# Heritage Impact Assessment report for the Eskom Gamohaan – Seven Miles 22kV Powerline

## On the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province

**Heritage Impact Assessment**

| Template Number | Document Number | Revision | Date |
|---|---|---|---|
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## REVISION HISTORY

| Version | Issue Date | Description of Changes |
|---|---|---|
| 01 | 26 August 2022 | First draft |
| 02 | 08 September 2022 | Second draft |
| | | |

## Declaration of Independence

- I, Michelle Sachse, declare that –
- General declaration:
- I act as the independent heritage practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting heritage impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

## Disclosure of Vested Interest

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


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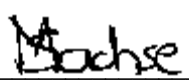
**SIGNATURE:** 

**ACKNOWLEDGEMENT OF RECEIPT**

| **Report Title** | Heritage Impact Assessment report for the Eskom Gamohaan – Seven Miles 22 kV Powerline - On the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province | | |
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The Heritage Impact Assessment Report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA): Appendix 6 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended, 2017) requirements for specialist reports as indicated in the table below.

| Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017 | Relevant section in report |
|---|---|
| 1.(1) (a) (i) Details of the specialist who prepared the report | Page ii of Report – Contact details and company |
| (ii) The expertise of that person to compile a specialist report including a curriculum vita | Section 1.2 – refer to Appendix C |
| (b) A declaration that the person is independent in a form as may be specified by the competent authority | Page ii of the report |
| (c) An indication of the scope of, and the purpose for which, the report was prepared | Section 1.1 |
| (cA) An indication of the quality and age of base data used for the specialist report | N/A |
| (cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change; | Section 5 |
| (d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment | Section 4.4 |
| (e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used | Appendix A and B |
| (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; | Section 4 |
| (g) An identification of any areas to be avoided, including buffers | Section 4 |
| (h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers; | Section 4.3 |
| (i) A description of any assumptions made and any uncertainties or gaps in knowledge; | Section 1.3 |
| (j) A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment | Section 4 |
| (k) Any mitigation measures for inclusion in the EMPr | Section 6 |
| (l) Any conditions for inclusion in the environmental authorization | Section 6 |
| (m) Any monitoring requirements for inclusion in the EMPr or environmental authorization | Section 6 |
| (n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and | Section 6 and 7 |
| (n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and | |
| (n)(ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan | Section 6 |
| (o) A description of any consultation process that was undertaken during the course of carrying out the study | Informal consultation in fieldwork. |
| (p) A summary and copies if any comments that were received during any consultation process | Not applicable. To date no comments regarding heritage resources that require input from a specialist have been raised. |
| (q) Any other information requested by the competent authority. | Not applicable. |
| (2) Where a government notice 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. | No protocols or minimum standards for HIAs or PIAs |

## EXECUTIVE SUMMARY


PGS Heritage (Pty) Ltd was appointed by Environmental Impact Management Services (EIMS) (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Environmental Assessment (BA) for the proposed Eskom Gamohaan – Seven Miles 22kV Powerline on the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province.

A further standalone Palaeontological Desktop Assessment (PDA) was completed for PGS Heritage by Dr Elize Butler of Banzai Environmental.

Heritage resources are unique and non-renewable and as such, any impact on such resources must be seen as significant. The HIA has shown that the study area and surrounding area has some heritage resources situated further away from the study area. Through data analysis and a site investigation, the following issues were identified from a heritage perspective.

**Heritage Resources**

During the fieldwork no heritage features and resources (archaeological sites or burial grounds and graves) where identified. A field survey of the study area was undertaken by a combination of vehicle and pedestrian means, by two archaeologists (Michelle Sachse and Henk Steyn) on 4 August 2022.

**Recommendations**

No evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage. With no impact expected on heritage, no further mitigation is required. Refer Chapter 7 of this report.

**Conclusion**

It is the combined considered opinion that the overall impact on heritage resources is Low. Provided that the recommended mitigation measures are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in section 8 of this report have been developed to minimise the project impact on heritage resources.

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## TERMINOLOGY AND ABBREVIATIONS

**Archaeological resources**

This includes:

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

**Cultural significance**

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

**Development**

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

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

**Early Stone Age**

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

**Fossil**

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

**Heritage**

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

**Heritage resources**

This means any place or object of cultural significance and can include (but not limited to) as stated under Section 3 of the NHRA,

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

**Holocene**

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

**Late Stone Age**

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

**Late Iron Age (Early Farming Communities)**

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

**Middle Stone Age**

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

**Palaeontology**

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

| Abbreviations | Description |
|---|---|
| AIA | Archaeological Impact Assessment |
| ASAPA | Association of South African Professional Archaeologists |
| BA | Basic Environmental Assessment |
| CRM | Cultural Resource Management |
| ECO | Environmental Control Officer |
| EIA practitioner | Environmental Impact Assessment Practitioner |
| EIA | Environmental Impact Assessment |
| ESA | Early Stone Age |
| GPS | Global Positioning System |
| HIA | Heritage Impact Assessment |
| I&AP | Interested & Affected Party |
| LSA | Late Stone Age |
| LIA | Late Iron Age |
| MSA | Middle Stone Age |
| MIA | Middle Iron Age |
| NEMA | National Environmental Management Act |
| NHRA | National Heritage Resources Act |
| PHS | Provincial Heritage Site |
| PSSA | Palaeontological Society of South Africa |
| SADC | Southern African Development Community |
| SAHRA | South African Heritage Resources Agency |

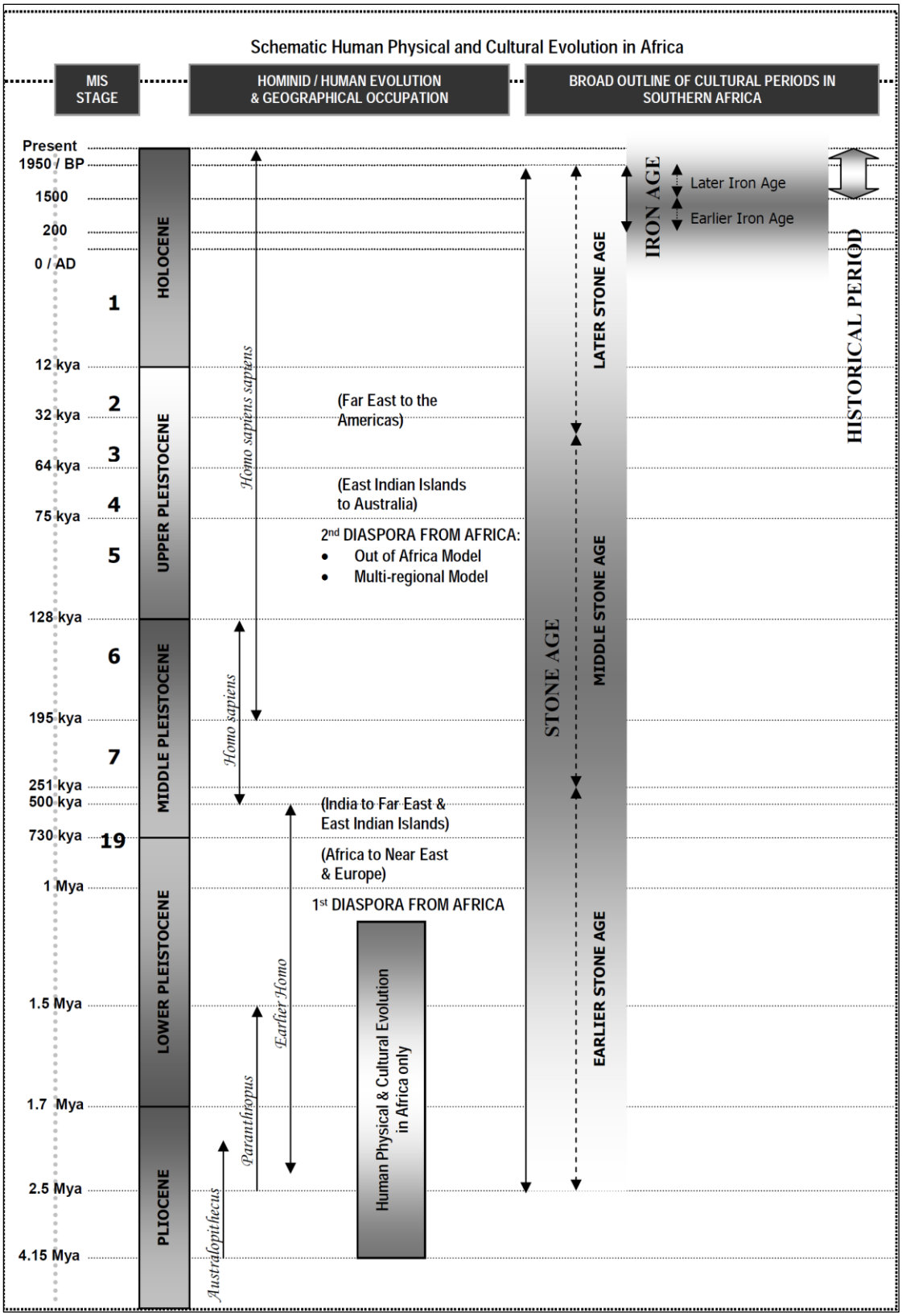


*Figure 1 – Human and Cultural Timeline in Africa*

# 1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Environmental Impact Management Services (EIMS) (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Environmental Assessment (BA) for the proposed Eskom Gamohaan - Seven Miles 22kV Powerline on the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province.

A further standalone Palaeontological Desktop Assessment (PDA) was completed for PGS by Dr Elize Butler of Banzai Environmental.

## 1.1 Scope of the Study

The study aims to identify heritage sites and finds that may occur in the proposed project area. The HIA aims to inform the BA to assist the developer in responsibly managing the discovered heritage resources, 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 Report was compiled by PGS.

The staff at PGS has a combined experience of nearly 70 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work with the relevant expertise and experience to undertake that work competently.

Michelle Sachse, the author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist, membership number - 526. She holds a master's degree (MA) in Archaeology from the University of Pretoria

Wouter Fourie, the Project Coordinator and Archaeologist, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP). He is also one of the Directors of PGS Heritage.

Henk Steyn is an Archaeologist and is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator. He is also the Managing Director of PGS Heritage.

### 1.3 Assumptions and Limitations

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 and existing vegetation cover.

It should be noted most of the study area was inaccessible for the pedestrian fieldwork survey. Fieldwork was difficult due to the very dense vegetation growth. Torn trees and bushes covered most of the area running alongside the R31 national road, which made surveying very difficult as well as minimised visibility of the area. Areas were surveyed as close as possible to the proposed powerline. The section running through the informal settlement was surveyed using a vehicle survey. The community is very active in the area, and the proposed powerline layout was located very close to the road, which was driven very slowly while looking for possible heritage features.

Therefore, should any heritage features and/or objects be located or observed outside the identified heritage-sensitive areas during the construction activities, a heritage specialist must be contacted immediately. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to assess as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. If any graves or burial places are located during the development, the procedures and requirements about graves and burials will apply as set out below.

### 1.4 Legislative Context

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

- Notice 648 of the Government Gazette 45421- general requirements for undertaking an initial site sensitivity verification where no specific assessment protocol has been identified
- National Environmental Management Act (NEMA), Act 107 of 1998 – Appendix 6
- National Heritage Resources Act (NHRA), Act 25 of 1999

#### *1.4.1 Notice 648 of the Government Gazette 45421*

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA, GN.648 requires sensitivity verification for a site selected on the national web based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this Government Notice (GN) are listed in **Table 1** and the applicable section in this report noted.

*Table 1: Reporting requirements for GN648*

| GN 648 | Relevant section in report | Where not applicable in this report |
|---|---|---|
| 2.2 (a) a desktop analysis, using satellite imagery; | section 4.3 | |
| 2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc. | Section 4.1 | - |
| 2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool; | section 4.1 | - |
| 2.3(b) contains motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; | section 4.1 | - |

### *1.4.2 NEMA – Appendix 6 requirements*

The HIA report has been compiled considering the NEMA Appendix 6 requirements for specialist reports as indicated in the table below. For ease of reference, the table below provides cross-references to the report sections where these requirements have been addressed.

### *1.4.3 The National Heritage Resources Act*

- National Heritage Resources Act (NHRA) Act 25 of 1999
  - Protection of Heritage Resources – Sections 34 to 36; and
  - Heritage Resources Management – Section 38

The NHRA is utilized as the basis for the identification, evaluation, and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA. This study falls under s38(8) and requires comment from the relevant heritage resources authority.

# 2 TECHNICAL DETAILS OF THE PROJECT

## 2.1 Locality

The study area is located approximately 10km north-west of the town of Kuruman. It is in the Ga-Segonyana Local Municipality and the John Taolo Gaetsewe District Municipality of the Northern Cape Province. The proposed Eskom Gamohaan – Seven Miles 22 kV Powerline is located outside and within

the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province. A portion is located alongside the R31 national road, and then proceeds to run through a portion of the informal settlement identified as Mamoratwe (**Figure 2**).

### *2.1.1 Site Description*

The application area is situated on the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman with a footprint area of approximately 600ha (**Figure 2**).

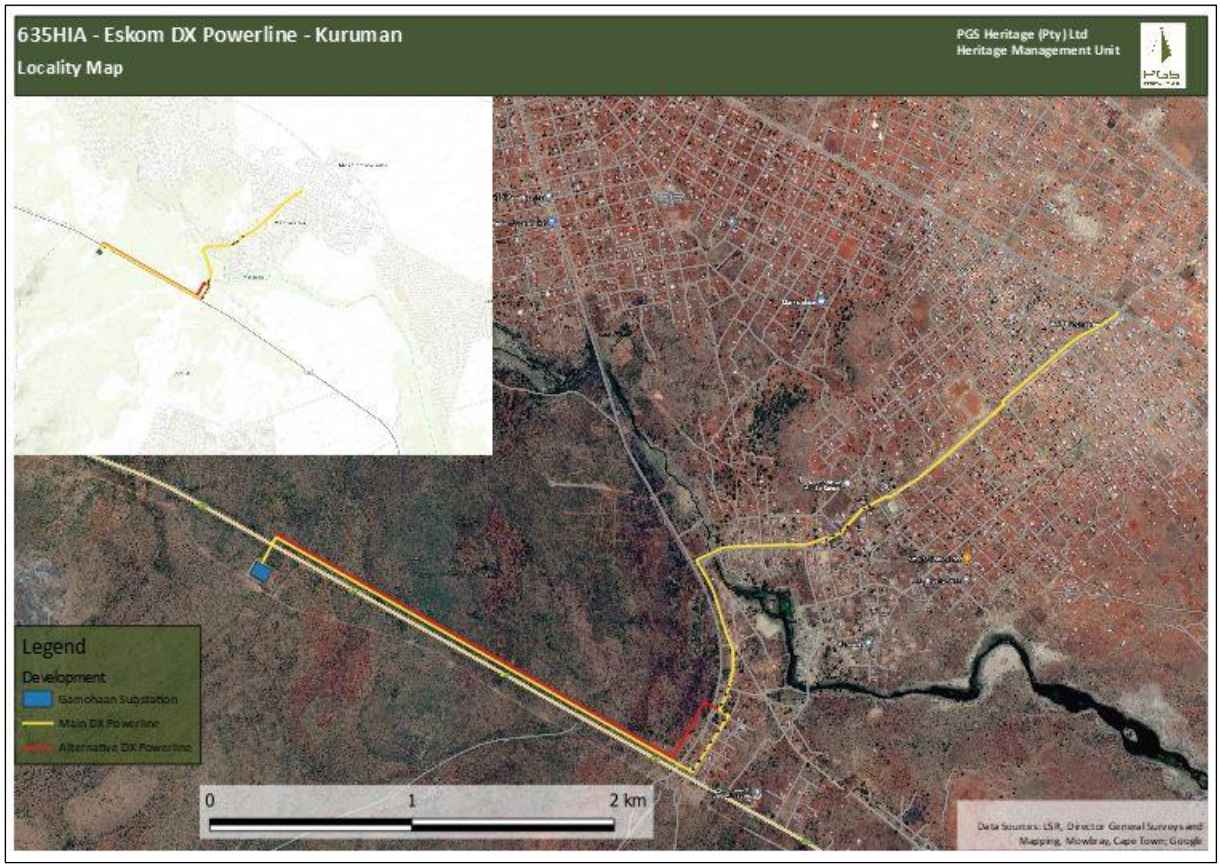


*Figure 2 - Regional Locality of study area.*

## 2.2 Technical Project Description

### *2.2.1 Project description*

The applicant wishes to construct a new 22kV powerline from the existing Gamohaan substation along the R31 provincial road toward Kuruman where the powerline will turn north at the Bathlaros intersection for 1,1km towards the community of Mamoratwe at which point the powerline will turn east towards Seven-Miles where it will cross the Kuruman watercourse. The proposed powerline will be located on

the remaining extent of the Farm Kuruman Reserve 690. The start, middle and end coordinates of the proposed powerline are:

Start Point (Preferred): 27°22'45.905"S, 23°21'40.352"E;
Start Point (Alternative): 27°22'45.476"S, 23°21'40.622"E;

Middle Point (Preferred): 27°23'23.399"S, 23°22'55.254"E;
Middle Point (Alternative) 27°23'21.102"S, 23°22'51.856"E; and

End Point: 27°22'10.47"S, 23°24'11.682"E.

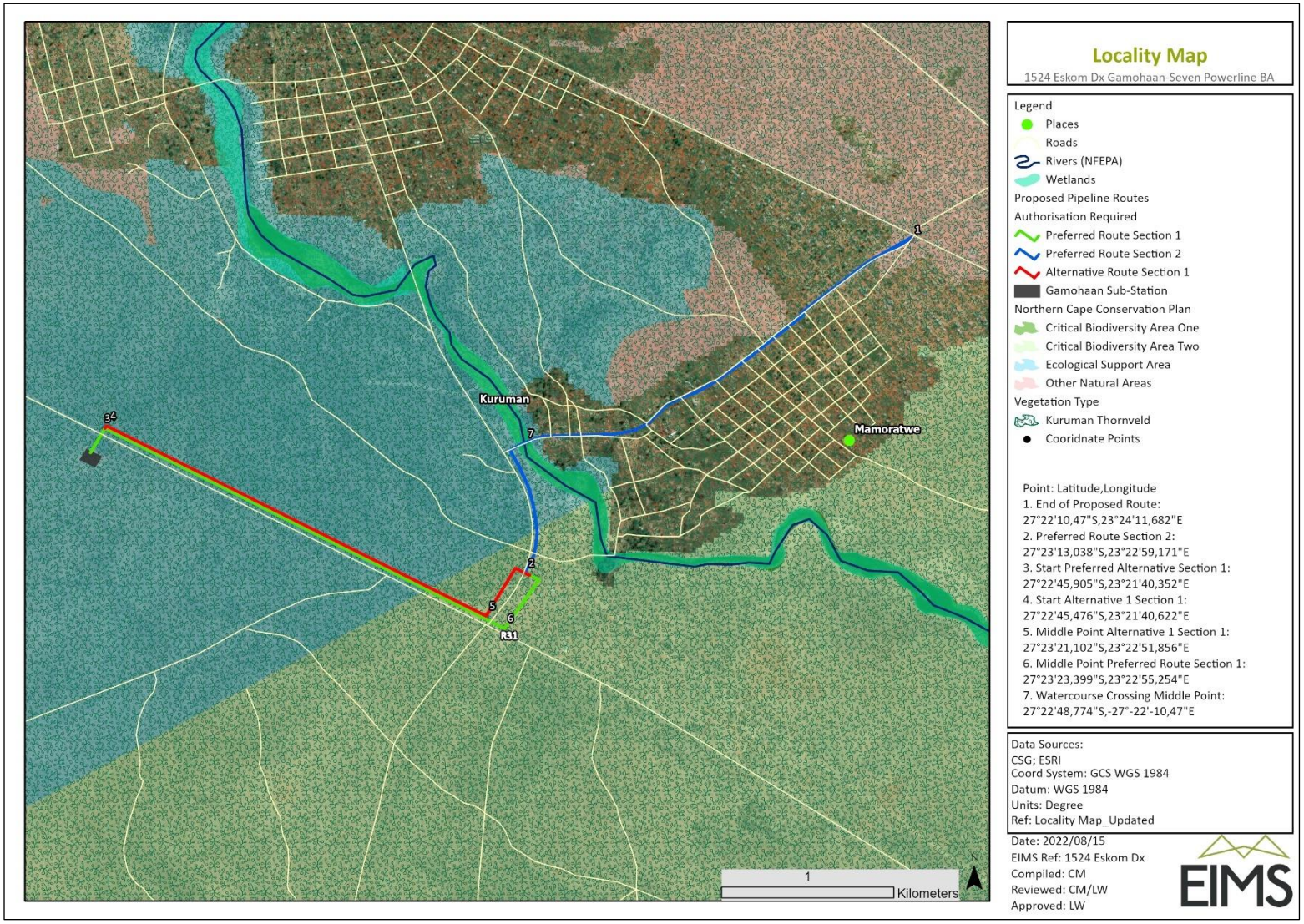


*Figure 3 - Locality Map of the proposed study area (Provided by EIMS).*

# 3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

## 3.1 Methodology for Assessing Heritage Site significance

This HIA report was compiled by PGS for the proposed Eskom Gamohaan – Seven Miles 22kV Powerline. The applicable maps, tables and figures are included, as stipulated in the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consists of three steps:

Step I – Literature Review and initial site analysis: The background information to the field survey relies greatly on Heritage Background Research, which was undertaken through archival research and evaluation of satellite imagery and topographical maps of the study area.

Step II – Physical Survey: A physical survey was conducted by a combination of vehicle and pedestrian access through the proposed project area by two qualified heritage specialists (on 4 August 2022), aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

Step III – The final step involved the recording and documentation of relevant heritage resources identified in the physical survey, the assessment of these resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of heritage sites is based on four 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
- Potential to answer present research questions.

Impacts on these sites by the development will be evaluated as follows:

### *3.1.1 Site Significance*

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for

archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2021) is implemented in this report

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (**Table 2** and **Table 3**).

*Table 2: Rating system for archaeological resources*

| Grading | Description of Resource | Examples of Possible Management Strategies | Heritage Significance |
|---|---|---|---|
| I | Heritage resources with qualities so exceptional that they are of special national significance.<br>Current examples: Langebaanweg (West Coast Fossil Park), Cradle of Humankind | May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation. | Highest Significance |
| II | Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status.<br>Current examples: Blombos, Paternoster Midden. | May be declared as a Provincial Heritage Site managed by Provincial Heritage Authority. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation. | Exceptionally High Significance |
| III | Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register. | | |
| IIIA | Such a resource must be an excellent example of its kind or must be sufficiently rare.<br>Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay | Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation. | High Significance |
| IIIB | Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. | Resource must be retained where possible where not possible it must be fully investigated and/or mitigated. | Medium Significance |
| IIIC | Such a resource is of contributing significance. | Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required. | Low Significance |
| NCW | A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate. | No further actions under the NHRA are required. This must be motivated by the applicant or the consultant and approved by the authority. | No research potential or other cultural significance |

*Table 3: Rating system for built environment resources*

| Grading | Description of Resource | Examples of Possible Management Strategies | Heritage Significance |
|---|---|---|---|
| I | Heritage resources with qualities so exceptional that they are of special national significance.<br>Current examples: Robben Island | May be declared as a National Heritage Site managed by SAHRA. | Highest Significance |
| II | Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status.<br>Current examples: St George's Cathedral, Community House | May be declared as a Provincial Heritage Site managed by Provincial Heritage Authority. | Exceptionally High Significance |
| II | Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register. | | |
| IIIA | Such a resource must be an excellent example of its kind or must be sufficiently rare.<br>These are heritage resources which are significant in the context of an area. | This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level. | High Significance |
| IIIB | Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.<br>These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community. | Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level. | Medium Significance |
| IIIC | Such a resource is of contributing significance to the environs<br>These are heritage resources which are significant in the context of a streetscape or direct neighbourhood. | This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs.<br>These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal | Low Significance |

| Grading | Description of Resource | Examples of Possible Management Strategies | Heritage Significance |
|---|---|---|---|
| | | alterations should not necessarily be regulated. | |
| NCW | A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate. | No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years. | No research potential or other cultural significance |

### 3.2 Methodology used in determining the significance of environmental impacts

The methodology used to determine the environmental impact significance was provided by Environmental Impact Management Services (EIMS) and is explained in **Appendix B**.

## 4 CURRENT STATUS QUO

### 4.1 Site Description

One portion of the proposed development area is located south-west of the informal settlement of Maroratwe. The portion starts at the Gamohaan Substation (**Figure 4**) and runs along the R31 national road (**Figure 5**) for 2.3km, until it turns north towards the Maroratwe informal settlement. Existing powerlines (Figure 6) were observed in the area along with bridges and stormwater drains **(**Figure 7) associated with the R31 main road. From here the road crosses a small perennial river (Figure 8) and runs all the way through the informal settlement for approximately 3.5km until the end where it connects with a road which separates the Maroratwe informal settlement (Figure 9 **-** Figure 10) with the Mokala-Mosesane informal settlement.

The portion of the study area running along the R31 main road was very densely vegetated by thorn trees and thorn bushes, and visibility and survey was limited (**Figure 11 - Figure 13**).

In terms of topography, the study area can be described as primarily flat.

In terms of vegetation, the portion of the study area is located within the Kuruman Thornveld vegetation type. This vegetation type is described as, "*Flat rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting of Acacia erioloba*" (www.sanbi.org).

In terms of geology and soils the Kuruman Thornveld type is "*Some Campbell Group dolomite and chert and mostly younger, superficial Kalahari Group sediments, with red wind-blown (0.3–1.2 m deep) sand. Locally, rocky pavements are formed in places. Most important land types of Ae, Ai, Ag and Ah, with Hutton soil form*" (www.sanbi.org).

Overall, the accessibility of the project footprint area was good, although difficult to navigate in some areas. Several photographs below provide general views of the study area and the landscape within which it is located.

Existing land uses associated with the project area and its immediate surroundings, include (**Figure 4 - Figure 13**):

- The Gamohaan Substation;
- Existing powerlines;
- The R31 national road;
- Bridges with stormwater drains;
- Large informal settlement;
- Perennial river.

*Figure 4 - View of the Gamohaan Substation.*

*Figure 5 - View of the R31 main road.*

*Figure 6 - View of existing powerlines in the area, along the R31 main road.*

*Figure 7 - View of a bridge and the storm water drain located beneath the R31 main road.*

*Figure 8 - View of the perennial river.*

*Figure 9 - View of the Maroratwe informal settlement.*

*Figure 10 - View of the Maroratwe informal settlement.*

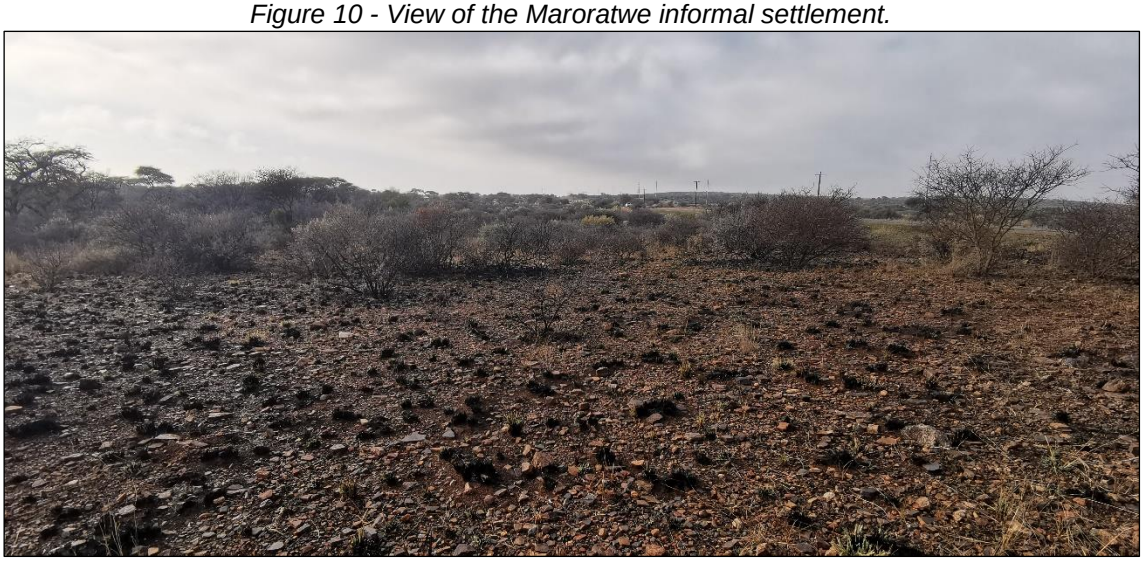

*Figure 11 - General view of the study area located along the R31 main road.*

*Figure 12 - General view of the study area located along the R31 main road.*

*Figure 13 - Example of some of the densely vegetated areas which were inaccessible (the scale is in 10cm increments).*

### 4.2 Overview of the study area and surrounding landscape

| DATE | DESCRIPTION |
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| 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 to approximately 1.5 million years ago.<br><br>Several important ESA sites are known from the general vicinity, including the very significant ESA Kathu Pan and Kathu Townlands localities and the Bestwood sites (Chazan et al, 2012). Research at Kathu Townlands was first undertaken by P.B. Beaumont (1990, 2004). The locality has a remarkable high lithic density containing millions of ESA artefacts (Mitchell, 2002; Walker et al, 2013 Walker et al. 2014). Moreover, the interface between the ESA and MSA is also represented at Kathu Pan by the transitional lithic industry of the Fauresmith (Porat et al 2010). |
| 250 000 – 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. This phase is furthermore associated with modern humans and complex cognition (Wadley 2013).<br><br>MSA sites and occurrences have been identified in the Kathu area, including the very significant Kathu Pan localities (Wilkins & Chazan, 2012). See also, for example, Beaumont (2009) and Kruger (2014). |
| 40 000 years ago – 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. |

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| | Settlement during the Later Stone Age:<br>Stone Age sites occur in the larger geographical area, including the well-known Wonderwerk Cave in the Kuruman Hills, Tsantsabane and Doornfontein, specularite workings and a cluster of important Stone Age sites near Kathu River. Several Stone Age sites are known for the area surrounding Kuruman, as well as along the Kuruman River (Humphreys & Thackeray, 1983; Beaumont & Morris, 1990; Parsons, 2003). Some sites contain rock engravings, such as Nchwaneng and Tsineng (Beaumont & Morris, 1990; Morris, 1988, 2002, 2003, 2005). As the wider landscape became increasingly inhabited, the San were forced to move further west and northwest to remain in the vicinity of wild game (Snyman, 1992). |
| AD 400 – AD 1100 | The expansion of early farmers, who, among other things, cultivated crops, raised livestock, made ceramic containers (pots), mined ore and smelted metals, brought the Early Iron Age (EIA) to South Africa. They settled in semi-permanent villages (De Jong 2010: 35).<br><br>The archaeological excavations undertaken by Beaumont and Bashier (1974) and Thackeray et al (1983) have revealed that the mining of specularite at Doornfontein and Tsantsabane/Blinkklipkop commenced during this time.<br><br>During this initial period the mining activities would have been undertaken by San hunter-gatherers and Kora pastoralists. Only after the 17th century were such mining activities likely also undertaken by the Iron Age Tswana groups. |
| AD 1400 – AD 1500 | The Highveld became active again due to a gradually warmer and wetter climate. From here communities spread to other parts of the interior. This later phase, termed the Late Iron Age (LIA), was accompanied by extensive stonewalled settlements, such as the Thlaping capital Dithakong, 40 km north of Kuruman (De Jong 2010: 35-36).<br><br>Sotho-Tswana and Nguni societies, the descendants of the LIA mixed farming communities, found the region already sparsely inhabited by the Late Stone Age (LSA) Khoisan groups, the so-called ‘first people’. Most of them were eventually assimilated by LIA communities and only a few managed to survive, such as the Korana and Griqua. This period of contact is known as the Ceramic Late Stone Age and is represented by the Blinkklipkop specularite mine near Postmasburg and finds at the Kathu Pan (De Jong 2010: 36). |
| Early 1600s | The Tswana groups known as the Thlaping and Thlaro moved southward into the area presently known as the Northern Cape. A century later they were settled in areas as far south as Majeng (Langeberg), Tsantsabane (Postmasburg) and Tlhaka le Tlou (Daniëlskuil) (Snyman, 1986). In terms of the Thlaro specifically, Breutz (1963) states that after they broke away from the Hurutshe during the period between 1580 and 1610, they travelled along the Molopo River and the Southern Kalahari before arriving at the confluence of the Kudumane, Mosaweng and Molopo. From here they established themselves at Tsowe (west of Morokweng), Gatlhose, Majeng (Langberg), Khoiise (Khuis on the Molopo River) and Tlhaka-la-Tlou (present day Danielskuil). It is evident that the study area and surrounding landscape would be central within the overall settlement area of the two Tswana groups at the time. |

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| AD 1770 | The Tlhaping conducted extensive trading activities with the Korana to the south and the Tswana to the north. Some of the Korana groups crossed the Orange River and came to the land of the Tlhaping. Although the initial contact was peaceful, conflict soon erupted.<br><br>During this time, the Kora moved into the area. Due to their superior firearms, they applied increasing pressure on the Thlaping and Thlaro groups. In the end, the Thlaping moved into a north-eastern direction to settle in the general vicinity of Dithakong, north-east of present-day Kuruman. The Thlaro settled in areas to the west and north-west of the Thlaping (Snyman, 1986). |
| AD 1775 | During the reign of Molehabangwe, who had succeeded his father Maswe, a confederation was formed which consisted of a stratified society comprised of the Tlhaping, Rolong, Tlharo, Kgalagadi and San groups. While the Tlhaping was seen as the ruler class, the Kgalagadi and San were viewed as vassals (Snyman, 1992). |
| 1786 – c. 1795 | The German deserter by the name of Jan Bloem established himself at Tsantsabane (Blinkklip) (Legassick, 2010). This place is located 5km north-east of the present-day town of Postmasburg. The settlement of Jan Bloem at the specularite mine may have been a way in which to control the valuable site and any trading activities associated with it.<br>The better-armed Korana managed to force the Tlhaping out of the area. This move was further augmented by the fact that the Nokaneng River had dried up. |
| AD 1795 | Legassick (2010) confirms the presence of the Thlaping, Thlaro and Kora in the general vicinity of the study area during this time. This said, the study area and surrounding landscape would have represented a western peripheral area of the overall landscape occupied by especially the Thlaping and Thlaro groups at the time. From a map depicted in Leggassick (2010:338), it is evident that at the time the Kora started moving in north-eastern direction from the areas along the central Orange River to the banks of the Harts River. |
| Early 1800s | After the threat of the Kora became less intensive, the Thlaping moved to the vicinity of present-day Kuruman. The Thlaro returned to the Langeberg, establishing them on a permanent basis there during the 1820s (Snyman, 1986).<br><br>The settlement of the Thlaping in the vicinity of Kuruman occurred during the reign of Molehabangwe. This period in the history of the Thlaping was seen as a period of wealth and power, and at the time they even had control of the Sibello quarry near Blinkklip (Legassick, 2010). |
| AD 1801 | The first known visit to this area by European explorers (i.e., excluding European renegades and fugitives such as Jan Bloem) took place in 1801. The journey was undertaken by P.J. Truter and Dr W. Somerville. They crossed over the Orange River in the vicinity of Prieska and passed Blinkklip on their way to present-day Kuruman (Bergh, 1999). |
| AD 1802 - 1813 | During this period William Anderson and Cornelius Kramer, both from the London Missionary Society, established a mission station at a place called Leeuwenkuil. The focus of their work was a group known as the Bastards |

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| | (Erasmus, 2004). This group could be described as a cultural conglomeration descending not only from relationships between different cultures and races (i.e., European and Khoi), but also comprised remnants of Khoi and San groups as well as freed slaves. The group later became known as the Griqua.<br><br>Due to the problems caused by the presence of lions at Leeuwenkuil, the mission station was moved in 1805 to Klaarwater. On 7 August 1813 the name of the settlement which had sprung up here was renamed Griquatown. This came about because of several proposals made by Reverend John Campbell, the Director of the London Missionary Society who was visiting the mission stations from this area at the time. He suggested that "...the Bastards change their name to 'Griqua' and that Klaarwater became Griquatown. This was because 'on consulting among themselves they found a majority were descended from a person of the name Griqua'..." (Legassick, 2010).<br><br>Griquatown is located 188km south-west of the present study area. |
| AD 1805 | During this year German explorer Martin Hinrich Carl Lichtenstein travelled through the general vicinity of the study area. After crossing the Orange River in the vicinity of present-day Prieska, Lichtenstein's party visited present-day Daniëlskuil, and by June 1805 they were at Blinkklip (Postmasburg), a well-known source for obtaining specular haematite. Archaeological investigations at Blinkklipkop (also known as Nauga) established a date of AD 800 for the utilisation of this rich source (Thackeray, et al 1983). From here they travelled further north and reached the Kuruman River where they met Tswana-speaking people. They followed the river downstream for three days, after which they followed a tributary to reach Lattakoe. From here they turned south and reached the Orange River on 11 July 1805.<br><br>While on his way to the Kuruman River (and to the south thereof), Lichtenstein visited a small settlement consisting of "…about thirty flat spherical huts." Although the people staying here were herdsmen who looked after the cattle of richer people living on the Kuruman River, they indicated that San (Bushmen) were also present in the area (Lichtenstein, 1930).<br><br>Although Lichtenstein was certainly not the first European explorer to travel through this area (the Truter & Somerville expedition had for example passed through this area in 1801), or for that matter the last (Burchell travelled through the area in 1811 followed by John Campbell in 1813) (Bergh, 1999), Lichtenstein did leave behind a written record of this journey providing a valuable glimpse into the early history of the general surroundings of the study area. What is also significant about the visit of Lichtenstein is that his journey took him from present-day Postmasburg to a place known as Tsenin which is located north-west of Kuruman. As a result, he would have passed near the present study area. |
| AD 1813 | During 1813 John Campbell of the London Missionary Society also visited the general vicinity of the study area. He arrived at Klaarwater on 9 June 1813, where he rested for a few days before continuing in a northern direction toward present-day Kuruman, passing through Blinkklip on the way (Bergh, 1999). |

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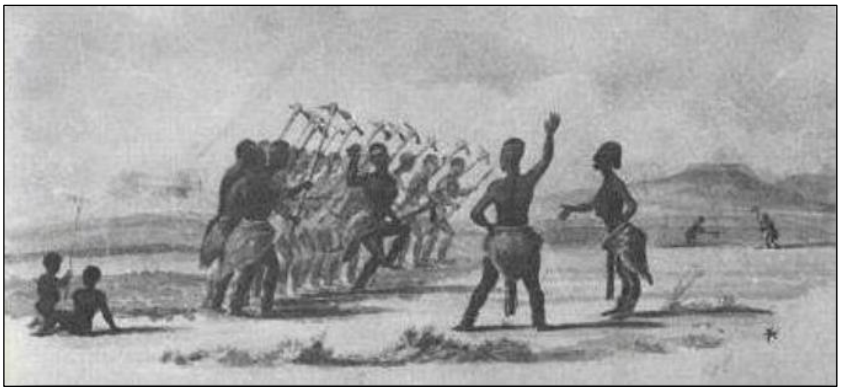
| |  <br>*Figure 14 - Reverend John Campbell (Campbell, 1815). He passed through the general vicinity of the study area during his travels from Klaarwater to Kuruman.* |
| AD 1819 | Reverend Robert Moffat first arrived in the Kuruman area. He found the Tlhaping settlement at Maropin in the Kuruman Valley under their ruler Mothibi.<br><br>They subsequently moved upstream to the vicinity of present-day Kuruman. During the same time Moffat found the BaTlharo settlement established at Tsening. |
| AD 1820 | Campbell noted on his visit to Nokaneng and Kuruman that the rivers had dried up, and deep wells in the riverbed supplied salt water (1922: Vol. II:125).<br><br>The Tlhaping first moved to Kathu and then to Ga-Mopedi on the Kuruman River to eventually established themselves at Dithakong on the Moshaweng River (Snyman, 1992).<br><br>  <br>*Figure 15 - "Tlhaping women cultivating gardens and singing" One of the sketches appearing in Dr. Andrew Smith's journal (Lye, 1975:171).* |

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| 20 December 1820 | On this day Andries Waterboer was elected as leader of Griquatown in the place of Berend Berends (Legassick, 2010). This period saw fission within the Griqua community, and it is not surprising that two long-term leaders moved away from Griquatown to establish autonomous settlements away from their former town. Berend Berends for example moved to Danielskuil (122km south of the study area), whereas Adam Kok II established himself in the vicinity of Campbell (Legassick, 2010). |
| 1821 – August 1828 | During this period a group of Griqua became dissatisfied with Waterboer and moved away from Griquatown to settle along the Modder River. They were known as the Bergenaars and were supported by Kora and San elements (Cope, 1977).<br><br>A section of the Bergenaars known as the Klein Bergenaars (Little Bergenaars), settled along the Langberg. This mountain range is located roughly 91km south-west of the present study area.<br><br>The Bergenaars constantly attacked the Thlaro, Thlaphing as well as the Griqua. On three separate occasions (Late 1824, July 1827 and December 1827) they attacked Griquatown itself. They also attacked the London Missionary Society station at Kuruman on several occasions with the last attack taking place in August 1828 (Cope, 1977). |
| AD 1824 | Robert Moffat of the London Missionary Society established the mission station at Kuruman (Erasmus, 2004). |
| Early 1830s | During this time Andries Waterboer stationed several Griqua families at a fountain north of Tsantsabane (Blinkklip) as well as at Danielskuil (Legassick, 2010). |
| AD 1835 | Near Tsineng, Smith found several springs which the local people called Malichana. He observed a small group of Tswanas (Bituanas) as well as a Griqua family staying near the springs and indicated that the Tswana group conducted agricultural activities in gardens laid out near the springs. From Tsineng, Smith's party travelled all along the bank of the Kuruman River, presumably to the confluence of the Ga-Mogara River. On this stretch of the journey Smith observed, "…a number of almost naked natives in the distance carrying ostrich shells and something resembling leather sacks upon their shoulders…" (Lye, 1975:181). These people were on their way to a water hole, which had been excavated some seven meters deep. Anyone wishing to obtain water had to climb down the hole making use of footholds along the sides. |
| 22 April 1842 | On this day a treaty was signed between Griqua leader Andries Waterboer and Thlaping leader Mahura at Mahura's settlement near Taungs. The agreement included a definition of the boundary between the two groups. The section of the agreed upon boundary closest to the study area ran from "...the northerly point of the Langeberg and extending a little south of Nokaneng, and further half-way between Maremane and Klipfontein..." (Legassick, 2010:291). While the exact location of Nokaneng is not currently known, the farms Klipfontein 437 and Maremane 678 are situated 98km and 71km to the south-west. This suggests that the present study area was located north of the boundary line between the Griqua and the Thlaping as defined in the treaty. As such, the study area was defined within this treaty as forming part of the land of the Thlaping. However, it must be noted that this boundary line was not cast in stone. This boundary was very similar to |

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| | an earlier one that was thought to have been agreed to during the 1820s as a boundary between the Griqua and the Thlaping (Legassick, 2010). |
| 1850 | During this time a Thlaro leader by the name of Molete and his baThlaro baga Keakopa moved away from the Korannaberg and established themselves at Gathlose, some 10.9km south-east of the study area. Breutz (1963) states that the land around Gathlose and Maremane used to belong to the Kora (Koranna) people and that they gave permission to Molete to settle here. After his death between 1885 and 1890, Molete was succeeded by Holele who ruled until his death during the Langberg Rebellion of 1897. Holele was succeeded by Kebiditswe John Holele who filled the post until 1912 when he was succeeded by his younger brother Kgosieng. Kgosieng ruled until he was pensioned on 28 February 1937, and was succeeded by Kebiditswe's son, Kgosietsiele Smous. Kgosietsiele died on 30 June 1956 and was succeeded by his son Frank Motsewakgosi Holele (Breutz, 1963).<br><br>Likely between 1850 and 1860 the area known as Maremane (located directly north of Gathlose) was an outpost grazing area of the BaThlaro chief Makgolokwe and his son Toto. The first designated leader of this area was Isaak Thupane Thupane, followed by Toto's son Robanyane who fled to present-day Namibia after the Langberg Rebellion of 1897. He was succeeded by his father's brother Jan Molebane Toto. However, the government only recognised him as chief in 1912 up to which point John Holele of the Gathlose Reserve was appointed by the government to act for the Maremane area as well. Molebane was dismissed in 1925 and was succeeded in 1926 by his brother David Makgolokwe. David Makgolokwe remained at his post until his death in 1942 when he was succeeded by Puso Togelo who remained as leader until his death in 1954. He in turn was succeeded by Felix Kgosithebe Toto (Breutz, 1963). |
| 1850 – 1855 | During this period a Thlaro chief by the name of Isaak Thupane Thupane established himself at Logageng (Gatkoppies) near Postmasburg. He subsequently moved with his followers to Groenwater 453. During the time that Thupane was living at Logageng, Kgangeng discovered the fountain at Metsematale. Subsequently, the land was ceded by Waterboer to the Thlaro and Kgangeng and his followers settled at Groenwater as well. The farm Groenwater 453 is located 114km south of the present study area. |
| 13 December 1852 | After the death of Andries Waterboer, his son Nicolaas Waterboer became the leader of Griquatown. He ruled Griquatown until the annexation of the area by the British in 1871 (see below) (Legassick, 2010). It was during the rule of Nicolaas Waterboer that diamonds were discovered in the area which led to a period of claims and counterclaims between the Griqua, the Orange Free State as well as the Zuid-Afrikaansche Republiek and which eventually led to the annexation of the area. |

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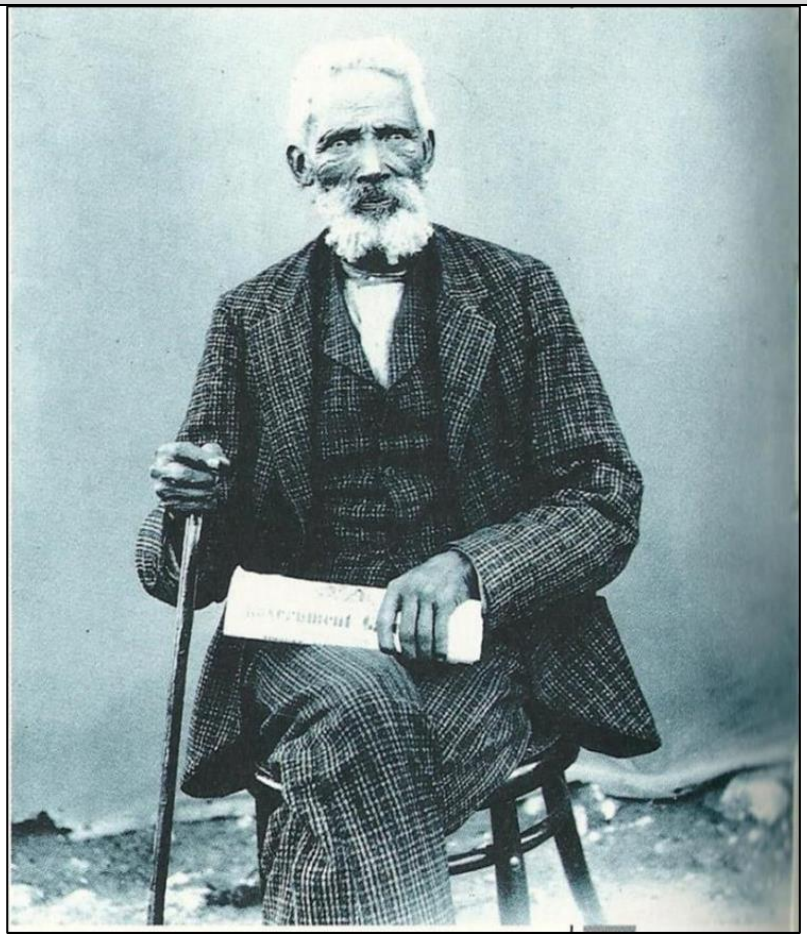
| |  <br>*Figure 16 - Nicolaas Waterboer, who succeeded as leader of Griquatown in 1852 after the death of his father Andries Waterboer (Reader's Digest, 1994:168).* |
| Before 1856 | During the period before 1856 the Thlaro leader Masibi occupied the area known as Skeyfontein, which is located 133km south-west of the study area. |
| 1867 | Diamonds were discovered for the first time in South Africa near Hopetown. Alluvial diamonds were also discovered along both banks of the Orange River (Van Staden, 1983). |
| 27 October 1871 | The area located in general terms between the Orange and Vaal Rivers and south of Kuruman was proclaimed as British Territory and named Griqualand West (www.wikipedia.org). |
| 1878 | A rebellion broke out amongst some of the Tswana communities living in Griqualand West. This rebellion, which was a response to British expansion and colonialism, spread to the Langberg. A British force left Griqualand West in October 1878 and defeated the "rebels" at the Langberg (Snyman, 1986). |
| 23 March 1885 | Britain declared a Protectorate over Bechuanaland and the Kalahari. |
| 30 September 1885 | The Protectorate was divided into two parts. The area north of the Molopo River remained the Bechuanaland Protectorate and up to 1895 was administered from Vryburg. The capital was later moved to Mafeking. The |

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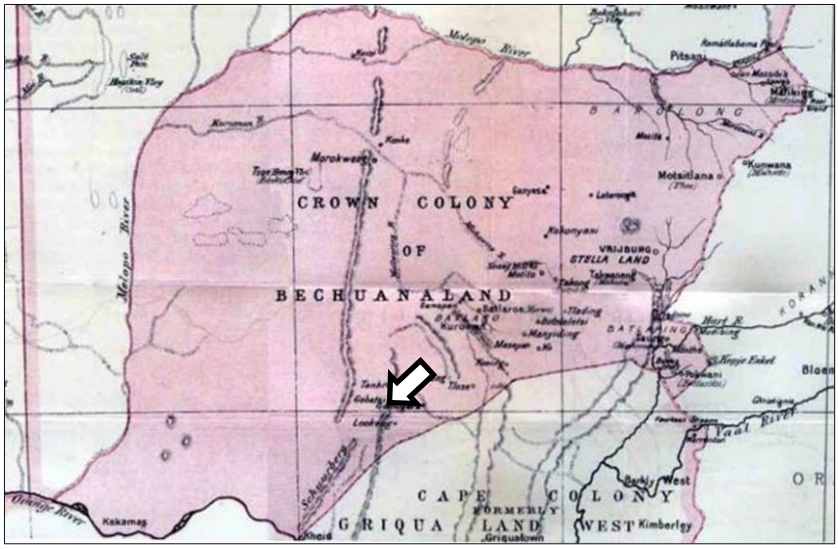
| | area south of the Molopo became the Crown Colony of British Bechuanaland with its capital at Vryburg (Tlou & Campbell, 1997). This area included the town of Kuruman.<br>  <br><br>*Figure 17 - Section of a map titled "Sketch Map of British Bechuanaland" which is dated to May 1887 (www.wikipedia.com) (www.kaiserscross.com). The approximate position of the study area is shown.* |
| 1886 | As a result of the work of a commission appointed by the British rulers of the Crown Colony of British Bechuanaland, several so-called "native reserves" were established in this area. These included Deben, Gatlhose, Maremane, Langberg as well as Kathu (Snyman, 1986).<br><br>The establishment of so many "native reserves" near the study area clearly support the suggestion made earlier that the study area was centrally located in the historic and prehistoric territories of Tswana groups such as the Thlaro and Thlaping.<br><br>In the same year a trader by the name of John Ryan established a shop on the farm Bishop's Wood. This farm is located 78km south-west of the study area. |
| 4 May 1895 | "Native reserves", including the Lower Kuruman Native Reserve, were established by virtue of Bechuanaland Proclamation No. 220 of 1895. At the time of its establishment, the Lower Kuruman Native Reserve had a population of 5425 and was 225 square miles in extent. With time, the population density and livestock numbers increased drastically. During negotiations and discussions on such an expansion of the reserve, it was indicated that several black people were residing outside the boundaries of the reserve. As a result of these pressures the size of the reserve was subsequently extended. |

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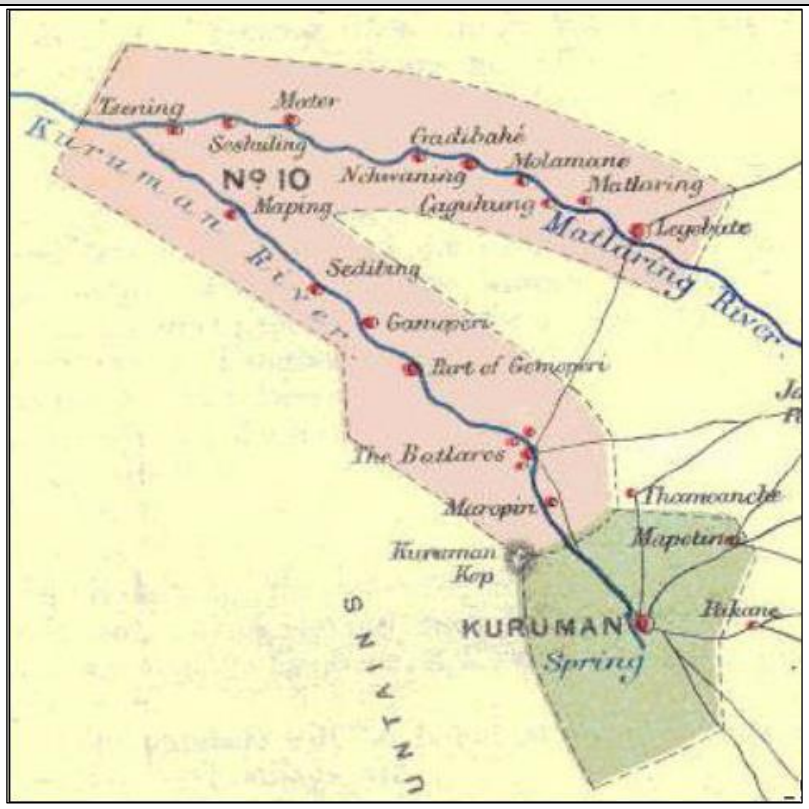
| |  <br>*Figure 18 - Map showing the original demarcation of the Lower Kuruman Native Reserve.* |
| 16 November 1895 | The Crown Colony of British Bechuanaland was annexed by the Cape Colony (www.wikipedia.org). |
| September 1896 | During this time a viral disease affecting cattle (and some other species of even-toed ungulates) known as Rinderpest swept through Southern Africa (www.wikipedia.org). Although attempts were made to halt the spread of the disease from the north by erecting a fence between the boundaries of Griqualand West and Bechuanaland, this proved unsuccessful.<br><br>Incidentally, only three gates were placed in the above-mentioned fence, namely at Gatlhose, Nelsonsfontein and Blikfontein (Snyman, 1988). Of these three places, Gatlhose is the closest and is situated 74km south-west of the study area. |

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| |  <br>*Figure 19 - An everyday scene during the Rinderpest Epidemic (Snyman, 1983:20).* |
| AD 1897 | The Rinderpest epidemic did not only have a massive socio-economic impact on the landscape, but it also resulted in the Langberg Rebellion of 1897. During this time conflict broke out between the authorities and a Thlaping leader from Taung, namely Galeshiwe. The conflict arose after infected cattle belonging to him were destroyed by representatives of the government as a way of kerbing the spread of the disease. After killing an officer, Galishewe fled to the Thlaro leader Toto of the Langberg. Subsequently, a full-scale rebellion broke out (Breutz, 1963). The British authorities eventually mustered a military force which included sections of the Cape Mounted Rifles and Bechuanaland Field Force and which on 14 March 1897 stood at roughly 1,000 men. Opposing this formidable and well-equipped force supported by artillery the Tswana rebels possessed an army of roughly 1,500 men who from the start of the rebellion already experienced serious shortages in the way of provisions and ammunitions (Snyman, 1986).<br><br>Although most of the activities associated with the rebellion took place some distance from the study area, the impact of the rebellion was felt throughout the surrounding landscape. Some noteworthy skirmishes took place on 9 May 1897 at Puduhush (some 91.8km south of the study area) and on 30 July 1897 at Gamaluse and Gamasep (89.9km south-west of the study area). Furthermore, the main British force under the overall command of Lieutenant-Colonel E.H. Dalgety used the farm Bishop's Wood as a base of operations (Snyman, 1986). The farm Bishop's Wood is located 61.9km south of the study area.<br><br>The rebellion was suppressed and came to an end with the surrender of rebel leader Toto, his son Robanyane and their Thlaro followers on 2 August 1897 (Snyman, 1986). |

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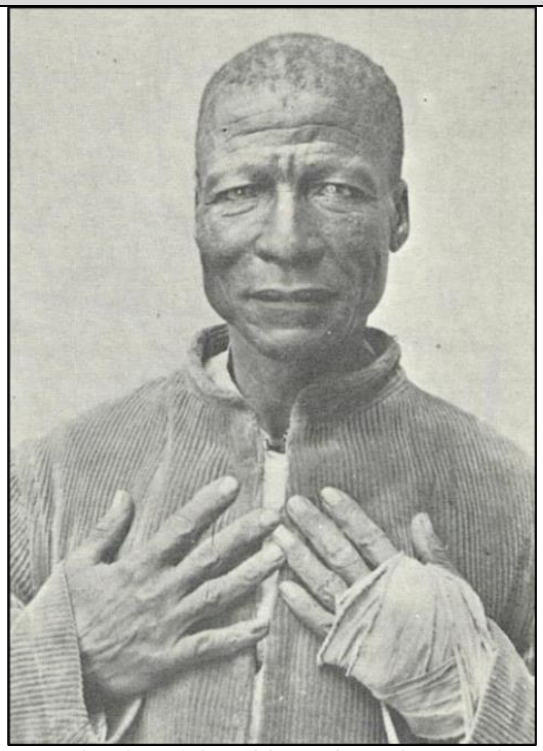
| |  <br>*Figure 20 - Toto, leader of the Thlaro along the Langberg (Snyman, 1986:17).* |
| 1899 - 1902 | The South African War was fought between Great Britain and the Boer republics of the Zuid-Afrikaansche Republiek and Orange Free State. However, no skirmishes or battles from this war are known from the direct vicinity of the study area. The closest known battles and skirmishes to the present study area include Kareepan on 10 August 1901 and Doornfontein in February 1902 (Snyman, 1983). These farms are located roughly 112 to 121km south-west and 112 and 119km south of the study area, respectively. |
| 1907 | Several trekboers from the southern Free State arrived in the general vicinity of the present study area (Erasmus, 2004). |
| 1913 | In this year the so-called “Native Locations” of Skeyfontein and Groenwater were established by Proclamation 131 of 1913 (Breutz, 1963). |
| 1914 | The town of Dibeng was laid out in 1914 on the banks of the Ga-Mogara river. This followed on the establishment of the Dibeng Dutch Reformed Church parish in 1909 (Erasmus, 2004). |
| 3 November 1921 | The Superintendent of Natives indicated that before the farms to the west of the Lower Kuruman Native Reserve were surveyed and ceded to different white farmers, the black people of the area “…had the run of the whole country to the Moshewing River on the one side and the Gamagara River on the other…” and grazed their livestock and conducted agricultural activities over these vast tracts of land. In an associated petition document drawn up by the Thlaro people of Bathlaros, they indicated that their agricultural lands and cattle posts used to stretch in a westward direction all the way to the “Dibeng” River, which appears to be the present-day Ga-Mogara River (NTS, 7752, 22/335). |

### *4.2.1 Historic Overview of Study Area and Surrounding Landscape*

The Northern Cape has a wealth of pre-colonial archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites in the region include the world renowned long-sequence Wonderwerk Cave, the major Tswana town, and the pre-colonial stone-walled settlements of Dithakong. More locally, the two shelters on the northern and southern faces of Gamohaan (in the Kuruman Hills North West of the town) contain Later Stone Age remains and rock paintings.

Historically, Kuruman boasts one of the longest trajectories of African-colonial interaction centered on the nearly two-century old Moffat Mission, characterised by what Comaroff and Comaroff referred to as a “long conversation”. Locally, the ‘Eye’ and the watercourse springing from it has been the focus of utilization and settlement and it was in its immediate vicinity that the town of Kuruman developed in the late nineteenth century.

Factors such as population expansion, increasing pressure on natural resources, the emergence of power blocs, attempts to control trade and penetration by Griquas, Korana and white communities from the south-west resulted in a period of instability in Southern Africa that began in the late 18th century and effectively ended with the settlement of white farmers in the interior. This period, known as the difaqane or Mfecane. Here, the period of instability, beginning in the mid-1820s, was triggered by the incursion of displaced refugees associated with the Tlokwa, Fokeng, Hlakwana and Phuting tribal groups.

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

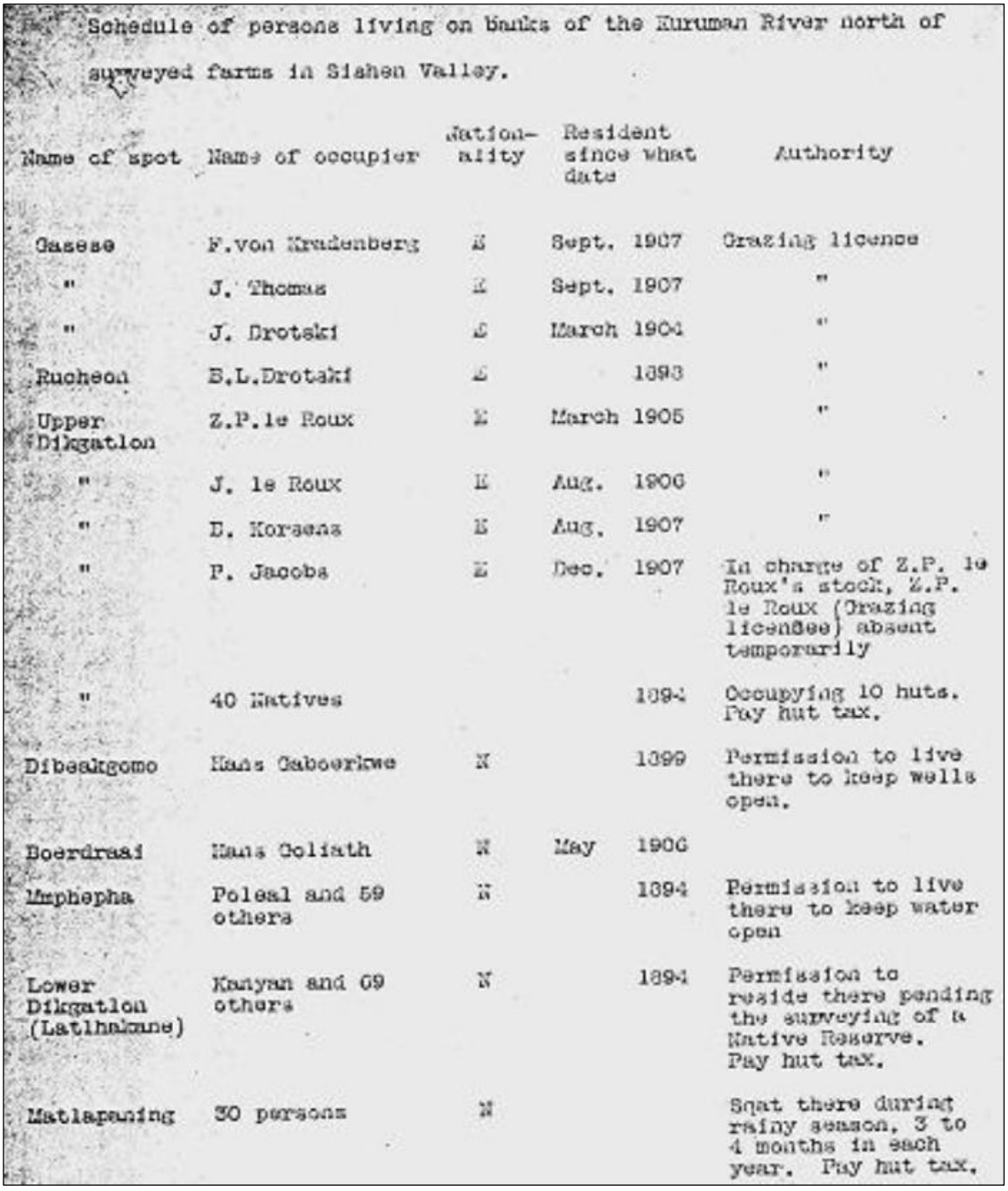
The Great Trek of the Boers from the Cape in 1836 brought large numbers of Voortrekkers up to the borders of the regions known as Bechuanaland and Griqualand West, thereby coming into conflict with many Tswana groups and the missionaries of the London Mission Society. The conflict between Boer and Tswana communities escalated in the 1860s and 1870s when the Korana and Griqua communities became involved and later also the British government.

Although some white farmers did travel down the Kuruman River to settle in the vicinity of Boeredraai during the latter part of the 19th century, by 1897 most of them had moved away again.

The first white people to settle on a permanent basis in the area were the Le Roux family who established themselves at Dikgathlon. More families followed and subsequently also settled in the area. During a period of great drought between 1907 and 1908 many farmers of the then Cape Colony moved into these areas along the edge of the Kalahari Desert in search of better grazing for their cattle (Smit, 1966).

When the First World War (1914-1918) broke out the South African Union Government decided to attack German South West Africa. As a result, several boreholes were dug all along the banks of the Kuruman River. These boreholes were drilled at places such as Eensaam, Kameelrus, Murray, Springputs and Van Zylsrus (Smit, 1966; Van der Merwe, 1949). After the war, farmers established themselves at these localities as borehole watchmen, in exchange for free grazing rights on the surrounding land. Subsequently, more boreholes were sunk by the Department of Lands (Smit, 1966; Van der Merwe, 1949).

At the end of the First World War the Department of Lands started distributing the farms on application under very lenient conditions. Many of the people who were already established as borehole watchmen and tenants were given first choice (Smit, 1966). Since the formulation of the Land Settlement Act No. 12 of 1912, as amended by Act No. 23 of 1917, many farms were distributed during this time, so much so that by 1929 all the farms up to Vanzylsrust were already handed out (Smit, 1966).



Schedule of persons living on banks of the Kuruman River north of surveyed farms in Siahen Valley.

| Name of spot | Name of occupier | Nationality | Resident since what date | Authority |
|---|---|---|---|---|
| Gasese | F.von Kradenberg | E | Sept. 1907 | Grazing licence |
| " | J. Thomas | E | Sept. 1907 | " |
| " | J. Drotski | E | March 1904 | " |
| Rucheon | E.L.Drotski | E | 1893 | " |
| Upper Dikgatlon | Z.P.le Roux | E | March 1905 | " |
| " | J. le Roux | E | Aug. 1906 | " |
| " | D. Korsens | E | Aug. 1907 | " |
| " | P. Jacobs | E | Dec. 1907 | In charge of Z.P. le Roux's stock, Z.P. le Roux (Grazing licensee) absent temporarily |
| " | 40 Natives | | 1894 | Occupying 10 huts. Pay hut tax. |
| Dibeakgomo | Hans Gaboerkwe | N | 1899 | Permission to live there to keep wells open. |
| Boerdraai | Hans Goliath | N | May 1906 | |
| Mphepha | Poleal and 59 others | N | 1894 | Permission to live there to keep water open |
| Lower Dikgatlon (Latlhakane) | Kanyan and 69 others | N | 1894 | Permission to reside there pending the surveying of a Native Reserve. Pay hut tax. |
| Matlapaning | 30 persons | N | | Squat there during rainy season, 3 to 4 months in each year. Pay hut tax. |

*Figure 21 - Police document listing all the people who resided on the banks of the Kuruman River at the time of an inspection in 1908. The names of several the early white pioneers in the area are also listed here.*

### *4.2.2 Farm Surveys*

During the 1910s a full-scale survey of large portions of the region was undertaken by Dirk Roos and Hendrik Wessels. While Wessels was concerned with surveying the farms from Dingle and Sishen up

to Cobham and Shirley, Dirk Roos was responsible for the surveying of the farms from Mamatwan in the south to areas further north of the Kuruman River (Samangan, 1977).

Many stories are told about these two pioneering characters. As they were allowed to name the farms they surveyed, most of the farm's names appearing on maps of the area were created by them. The farm Wessels, for example, was named by Dirk Roos in honour of his colleague Hendrik Wessels. Mamatwan, another farm forming part of this study, was derived from the Tswana name for a bat. Kuruman's name is thought to be derived from the name of an 18th century San leader Kudumane (Kalahari Tourism Information Booklet p.32). Although a fair amount of information on the general history of Kuruman and the Moffat Mission Station is available.

### *4.2.3 Mining*

The study area and surrounding region is today well known for its manganese mines. The importance of manganese lies in the fact that it is used in the manufacture of carbon steel. Dr. A.W. Rogers published a record of the geology of present-day Botswana and Griqualand West as part of the annual report of the Geological Commission of the Cape Colony in 1906. The significance of his publication is that Rogers found that the well-known hill from the area known as Black Rock consisted largely of manganese, a mineral ore previously undiscovered in the Cape Colony. Dr. Boardman investigated the manganese deposits at Black Rock during or directly after 1940 and published his findings in a paper he wrote for the Geological Society of South Africa. A prospector by the name of A.T. Fincham obtained options on several farms surrounding Black Rock. S.A. Manganese rejected these options as they felt that the Black Rock area was too isolated at the time. However, Ammosal over his options on three farms and after a further assessment by geophysicist Oscar Weiss, decided to mine the Black Rock area during mid-1940.

During 1950 S.A. Manganese surveyed a large tract of land, including the farms Wessels, Mamatwan, Dikgathlong and Dibiaghomo. Promising results over large sections of land were found, and a drilling rig soon arrived. At Dibiaghomo ore containing a very high manganese percentage was reached. Other boreholes in the area yielded similar results and the freehold to several farms was obtained. When information about these discoveries leaked out and reached Ammosal, a tussle broke out between the two companies to obtain freeholds to as many farms in the mineral-rich area as possible.

Although mining operations started in earnest on Smartt, S.A. Manganese's attention was soon drawn to the farm Hotazel. A whole village was constructed on the farm, and the Hotazel mine was officially opened on 19 November 1959. Although, the mining rights of the farm Wessels had been acquired by S.A. Manganese in 1952, it was not until 1965 that the farm was again investigated. By January 1969 20 boreholes had been sunk on the farm Wessels, Dibiaghomo and Dikgathlong, which revealed three bands of manganese ore, of which the top and bottom bands were considered mineable. The official

opening of Wessels mine took place on 2 May 1973. By 1976 the mine was producing 750 000 tons of ore a year (Samangan, 1977).

### *4.2.4 Archival and historical maps*

The examination of historical data and cartographic resources represents a critical tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Relevant topographic maps and satellite imagery were studied to identify structures, possible burial grounds or archaeological sites present in the footprint area.

Historical topographic maps (1:50 000) for one year (1973) was available for utilisation in the background study. These maps were assessed to observe the development of the area, as well as the location of possible historical structures and burial grounds. The study area was overlain on the map sheets to identify structures or graves situated within or immediately adjacent to the study area that could possibly be older than 60 years and thus protected under Section 34 and 36 of the NHRA.

#### *4.2.4.1 Kuruman Imperial Map, 1900 – 1919*

(University of Cape Town Libraries, South Africa)
The map depicted in **Figure 22** below is titled “Kuruman”. It was compiled by John Wood for the Field Intelligence Department. The map dates from 1900. On it is indicated the Kuruman Reservaat area, where the proposed study area is located. Within the Kuruman Reservaat the name Mamorato in indicated in the approximate area where the proposed study area is located, this could possibly be the old name for Maroratwe.

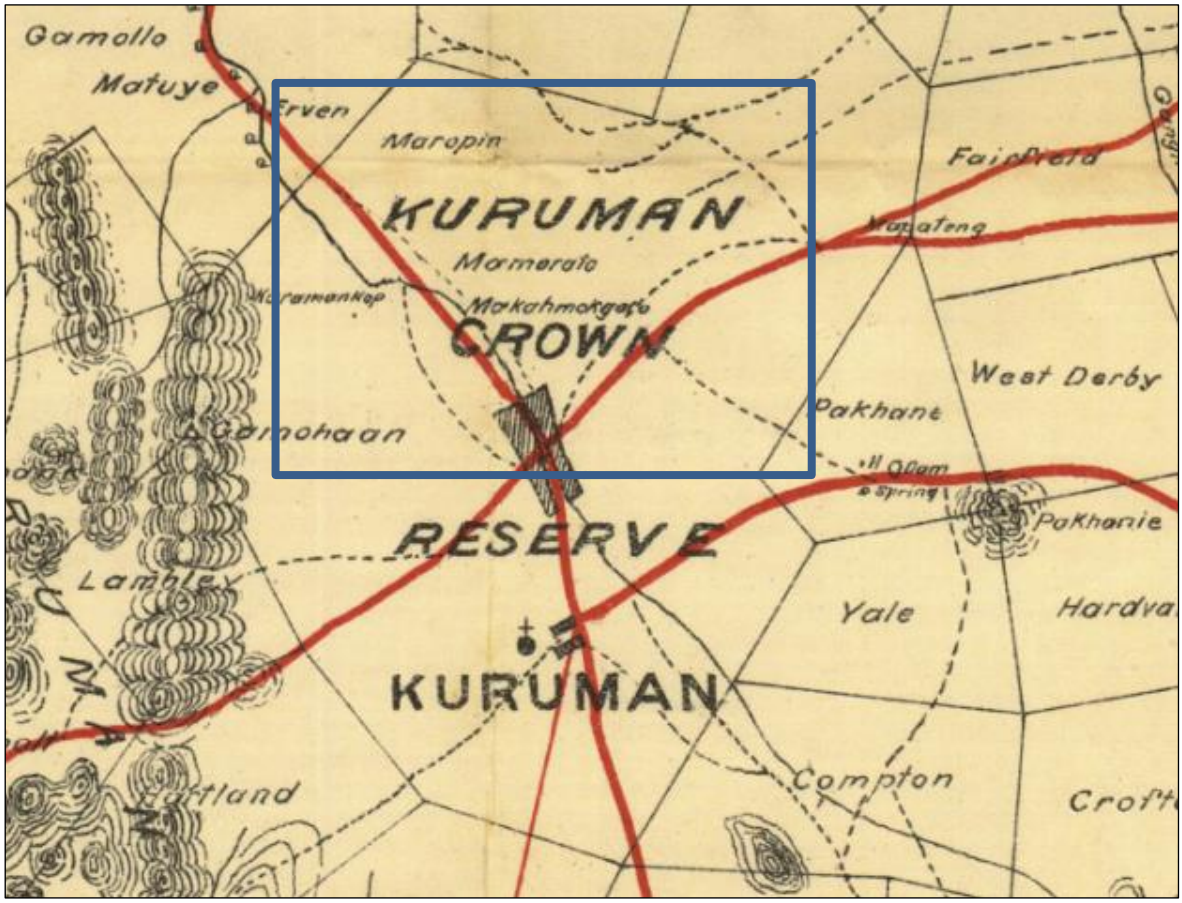



*Figure 22 - Section of the 1900 Kuruman map highlighting the name of Mamorato, located within the Kuruman Reservaat (blue polygon) (University of Cape Town Libraries, South Africa).*

*4.2.4.2 First edition of the 2723AD Kuruman Topographical Map dated to 1973*

The 2723AD Kuruman Topographical Map was utilised to create an image overlay of the proposed development area (Figure 23). This map sheet shows no heritage features within the proposed development area.

Overlays of the study area over this map sheet are provided in the image below. The following observations can be made from this overlay:

- The perennial river is visible.
- A housing area is visible.
- No heritage sites or features are depicted within the study area.
- However, the Moffat Mission Station is located 6km outside the area.

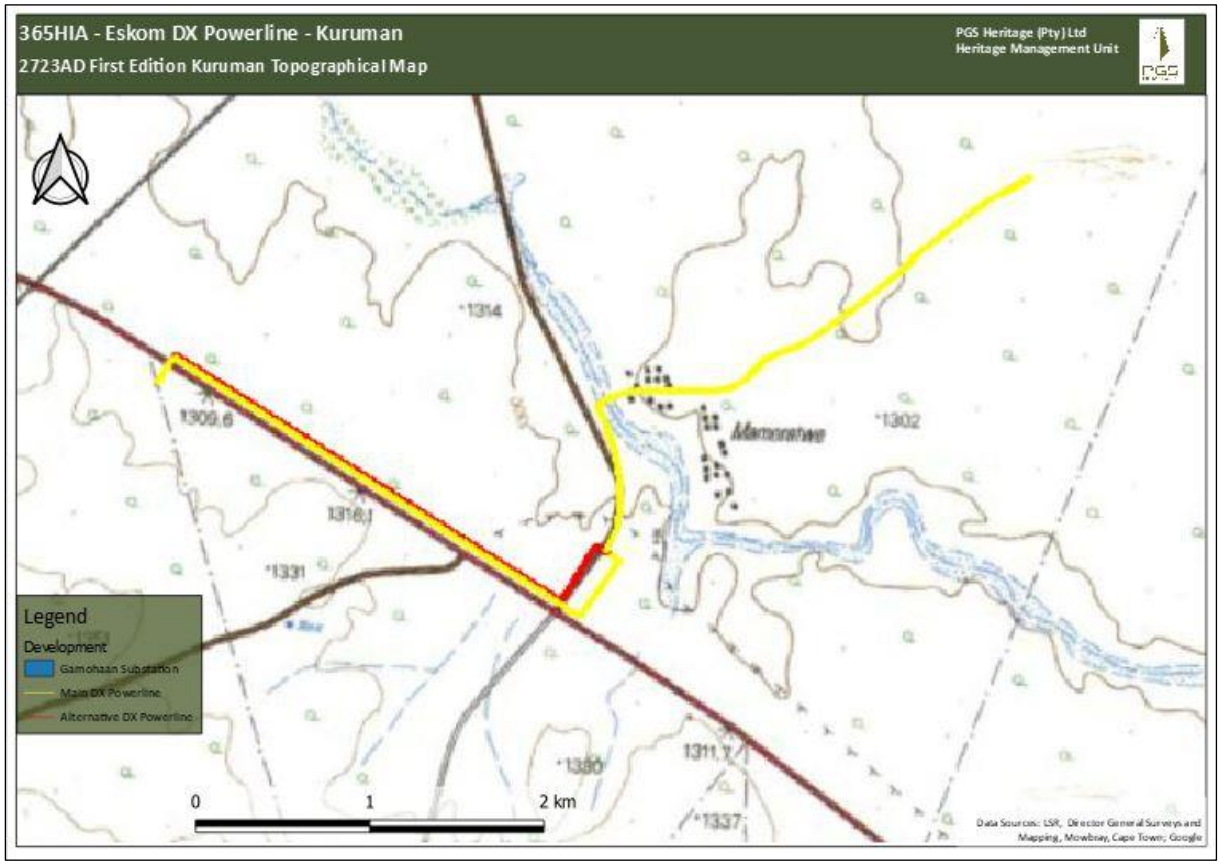



*Figure 23 - Section of the 2723AD Kuruman Topographical Map highlighting the study area.*

*4.2.4.3 Previous heritage impact assessment reports from the study area and surroundings*

A search of the South African Heritage Resources Information System (SAHRIS) database revealed that several previous archaeological and heritage impact assessments had been undertaken within the surroundings of the study area. In each case, the results of each study are shown in bold. These previous studies are listed below in ascending chronological order:

- Fourie, W. 2011. Archaeological Site Assessment: Ghaap Abattoir. Cadastral boundary: A portion of Erf 1, Kuruman, Ga-Segonyana Municipality, Northern Cape Province. **The fieldwork resulted in the identification of 2 archaeological and heritage sites. These identified sites comprise the following: two (2) sites dating to the late 19th to early 20th century with structural foundations and surface scatter of cultural remains including glass and metal.**

- Pelser, A. J. 2012. A Report on an Archaeological Impact Assessment (AIA) for a Proposed Housing Development on Erf 675, Kuruman, in the Northern Cape. **The fieldwork resulted in the identification of 2 archaeological and heritage sites. These identified sites comprise**

**the following: Two (2) different areas with low density stone tool scatter, dating to between the middle to later stone age.**

- Fourie, W. 2015. Heritage Impact Assessment for the proposed upgrade of the 66kV network in the Kuruman area, Northern Cape Province. **The fieldwork resulted in the identification of 15 archaeological and heritage sites. These identified sites comprise the following: two (2) cemeteries, nine (9) historic farmsteads, two (2) historic asbestos mines, one (1) sacred/religious site, one (1) provincial monument and one (1) memorial.**

- Van der Walt, J. 2016. Archaeological Impact Assessment for the prosed metals industrial cluster near Kuruman, Northern Cape Province. **The fieldwork resulted in the identification of no archaeological and heritage sites.**

- Nienaber, C and van Schoor, M. 2018. Kuruman Moffat Mission: Ground Penetrating Radar survey of selected localities, September 2017. Preliminary fieldwork at the Moffat Kuruman Mission in the Northern Cape Province of South Africa in 2017, as part of the larger Re-collecting the Missionary Road project of the University of Cambridge Museum of Archaeology and Anthropology. Between 16 and 24 September 2017 a larger team to survey the site and conduct geophysical investigations (Magnetometry and Ground Penetrating Radar (GPR) in preparation for the first season of excavation, planned for July 2018, visited the site.

- Engelbrecht, J and Fivaz, H. 2020. Phase 1 HIA Report: Development Erf 4440 Kuruman Northern Cape. Proposed Subdivision, Rezoning, and Development of Erf 4440, Kuruman, Ga-Segonyana Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape. **The fieldwork resulted in the identification of 2 archaeological and heritage sites. These identified sites comprise the following: one (1) small MSA scatter and one (1) unfenced cemetery, although both sites are located far from the proposed development area and won't be affected by development.**

- Birkholtz, P. 2021. Proposed Exploration Camp on the Farm Demaneng 546, Near Kathu in the Gamagara Local Municipality, Northern Cape Province. **The fieldwork resulted in the identification of 2 archaeological and heritage sites. These identified sites comprise the following: two (2) sites with a substantial scatter of MSA lithic artefacts.**

### *4.2.5 Heritage screening*

A heritage screening report was compiled using the Department of Forestry, Fisheries and Environmental Affairs (DFFE) National Web-based Environmental Screening Tool as required by Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended.

According to the heritage screening report, the project area has a Low Heritage Sensitivity (**Figure 24**), and a Very High, High, Medium and Low Palaeontology Sensitivity (**Figure 25**).

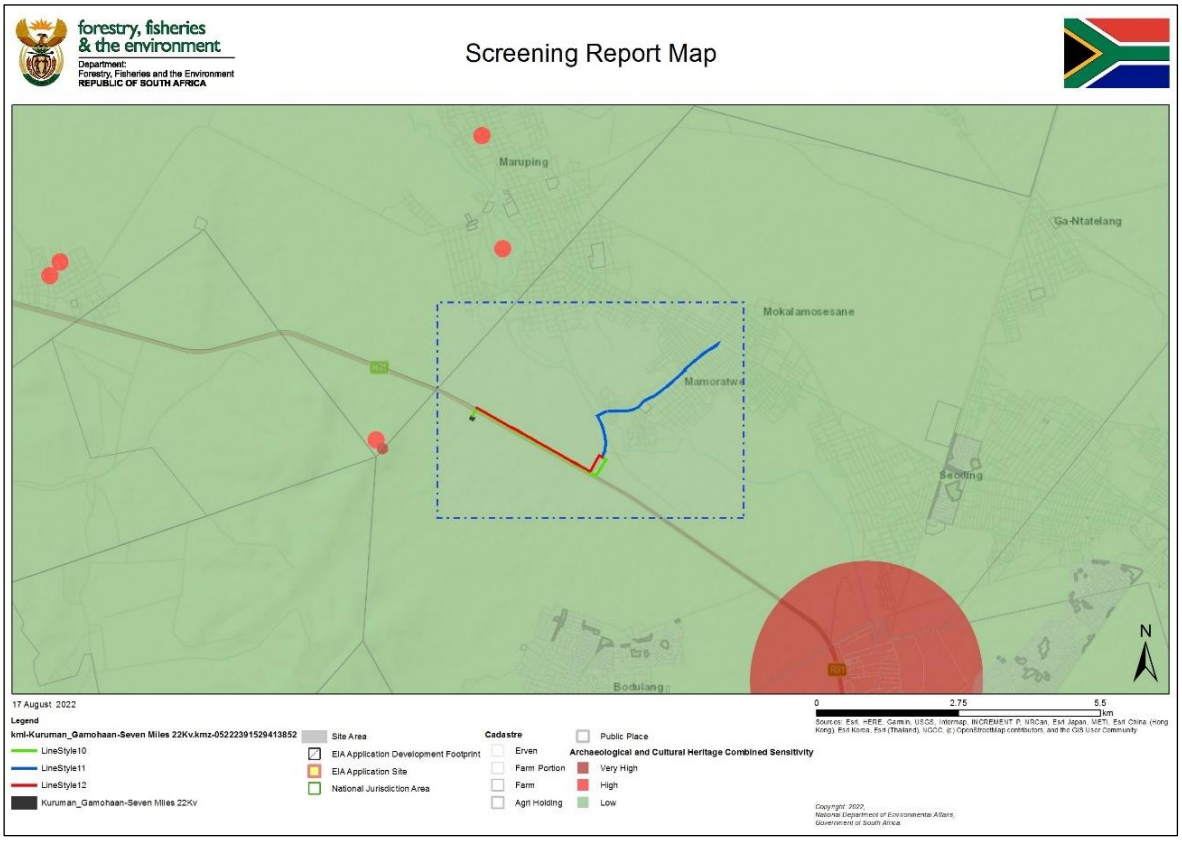



*Figure 24 - Screening tool map indicating a low sensitivity rating for archaeology and heritage in the proposed study area (Source: DFFE).*

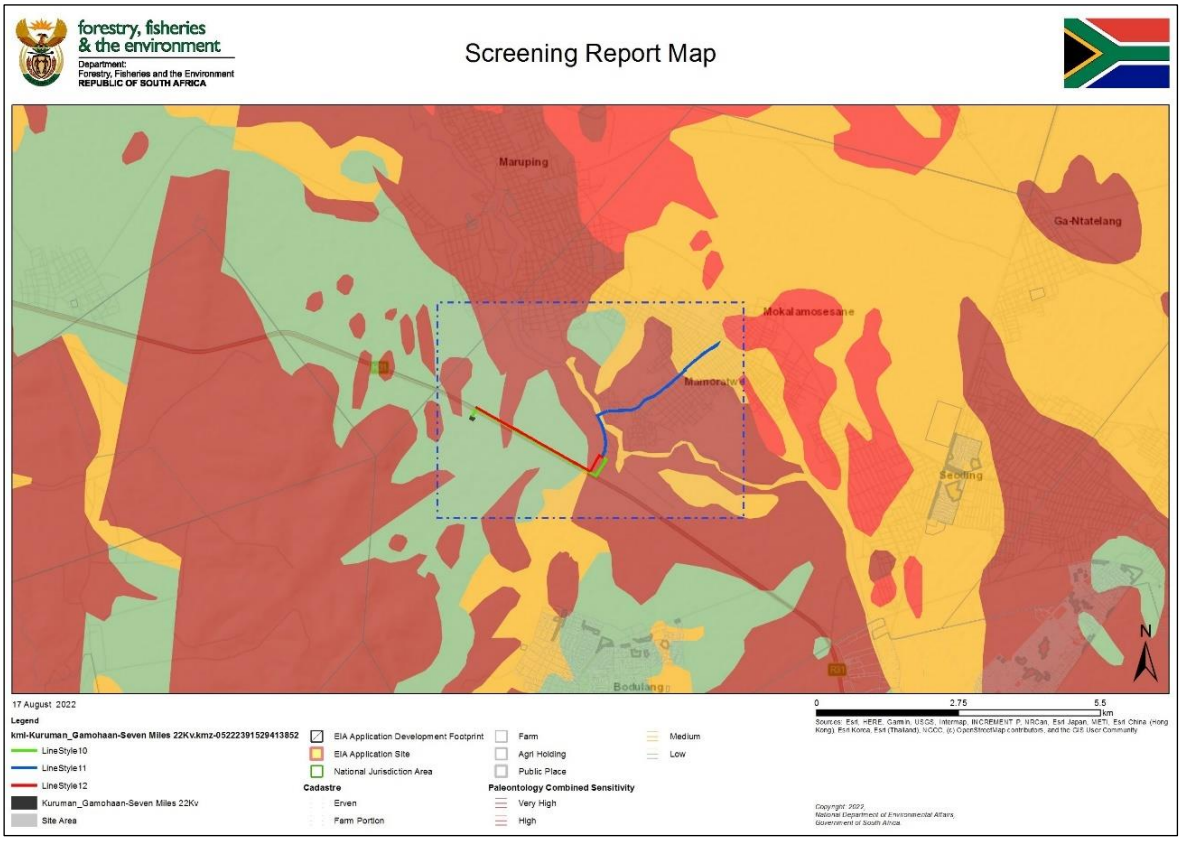



*Figure 25 - Screening tool map indicating a very high, high, medium, and low sensitivity rating for palaeontology in the proposed study area (Source: DFFE).*

### *4.2.6 Heritage sensitivity*

Analysis of maps and satellite imagery enabled the identification of possible heritage sensitive areas. By superimposition and analysis, it was possible to rate these structures according to age and thus their level of protection under NHRA. **Table 4** lists the possible tangible heritage sites identified in the vicinity of the study area and the relevant legislative protection.

*Table 4: Tangible heritage site in the study area.*

| Name | Description | Legislative protection |
|---|---|---|
| Archaeology | Older than 100 years | NHRA Sections 3 and 35 |
| Structures | Possibly older than 60 years | NHRA Sections 3 and 34 |
| Burial grounds | Graves | NHRA Sections 3 and 36 and MP Graves Act |

Additionally, evaluation of satellite imagery has indicated the following areas that may be sensitive from a heritage perspective. The analysis of the studies conducted in the area assisted in the development of the following landform type to heritage find matrix (**Table 5**).

*Table 5: Landform type to heritage find matrix*

| LANDFORM TYPE | HERITAGE TYPE |
|---|---|
| Crest and foot hill | LSA and MSA scatters, LIA settlements |

| | |
|---|---|
| Crest of small hills | Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery, and beads |
| Water holes/pans/rivers | MSA and LSA sites, LIA settlements |
| Farmsteads | Historical archaeological material |
| Ridges and drainage lines | LSA sites, LIA settlements |

### 4.3 Fieldwork findings[1]

A controlled surface survey was conducted on foot and by a vehicle by two archaeologists (Michelle Sachse and Henk Steyn) from PGS Heritage. The fieldwork was conducted on 4 August 2022. During the fieldwork, hand-held GPS devices were used to record tracklogs. These recorded track logs show the routes followed by the fieldwork team on site. The tracklogs for the survey are indicated in **Figure 26**.

During the survey, no heritage sites were identified. This includes archaeological sites, historical structures and burial ground and graves.

[1] *Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.*

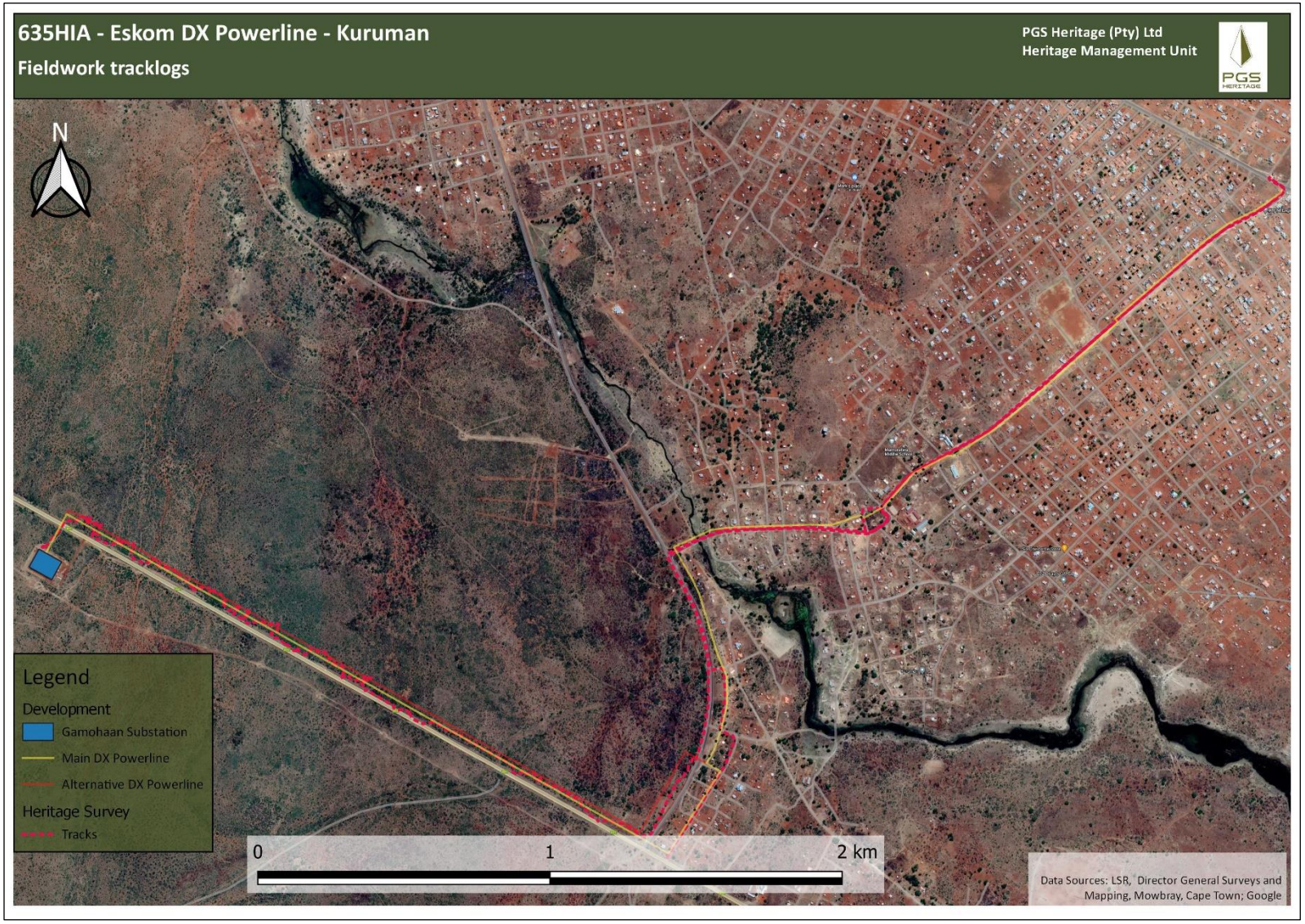

635HIA - Eskom DX Powerline - Kuruman
Fieldwork tracklogs
PGS Heritage (Pty) Ltd
Heritage Management Unit
N
Legend
Development
Gamohaan Substation
Main DX Powerline
Alternative DX Powerline
Heritage Survey
Tracks
0
1
2 km
Data Sources: LSR, Director General Surveys and Mapping, Mowbray, Cape Town; Google

*Figure 26 - Fieldwork tracklogs (tracks in pink).*

### 4.4 Palaeontology

Banzai Environmental was appointed by PGS Heritage (Pty) Ltd to conduct a Palaeontological Desktop Assessment (PDA) for the proposed 22KV Powerline on the Remaining Extent of the Farm Kuruman Reserve 690, in Kuruman, Northern Cape Province. In compliance with the National Heritage Resources Act (No 25 of 1999, section 38) (NHRA), this PDA is necessary to confirm if fossil material could potentially be present in the development area and to evaluate the impact of the proposed development on the Palaeontological Heritage of the area.

The proposed development is underlain by Caenozoic deposits of the Kalahari Group, the Kuruman Formation (Asbestos Hills Subgroup) as well as the Kogelbeen Formation (Campbell Rand Subgroup) of the Ghaap Group (Transvaal Supergroup). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Caenozoic Kalahari deposits is moderate, that of the Kuruman Formation is low while that of the Kogelbeen Formation is very high (Almond and Pether 2008, SAHRIS website).

It is thus recommended that a field-based palaeontological impacts assessment (PIA) report must be conducted to assess the value and prominence of fossils in the development area and the effect of the proposed development on the palaeontological heritage. The purpose of the PIA is to elaborate on the issues and potential impacts identified during the PDA. The field-based assessment would be conducted with research in the site-specific study area, as well as a comprehensive assessment of the impacts identified during the PDA.

The geology of the proposed 22KV Powerline on the Remaining Extent of farm Kuruman Reserve 690, in Kuruman, in the Northern Cape Province is shown on the 1:250 000 Kuruman 2722 Geological Map (1979) (Council of Geoscience, Pretoria) (**Figure 27; Table 6**). According to this map the development is underlain by the Campbell Group (Ghaapplato Formation) (Vgd, blue) as well as the Kuruman Member (Vak, brown) of the Asbestos Hills Formation (Griquatown Group).

Updated geological maps (Figure 28) indicates that the proposed development is underlain by the Kalahari Group as well as the Kogelbeen Formation (Campbell Rand Subgroup) and the Kuruman Formation (Asbestos Hill Subgroup), both Ghaap Group. The proposed development is underlain by sediments of the Transvaal Supergroup of the Griqualand West Basin. In Griqualand West the Ghaap Group is subdivided in the oldest Schmidtsdrif, middle Campbell Rand and youngest Asbestos Hills and Koegas Subgroups (**Figure 29**). The proposed development is located on the western border of the Kaapvaal Craton (McCarthy & Rubidge 2005, Eriksson et al. 2006).

The Campbell Rand Subgroup (**Figure 29 - Figure 30**) consists of a thick (1,6 to 2,5 km) carbonate platform succession of cherts with minor tuffs and siliciclastic rocks as well as dolomitic limestones and dolostones. These sediments were deposited about 2,6 to 2,5 Ga (billion years ago) on the shallow submerged shelf of the Kaapvaal Craton. Frequent changes in sea level were caused by changing depositional cycles in shallow water facies. Stromatolitic limestones and dolostones, oolites, laminated calcilutites, cherts, with subordinate siliclastics (shales, siltstones) and minor tuffs (Beukes 1980, Beukes 1986, Sumner 2002, Eriksson *et al.* 2006, Sumner & Beukes 2006) are present in this area.

The late Archaean Kogelbeen Formation is about 450m thick and comprise of limestone and chert with stromatolites and microbial horizons as well as dolomite. Within the stromatolitic horizons secondary chert replacement occurs. Almond (2018, 2019) described small exposures of the Kogelbeen Formation bedrocks on the western outskirts of Kuruman.

The Precambrian bedrocks are mantled by superficial deposits comprising of alluvial and colluvial gravels, cherty surface rubble as well as sediments of the Kalahari Group. Along river valley floors gravelly to sandy sediments is often calcretised. In some areas of Kuruman highly resistant, blocky-weathering siliceous breccia mantles caps the carbonate bedrocks. These silcrete-like breccia consists of angular clasts of laminated silicified carbonate and chert but no banded iron formations (BIF). This indicates that it was formed during a major explosive episode during the deposition of the Asbestos Hills deep marine succession. The upper surface of low-lying carbonate bedrocks has been karstified during the Caenozoic with common steep-sided solution hallows (sometimes infilled with ferruginised surface gravels and BIF forming underground drainage networks like the Eye of Kuruman as well as cave systems).

The fossil assemblages of the Kalahari (Figure 31) are represented by terrestrial plants and animals with a close resemblance to living forms. Fossil assemblages include bivalves, diatoms, gastropod shells, ostracods, and trace fossils. Late Cenozoic calcrete may comprise of bones, horn corns as well as mammalian teeth. Tortoise remains have also been uncovered as well as trace fossils which includes termite and insect's burrows and mammalian trackways. Amphibian and crocodile remains have been uncovered where the depositional settings in the past were wetter. Fossils are mostly associated with ancient lakes, pans, and river systems.

According to the PalaeoMap (Figure 32) on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Caenozoic Kalahari deposits is moderate, that of the Kuruman Formation is low while that of the Kogelbeen Formation is Very High (Almond and Pether 2008, SAHRIS website).

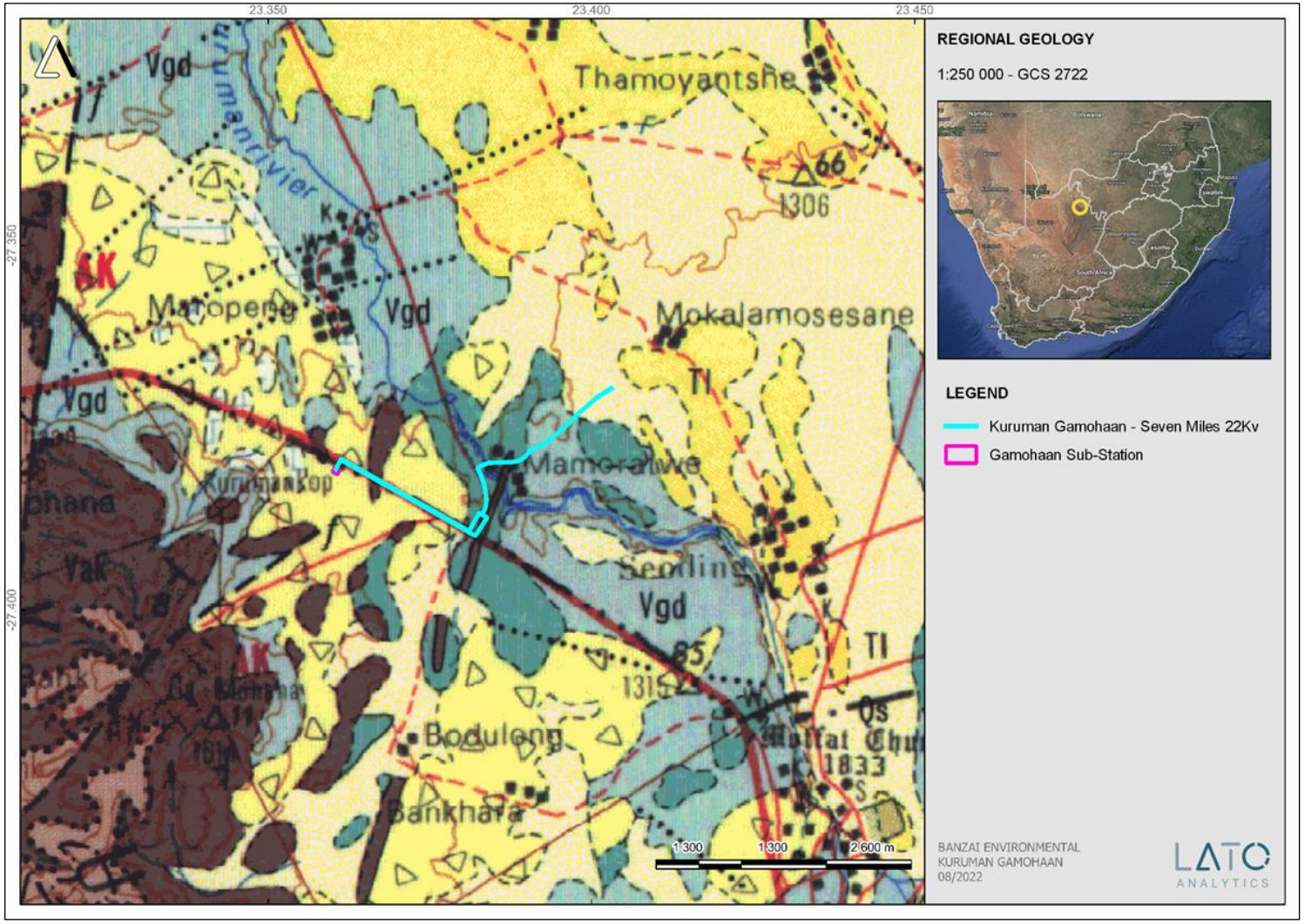
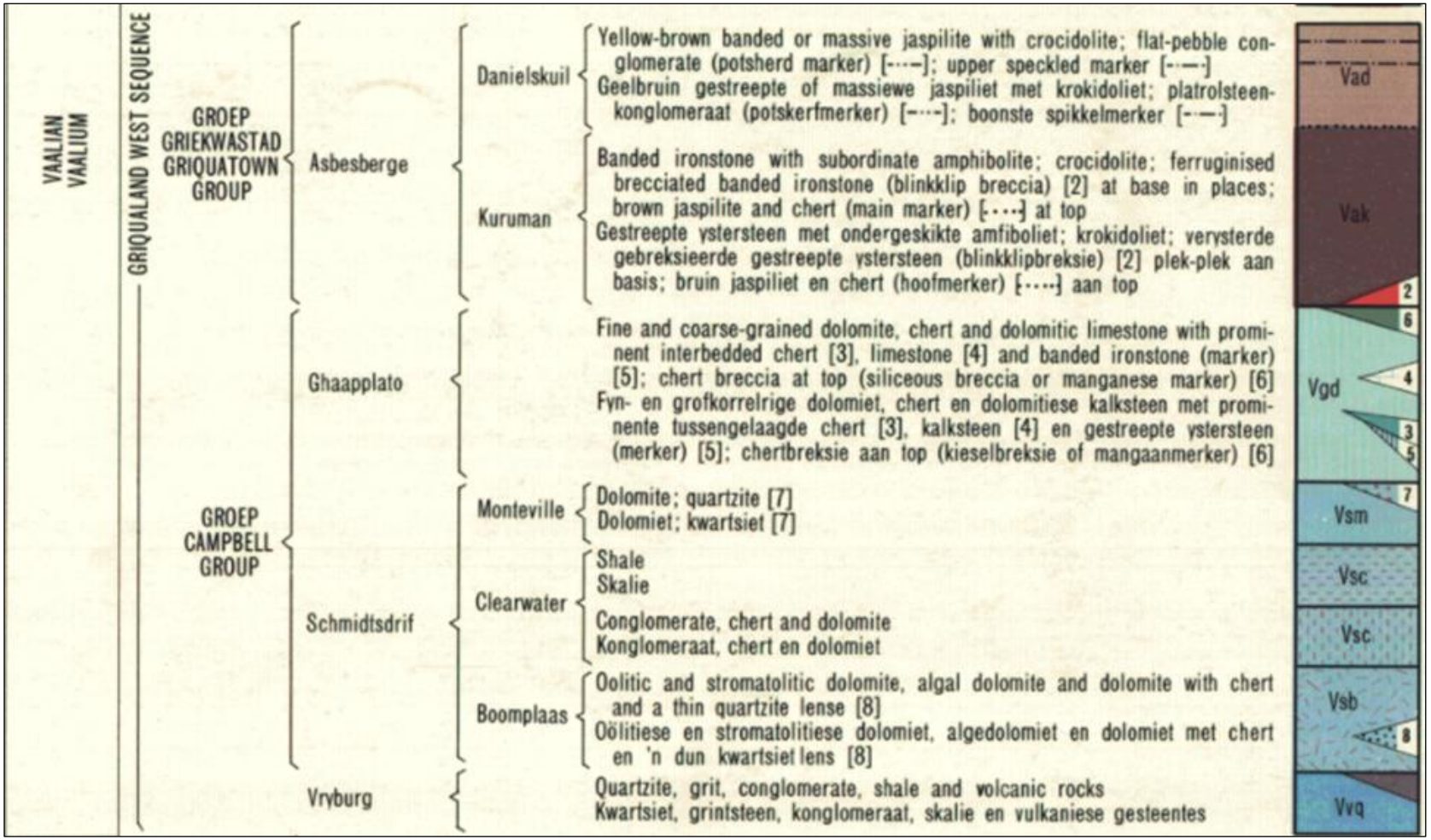



*Figure 27 - Extract of the 1:250 000 Kuruman 2722 Geological Map (1979) (Council of Geoscience, Pretoria) indicating the geology of the proposed development in light blue.*

*Table 6: Legend of the Kuruman 2722 Geological Map (1979) (Council of Geoscience, Pretoria)*


VAALIAN
VAALIUM
GRIQUALAND WEST SEQUENCE
GROEP GRIEKWASTAD GRIQUATOWN GROUP
GROEP CAMPBELL GROUP
Asbesberge
Ghaapplato
Schmidtsdrif
Vryburg
Danielskuil
Kuruman
Monteville
Clearwater
Boomplaas
Yellow-brown banded or massive jaspilite with crocidolite; flat-pebble conglomerate (potsherd marker) [----]; upper speckled marker [----]
Geelbruin gestreepte of massiewe jaspiliet met krokidoliet; platrolsteenkonglomeraat (potskerfmerker) [----]; boonste spikkelmerker [----]
Banded ironstone with subordinate amphibolite; crocidolite; ferruginised brecciated banded ironstone (blinkklip breccia) [2] at base in places; brown jaspilite and chert (main marker) [----] at top
Gestreepte ystersteen met ondergeskikte amfiboliet; krokidoliet; verysterde gebreksieerde gestreepte ystersteen (blinkklipbreksie) [2] plek-plek aan basis; bruin jaspiliet en chert (hoofmerker) [----] aan top
Fine and coarse-grained dolomite, chert and dolomitic limestone with prominent interbedded chert [3], limestone [4] and banded ironstone (marker) [5]; chert breccia at top (siliceous breccia or manganese marker) [6]
Fyn- en grofkorrelrige dolomiet, chert en dolomitiese kalksteen met prominente tussengelaagde chert [3], kalksteen [4] en gestreepte ystersteen (merker) [5]; chertbreksie aan top (kieselbreksie of mangaanmerker) [6]
Dolomite; quartzite [7]
Dolomiet; kwartsiet [7]
Shale
Skalie
Conglomerate, chert and dolomite
Konglomeraat, chert en dolomiet
Oolitic and stromatolitic dolomite, algal dolomite and dolomite with chert and a thin quartzite lense [8]
Oölitiese en stromatolitiese dolomiet, algedolomiet en dolomiet met chert en 'n dun kwartsietlens [8]
Quartzite, grit, conglomerate, shale and volcanic rocks
Kwartsiet, grintsteen, konglomeraat, skalie en vulkaniese gesteentes
Vad
Vak
Vgd
Vsm
Vsc
Vsc
Vsb
Vvq
2
6
4
3
5
7
8

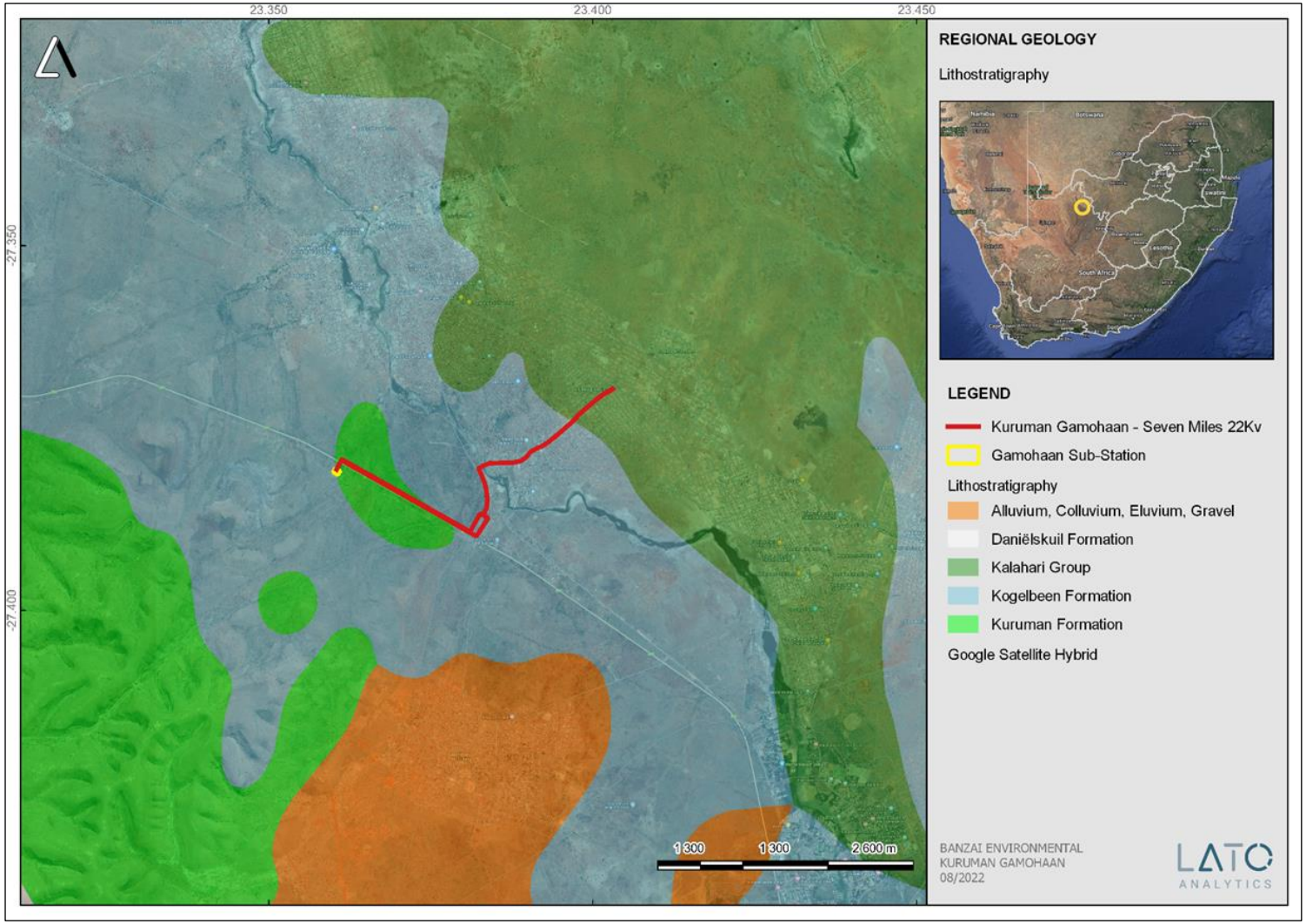



*Figure 28 - Updated geology (Council of Geosciences, Pretoria) indicates that the proposed development is underlain Vryheid Formation of the Ecca Group (Karoo Supergroup).*

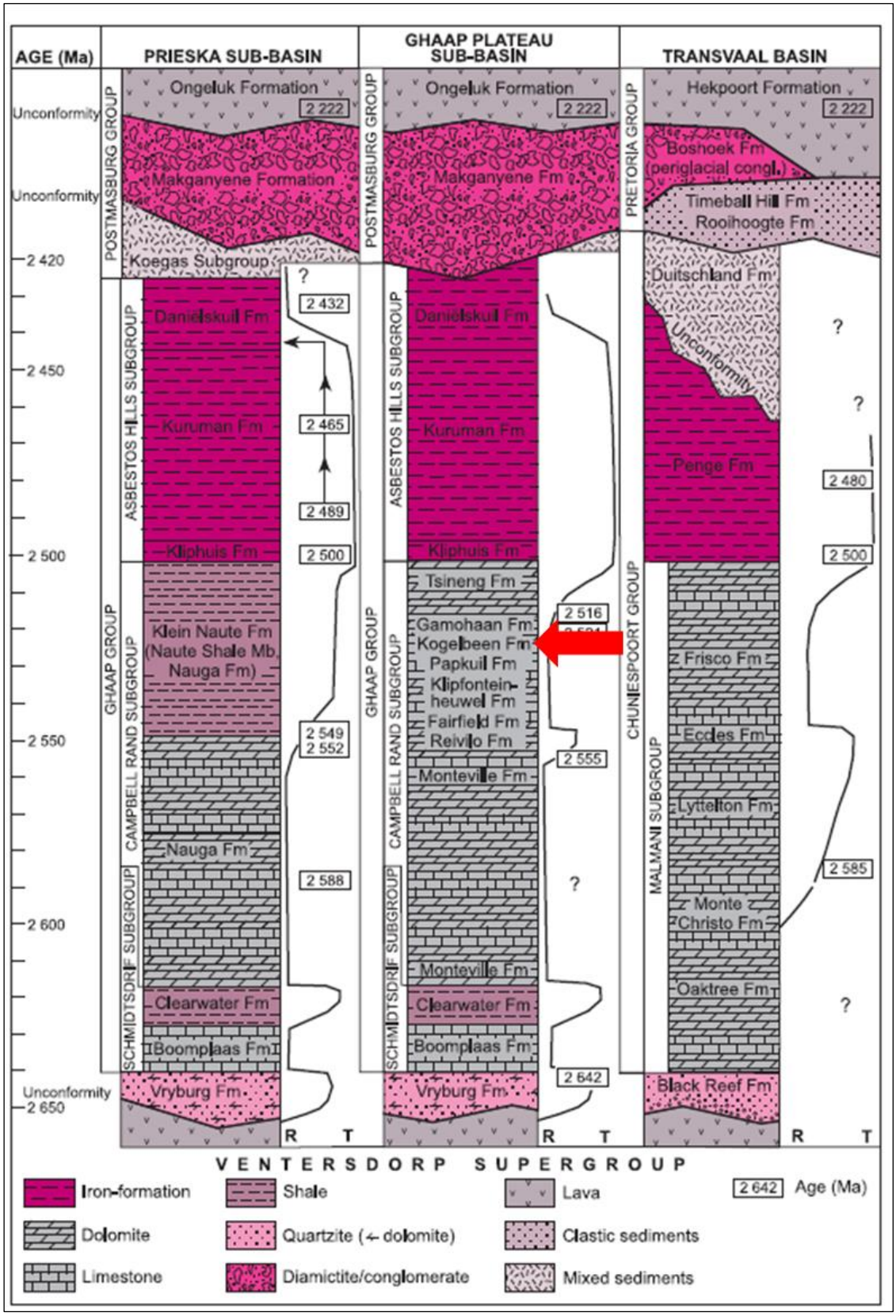



*Figure 29 - Stratigraphy of the Transvaal Supergroup (Ghaap Plateau Sub-basin, indicated in the middle column). Precambrian bedrock units represented in the study area is indicated by the red arrow (Modified from Eriksson et al. 2006).*

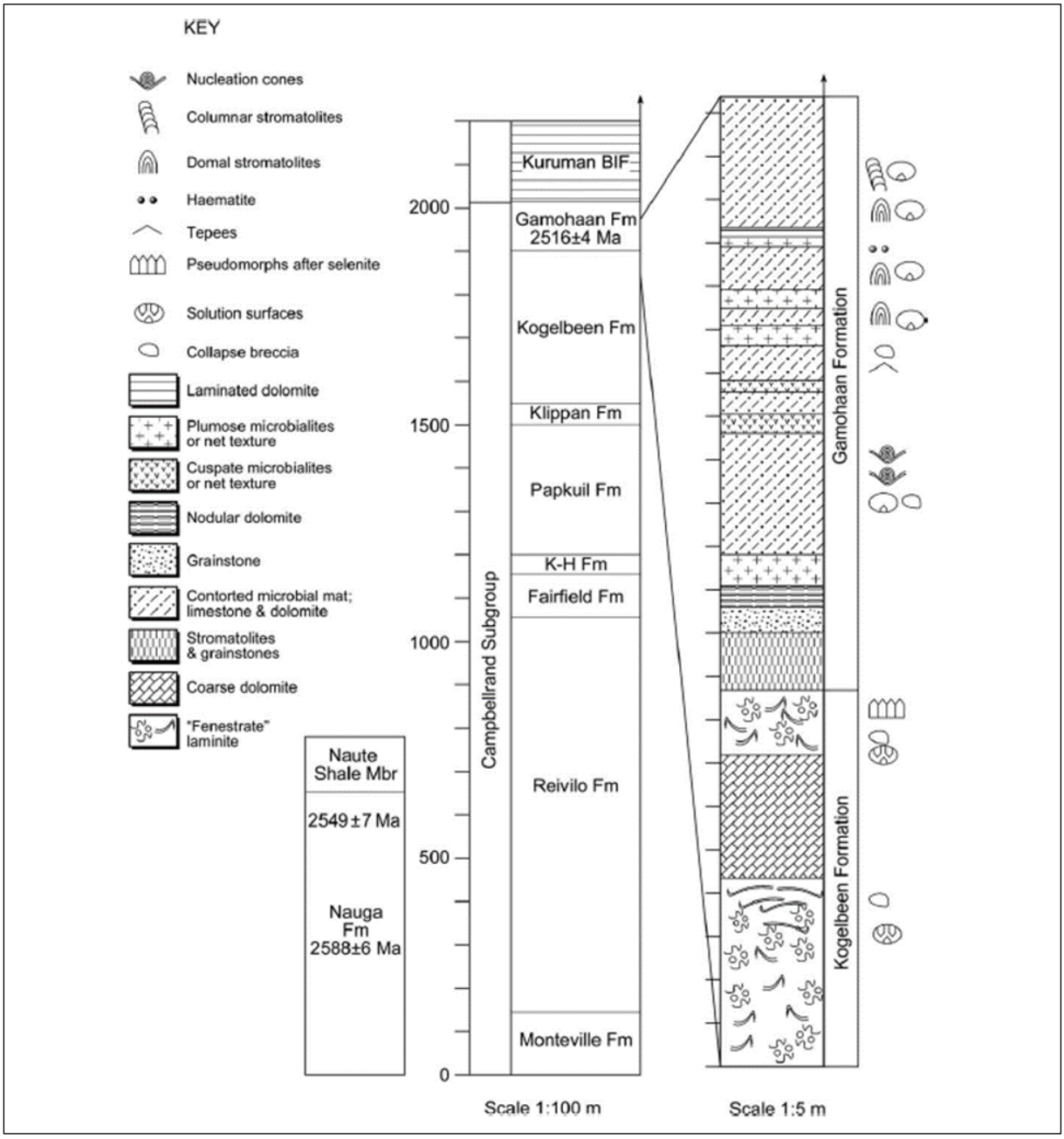



*Figure 30 - Stratigraphy of the Campbell Rand Supergroup indicating the main lithologies and sedimentary features (Taken from Gardine et al, 2005).*

*Table 7: Fossil Heritage probably present in the development footprint. Table modified from Palaeotechnical Report (Almond and Pether 2009).*

| Subgroup/ sequence | Group | Formation | Fossil Heritage |
|---|---|---|---|
| Tertiary-Quaternary | Kalahari | - | Terrestrial organisms include trace fossils, ostracods, bivalves, gastropod shells, diatoms, and trace fossils. Late Cenozoic calcrete may comprise of bones, horn corns as well as mammalian teeth. Tortoise remains have also been uncovered as well as trace fossils which includes termite and insect's burrows and mammalian trackways. |

| | | | |
|---|---|---|---|
| Griqualand West Super Group | Campbell Rand Subgroup | Ghaapplato | Stromatolites e.g., Cyanobacterial microfossils |

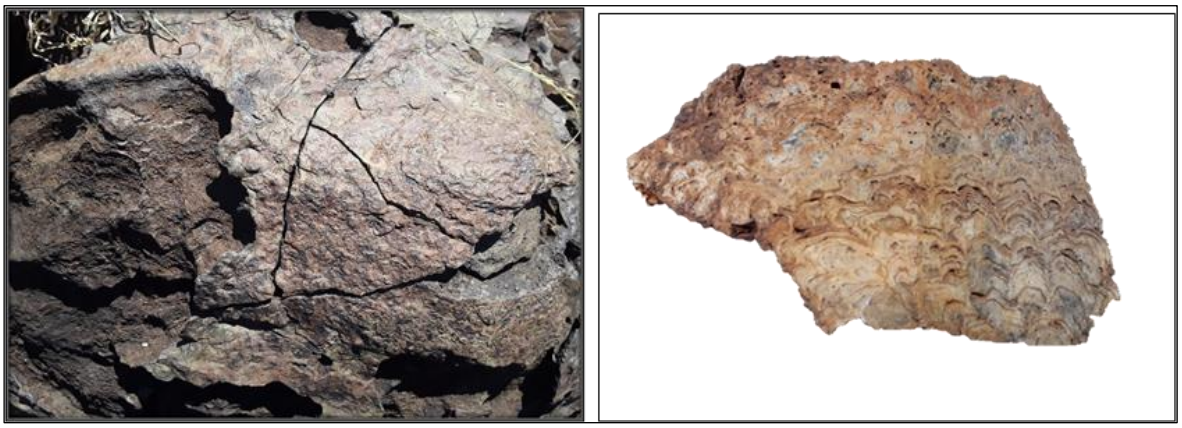


*Figure 31 - Archaeon stromatolites.*

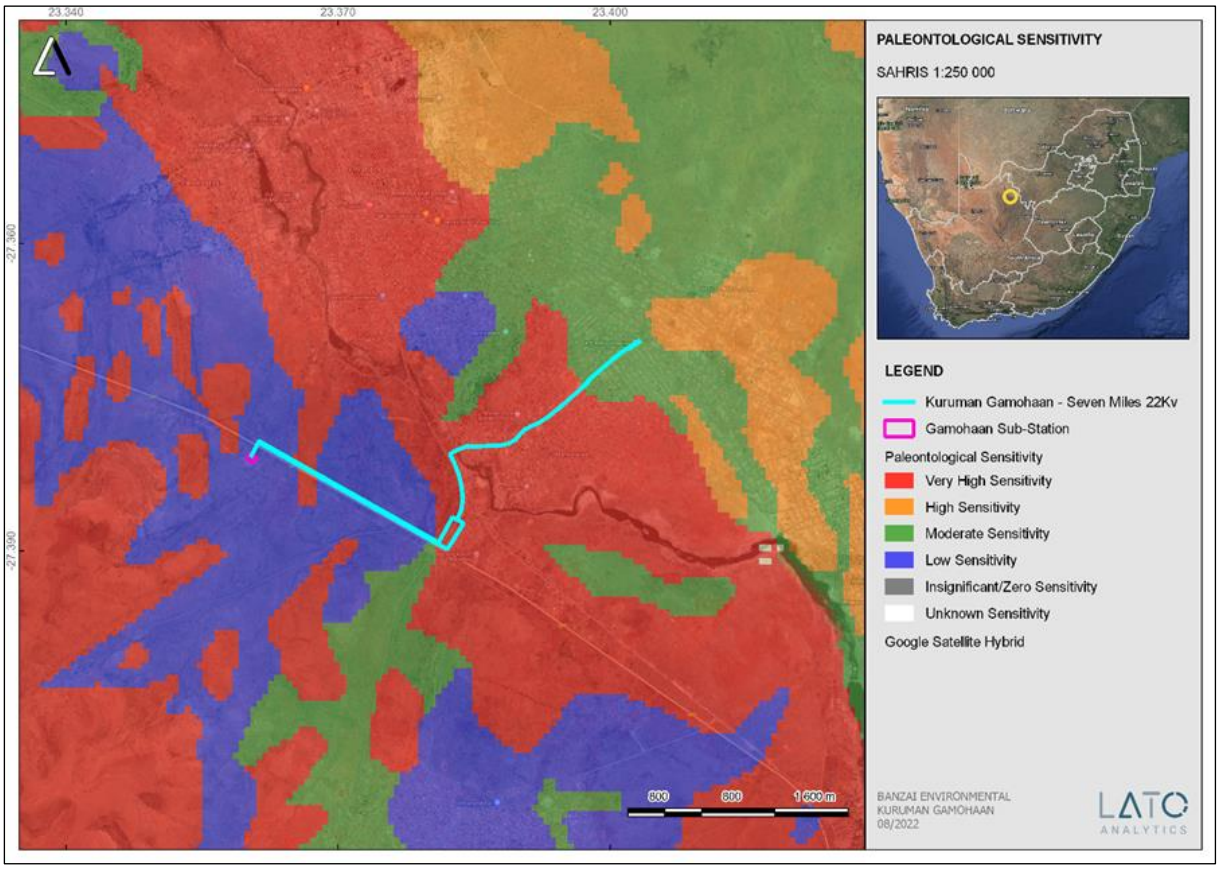



*Figure 32 - Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed development in light blue.*

*Table 8: Palaeontological Sensitivity*

| Colour | Sensitivity | Required Action |
|---|---|---|

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

According to the SAHRIS Palaeosensitivity map (**Figure 32**) the proposed development is underlain by sediments with a Very High (red), Moderate (green) a Low (blue) Palaeontological Sensitivity.

# 5 IMPACT ASSESSMENT

The impact assessment rating is based on the rating scale as contained in **Appendix B**.

The following section provides an analysis of the impact of the proposed project area on heritage resources identified within the Eskom Gamohaan – Seven Miles 22 kV powerline area.

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

## 5.1 Details of all alternatives considered

This section describes alternative means of carrying out the operation and the consequences of not proceeding with the proposed project.

The “no-go” alternative refers to the option of not going ahead with the proposed project. This will entail maintaining the current status quo with no impact from the project.

### *5.1.1 Burial grounds and graves*

No heritage resources were identified.

### *5.1.2 Historical Structures*

No heritage resources were identified.

### *5.1.3 Archaeological resources*

No heritage resources were identified.

#### *5.1.4 Palaeontology*

The PDA notes that the paleontological significance and potential of the geology of the area is rated as low to very high.

### 5.2 Impact assessment summary table

Implementing the impact assessment methodology as supplied by the Environmental Impact Management Services (EIMS)**, Table 9** provides a quantitative assessment of the impacts of the proposed Eskom Gamohaan – Seven Miles 22 kV Powerline Project.

*Table 9: Impact rating for heritage resources*

| IMPACT DESCRIPTION | | | Pre-Mitigation | | | | | | | Post Mitigation | | | | | | | | Priority Factor Criteria | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Identifier | Impact | Phase | Nature | Extent | Duration | Magnitude | Reversibility | Probability | Pre-mitigation ER | Nature | Extent | Duration | Magnitude | Reversibility | Probability | Post-mitigation ER | Confidence | Cumulative Impact | Irreplaceable loss | Priority Factor | Final score |
| 10.1.1 | Impact on heritage resources | Planning | -1 | 1 | 2 | 1 | 3 | 2 | -3.5 | -1 | 1 | 2 | 1 | 2 | 1 | -1.5 | High | 1 | 1 | 1.00 | -1.5 |
| | | Construction | -1 | 1 | 2 | 1 | 3 | 2 | -3.5 | -1 | 1 | 2 | 1 | 2 | 1 | -1.5 | High | 1 | 1 | 1.00 | -1.5 |
| 10.1.2 | Impact on palaeontology | Planning | -1 | 1 | 4 | 2 | 2 | 2 | -4.5 | -1 | 1 | 4 | 2 | 1 | 1 | -2 | High | 1 | 1 | 1.00 | -2 |
| | | Construction | -1 | 1 | 4 | 2 | 2 | 2 | -4.5 | -1 | 1 | 4 | 2 | 1 | 1 | -2 | High | 1 | 1 | 1.00 | -2 |

# 6 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

## 6.1 Construction and operational phases

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camp areas and small-scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction, and as such must be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, however foundation holes do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project, and these must be catered for. Temporary infrastructure developments, such as construction camps and laydown areas, are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented.

## 6.2 Chance finds procedure

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts **during the implementation of the EMPr**.
- An appropriately qualified heritage practitioner / archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

### 6.3 Possible finds during construction

The study area occurs within a greater historical and archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed reclamation activities, could uncover the following:

- Historical structures and foundations
- unmarked burial grounds and graves

### 6.4 Timeframes

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 10** gives guidelines for lead times on permitting.

*Table 10: Lead times for permitting and mobilisation*

| Action | Responsibility | Timeframe |
|---|---|---|
| Preparation for field monitoring and finalisation of contracts | The contractor and service provider | 1 month |
| Application for permits to do necessary mitigation work | Service provider – Archaeologist and SAHRA | 3 months |
| Documentation, excavation, and archaeological report on the relevant site | Service provider – Archaeologist | 3 months |
| Handling of chance finds – Graves/Human Remains | Service provider – Archaeologist and SAHRA | 2 weeks |
| Relocation of burial grounds or graves in the way of the development | Service provider – Archaeologist, SAHRA, local government and provincial government | 6 months |

# 7 CONCLUSIONS AND RECOMMENDATIONS

During the fieldwork no heritage features and resources (archaeological sites or burial grounds and graves) where identified. A field survey of the study area was undertaken by a combination of vehicle and pedestrian means, by two archaeologists (Michelle Sachse and Henk Steyn) on 4 August 2022. No evidence for any archaeological or heritage sites could be identified.

As a result, no impact is expected from the proposed development on heritage. With no impact expected on heritage, no further mitigation is required.

## 7.1 Historical Structures

No heritage resources were identified.

## 7.2 Archaeological Site

No heritage resources were identified.

## 7.3 Burial grounds and graves

No heritage resources were identified.

## 7.4 Palaeontology

The PDA notes that the paleontological significance and potential of the geology of the area is rated as low to very high.

## 7.5 Mitigation measures

With no impact expected on heritage, no further mitigation is required. Refer to **Chapter 6** of this report.

## 7.6 General

It is the combined considered opinion that the overall impact on heritage resources is Low. Provided that the recommended mitigation measures are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in section 8 of this report have been developed to minimise the project impact on heritage resources.

With the implementation of recommended mitigation measures the overall impact on heritage resources will be reduced to acceptable levels during the activities of the project.

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### 8.3 Internet


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### 8.4 Google Earth

All the aerial depictions and overlays used in this report are from Google Earth.

### 8.5 Historic Topographical Maps

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

## APPENDIX A
## ENVIRONMENTAL IMPACT METHODOLOGY

## ENVIRONMENTAL IMPACT MANAGEMENT SERVICES (EIMS): IMPACT ASSESSMENT METHODOLOGY

| TITLE: | ENVIRONMENTAL IMPACT ASSESSMENT RATING PROCEDURE | DOC No: | PRO 106 | REV: | 00 | Page 2 of 7 |
|---|---|---|---|---|---|---|

### 1. Purpose

The purpose of this procedure is to guide the undertaking of an impact and risk assessment process, as required under the regulations promulgated under the National Environmental Management Act (Act 107 of 1998 - NEMA).

### 2. Scope

This procedure provides the methodology to be applied to environmental impacts and risks identified during the Environmental Impact Assessment Process. The methodology ensures that consistent impact assessment rating is carried out that is legally compliant and aligned with EIMS's objective of providing a quality service.

### 3. References

GNR. 982 National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations, 2014 – hereafter referred to as the Regulations.

### 4. Additional Guidelines and References

| Guidelines and Reference Docs (not exhaustive – please verify with the applicable competent authority). | |
|---|---|
| Compulsory Compliance: GNR. 982 National Environmental Management Act (Act No. 107 of 1998 - NEMA): Environmental Impact Assessment Regulations, 2014. | National |
| Companion Guideline for Implementation: Environmental Management Assessment Regulations, 2010 - GN 805/2012 (NEMA) | National |
| DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria | National |

### 5. Definitions and Abbreviations

Refer to Chapter 1 of the Regulations.

### 6. Procedure

The impact significance rating methodology, as presented herein and utilised for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. The ER is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives.

#### a. Determination of Environmental Risk

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 1 below.

Table 1: Criteria for Determining Impact Consequence

| Aspect | Score | Definition |
|---|---|---|

| | | |
|---|---|---|
| **Nature** | - 1 | Likely to result in a negative/ detrimental impact |
| | +1 | Likely to result in a positive/ beneficial impact |
| **Extent** | 1 | Activity (i.e. limited to the area applicable to the specific activity) |
| | 2 | Site (i.e. within the development property boundary) |
| | 3 | Local (i.e. the area within 5 km of the site) |
| | 4 | Regional (i.e. extends between 5 and 50 km from the site) |
| | 5 | Provincial / National (i.e. extends beyond 50 km from the site) |
| **Duration** | 1 | Immediate (<1 year) |
| | 2 | Short term (1-5 years) |
| | 3 | Medium term (6-15 years) |
| | 4 | Long term (15-65 years, the impact will cease after the operational life span of the project) |
| | 5 | Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction) |
| **Magnitude/ Intensity** | 1 | Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected) |
| | 2 | Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected) |
| | 3 | Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts) |
| | 4 | High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts) |
| | 5 | Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts) |
| **Reversibility** | 1 | Impact is reversible without any time and cost. |
| | 2 | Impact is reversible without incurring significant time and cost. |
| | 3 | Impact is reversible only by incurring significant time and cost. |
| | 4 | Impact is reversible only by incurring prohibitively high time and cost. |
| | 5 | Irreversible Impact. |

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 2.

Table 2: Probability Scoring

| | | |
|---|---|---|
| Probability | 1 | Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%), |
| | 2 | Low probability (there is a possibility that the impact will occur; >25% and <50%), |
| | 3 | Medium probability (the impact may occur; >50% and <75%), |
| | 4 | High probability (it is most likely that the impact will occur- > 75% probability), or |
| | 5 | Definite (the impact will occur), |

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 3: Determination of Environmental Risk

| Consequence | | | | | | |
|---|---|---|---|---|---|---|
| | 5 | 5 | 10 | 15 | 20 | 25 |
| | 4 | 4 | 8 | 12 | 16 | 20 |
| | 3 | 3 | 6 | 9 | 12 | 15 |
| | 2 | 2 | 4 | 6 | 8 | 10 |
| | 1 | 1 | 2 | 3 | 4 | 5 |
| | | 1 | 2 | 3 | 4 | 5 |
| | Probability | | | | | |

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 4.

Table 4: Environmental Risk Scores

| ER Score | Description |
|---|---|
| <9 | Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward). |
| ≥9 ≤17 | Medium (i.e. where the impact could have a significant environmental risk/ reward), |
| >17 | High (i.e. where the impact will have a significant environmental risk/ reward). |

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

**b. Impact Prioritisation**

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the

decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 5: Criteria for Determining Prioritisation

| | | |
|---|---|---|
| **Cumulative Impact (CI)** | Low (1) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change. |
| | Medium (2) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change. |
| | High (3) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change. |
| **Irreplaceable Loss of Resources (LR)** | Low (1) | Where the impact is unlikely to result in irreplaceable loss of resources. |
| | Medium (2) | Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited. |
| | High (3) | Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions). |

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$Priority = CI + LR$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 6).

Table 6: Determination of Prioritisation Factor

| Priority | Prioritisation Factor |
|---|---|
| 2 | 1 |
| 3 | 1.125 |
| 4 | 1.25 |
| 5 | 1.375 |
| 6 | 1.5 |

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 7: Final Environmental Significance Rating

| Significance Rating | Description |
|---|---|
| <-17 | High negative (i.e. where the impact must have an influence on the decision process to develop in the area). |
| ≥-17, ≤-9 | Medium negative (i.e. where the impact could influence the decision to develop in the area). |
| >-9, < 0 | Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area). |
| 0 | No impact |
| >0, <9 | Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area). |
| ≥9, ≤17 | Medium positive (i.e. where the impact could influence the decision to develop in the area). |
| >17 | High positive (i.e. where the impact must have an influence on the decision process to develop in the area). |

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

## 7. Responsibilities

It is the responsibility of each EIMS employee and each external Specialist appointed by EIMS to ensure that this procedure is carried out as described. All the personnel within the organization have the responsibility to report any deviations/changes from the procedures to management. This is to ensure that the necessary changes are documented after approval.

It is the responsibility of the senior/ junior consultant (as applicable) assigned with the task of report compilation to ensure that this methodology/ procedure is strictly applied. It is the responsibility of the assigned Senior Consultant or Quality Reviewer to review and verify that the procedure has been complied with, and such documented at the specified quality check intervals.

## 8. Records

| RECORD | STORAGE LOCATION | STORAGE SYSTEM | RESPONSIBLE PERSON | RETENTION PERIOD |
|---|---|---|---|---|
| Significance Rating Input Spreadsheet | Project File - /Server/assignments/ Job#/Records | Electronic- Scanned PDF | Project Manager | 10 Years |

## 9. Record of Changes, Revisions and Cancellations

| RECORD OF CHANGES, REVISIONS AND CANCELLATIONS | | |
|---|---|---|
| DATE | NATURE / DETAIL OF CHANGE | REV No. |
| | | |

**APPENDIX B**

**PGS TEAM CVS**

**PROFESSIONAL CURRICULUM FOR WOUTER FOURIE**

**Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage**

**Summary of Experience**

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave "rescue" excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
    - Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
    - Involvement with various Heritage Impact Assessments, outside South Africa, including -
- Archaeological Studies in Democratic Republic of Congo
- Heritage Impact Assessments in Mozambique, Botswana and DRC
- Grave Relocation project in DRC

**Key Qualifications**

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology - 1996

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

**Key Work Experience**

2003- current - Director – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

2000-2004 - CEO– Matakoma Consultants

1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng

1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mauritius, Malawi, Zambia, Mozambique, and the Democratic Republic of the Congo.

**PROFESSIONAL CURRICULUM FOR HENK STEYN**

**Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage**

**Name:** HS (Henk) Steyn
**Profession:** Archaeologist
**Date of birth:** 1971-09-15
**Parent Firm:** PGS Heritage (Pty) Ltd
**Position at Firm:** Managing Director and Archaeologist
**Years with firm:** 18
**Years of experience:** 23
**Nationality:** South African
**HDI Status:** White Male

**EDUCATION**

**Name of University or Institution:** University of Pretoria
**Degree obtained:** BA
**Major subjects:** Archaeology, History & Cult. History
**Year:** 1996

**Name of University or Institution:** University of Pretoria
**Degree obtained:** BA [Hons] (Cum laude)
**Major subjects:** Archaeology
**Year:** 1997

**PROFESSIONAL QUALIFICATIONS:**

Professional Archaeologist - Association of Southern African Professional Archaeologists - Professional Member

**CRM Accreditation:**

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age

Treasurer of ASAPA (Association of Southern African Professional Archaeologists) from 2012 – 2017
Director of PGS Heritage (Pty) Ltd (SA), PGS Heritage (Pty) Ltd (Lesotho) and PGS Heritage Limitada (Mozambique).

**Languages:**

Afrikaans – First language
English – Speaking (Good) Reading (Good), Writing (Good)

**KEY QUALIFICATIONS**

Grave Relocation Management, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Business Management.

**HERITAGE EXPERIENCE**

Grave Relocations

As Managing Director of PGS, I have been involved in a large number of grave relocation projects, including, but not limited to:

• iMpunzi Division of Duiker Mining, Witbank, Relocation of 950 graves. • University of Pretoria, Nandoni Dam Grave Relocation Project, Thohoyandou, Limpopo Province. Relocation of approximately 1,000 graves.

• Alveda Park Development, NewHco. Relocation of 114 graves.

• Tselentis Colliery, Duiker Mining. Relocation of 80 graves.

• Tselentic Colliery, Expansion of mining activities. Relocation of 15 graves. • Abland, Proposed development of Portion 41 of the farm Wonderboom 302-JR. Relocation of 17 graves

• TCTA, VRESAP Development. Relocation of 56 graves.

• Biscuit Trading, Proposed Development of Portion 97 of the farm Knopjeslaagte 385-JR. Relocation of 5 graves.

• Savannah Country Estates, Mamelodi, Pretoria, Gauteng Province. Relocation of 7 graves.

• Atterbury Property Developments, Hartebeespoort Dam, Pretoria. Relocation of 11 graves.

• The Outpost Estate, Bela-Bela, Limpopo Province. Relocation of 78 graves. • Nkomati Mine, Onverwacht grave relocation, near Badplaas, Mpumalanga. Relocation of 45 graves.

• Nkomati Mine, Nkomati Mine grave relocation, near Badplaas, Mpumalanga. Relocation of 60 graves..

• New Vaal Colliery, Mac West Project, Free State, Relocation of 650 graves. • Phokathaba Platinum, Smokey Hills Mine, Maandagshoek, Burgersfort, Limpopo Province. Relocation of 11 graves.

• Martins Funerals (Randburg), Garstfontein Road grave relocation, Pretoria, Gauteng Province. Relocation of 1 grave.

• Bombela CJV, Graves affected by Gautrain Development, Midrand, Gauteng Province. Relocation of 26 graves.

• Cranbrook Properties, Motaganeng Project, Burgersfort, Limpopo Province. Relocation of 60 graves..

• Silver Glade Investments, Swavelpoort, Pretoria. Relocation of 45 graves. • Anglo Coal (Kleinkopje Colliery), Zondagsvlei, near Ogies, Mpumalanga Province. Relocation of 110 graves.

• Anglo Coal (Kleinkopje Colliery), Kleinkopje Coppiery, Witbank, Mpumalanga Province. Relocation of 4 graves.

• Africon. Rescue excavation of 1 grave near Silvertondale, Pretoria, Gauteng Province. • Osizweni Plaza, Newcastle, KwaZulu-Natal. Relocation of 65 graves.

• Anglo Coal, Farm Straffontein, Delmas, Mpumalanga. Relocation of 16 graves. • Beaurivage, Relocation of 3 graves, Hartebeestpoort, North West Province. • EIMS, Rescue excavation of 2 graves, Waltloo, Pretoria, Gauteng Province. Project Manager and Permit Holder with WC Nienaber as PI.

• Xstrata Coal, Phoenix Plant. Relocation of 1 grave.

• Xstrata Coal, ATCOM East. Relocation of 53 graves.

• AGES Environmental, Sephaku Fluoride Chemical Plant, Ekandustria, Bronkhorstspruit, Gauteng Province.

• Nkomati Mine, near Badplaas, Mpumalanga Province. Relocation of approximately 70 graves in various phases.

• SMEC South Africa/Hillary Construction (on behalf of SANRAL). Relocation of 64 graves affected by the widening of the N1 at Holfontein, Kroonstad.

• Crystal Park Development Pty (Ltd). Rescue excavation of 17 graves exposed during construction activities. Crystal Park, Benoni (Current Project)

• Hatch-Goba, relocation of 30 graves from the Coega Industrial Development Zone, Port Elizabeth.

• Transnet, Relocation of 190 graves from the Coega Industrial Development Zone, Port Elizabeth.

• Glencore, relocation of 850 graves from the Tweefontein Optimisation Project, Ogies, Mpumalanga

• Rietvlei Mining, relocation of 59 graves near Middelburg, Mpumalanga (current project) • Kophia Diamonds, relocation of 5 graves exposed during mining activities. Boshoff, Free State (current project).

• Estor Properties, relocation of 90 graves from The Orchards, Pretoria (current project)

Heritage Assessments

As a heritage practitioner I have been involved with approximately 60 Heritage Impact Assessments including, but not limited to:

• Archaeological Walkdown, Hydra-Perseus Transmission line (260km), Northern Cape Province - Eskom

• Phase 2 Heritage Impact Assessment and EMP, Gamma-Omega Transmission line (550km), Western Cape Province - Nature Conservation Corporation

• Archaeological Walk Down and EMP, Eros-Neptune Transmission Line (380km), Transkei, Eastern Cape Province – Aurecon

• Phase 2 Heritage Impact Assessment in terms of the proposed Comet Ext. 8 Development, Ekurhuleni Metropolitan Municipality – Urban Dynamics

• Heritage Impact Assessment for the proposed development of Comet Ext. 14, Ekurhuleni Metropolitan Municipality, Marsh Environmental

• Nature Conservation Corporation, Phase 2 Heritage Impact Assessment and EMP, Hydra Perseus Transmission line (260km – selected areas), Northern Cape Province • Heritage Assessment, Friarsdale, Northern Cape – Afrimat

• Heritage Assessments for three SCP Projects (De Aar, Kimberley, Loeriesfontein) – SiVest • Co-Author of a Cultural Resources Management Plan for Marakele National Park. • Co-Author of a Cultural Resources Management Plan for Augrabies National Park.

**EMPLOYMENT SUMMARY**

Managing Director of PGS Heritage (Pty) Ltd 2003 - current

Director of PGS Heritage (Pty) Ltd – Lesotho

Director of PGS Heritage Africa

Shareholder in PGS Heritage Mozambique

**COUNTRIES OF WORK EXPERIENCE:**

• South Africa

**PROFESSIONAL CURRICULUM FOR MICHELLE SACHSE**

**Archaeologist for PGS Heritage**

**Summary of Experience**

Involvement in various grave relocation projects in the various provinces of South Africa.
Expertise in Heritage Impact Assessment Surveys, Historical and Archival Research, Archaeology, Fieldwork including *inter alia* -

Involvement with various Heritage Impact Assessments,

- Heritage Impact Assessments within Gauteng, Limpopo, Mpumalanga, Free State, North West and the Northern Cape and Western Cape Provinces.
- Archaeological Walkdowns for various projects.
- Desktop, archival and heritage screening for projects.
- Instrument Survey and recording for various projects.

**Heritage Impact Assessments:**

- Proposed New Pit for Msobo Coal (Spitzkop Colliery), in Ermelo, within the Mpumalanga Province. **Position:** Heritage Specialist.
- The Proposed Harmony FSS6 Reclamation Pipeline, Welkom, Free State Province. **Position:** Heritage Specialist.
- Heritage Impact Assessment Report, for the Proposed Kalgold Expansion Project between Mafikeng and Vryburg, the North West Province. **Position:** Heritage Specialist.
- Heritage Impact Assessment Report, for the Proposed Chartwell Data Centre Project in Chartwell, Johannesburg, Gauteng Province. **Position:** Heritage Specialist.
- Proposed Development on Portions of the Farm Rondebult 303 JS, Near Kwa-Guqa, Emalahleni Local Municipality, Nkangala District Municipality, Mpumalanga Province. **Position:** Heritage Specialist.
- The Buffelspoort Solar Photovoltaic (PV) Energy Facility, on Portions 75 and 134 of the Farm Buffelspoort 343 JQ, between Buffelspoort and Mooinooi, in the North West Province. **Position:** Heritage Specialist.
- Proposed Development on Portion 7 of the Farm Langkuil 363 IR, in Meyerton, within the Midvaal Local Municipality, and the Sedibeng District Municipality, in the Gauteng Province**.** **Position:** Heritage Specialist.

**Grave Relocation Projects:**

- Report on the Relocation of Graves: Relocation of 22 Graves at Nkomati Anthracite Mine on the Farm Fig Tree 503 JU, near Madadeni Mpumalanga Province.

- Report on the Relocation of Graves: Relocation of 27 Graves Located on the Farm Welstand 55 IS, near Kriel, Mpumalanga Province.
- Report on the Relocation of Graves: Relocation of 6 Graves Located on the Farm Klipfontein 241 IS, near Breyten, Mpumalanga province.
- Report on the Relocation of Graves. Relocation of 68 Graves Located at Erf 4460, 4461 and 4463, Kudube Unit 4, in Hammanskraal, Gauteng Province.

**Key Qualifications**

| | |
|---|---|
| 2016 - 2019 | MA in Archaeology<br>University of Pretoria, Pretoria |
| 2015 | BA Honours in Archaeology<br>University of Pretoria, South Africa |
| 2012 - 2014 | BA (General)<br>University of Pretoria, South Africa<br>Major subjects: Archaeology and History |

**Professional Qualifications**

Professional Archaeologist - Association of Southern African Professional Archaeologists - Professional Member – No 526

**Key Work Experience**

- 2020 – to date: Archaeologist - PGS Heritage
- 2018 – 2019: Assistant Manager at the Archaeology Laboratory on South Campus at the University of Pretoria