the present study, and as these six sites are located far away from the present study area boundaries, these four sites are not included here.

6.2.6.1 AGA-MWS-BFF-7

Site Coordinates:

S 26° 55’ 01.6”
E 26° 51’ 30.3”

Site Description:

The site was identified by Dr. J.C.C. Pistorius as GY05 in his heritage impact assessment undertaken in 2008 for a proposed tailings reclamation project (Pistorius, 2008).

A cemetery is located here and comprises 29 graves. The cemetery layout is such that the graves are located in a number of rows. The graves are all stone packed and are oval or rectangular in shape and in some cases upright stones were observed on the western ends of some of the graves. However, no formal headstones or inscriptions were observed. A total of 23 graves are orientated along the east-west axis with the remaining six graves orientated north-south.

The characteristics of the site conform to a cemetery associated with black people. While dating the site is difficult, cemeteries such as this one can date from as early as the 1800s to the late 1900s. Although the cemetery is not depicted on the first edition of the 2626DD Topographical Sheet, a hut and kraal are shown in proximity to the cemetery. On the second edition sheet of the same map that was surveyed in 1967 a farmhouse and huts are depicted in this area. As a result, it seems likely that the cemetery was associated with a farm.

Site Extent:

The site is roughly 100m by 100m in extent.

Site Significance:

All graves possess high levels of religious, cultural, emotional and legislative significance. As such, the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 116 – Recent photograph providing a general view of some of the graves from the site. The scale is in 10cm increments.

Figure 117 – Another general view of the cemetery. This photograph was taken in 2014.

Figure 118 – Closer view of some of the graves from the site. Scale is in 10cm increments.

6.2.6.2 AGA-MWS-BFF-8

Site Coordinates:

S 26° 54’ 48.8”
E 26° 51’ 54.5”

Site Description:

The site comprises a lane of eucalyptus trees that was planted to create a wind break. The lane of trees forms a corner on its north-western end. It is not known what the arboreal wind break was used to protect as no evidence for farmsteads or houses could be identified in the sheltered are of the wind break.

The lane of trees is depicted on the first edition of the 2626DD Topographical Sheet that was surveyed in 1944 and is also depicted on the 1944 aerial photograph (NGI, Aerial Photograph, 77_044_02446). This indicates that it is at least 75 years old.

Site Extent:

The site is roughly 800m by 800m in extent.

Site Significance:

The site has some historical significance and is of Generally Protected B (GP. B) or Medium Significance. This indicates that the site must be recorded before destruction.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 119 – Depiction of the site on the Google Earth image which dates to 2018.

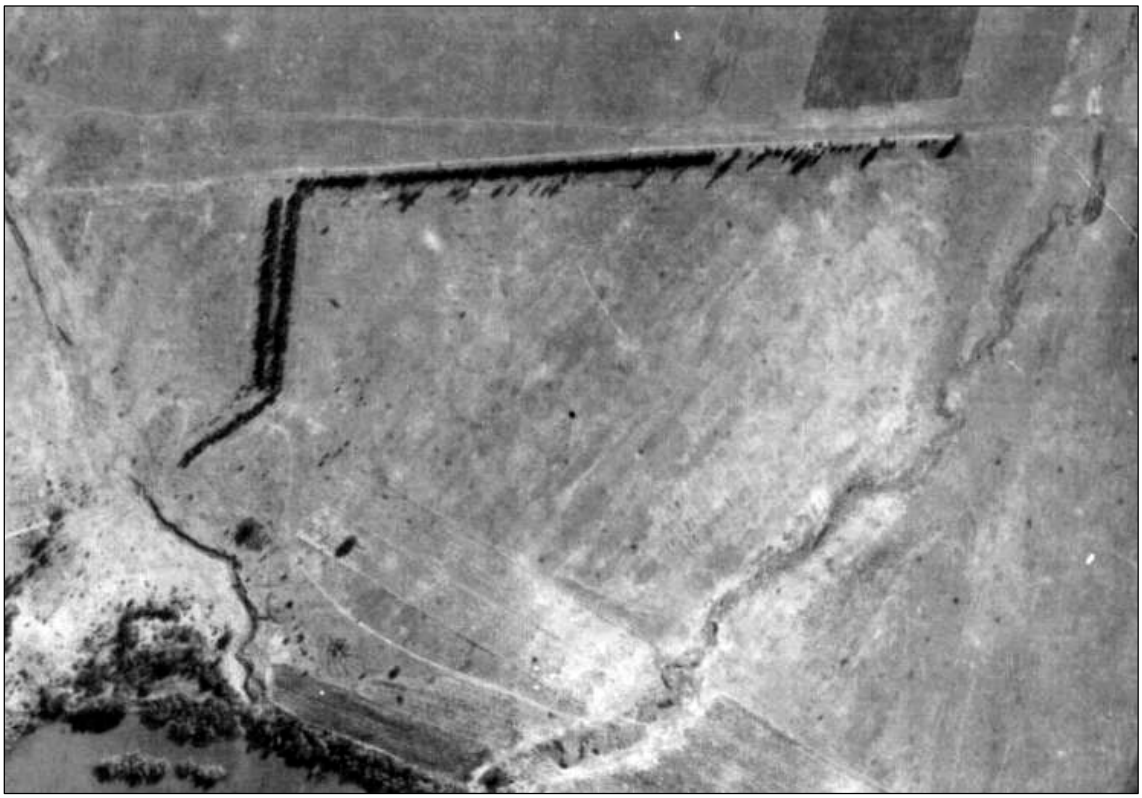


Figure 120 – Depiction of the site on the aerial photograph that was taken in 1944.

6.2.6.3 AGA-MWS-BFF-9

Site Coordinates:

S 26° 53’ 44.1”
E 26° 52’ 26.8”

Site Description:

A historic black homestead is located here. It is located on the summit of a ridge and overlooks a river valley to the east. At the north-eastern end of the site a large rectangular structure is located which is roughly 5m by 3m in extent. The structure comprises the stone foundation remains of what appears to have been a dwelling and has a smaller annex on its northern end.

Roughly 10m to the south by south-west a small rectangular stone structure was identified which is orientated along the east-west axis. It is possible that this structure is a grave but this cannot be stated for certain.

Another rectangular stone structure is located a short distance to the south-west of the possible grave and which must have formed part of the same site.

No concentrations of cultural material could be observed on the surface of the site.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are relatively small and as a result would be difficult to identify on the aerial photograph. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Apart from the possible grave that was identified at the site, it is also possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As

this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 30m by 30m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 121 – General view of the dwelling-like structure from the site.

Figure 122 – A section of walling forming part of the dwelling-like structure can be seen.

6.2.6.4 AGA-MWS-BFF-10

Site Coordinates:

S 26° 53’ 44.48”
E 26° 52’ 30.14”

Site Description:

A historic black homestead is located here. It is located on the summit of a ridge and overlooks a river valley to the east. The site comprises an elongated rectangular structure which is roughly 8m by 3m in extent. No concentrations of cultural material could be observed on the surface of the site.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are relatively small and as a result would be difficult to identify on the aerial photograph. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Although no graves were identified at the site, it is also possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be

viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 123 – General view of the structure from the site.

6.2.6.5 AGA-MWS-BFF-11

Site Coordinates:

S 26° 53’ 51.2”
E 26° 52’ 30.1”

Site Description:

A historic black homestead is located here. It is located on the summit of a ridge and overlooks a river valley to the east. Three rectangular stone structures are located here and each is roughly 5m by 5m in extent. The structures comprise the stone foundation remains of what appears to have been dwellings. One of the structures has an entrance on its eastern end defined by two upright stones. No cultural material could be observed on the site surface.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are relatively small and as a result would be difficult to identify on the aerial photograph. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Although no graves were identified at the site, it is possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 30m by 30m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 124 – General view of one of the structures from the site.

6.2.6.6 AGA-MWS-BFF-12

Site Coordinates:

S 26° 53’ 53.3”
E 26° 52’ 29.8”

Site Description:

A historic black homestead is located here. It is located on the summit of a ridge and overlooks a river valley to the east. Two rectangular stone structures are located here and each is roughly 5m by 5m in extent. The structures comprise the stone foundation remains of what appears to have been dwellings. No cultural material could be observed on the site surface.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structures are relatively small and as a result would be difficult to identify on the aerial photograph. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Although no graves were identified at the site, it is possible for stillborn babies to have been buried in association with at least some of these structures. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be

viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 125 – General view of the structures from the site.

6.2.6.7 AGA-MWS-BFF-13

Site Coordinates:

S 26° 53’ 54.6”
E 26° 52’ 29.7”

Site Description:

A historic black homestead is located here. It is located on the summit of a ridge and overlooks a river valley to the east. One rectangular stone structure is located here and is roughly 5m by 5m in extent. The structure comprises the stone foundation remains of what appears to have been a dwelling. No cultural material could be observed on the site surface.

The site is not depicted on the first edition of the 2626DD Topographical Sheet or on the 1944 aerial photograph (NGI, Aerial Photograph, 77_043_02400). However, it is worth stating that the structure from the site is relatively small and as a result would be difficult to identify on the aerial photograph. The site was in all likelihood associated with the nearby black homesteads and structures at sites such as AGA-MWS-MGD-5 and AGA-MWS-MGD-6 and is more than likely older than 60 years.

Although no graves were identified at the site, it is possible for stillborn babies to have been buried in association with the structure. Past experience has shown that in some cases stillborn babies were buried in close proximity to such black homesteads and aspecially along the sides of the parents’ dwelling. This seems to be especially true for older sites. As this site was abandoned some time ago, no direct information with regards to the presence (or not) of stillborn graves are currently available.

Site Extent:

The site is roughly 20m by 20m in extent.

Site Significance:

Until such time that the presence of graves here has been confirmed or disproved, the site must be

viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. As such the site is of Generally Protected A (GP. A) or High/Medium Significance. This indicates that the site may not be impacted upon without prior mitigation. The mitigation measures to be undertaken for the site can be found below.

Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

6.2.6.8 AGA-MWS-BFF-14

Site Coordinates:

S 26.901044
E 26.870856

Site Description

The site comprises a low density surface occurrence of primarily Middle Stone Age lithics which were identified along a farm road. Lithics were observed over an area roughly 20m by 20m in extent, with only seven lithics identified within this relatively wide area. It is not surprising therefore that the highest density observed at the site is one lithic per/ $m^{2.}$

A number of flakes were observed here, including a backed flake and proximal segment of a larger flake. The raw material used in the manufacture of these lithics include quartzite and quartz. No hammerstones were observed at the site. A crystal was observed on the surface of the site.

Site Extent

Lithics were observed over an area roughly 20m x 20m in extent.

Site Significance

The site comprises lithics that were exposed by burrowing activities. Furthermore, a number of such Stone Age occurrences had been found in relative proximity to one another at the following sites: AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18. The suggestion therefore is that more lithics are expected to be located under the surface, and that these five sites may have formed part of a much larger Stone Age site. As a result, the site is deeemed to be of **Medium Significance** and is rated as **Generally Protected B (GP.B)**.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 126 – General view of the site. Scale is in 10cm increments.

Figure 127 – Example of lithics identified at the site. Scale is in 1cm increments.

6.2.6.9 AGA-MWS-BFF-15

Site Coordinates:

S 26.907061
E 26.869061

Site Description

The site comprises a low density surface occurrence of Middle Stone Age lithics which were identified along a farm road. Lithics were observed over an area roughly 20m by 20m in extent, with only three lithics identified within this relatively wide area. It is not surprising therefore that the highest density observed at the site is one lithic per/ $m^{2.}$

The lithics comprise two cores, including what appears to be a parallel core, as well as a flake. No hammerstones were identified at the site. Quartzite was used as the raw material in the manufacture of these lithics.

Site Extent

Lithics were observed over an area roughly 20m x 20m in extent.

Site Significance

The site comprises lithics that were exposed by burrowing activities. Furthermore, a number of such Stone Age occurrences had been found in relative proximity to one another at the following sites: AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18. The suggestion therefore is that more lithics are expected to be located under the surface, and that these five sites may have formed part of a much larger Stone Age site. As a result, the site is deeemed to be of **Medium Significance** and is rated as **Generally Protected B (GP.B)**.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 128 – General view of the site. The lithics were observed along the sides of this farm road.

Figure 129 – The three lithics identified at the site. Scale is in 1cm increments.

6.2.6.10 AGA-MWS-BFF-16

Site Coordinates:

S 26.910178
E 26.865273

Site Description

The site comprises a low density surface occurrence of Middle Stone Age lithics which were exposed by burrowing activities by animals. The highest density of lithics observed at the site is two lithics per/ $m^{2.}$

The raw material used in the manufacture of these lithics include quartzite and quartz. No hammerstones were observed at the site.

Site Extent

Lithics were observed over an area roughly 20m x 20m in extent.

Site Significance

The site comprises lithics that were exposed by burrowing activities. Furthermore, a number of such Stone Age occurrences had been found in relative proximity to one another at the following sites: AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18. The suggestion therefore is that more lithics are expected to be located under the surface, and that these five sites may have formed part of a much larger Stone Age site. As a result, the site is deeemed to be of **Medium Significance** and is rated as **Generally Protected B (GP.B)**.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 130 – General view of the site. Scale is in 10cm increments.

Figure 131 – Sample of lithics observed on the surface of the site. Scale is in 1cm increments.

6.2.6.11 AGA-MWS-BFF-17

Site Coordinates:

S 26.908039
E 26.860179

Site Description

The site comprises a low density surface occurrence of Middle Stone Age lithics which were identified along a gravel road. Lithics were observed over an area roughly 40m by 20m in extent. The highest density observed at the site is two lithics per/ $m^{2.}$

The lithics comprise flakes and debitage, as well as at least one cores. No hammerstones were identified at the site. The raw material used in the manufacture of these lithics include quartzite and quartz.

Site Extent

Lithics were observed over an area roughly 40m x 40m in extent.

Site Significance

The site comprises lithics that were exposed by burrowing activities. Furthermore, a number of such Stone Age occurrences had been found in relative proximity to one another at the following sites: AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18. The suggestion therefore is that more lithics are expected to be located under the surface, and that these five sites may have formed part of a much larger Stone Age site. As a result, the site is deeemed to be of **Medium Significance** and is rated as **Generally Protected B (GP.B)**.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 132 – General view of the site. Scale is in 10cm increments.

Figure 133 – Sample of lithics identified at the site. Scale is in 1cm increments.

6.2.6.12 AGA-MWS-BFF-18

Site Coordinates:

S 26.904346
E 26.860307

Site Description

The site comprises a low density surface occurrence of Later Stone Age and Middle Stone Age lithics which were exposed during the excavation of a nearby dam. Lithics were observed over an area roughly 60m by 60m in extent. The highest density observed at the site is two lithics per/ $m^{2.}$

Compared to the lithics observed at the other sites, the ones from this site appear smaller. The lithics comprise some flakes as well as cores. No hammerstones were identified at the site. The raw material used in the manufacture of these lithics include quartzite and quartz.

Site Extent

Lithics were observed over an area roughly 60m x 60m in extent.

Site Significance

The site comprises lithics that were exposed by burrowing activities. Furthermore, a number of such Stone Age occurrences had been found in relative proximity to one another at the following sites: AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18. The suggestion therefore is that more lithics are expected to be located under the surface, and that these five sites may have formed part of a much larger Stone Age site. As a result, the site is deeemed to be of **Medium Significance** and is rated as **Generally Protected B (GP.B)**.

Impact Assessment and Mitigation:

See Chapter 7 for impact assessment calculations and Chapter 8 for required mitigation measures.

Figure 134 – General view of the site. The lithics were observed along the sides of the dam.

Figure 135 – Sample of lithics observed on the surface of the site. Scale is in 1cm increments.

7 ASSESSMENT OF IMPACT OF PROPOSED DEVELOPMENT ON IDENTIFIED HERITAGE SITES

7.1 General Observations

In this section, an assessment will be made of the impact of the proposed development on the identified archaeological and heritage sites. For this purpose, an overlay of the identified archaeological and heritage sites over the proposed development footprint areas was made. This overlay revealed that four sites are located within, or in proximity to, these proposed development footprint areas. These four sites are as follows:

- AGA-MWS-WBP-2;
- AGA-MWS-MGD-5;
- AGA-MWS-MGD-6; and
- AGA-MWS-MGD-7.

Please note the following regarding impact assessments and the impact assessment process followed in this report:

- In the pages that follow, impact risk assessment calculations will be undertaken for both pre-mitigation and post-mitigation scenarios.

- The proposed project is subdivided into four project phases, namely Construction, Operations, Decommisioning and Post-Closure. The impacts of the proposed development are expected to occur during the Construction Phase only. With the required mitigation measures outlined for these four sites expected to be completed even before the Construction Phase commences, no further impacts are expected during the subsequent project phases (i.e. Operations, Decommissioning and Post-Closure). As a result, no impact assessments will be undertaken for these three subsequent project phases.

- Heritage sites assessed to have a low heritage significance are not included in these impact risk assessment calculations. The reason for this is that sites of low significance will not require mitigation.

- The impact assessments undertaken in this report are based on the assumption that the

proposed development footprints represent the only tangible impacts associated with the proposed project on the surface of the study area.

- In terms of the sites directly impacted upon by the proposed development, it is expected that latent impacts associated with the identified sites once the project has run its course, will be negligible. In general terms, this report recommends that a heritage management plan be compiled that includes all the sites listed in this report with a heritage significance of Medium and higher. Such a management plan would outline the ongoing management of these identified archaeological and heritage sites.

- This paragraph evaluates the possible cumulative impacts on heritage resources as a result of the implementation of the proposed project. It must be noted that the evaluation is based on available heritage studies and cannot take the findings of outstanding studies on current ongoing EIA's in consideration. The following must be considered in the analysis of the cumulative effect of development on heritage resources:

    - **Fixed datum or dataset**: There is no comprehensive heritage data set for the surrounding region of the study area and thus we cannot quantify how much of a specific cultural heritage element is present in the region. The region has never been covered by an extensive heritage resources study that can account for all heritage resources in the surroundings of the study area. Furthermore, none of the heritage studies conducted can with certainty state that all heritage resources within their specific area of study had been identified and evaluated;

    - **Defined thresholds**: The value judgement on the significance of a heritage site will vary from individual to individual and between interest groups. The implication is that the significance of heritage resources can and does change over time. In the same way, the tipping threshold for impacts on a certain type of heritage resource also change; and

    - **Threshold crossing**: In the absence of a comprehensive dataset or heritage inventory of the entire region, one will never be able to quantify or set a threshold to determine at what stage the heritage impact from developments have reached or are reaching the danger level or excludes the new development on this basis (Godwin, 2011).

With the above-mentioned as background, the only cumulative impacts on heritage

resources that is foreseen on a local level, are the impacts already identified in terms of the impact assessments undertaken on an individual site basis. The site-specific mitigation measures outlined in Chapter 8 would address the required measures to mitigate these impacts. On a regional level, and as far as is presently known, no gold mines or associated activities such as Tailings Storage Facilities, are expected to be developed in the surroundings of the current development footprints. As a result, insignificant to low cumulative impacts are foreseen on heritage resources on a regional level. This statement may of course be altered should more information become available.

7.2 Pre-Mitigation Impact Risks of the Proposed Development on the identified Heritage Sites

7.2.1 Pre-Mitigation Impact of the Proposed Development on AGA-MWS-WBP-2

In this section the pre-mitigation impact of the proposed development on site AGA-MWS-WBP-2 will be assessed. A fence is proposed to be erected across the centre of the site. As a result, some impacts may be expected to the site.

Table 11 – Risk calculation for the Pre-Mitigation Impact of the Development on AGA-MWS-WBP-2

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
3	4	5	12	1	3	5	3	12	**Significance**	- 144
									Risk Rating	M

This calculation has revealed that the pre-mitigation impact risk of the proposed development of the fence on site AGA-MWS-WBP-2 is expected to be of Moderate Impact Risk. Mitigation would therefore be required.

7.2.2 Pre-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-5

In this section the pre-mitigation impact of the proposed development on site AGA-MWS-MGD-5 will be assessed. The site will be partially destroyed by the construction of the proposed return water

dams. While these impacts are expected to largely take place on a livestock enclosure situated on the eastern end of the site, the possibility still exists for unmarked graves to be impacted upon by the proposed development.

Table 12 – Risk calculation for the Pre-Mitigation Impact of the Development on AGA-MWS-MGD-5

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
3	4	5	12	1	3	5	3	12	**Significance**	- 144
									Risk Rating	M

This calculation has revealed that the pre-mitigation impact risk of the return water dams on site AGA-MWS-MGD-5 is expected to be of Moderate Impact Risk. Mitigation would be required.

7.2.3 Pre-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-6

The pre-mitigation impact of the proposed development on site AGA-MWS-MGD-6 will be assessed. This site comprises a historic black homestead containing a possible grave. Furthermore, the possibility exists for unmarked stillborn graves to also be buried here. A fence is proposed to be erected across the southern end of the site. As a result, some impacts may be expected to the site.

Table 13 – Risk calculation for the Pre-Mitigation Impact of the Development on AGA-MWS-MGD-6

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
3	4	5	12	1	2	5	3	12	**Significance**	- 132
									Risk Rating	M

This calculation has revealed that the pre-mitigation impact risk of the proposed fence on site AGA-MWS-MGD-6 is expected to be of Moderate Impact Risk. As a result, mitigation would be required.

7.2.4 Pre-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-7

In this section the pre-mitigation impact of the proposed development on site AGA-MWS-MGD-7 will be assessed. This site comprises a cluster of two possible graves which is located at distances of between 26m and 33m from the nearest development footprints.

Table 14 – Risk calculation for the pre-mitigation Impact of the Development on AGA-MWS-MGD-7

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
3	4	4	11	1	1	5	3	10	**Significance**	- 110
									Risk Rating	M

This calculation has revealed that the pre-mitigation impact risk of the proposed fence on the site is expected to be of Moderate Impact Risk. As a result, mitigation would be required.

7.3 Post-Mitigation Impact Risks of the Proposed Development on the identified Heritage Sites

7.3.1 Post-Mitigation Impact of the Proposed Development on AGA-MWS-WBP-2

In this section the post-mitigation impact of the proposed development on site AGA-MWS-WBP-2 will be assessed. This means that the impact assessment calculation shown below was based on the supposition that the mitigation measures outlined in Chapter 8 had already been undertaken.

Table 15 – Risk calculation for the Post-Mitigation Impact of the Development on AGA-MWS-WBP-2

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
2	3	4	9	1	1	1	3	6	**Significance**	- 54
									Risk Rating	L

This calculation has revealed that the post-mitigation impact risk of the proposed development of the fence on site AGA-MWS-WBP-2 is expected to be of Low Impact Risk.

7.3.2 Post-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-5

In this section the post-mitigation impact of the proposed development on site AGA-MWS-MGD-5 will be assessed. This means that the impact assessment calculation shown below was based on the supposition that the mitigation measures outlined in Chapter 8 had already been undertaken.

Table 16 – Risk calculation for the Post-Mitigation Impact of the Development on AGA-MWS-MGD-5

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
2	3	4	9	1	1	1	3	6	**Significance**	- 54
									Risk Rating	L

This calculation has revealed that the post-mitigation impact risk of the proposed development of the return water dams on site AGA-MWS-MGD-5 is expected to be of Low Impact Risk.

7.3.3 Post-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-6

In this section the post-mitigation impact of the proposed development on site AGA-MWS-MGD-6 will be assessed. This means that the impact assessment calculation shown below was based on the supposition that the mitigation measures outlined in Chapter 8 had already been undertaken.

Table 17 – Risk calculation for the Post-Mitigation Impact of the Development on AGA-MWS-MGD-6

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
2	3	4	9	1	1	1	3	6	**Significance**	- 54
									Risk Rating	L

This calculation has revealed that the post-mitigation impact risk of the proposed fence on site AGA-MWS-MGD-6 is expected to be of Low Impact Risk.

7.3.4 Post-Mitigation Impact of the Proposed Development on AGA-MWS-MGD-7

In this section the post-mitigation impact of the proposed development on site AGA-MWS-MGD-7 will be assessed. This means that the impact assessment calculation shown below was based on the supposition that the mitigation measures outlined in Chapter 8 had already been undertaken.

Table 18 – Risk calculation for the post-mitigation Impact of the Development on AGA-MWS-MGD-7

Severity Rating	Spatial Scale	Duration	Consequence	Frequency of Activity	Frequency of Impact	Legal Issues	Detection	Likelihood		
2	3	4	9	1	1	1	3	6	**Significance**	- 54
									Risk Rating	L

This calculation has revealed that the post-mitigation impact risk of the proposed development of the fence on site AGA-MWS-MGD-7 is expected to be of Low Impact Risk.

8 REQUIRED MITIGATION MEASURES

8.1 Introduction

In this chapter, required mitigation measures for each of the sites affected by the proposed development will be outlined.

8.2 Required Mitigation Measures for the Identified Sites

8.2.1 Required Mitigation Measures for sites AGA-MWS-WBP-2, AGA-MWS-MGD-5 and AGA-MWS-MGD-6

The impact risk calculations undertaken in Chapter 7 have shown that the impact risk for the proposed development on sites AGA-MWS-WBP-2, AGA-MWS-MGD-5 and AGA-MWS-MGD-6 comprise a Moderate Impact Risk. These sites all comprise historic black homesteads where the risk for unmarked stillborn graves exist.

The following initial mitigation measure is required for the four sites:

- A social consultation process to assess whether any local residents or the wider public is aware of the presence of graves here.

Depending on the outcome of the social consultation process, three different outcomes would be the result, namely:

- Outcome 1: The social consultation absolutely confirms that no graves are located here.
- Outcome 2: The social consultation absolutely confirms that graves are located here.
- Outcome 3: The social consultation does not yield any confident results.

The following mitigation measures would be required for sites falling under Outcome 1:

- No further mitigation with regards to the unmarked stillborn graves would be required.

The following mitigation measures would be required for sites falling under Outcome 2:

- A grave relocation process must be undertaken.
- A detailed social consultation process, at least 60 days in length, comprising the attempted identification of the next-of-kin in order to obtain their consent for the relocation.
- Bilingual site and newspaper notices indicating the intent of the relocation.
- Permits from all the relevant and legally required authorities.
- An exhumation process that keeps the dignity of the remains and family intact.
- An exhumation process that will safeguard the legal rights of the families as well as that of the mining company.
- The process must be done by a reputable company well versed in the mitigation of graves.

The following mitigation measures would be required for sites falling under Outcome 3:

- Test excavations to physically confirm the presence or absence graves.
- If no evidence for graves are found, the site will fall within Outcome 1 as outlined above. This means that no further mitigation measures would be required.
- If evidence for stillborn babies are found, the site will fall within Outcome 2 as outlined above. This means that a full grave relocation process must be implemented.

Additionally, the following general mitigation measures must be undertaken for all four these sites:

- All structures and site layouts from each site must be recorded using standard survey methods and/or measured drawings. The end result would be a site layout plan.
- A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report.
- The completed mitigation report must be submitted to the relevant heritage authorities.

8.2.2 Required Mitigation Measures for site AGA-MWS-WGD-7

The impact risk calculations undertaken in Chapter 7 have shown that the impact risk for the proposed development on site AGA-MWS-WGD-7 comprise a Moderate Impact Risk. This site consists of a cluster of two attached possible graves.

The following mitigation measures are required for this site:

- The site must be fenced before construction commences. This fencing must be undertaken in such a way that the closest distances between the possible graves and the fence are at all times at least 2m.
- Signposts must be erected that clearly indicate the fenced area as containing possible graves.
- The position of the possible graves must be shown on all the construction and operation maps to ensure that all individuals associated with construction and mining activities are aware of the presence of these sites.

9 CONCLUSIONS AND RECOMMENDATIONS

PGS Heritage (Pty) Ltd was appointed by GCS Water & Environmental Consultants to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Kareerand TSF Expansion Project, located on certain portions of the farms Kromdraai 420 IP, Hartebeestfontein 422 IP, Wildebeestpan 442 IP, Buffelsfontein 443 IP, Umfula 575 IP and Megadam 574 IP, to the east and south-east of Klerksdorp, within the City of Matlosana and Potchefstroom Local Municipalities, North West Province.

An archival and historical desktop study was undertaken to provide a historic framework for the project area and surrounding landscape. This was augmented by a study of available historical topographical maps and an assessment of previous archaeological and heritage studies completed for the study area and surrounding landscape. The desktop study revealed that the study area is located in surroundings characterised by a long and significant history.

The study area was assessed in the field by way of intensive walkthroughs that were augmented by vehicle surveys. The fieldwork was undertaken by experienced fieldwork teams comprising one heritage specialist/archaeologist and one fieldwork assistant. A total of four fieldwork trips were undertaken by experienced fieldwork teams between 2017 and 2018. During all these fieldwork trips these teams comprised one heritage specialist/archaeologist and one fieldwork assistant. The fieldwork resulted in the identification of 48 archaeological and heritage sites. These identified sites comprise the following:

- Six Cemeteries (see sites AGA-MWS-WBP-6, AGA-MWS-WBP-12, AGA-MWS-UMF-4, AGA-MWS-MGD-2, AGA-MWS-MGD-3 and AGA-MWS-BFF-7);
- Eight Possible Graves (see sites AGA-MWS-HBF-5, AGA-MWS-WBP-15, AGA-MWS-WBP-18, AGA-MWS-WBP-19, AGA-MWS-KRD-1, AGA-MWS-MGD-7, AGA-MWS-MGD-8, AGA-MWS-MGD-9);
- One Historic Black Homestead containing Confirmed Graves (AGA-MWS-MGD-5);
- Twenty Historic Black Homesteads (AGA-MWS-WBP-1, AGA-MWS-WBP-2, AGA-MWS-WBP-3, AGA-MWS-WBP-4, AGA-MWS-WBP-7, AGA-MWS-WBP-8, AGA-MWS-WBP-9, AGA-MWS-WBP-10, AGA-MWS-WBP-11, AGA-MWS-WBP-13, AGA-MWS-WBP-14, AGA-MWS-WBP-16, AGA-MWS-UMF-5, AGA-MWS-MGD-4, AGA-MWS-MGD-6, AGA-MWS-BFF-9, AGA-MWS-BFF-

10, AGA-MWS-BFF-11, AGA-MWS-BFF-12 and AGA-MWS-BFF-13);

- Three Recent Structures (see sites AGA-MWS-HBF-6, AGA-MWS-UMF-1 & AGA-MWS-MGD-1);
- Two Historic Farmsteads (see sites AGA-MWS-WBP-17 & AGA-MWS-UMF-3);
- Seven Stone Age sites (see sites AGA-MWS-WBP-5, AGA-MWS-UMF-2, AGA-MWS-BFF-14, AGA-MWS-BFF-15, AGA-MWS-BFF-16, AGA-MWS-BFF-17 and AGA-MWS-BFF-18); and
- One old lane of trees (AGA-MWS-BFF-8).

The impact of the proposed development on the located heritage sites was assessed in Chapter 7 of this report. For this purpose, an overlay of the identified archaeological and heritage sites over the proposed development footprint areas was made. This overlay revealed that four sites are located within, or in proximity to, these proposed development footprint areas. These four sites are AGA-MWS-WBP-2, AGA-MWS-MGD-5, AGA-MWS-MGD-6 AND AGA-MWS-MGD-7. Assessments of the impact before and after mitigation were undertaken.

Mitigation measures are outlined in Chapter 8 of this report. The mitigation measures required for sites AGA-MWS-WBP-2, AGA-MWS-MGD-5 and AGA-MWS-MGD-6 will be outlined first. The following initial mitigation measure is required for the four sites:

- A social consultation process to assess whether any local residents or the wider public is aware of the presence of graves here.

Depending on the outcome of the social consultation process, three different outcomes would be the result, namely:

- Outcome 1: The social consultation absolutely confirms that no graves are located here.
- Outcome 2: The social consultation absolutely confirms that graves are located here.
- Outcome 3: The social consultation does not yield any confident results.

The following mitigation measures would be required for sites falling under Outcome 1:

- No further mitigation with regards to the unmarked stillborn graves would be required.

The following mitigation measures would be required for sites falling under Outcome 2:

- A grave relocation process must be undertaken.
- A detailed social consultation process, at least 60 days in length, comprising the attempted identification of the next-of-kin in order to obtain their consent for the relocation.
- Bilingual site and newspaper notices indicating the intent of the relocation.
- Permits from all the relevant and legally required authorities.
- An exhumation process that keeps the dignity of the remains and family intact.
- An exhumation process that will safeguard the legal rights of the families as well as that of the mining company.
- The process must be done by a reputable company well versed in the mitigation of graves.

The following mitigation measures would be required for sites falling under Outcome 3:

- Test excavations to physically confirm the presence or absence graves.
- If no evidence for graves are found, the site will fall within Outcome 1 as outlined above. This means that no further mitigation measures would be required.
- If evidence for stillborn babies are found, the site will fall within Outcome 2 as outlined above. This means that a full grave relocation process must be implemented.

Additionally, the following general mitigation measures must be undertaken for all four these sites:

- All structures and site layouts from each site must be recorded using standard survey methods and/or measured drawings. The end result would be a site layout plan.
- A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report.
- The completed mitigation report must be submitted to the relevant heritage authorities.

The following mitigation measures are required for site AGA-MWS-MGD-7:

- The site must be fenced before construction commences. This fencing must be undertaken in such a way that the closest distances between the possible graves and the fence are at all

times at least 2m.

- Signposts must be erected that clearly indicate the fenced area as containing possible graves.
- The position of the possible graves must be shown on all the construction and operation maps to ensure that all individuals associated with construction and mining activities are aware of the presence of these sites.

Ms. Elize Butler of Banzai Environmental (Pty) Ltd was commissioned to undertake a desktop Palaeontological Impact Assessment. Her report and findings are attached in full in **Appendix C**. Ms. Butler found that the proposed development area is "*…is underlain by the Hekpoort-; Daspoort and Strubenkop Formations of the Pretoria Group within the Transvaal Supergroup as well as the igneous intrusion diabase. According to the PalaeoMap of SAHRIS the Palaeontological Sensitivity of the Hekpoort Formation is moderate, Strubenkop Formation is Low, Daspoort Formation is High, while diabase is igneous rocks and thus unfossiliferous (Almond et al, 2013; Groenewald et al 2014; SAHRIS website). Since the area has already been disturbed with mining activities in the past the sensitivity is regarded as low."*

It is therefore considered that the construction and operation of the development footprint and associated infrastructure is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. Although fossils are rare in this biozone a single fossil can have a huge scientific importance as many fossil taxa are known from only one fossil.

The following mitigation measures would be required for palaeontology:

- In the unlikely event that fossil remains are discovered during any phase of construction, on the surface or exposed by excavations the Chance Find Protocol outlined in the palaeontological report must be implemented by the ECO in charge of these developments. These discoveries ought to be protected (*in situ*) and the ECO must report to SAHRA (contact details provided in the specialist report) so that correct mitigation (recording and collection) can be carry out.

- Preceding any collection of fossil material, the palaeontologist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum

standards for palaeontological impact studies suggested by SAHRA.

The following general mitigation measures are required:

- An archaeological and heritage monitoring process must be implemented for three sites containing cemeteries and possible graves located approximately 50m from the proposed development footprint areas. Although these sites are not expected to be directly impacted upon by the proposed development, this monitoring process will ensure that no peripheral impacts take place. These four sites are AGA-MWS-MGD-2, AGA-MWS-MGD-3 and AGA-MWS-MGD-8.

- All the sites listed in this report with a heritage significance of Medium and higher, must be included in a heritage management plan. Such a management plan would allow for the future management and protection of these sites.

While the unmitigated impact of the proposed development is expected to result in a relatively high negative impact in terms of the identified archaeological and heritage sites located here, these impacts can be suitably mitigated to acceptable levels by way of a range of mitigation measures outlined in this report. As a result, on the condition that the recommendations made in this report are adhered to, no heritage reasons can be given for the development not to continue.

10 PREPARERS

This Heritage Impact Assessment was written by the following preparers:

- Polke Birkholtz – Project Manager / Archaeologist / Author

11 REFERENCES

Published References

Amery, L.S. 1909: *The Times History of the War in South Africa: 1899 – 1902*. Volume VII. Sampson, Law, Marston and Company Limited, London.

Antrobus, E.S.A. 1986. *Witwatersrand Gold - 100 Years: A review of the discovery and development of the Witwatersrand Goldfield as seen from the geological viewpoint.* Geological Society of South Africa, Pretoria.

Bergh, J.S. (ed.). 1999: *Geskiedenis Atlas van Suid-Afrika: Die Vier Noordelike Provinsies*. J.L. van Schaik. Pretoria.

Bhushan, K. and G. Katyal. 2002. *Nuclear, Biological and Chemical Warfare*. Efficient Offset Printers, India.

De Jong, R.C., G.M. van der Waal and D.H. Heydenreich. 1988. *NZASM 100: The Buildings, Steam Engines and Structures of the Netherlands South African Railway Company*. Chris van Rensburg Publications, Pretoria.

Du Plessis, W.F. 1952: *Die Beknopte Geskiedenis van Klerksdorp*.

Erasmus, B.J. 2004. *On Route in South Africa*. Jonathan Ball Publishers, Johannesburg.

Goldmann, C.S. 1892: *The Witwatersrand Gold Fields: The Financial, Statistical and General History of the Gold and other companies of the Witwatersrand, South Africa*. Argus Printing and Publishing Company, Johannesburg.

Goldmann, C.S. 1895/1896: *South African Mines: Their Position, Results and Developments*. Argus Printing and Publishing Company, Johannesburg.

Groves, L.R. 1962. *Now It Can Be Told: The Story of the Manhattan Project.* Harper, New York.

Guest, H. 1938: *Klerksdorp's Fifty Years of Mining*. Mine Manager's Association, Klerksdorp.

Gurney, R. and W.J. Jervois. 1935. *History of the Northamptonshire Regiment*. Gale & Polden, London.

Hocking, A. 1987. *A Court of Kings: the Story of South Africa's Association of Mine Managers*. Hollards Corporate.

Huffman, T.N. 2007. *Handbook to the Iron Age: The archaeology of Pre-Colonial Farming*

Societies in Southern Africa. University of KwaZulu-Natal Press, Scottsville.

Jones, J.D.F. 1995. *Through Fortress and Rock: The Story of Gencor*. Jonathan Ball, Johannesburg.

Marx, R. 1987: *Klerksdorp Groeiende Reus: 1837 – 1987*. Klerksdorp City Council, Klerksdorp.

Orkney Diary. 1990: *Commemorative Diary of Orkney: 1940-1990*. Gutenberg Publishers, Pretoria.

Raath, A.W.G. 2007. *De La Rey: 'n Stryd vir Vryheid*. Kraal Uitgewers, Brandfort.

South African Mining and Engineering Journal. 1982.

Standard Encyclopaedia of Southern Africa, 1972. NASOU.

The Mining Magazine, 1952.

Theal, G.M. 2010. *History of South Africa since September 1795*. Cambridge University Press, Cambridge.

Van Schoor, M.C.E. 2007. *Christiaan Rudolph de Wet: Krygsman en volksman*. Protea Boekhuis, Pretoria.

Visagie, J.C. 2000. *Voortrekkerstamouers: 1835 -1845*. University of South Africa, Pretoria.

Warwick, P. 1983. *Black People and the South African War: 1899-1902*. Ravan Press, Johannesburg.

Unpublished References

Birkholtz, P.D. 2014. *Heritage Inventory of the Mines Waste Solutions (MWS) Areas located on certain portions of the farms Stilfontein 408 IP, Kromdraai 420 IP, Hartebeestfontein 422 IP, Modderfontein 440 IP, Buffelsfontein 443 IP and Kareerand 444 IP, to the east and south-east of Klerksdorp, North West Province*. For AngloGold Ashanti Limited.

Coetzee, F. 2012. *Cultural Heritage Survey of the Proposed Kabi Vaalkop PV Solar Facility, near Orkney, Dr Kenneth Kaunda District, North West Province*. For Savannah Environmental (Pty) Ltd.

Dreyer, K. 2005. *Archaeological and Historical Investigation of the Proposed Residential Developments on Subdivision 13 of the farm Pretoriuskraal 53, Viljoenskroon, Free State*.

Matlosana Municipality, n.d. *Catalogue of Heritage Sites*.

Miller, S. 2015. *Cultural Heritage Impact Assessment for Shafts #1 to #7, Orkney, Northwest Province,*

South Africa. For CAPM Gold.

Pistorius, J.C.C. 2008. *A Phase 1 Heritage Impact Assessment Study for the Proposed Tailings Reclamation Project near the Mine Village of Stilfontein in the North West Province of South Africa*. An unpublished report.

Pistorius, J.S.S. 2011. *A Phase I Heritage Impact Assessment (HIA) Study for a Proposed Tailings Reclamation Project near the Mine Village of Stilfontein in the North West Province of South Africa*. For Ground Water Consulting Services.

Van der Walt, J. 2016. *Archaeological Impact Assessment for the Proposed Buffels Solar 1 Solar Energy Facility, North West province*. For Savannah Environmental (Pty) Ltd.

Van der Walt, J. 2016. *Archaeological Impact Assessment for the Proposed Buffels Solar 2 Solar Energy Facility, North West province*. For Savannah Environmental (Pty) Ltd.

Newspapers

Mining Mirror, June 2013

Potchefstroom Herald, 28 February 2014

Sydney Morning Herald, 15 December 1900

The Advertiser, 19 December 1900

The Star, 13 September 1983

The Transvaler, 20 February 1981

Archival References

National Archives, Maps, 3/614
National Archives, Photographs, 16342

CJC, 35, 656
CJC, 128, 2493
CJC, 994, 925

MHG 1880/38
MHG 3385/40
MHG 41445/19
MHG 49765
RAK 2875

RAK 2876

Historic Aerial Photographs and Topographic Maps

All the historic aerial photographs and early topographic 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.

Internet

http://www.antiquarianauctions.com/lots/16-original-anglo-boer-war-photographs
www.nwpg.gov.za
www.sanbi.org
www.wikipedia.org

Google Earth

All the aerial depictions and overlays used in this report are from 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 19: 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	The client	Archaeologist and a competent archaeological support

evaluation.		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: 17 Years

Experience Related to the Scope of Work:

- Polke has worked as a **HERITAGE SPECIALIST / ARCHAEOLOGIST / HISTORIAN** on more than 275 projects, and acted as **PROJECT MANAGER** on almost all of these projects. His experience include 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 *Centre 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.*

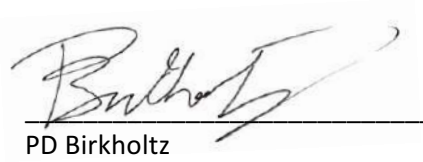
- Polke's **KEY QUALIFICATIONS:**

  - 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

5 January 2016
Date

Appendix C

DESKTOP-BASED PALAEONTOLOGICAL IMPACT ASSESSMENT