



SiVEST SA (PTY) LTD

**PROPOSED CONSTRUCTION OF THE KLIPKRAAL
WIND ENERGY FACILITY 2, NEAR FRASERBURG,
NORTHERN CAPE PROVINCE, SOUTH AFRICA**

Heritage Impact Assessment

DFFE Reference:	TBA
Report Prepared by:	PGS Heritage Pty Ltd
Issue Date:	6 December 2022
Version No.:	0.1

Declaration of Independence

- I, Nikki Mann, 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.

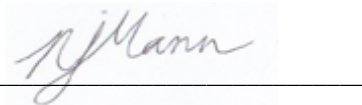
Disclosure of Vested Interest

- 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;



HERITAGE CONSULTANT: PGS Heritage (Pty) Ltd

CONTACT PERSON: Nikki Mann - Archaeologist
Tel: +27 (0) 12 332 5305
Email: nikki@pgsheritage.co.za

SIGNATURE:



ACKNOWLEDGEMENT OF RECEIPT

Report Title	Heritage Impact Assessment for the Proposed Construction of Klipkraal Wind Energy Facility 2, Near Fraserburg, Northern Cape Province, South Africa		
Control	Name	Signature	Designation
Author	Nikki Mann		Archaeologist/ PGS Heritage
Reviewed	Wouter Fourie		Principal Heritage Specialist
Reviewed			SiVEST/Environmental Division

Date:	6 12 2022
Document Title:	Heritage Impact Assessment Report
Author:	Nikki Mann
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PGS confirms that this HIA report is done in accordance with the QMS implemented by PGS Heritage. The report structure and format followed is that of SiVEST Environmental as per the appointment scope and deliverable of SiVEST. The author did implement the PGS HIA SOP and requirements.

SiVEST SA (PTY) LTD

PROPOSED CONSTRUCTION OF THE KLIPKRAAL WIND ENERGY FACILITY 2, NEAR FRASERBURG, NORTHERN CAPE PROVINCE, SOUTH AFRICA

Heritage Impact Assessment

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) has been appointed by SiVest (PTY) Ltd (hereafter referred to as “SiVEST”), on behalf of Klipkraal Wind Energy Facility 2 (Pty) Ltd (hereafter referred to as ‘Klipkraal 2’), to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed construction of the Klipkraal Wind Energy Facility (WEF), BESS and associated infrastructure near the towns of Beaufort West and Fraserburg in the Northern Cape Province of South Africa.

The proposed wind farms make up a larger wind energy facility (WEF) (with associated BESS) which will be referred to as the Klipkraal WEF, consisting of up to five (5) phases, with a combined generation capacity of up to approximately 1 500 MW, as follows:

- Klipkraal Wind Energy Facility 1: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 2: up to 300MW + BESS (**this application**)
- Klipkraal Wind Energy Facility 3: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 4: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 5: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal On-site Switching / Collector Substation and associated 132kV/400kV Power Line (part of a separate BA application).

The overall impact of the Klipkraal WEF 2, on the heritage resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised.

1. SITE NAME

The Klipkraal Wind Energy Facility 2

2. LOCATION

The proposed WEF is located approximately 30km south-east of Fraserburg, in the Northern Cape Province and is within the Karoo Hoogland Municipality (**Figure 1**).

The WEF application site incorporates the following farm portions:

- Remainder of the Farm Matjiesfontein No. 409 (RE/409)
- Remainder of the Farm Klipfontein No. 447 (RE/447)
- Portion 1 of the Farm Klipfontein No. 447 (1/447)



Figure 1: Regional Context Map.

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

It is anticipated that the proposed Klipkraal WEF 2 will comprise approximately sixty (60) wind turbines with a maximum total energy generation capacity of up to approximately 300MW (**Figure 2**). The electricity generated by the proposed WEF development will be fed into the national grid via a 132kV/400kV overhead power line. A Battery Energy Storage System (BESS) will be located next to the onsite 11-66/132-140kV substation. The storage capacity and type of technology would be confirmed prior to construction. This information will be provided to I&AP's prior to the commencement of construction.



Figure 2: Klipkraal WEF 2 Site Locality.

4. HERITAGE RESOURCES IDENTIFIED

A selective survey of the study area was conducted between 22-27 September 2021. Farmsteads and structures were documented from their property boundaries when access was restricted. Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

4.1 Archaeology, built environment and burial grounds and graves

The fieldwork conducted in 2021 within the Klipkraal WEF 2 study area identified two (2) structures and one findspot.

- 1 stone shepherds' shelter (**K-08**) was rated as having low heritage significance.
- 1 stone ruin farmstead (**K-05**) was rated as having medium heritage significance.
- 1 Low density MSA scatter (**FS-03**) was rated as having low heritage significance.

4.2 Palaeontology

The Palaeontological Impact assessment (PIA) conducted by Butler (2022) determined that that the south-western portion as well as a small portion in the development is underlain by Jurassic Dolerite while the rest of the footprint is underlain by the Teekloof Formation of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup).

The PalaeoMap of the South African Heritage Resources Information System indicates that the Palaeontological Sensitivity of the Jurassic Dolerite is Zero as it is igneous in origin and thus unfossiliferous while that of the Adelaide Subgroup is Very High (Almond and Pether, 2009; Almond *et al.*, 2013). Large areas in the development are underlain by white and indicates that these areas have not been allocated so a specific Palaeontological Sensitivity. This Map differs considerable from the Geological Map.

Updated Geology (Council of Geosciences, Pretoria; refines the geology of the 1983 Geological Map and indicates that the entire Klipkraal WEF 2 is underlain by the Middleton Formation (Adelaide Subgroup, Beaufort Group).

In the last few decades extensive research and collecting have been conducted by palaeontologists in this part of the basin and the Fraserburg area was found to be highly fossiliferous. A three day-site-specific field survey of the development footprint was conducted on foot 24-26 September 2021. Various fossiliferous sites, where fossils were found to be well-preserved, has been identified in the development footprint.

5. ANTICIPATED IMPACTS ON HERITAGE RESOURCES

The pre-construction and construction phase of the proposed WEF will entail extensive surface clearance as well as excavations into the superficial sediment cover and underlying bedrock (e.g., for widened or new access roads, wind turbine foundations, hardstanding areas, on-site substation, underground cables, construction laydown area, O&M building and BESS).

Construction of the facility may adversely affect potential archaeological and fossil heritage within the development footprint by damaging, destroying, disturbing or permanently sealing-in fossils preserved at or beneath the surface of the ground that are then no longer available for scientific research or other public good.

The possible pre-construction impacts calculated on the tangible cultural heritage resources is overall **VERY HIGH** to **MODERATE NEGATIVE** rating but with the implementation of the recommended buffers and management guidelines will be reduced to a **MEDIUM - LOW NEGATIVE** impact.

6. RECOMMENDATIONS

The calculated impact as summarised in **Section 9** of this report confirms the impact of the new Klipkraal WEF 2 will be reduced with the implementation of the mitigation measures. This finding in addition to implementing a chance finds procedure, as part of the EMP, will mitigate possible impacts on unidentified heritage resources.

The following mitigation measures will be required if associated infrastructure does encroach upon the identified heritage sites:

- 30m buffer zone around historical farmstead
- 50m buffer around graves
- It is essential that a walk down survey of the final footprint of the new Klipkraal WEF 2 and associated grid connection infrastructure be conducted.
- A management plan for the heritage resources then needs to be compiled and approved for implementation during construction and operations.

In terms of the PIA:

As the site visit was conducted in 2021 the layout of the WEF was not yet known. The specific layout of the Klipkraal WEF 2 development was thus not investigated in detail.

It is thus recommended that a Palaeontological Walkdown of the development is conducted when the layout of the roads and turbines have been established.

The appointed Palaeontologist will also have to include a Chance Find Protocol for the Klipkraal WEF 2 development and training of accountable supervisory personnel by a qualified palaeontologist in the recognition of fossil heritage is necessary.

General

The overall impact of the Klipkraal WEF 2, on archaeological and fossil heritage, is seen as **very high to medium** before mitigation. Once the recommendations have been implemented, the impacts can be mitigated to a **Medium to Low** level.

7. ADDITIONAL SURVEY

An additional survey of the Klipkraal WEFs 1-3 final development area was conducted by a qualified archaeologist (Henk Steyn) and field assistant (Xander Fourie) from PGS (8-10 November 2022). This has been requested by the SAHRA, as it was noted that the initial survey of the study area, as part of the HIA, was minimal (**Figure 3, Figure 4**).

Four (4) additional heritage resources were recorded within the study area during this fieldwork (**Figure 5**). These included:

- One (1) site with old irrigation infrastructure (**0187**) was rated as having low heritage significance.
- One (1) site with the remains of a stone kraal (**0184**) that was rated as having low heritage significance.
- One (1) Findspot (**0185**) was rated as having low heritage significance.
- One (1) possible grave site (**0186**) was rated as having medium-high heritage significance.

From an archaeological and historical structure perspective, the proposed footprint areas will not change the impact on the identified heritage resources in the HIA. As such the recommended mitigation measures as described in the report remain.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout

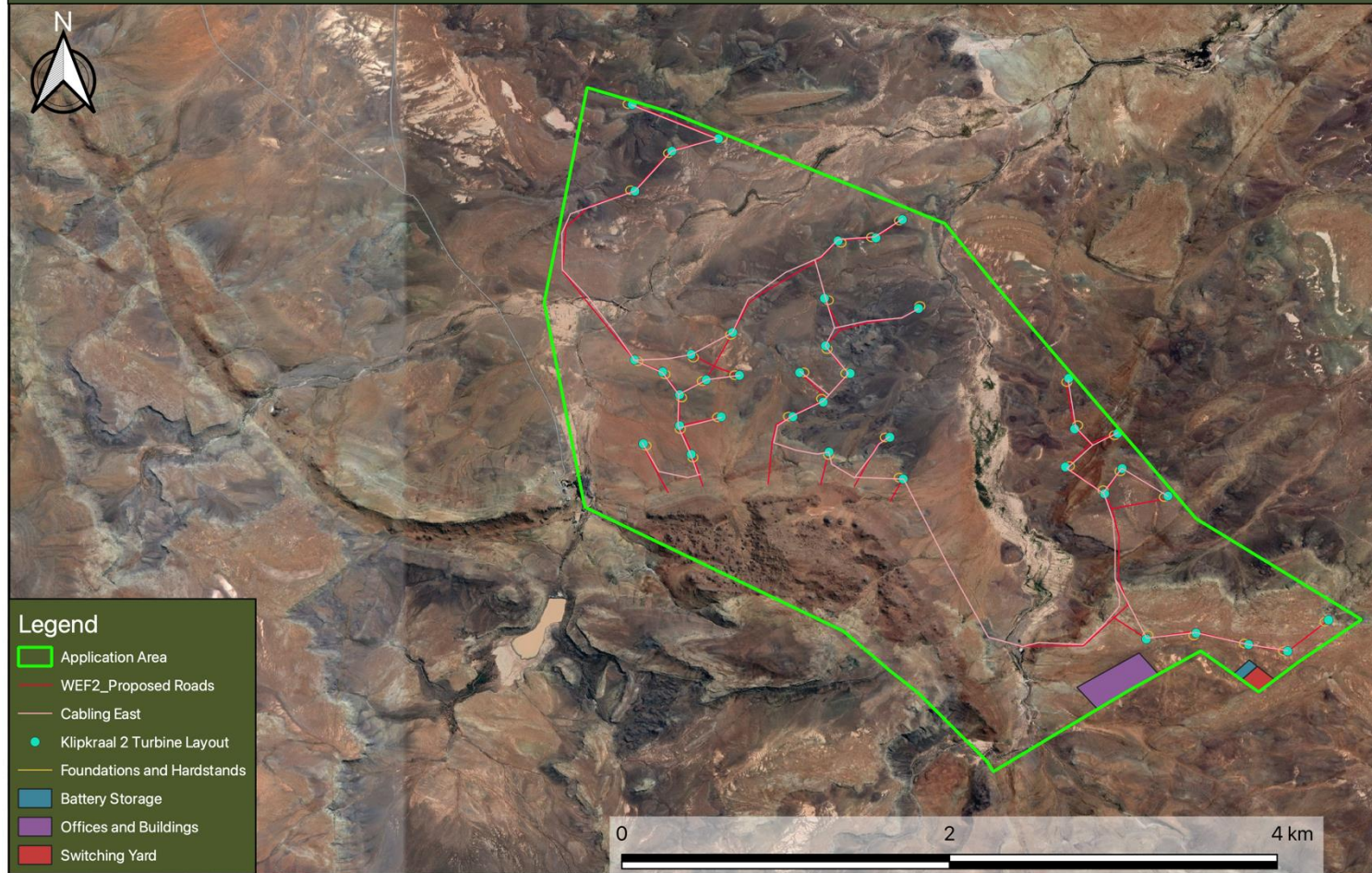


Figure 3: Final proposed development area.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout and Combined Survey Tracks

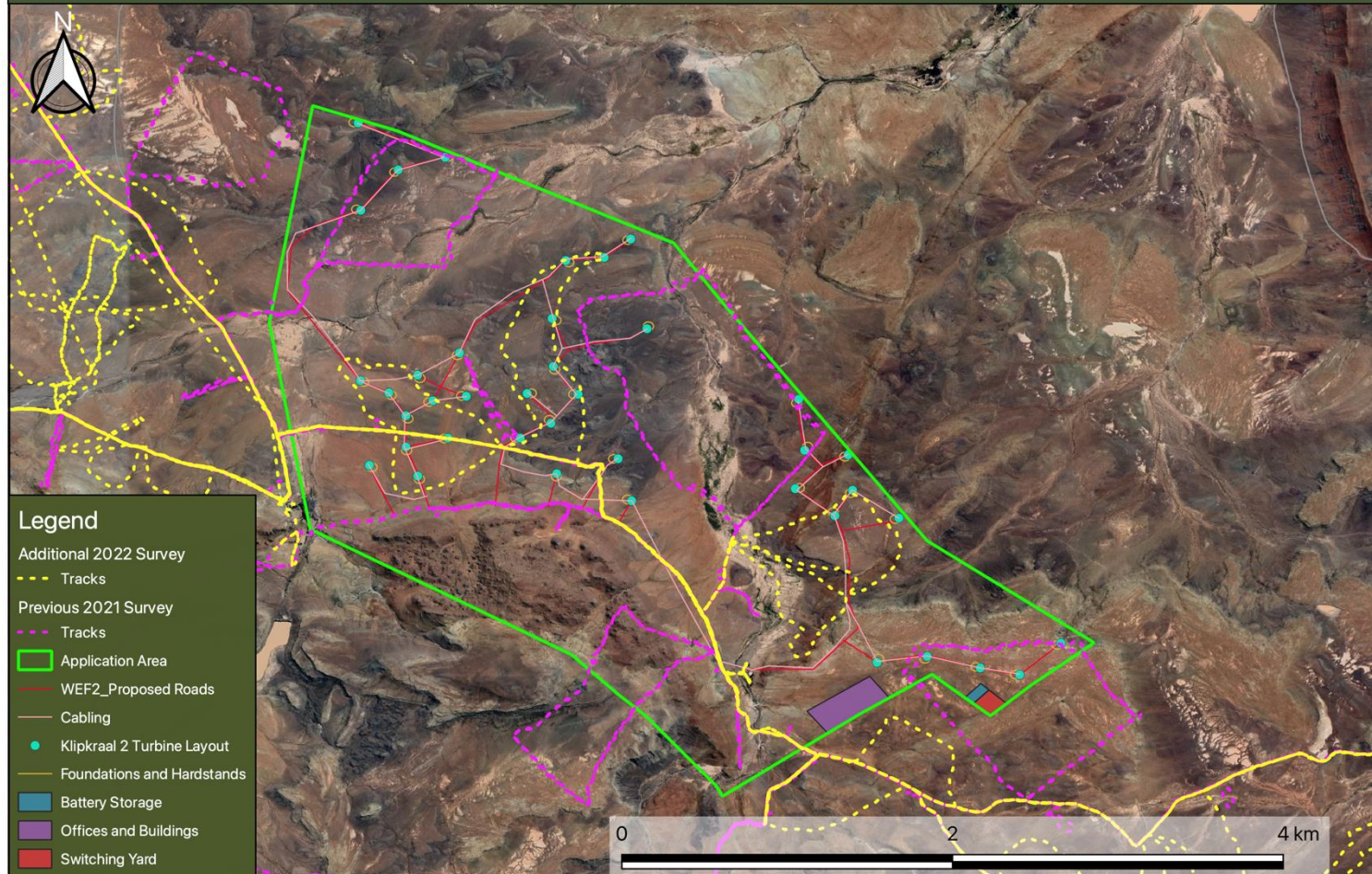


Figure 4: Final proposed development area relative to all the survey tracks.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout and Combined Heritage Resources

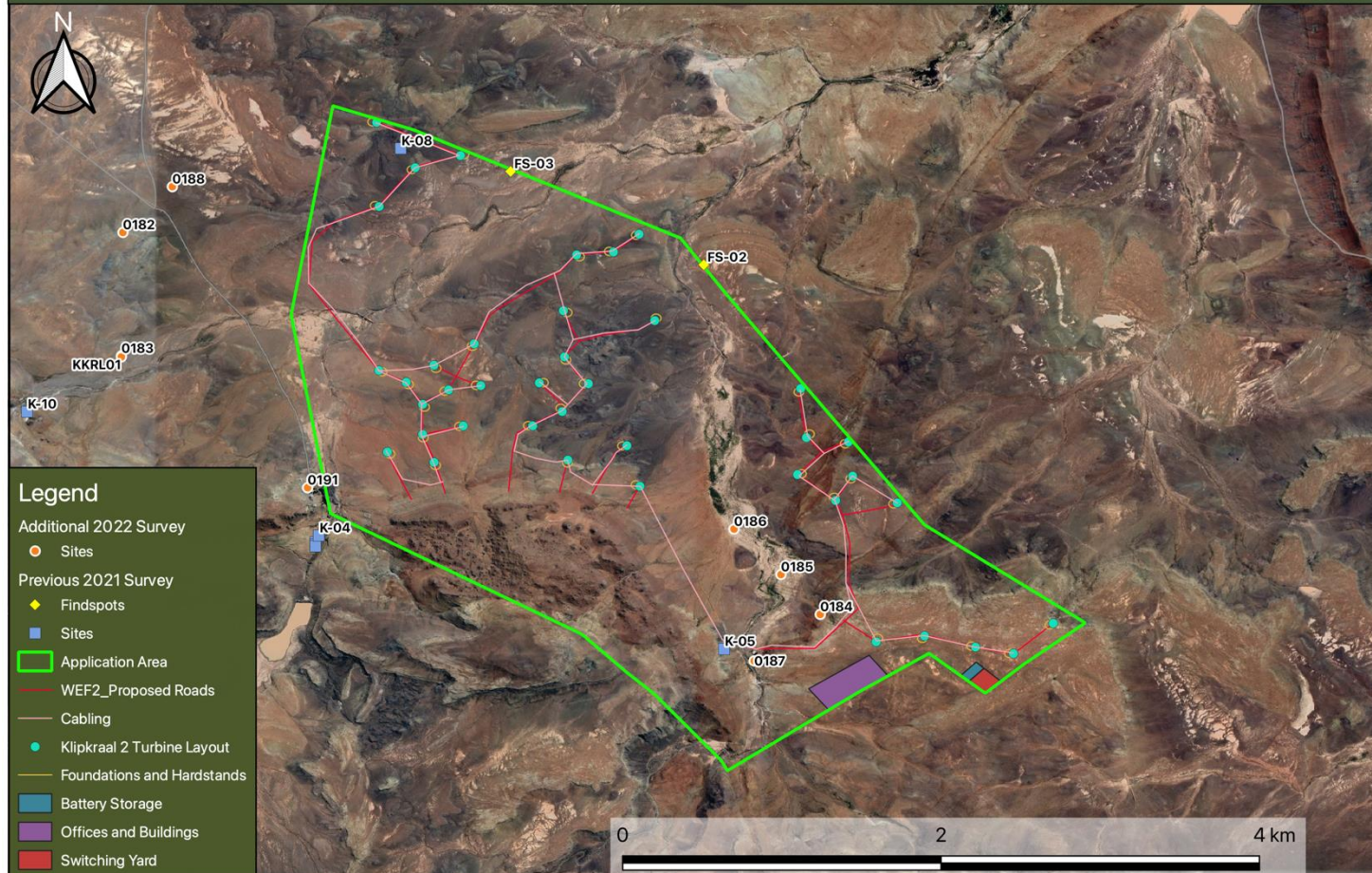


Figure 5: Final proposed development area relative to the locality of the heritage resources identified within the study area.

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) - REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	Page ii of Report- Contact details and company
a) details of-	
i. the specialist who prepared the report; and	
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.2 and Appendix A
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 2
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 8, 10
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 2
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 8, 10
g) an identification of any areas to be avoided, including buffers;	Section 7.3 and 8
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 8
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 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) or activities;	Section 8, 10
k) any mitigation measures for inclusion in the EMPr;	Section 8, 11 and 12
l) any conditions for inclusion in the environmental authorisation;	
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 8 and 12
n) a reasoned opinion-	Section 12
i. (as to) whether the proposed activity, activities or portions thereof should be authorised;	
(iA) regarding the acceptability of the proposed activity or activities; and	
ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	
q) any other information requested by the competent authority.	
2) Where a government notice <i>gazetted</i> 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.	NEMA Appendix 6 and GN648

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Heritage Impact Assessment

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APPENDIX C: Site Sensitivity Verification Report

Glossary of Terms

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 20 000 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 20 000-300 000 years ago, associated with early modern humans.

Site

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

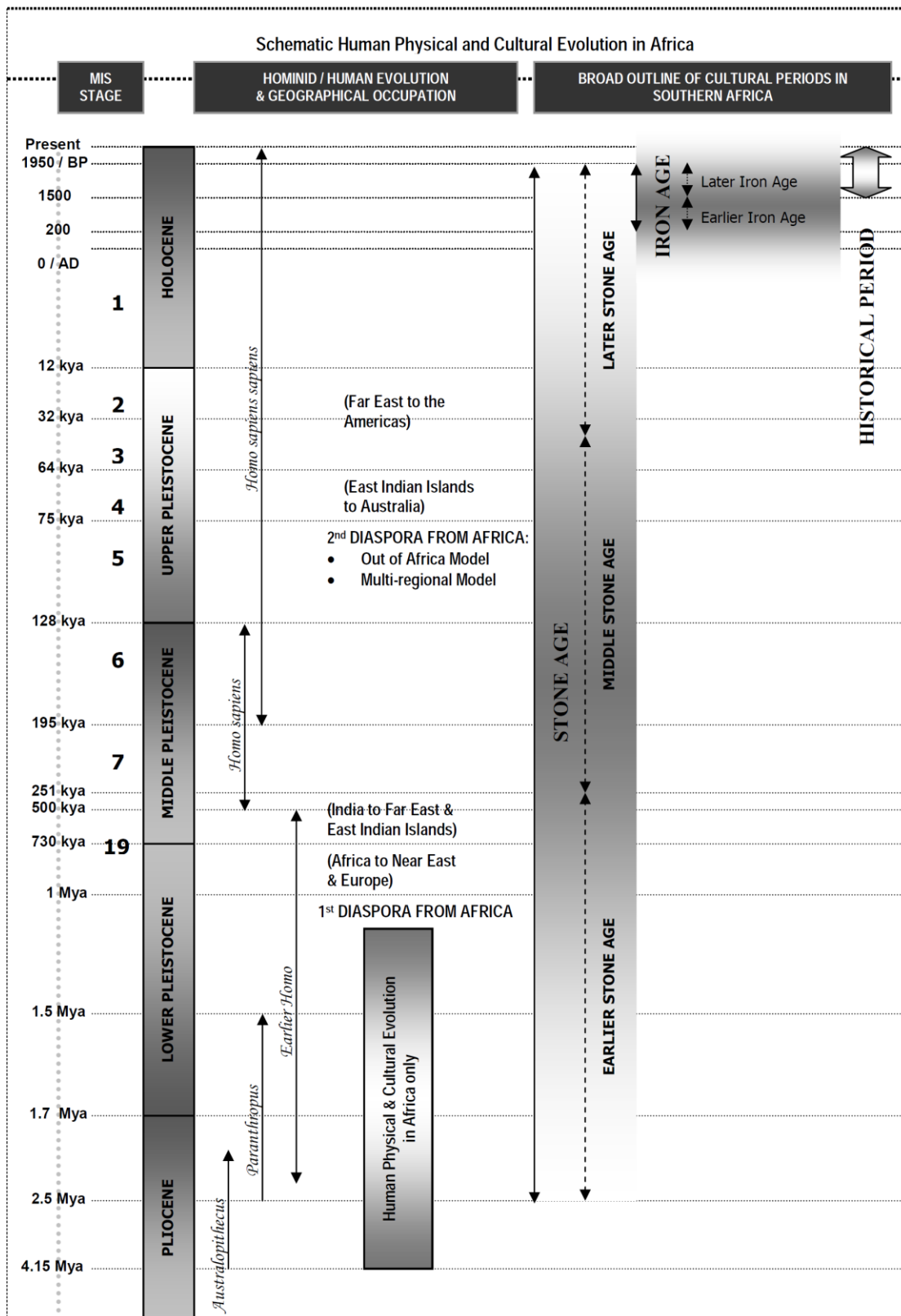


Figure 6: Human and Cultural Timeline in Africa (Morris, 2008).

List of Abbreviations

Abbreviations	Description
AIA	Archaeological Impact Assessment
Aura	Aura Development Company (Pty) Ltd
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DFFE	Department of Environment, Forestry and Fisheries
ECO	Environmental Control Officer
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
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
MTS	Main Transmission Substations
NCW	Not Conservation Worthy
NEMA	National Environmental Management Act
Ngwao-Boswa	Ngwao-Boswa Jwa Kapa Bokone
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SiVEST	SiVest (PTY) Ltd
WEF	Wind Energy Facility

SiVEST SA (PTY) LTD

PROPOSED CONSTRUCTION OF THE KLIPKRAAL WIND ENERGY FACILITY 2, NEAR FRASERBURG, NORTHERN CAPE PROVINCE, SOUTH AFRICA

Heritage Impact Assessment

1. INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) has been appointed by SiVest (PTY) Ltd (hereafter referred to as “SiVEST”), on behalf of Klipkraal Wind Energy Facility 2 (Pty) Ltd (hereafter referred to as ‘Klipkraal 2’), to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed construction of the Klipkraal Wind Energy Facility (WEF), BESS and associated infrastructure near the towns of Beaufort West and Fraserburg in the Northern Cape Province of South Africa.

The proposed wind farms make up a larger wind energy facility (WEF) (with associated BESS) which will be referred to as the Klipkraal WEF, consisting of up to five (5) phases, with a combined generation capacity of up to approximately 1 500 MW, as follows:

- Klipkraal Wind Energy Facility 1: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 2: up to 300MW + BESS (**this application**)
- Klipkraal Wind Energy Facility 3: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 4: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 5: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal On-site Switching / Collector Substation and associated 132kV/400kV Power Line (part of a separate BA application).

The overall objective of the development is to generate electricity by means of renewable energy technology capturing wind energy to feed into the National Grid.

It is anticipated that the proposed Klipkraal WEF 2 will comprise sixty (60) wind turbines with a maximum total energy generation capacity of up to approximately 300MW. The electricity generated

by the proposed WEF development will be fed into the national grid via a 132kV/400kV overhead power line. A Battery Energy Storage System (BESS) will be located next to the onsite 33/132kV substation. The storage capacity and type of technology would be determined at a later stage during the development phase, but most likely will comprise an array of containers, outdoor cabinets and/or storage tanks.

In terms of the Environmental Impact Assessment (EIA) Regulations, which were published on 04 December 2014 [GNR 982, 983, 984 and 985) and amended on 07 April 2017 [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities under GNR 327 and GNR 324 which may have an impact on the environment and therefore require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries and Environment (DFFE), prior to the commencement of such activities. Specialist studies have been commissioned to assess and verify the project under the new Gazetted specialist protocols.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development areas. The report aims to inform the EIA in the development of a comprehensive EMP to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act (Act 25 of 1999) (NHRA).

1.2 Specialist Credentials

This study was compiled by PGS and its appointed specialists and is detailed below:

The staff at PGS has a combined experience of nearly 90 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Ms. Nikki Mann, author of this report, graduated with her Master's degree (MSc) in Archaeology and is registered as a Professional Archaeologist with the Association of Southern African Professional Archaeologists (ASAPA).

Wouter Fourie, the Project Coordinator, is registered with the 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).

Table 1: 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. 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. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by Ngwao-Boswa Jwa Kapa Bokone is the Provincial Heritage Resources Authority of the Northern Cape Province (Ngwao-Boswa). 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. 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 2: 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. 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. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by Ngwao-Boswa.	Exceptionally High Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage 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. 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. 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. 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. 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 alterations should not necessarily be regulated.	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 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. 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 the mountainous terrain of the farms which made access and thus coverage of the farms difficult. The size of the survey areas also meant that we were unable to assess every proposed wind turbine. It was decided to place more focus on specific sensitive areas (incl. ridges, pans, river valleys) which were considered more likely to contain archaeological sites.

As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.

Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out in **Section 5**.

In terms of the PIA, the following identified limitations should be noted:

The focal point of geological maps is the geology of the area and the sheet explanations of the Geological Maps were not meant to focus on palaeontological heritage. Many inaccessible regions of South Africa have never been reviewed by palaeontologists and data is generally based on aerial photographs alone. Locality and geological information of museums and universities databases have not been kept up to date or data collected in the past have not always been accurately documented.

Comparable Assemblage Zones in other areas is also used to provide information on the existence of fossils in an area which has not documented in the past. When using similar Assemblage Zones and geological formations for Desktop studies it is generally **assumed** that exposed fossil heritage is present within the footprint. A field-assessment has thus been conducted to improve the accuracy of the desktop assessment.

4. TECHNICAL DESCRIPTION

4.1 Project Location

The proposed WEF is located approximately 30km south-east of Fraserburg, in the Northern Cape Province and is within the Karoo Hoogland Municipality (**Figure 7**).



Figure 7: Regional Context Map.

4.1.1 WEF

The WEF application site as shown on the locality map below (**Figure 8**) incorporates the following farm portions:

- Remainder of the Farm Matjiesfontein No. 409 (RE/409)
- Remainder of the Farm Klipfontein No. 447 (RE/447)
- Portion 1 of the Farm Klipfontein No. 447 (1/447)

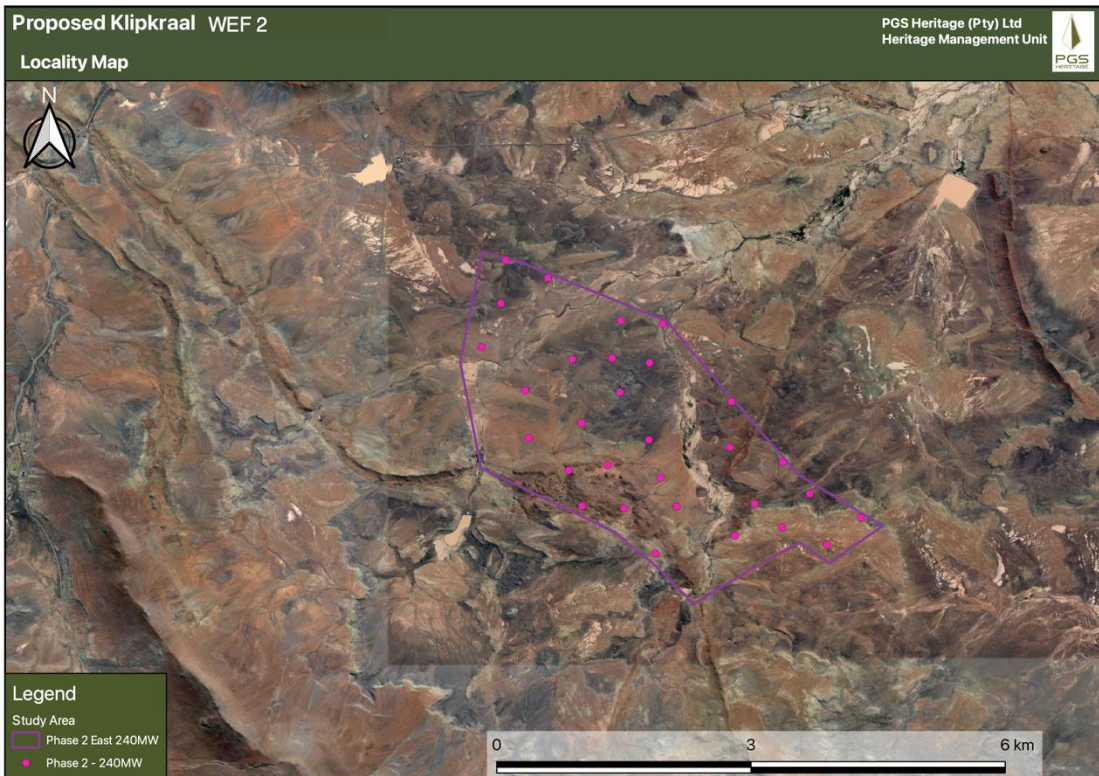


Figure 8: Klipkraal WEF 2 Site Locality.

4.2 Project Description

It is anticipated that the proposed Klipkraal WEF 2 will comprise sixty (60) wind turbines with a maximum total energy generation capacity of up to approximately 300MW. The electricity generated by the proposed WEF development will be fed into the national grid via a 132kV overhead power line. The location of the BESS and substation will be confirmed during the EIA phase. The storage capacity and type of technology would be determined at a later stage during the development phase, but most likely will comprise an array of containers, outdoor cabinets and/or storage tanks.

4.2.1 Wind Farm Components

The proposed wind farm projects which form part of the larger Klipkraal WEF will each include the following components:

4.2.1.1 Wind Turbines

Wind Energy Facility	Capacity	No. of turbines
1	300 MW	60
2	300 MW	60
3	300 MW	60
4	300 MW	60
5	300 MW	60

- Approximately 60 turbines per wind farm, with a maximum export capacity of up to approximately 300MW for each wind farm. This will be subject to allowable limits in terms of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or any other program.
- Each wind turbine will have a maximum hub height of up to approximately 200m;
- Each wind turbine will have a maximum rotor diameter of up to approximately 200m;
- Permanent compacted hard standing areas / platforms (also known as crane pads) of approximately 100m x 100m (total footprint of approx. 410 000m²) per wind turbine during construction and for on- going maintenance purposes for the lifetime of the proposed wind farm projects. This will however depend on the physical size of the wind turbine;
- Each wind turbine will consist of a foundation (i.e., foundation rings) which may vary in depth, from approximately 3m and up to 10m or greater, depending on the physical size of each wind turbine. It should be noted that the foundation can be up to as much as approximately 700m³.

4.2.1.2 Electrical Transformers

- Electrical transformers will be constructed near the foot of each respective wind turbine in order to step up the voltage to 66kV.
- The typical footprint of the electrical transformers is up to approximately 10m x 10m but can be up to 20m x 20m at certain locations.

4.2.1.3 Step-up/Collector Substations

- New 11-66/33-400kV step-up / collector substations, each occupying an area of up to approximately 2ha, for each wind farm being proposed [i.e., one (1) substation per phase].
- The proposed substations will include an Eskom portion and an Independent Power Producer (IPP) portion; hence the substations have been included in each respective wind farm EIA and in the grid connection infrastructure BA (substations, switching stations and power lines) to allow for handover to Eskom.
- Following construction, the substations will be owned and managed by Eskom. The current applicant will retain control of the medium voltage components (i.e., 33kV components) of the

substations, while the high voltage components (i.e., 400kV components) of these substations will likely be ceded to Eskom shortly after the completion of construction.

4.2.1.4 *Main Transmission Substations (MTS)*

- Two (2) new 132/400kV Main Transmission Substations (MTS) are being proposed, occupying an area of up to approximately 120ha each.
- Each proposed MTS will include an Eskom portion and an IPP portion. However, a separate substation has also been included in each respective wind farm EIA and in the grid connection infrastructure BA to allow for handover to Eskom.
- Following construction, the substations will be owned and managed by Eskom. The current applicant will retain control of the 132-400kV and lower voltage components of each MTS, while the 132/400kV voltage components of each MTS will likely be ceded to Eskom shortly after the completion of construction.

4.2.1.5 *Electrical Infrastructure*

- The wind turbines will be connected to the proposed substations via medium voltage (i.e., 33kV) cables.
- These cables will be buried along access roads wherever technically feasible, however, the cables can also be overhead (if required).
- Each WEF will then connect to the MTS via a 400kV line.

4.2.1.6 *Battery Energy Storage Systems (BESS)*

- A Battery Energy Storage System (BESS) will be constructed for each respective wind farm [i.e., one (1) BESS per phase] and will be located next to the 33-66/132-400kV step-up / collector substations which form part of the respective wind farms, or in between the wind turbines.
- It is anticipated that the type of technology will be either Lithium Ion or Sodium-Sulphur (or as determined prior to construction).
- These batteries are not considered hazardous goods as they will be storing 'energy'.
- The size, storage capacity and type of technology will be determined / confirmed prior to construction.

4.2.1.7 *Roads*

- Internal roads with a width of up to approximately 15m will provide access to each wind turbine.
- Existing site roads will be used wherever possible, although new site roads will be constructed where necessary.
- Existing site roads may also be upgraded using temporary concrete stones in order to accommodate for the heavy loads.

- Turns will have a radius of up to 50m for abnormal loads (especially turbine blades) to access the various wind turbine positions.

4.2.1.8 *Site Access*

- The proposed wind farm application sites will be accessed via existing gravel roads from the R353 Regional Route.

4.2.1.9 *Temporary Staging Areas*

- Temporary staging areas will be required for each wind farm and will be located both at the foot of each wind turbine and at the storage facility (i.e., turbine development area) to allow for working requirements.
- One (1) temporary staging area per wind turbine / range of wind turbines will be required for each wind farm (i.e., for each phase).
- Temporary staging areas will cover an area of up to approximately 100m x 100m (10 000m² / 1ha) each.

4.2.1.10 *Temporary Construction Camps*

- Temporary construction camps will be required during the construction phase. One (1) temporary construction camp per wind farm is being proposed [i.e., one (1) per phase].
- This area will be used as a permanent maintenance area during the operational phase. One (1) permanent Maintenance Area will be required per wind farm [i.e., one (1) per phase].
- Each combined Temporary Construction Camp / Permanent Maintenance Area will cover an area of up to approximately 2.25ha.
- A cement batching plant as well as a chemical storage area will fall within each Temporary Construction Camp and Permanent Maintenance Area.
- Each Temporary Construction Camp and Permanent Maintenance Area will be strategically placed around the proposed wind farm sites and will avoid all high sensitivity and/or 'no-go' areas.

4.2.1.11 *Offices, Accommodation, a Visitors' Centre and Operation & Maintenance (O&M) Buildings*

- Offices (including ablution facilities), Accommodation (including ablution facilities), a Visitors' Centre and Operation & Maintenance (O&M) buildings will be required and will occupy areas of up to approximately 100m x 100m (i.e., 1ha).
- Each wind farm (i.e., each phase) will have its own O&M building and Office, however, the Accommodation and Visitors' Centre will be centralised locations which will be shared between

certain wind farm projects (i.e., shared between certain phases which will be confirmed at a later stage).

4.2.1.12 *Septic Tank and Soak-Away Systems*

- Each wind farm will consist of septic tank and soak-away systems.
- This will be required for construction as well as long term use.
- Septic tanks and soak-away systems will be placed 100m or more from water resource (which includes boreholes).

4.2.1.13 *Wind Measuring Lattice Masts*

- Two (2) wind measuring lattice masts (approximately 120m in height) have already been strategically placed within the wind farm application sites in order to collect data on wind conditions.
- Two (2) additional wind measuring lattice masts may be installed within the wind farm application sites. This will be confirmed at a later stage, prior to the respective application forms being submitted.

4.2.1.14 *Fencing*

- Fencing will be required and will surround each respective wind farm.
- A maximum height of 3m for the fencing is proposed. The area which the fencing will cover will be confirmed during the detailed design phase, prior to construction commencing. The type of fencing to be used will be either palisade or diamond/clear view/mesh.
- Fences will however be constructed according to specifications recommended by the Ecologist and Avifauna specialist (as per the EMPr).

4.2.1.15 *Temporary Infrastructure to Obtain Water from Available Local Sources*

- Temporary infrastructure to obtain water from available local sources will be required. Water may also be obtained from onsite boreholes and from the town of Fraserburg.
- New or existing boreholes, including a potential temporary above ground pipeline (approximately 50cm in diameter) for each wind farm, to feed water to the sites are being proposed.
- Water will potentially be stored in temporary water storage tanks.

4.2.1.16 *Temporary Containers*

- Temporary containers of up to approximately 80m³ will be required for the storage of fuel on-site during the construction phase of each wind farm.
- As mentioned, a chemical storage area will fall within the Temporary Construction Camp and permanent Maintenance Area.

4.3 Layout Alternatives

4.3.1 *Wind Energy Facility*

Design and layout alternatives will be considered and assessed as part of the EIA. These include alternatives for the Substation locations and also for the construction / laydown area.

4.3.2 *No-go Alternative*

The 'no-go' alternative is the option of not undertaking the proposed WEF infrastructure project. Hence, if the 'no-go' option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

5. LEGAL REQUIREMENT AND GUIDELINES

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

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

5.1.1 Section 35 – Archaeology, Palaeontology and Meteorites

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

5.1.2 Section 36 – Burial Grounds & Graves

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

Permitting requirements for burial grounds and graves older than 60 years (prehistoric) and historic burials to the SAHRA:

- a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves.
- b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

- c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- d) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant.

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

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

Permitting requirements for demolition of built environment features:

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.
- b) the construction of a bridge or similar structure exceeding 50 m in length.
- c) any development or other activity which will change the character of a site,
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iii. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resource authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent; or
- e) any other category of development provided for in regulations by HWC or a provincial heritage resources authority

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

This is an HIA submitted to the relevant authority in terms of Section 38(8) of the National Heritage Resources Act. The commenting authority is the SAHRA.

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

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

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

5.1.4 Notice 648 of the Government Gazette 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments¹ were published by SAHRA and Heritage Western Cape²³, 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 3** and the applicable section in this report noted. The screening tool indicated a low archaeological and cultural heritage significance (**Figure 9**) and a very high to medium palaeontological significance (**Figure 10**).

Table 3 : 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 7	
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 6	-

¹ South African Heritage Resources Agency. 2007. *Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports*. May 2007.

² Heritage Western Cape. 2016. *Guide for Minimum Standards for Archaeology and Palaeontology Reports Submitted to Heritage Western Cape*. June 2016.

³ Heritage Western Cape 2016. *Guidelines for Heritage Impact Assessments required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999)*.

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 6	-
2.3(b) contains motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity;	Section 6 provides a description of the current use and confirms/doesn't confirm the status in the screening report.	-

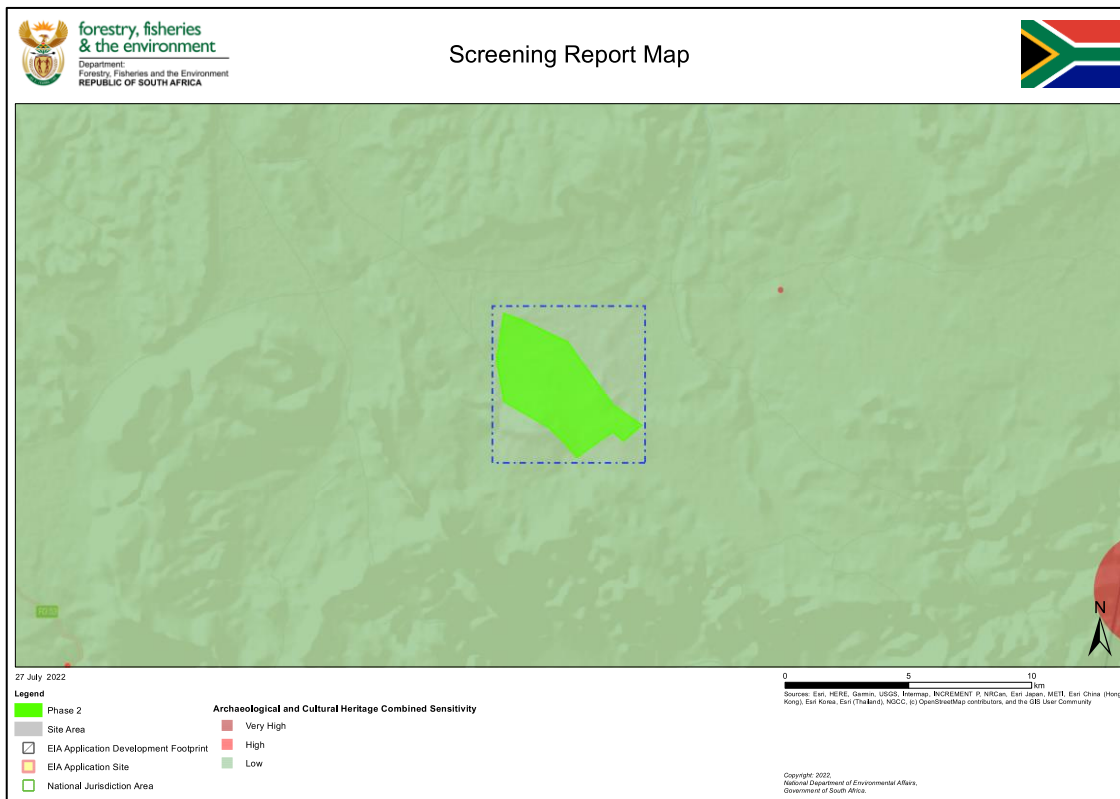


Figure 9: Archaeological sensitivity map for Klipkraal WEF 2 project area abstracted from the DFFE Screening tool.

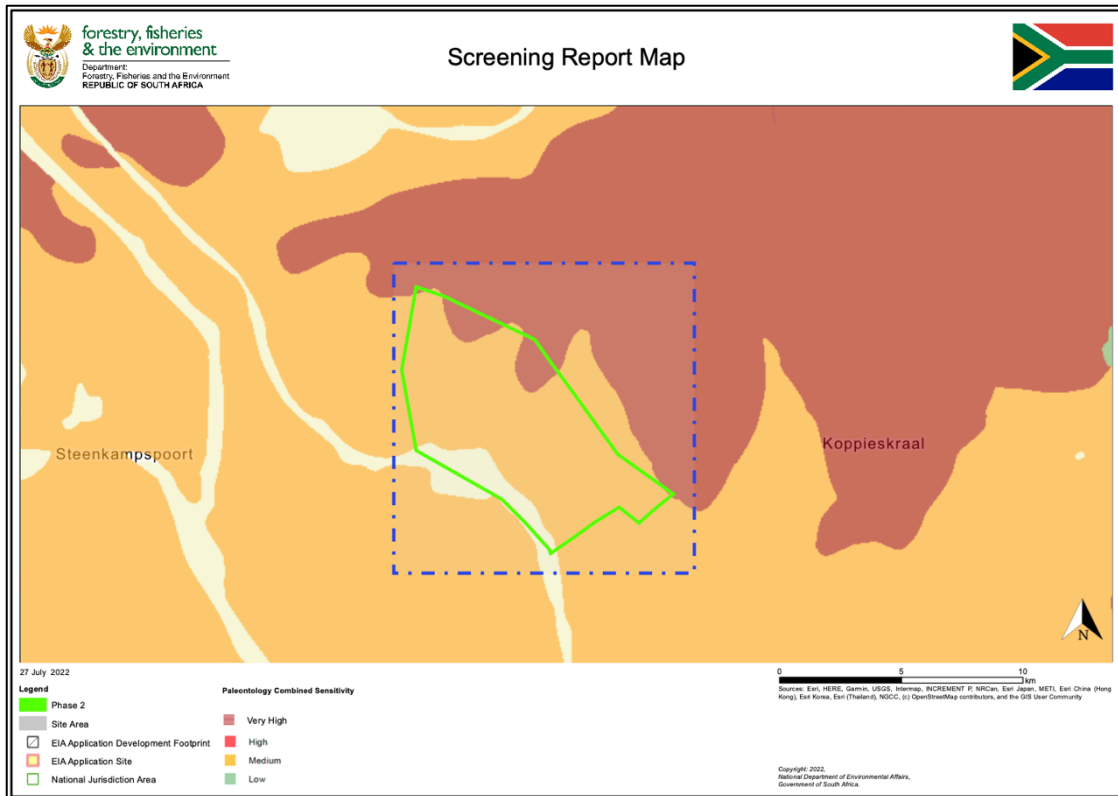


Figure 10: Palaeontological sensitivity map for Klipkraal WEF 2 project area abstracted from the DFFE Screening tool.

5.1.5 NEMA – Appendix 6 requirements

The HIA report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) Appendix 6 requirements for specialist reports as indicated in the table on page vi and vii of this report.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

In this section, the general description of the Klipkraal WEF region is described based on a site visit that was conducted by an archaeologist and field assistant from the 22nd-27th September 2021.

The proposed Klipkraal WEF is located near Fraserburg, in the Northern Cape Province and is within the Karoo Hoogland Municipality. The study area is accessed via the tar R356, gravel roads and farm tracks (**Figure 31**). Existing infrastructure includes farmsteads with associated structures, fences (**Figure 32**), drystone walling (**Figure 28**), windmills, dams (**Figure 23**) and borrow pits (**Figure 26**). Radio masts and trigonometric beacons were also observed within the study area. The main Klipkraal farmstead and associated labourer's dwellings, are currently occupied with the nearest proposed turbine situated more than 700m away (**Figure 29, Figure 30**).

The study area is situated in the Nama-Karoo region of the Northern Cape. Most rainfall occurs during the summer period and the majority of the rivers in the region are non-perennial (**Figure 16, Figure 17**). Currently, the region has been experiencing drought conditions for the last 8 years. Summers are hot, with temperatures greater than 30°C, and winters cold with minimums of 0°C.

The topography is comprised of flat plains, rocky scree slopes (**Figure 18**) and mountainous regions ranging from approximately 1380 amsl to 1900 amsl (**Figure 11, Figure 12, Figure 13, Figure 14, Figure 15**). The area is underlain by a succession of sedimentary rocks comprising Beaufort and Ecca Group fossiliferous shale, mudstone and sandstone units. The sedimentary units are intruded by numerous igneous dykes and sills (**Figure 19, Figure 20**). Soils are generally shallow with large areas of exposed rock outcrop. Several areas of the study area are characterised by aeolian sands with widespread deflation zones (**Figure 22, Figure 24**). Erosion in the area includes sheet wash, gully erosion, rill erosion and aeolian erosion (**Figure 25**). The wind erosion accounts for many of the sandy areas within the study area's plains and flat mountain/hill tops (**Figure 21**). Bioturbation was evident throughout the study area and included aardvark/porcupine burrows (**Figure 27**), rabbit/mole warrens and widespread tracks caused by the movement of sheep.

Vegetation cover is dominated by low (dwarf) shrubs intermixed with grasses, succulents, geophytes and annual forbs (Mucina & Rutherford, 2006). As a result, the archaeological visibility of the area was ideal for surveying. Taller shrubs and trees occur along drainage lines and on rocky outcrops. Drought and overgrazing accounts for the stunted and limited distribution of vegetation. The main form of agriculture in the region is sheep farming. Other livestock encountered included horses and small game.



Figure 11: Typical Karroo landscape of low-lying plains with flat topped hills and mountains (facing south).



Figure 12: Hill and mountainous region with flat-lying stratigraphy (facing south).



Figure 13: General view from southern portion of the additional proposed wind farm, showing a deflation zone in the distance with sparsely vegetated stony and sandy soils.



Figure 14: Scree slope developed at the base of a hill with numerous angular rock fragments.



Figure 15: Common rock pavement found in the region.



Figure 16: Ephemeral stream developed at base of hill.



Figure 17: Typical ephemeral stream in low-lying area with coarse grained sands.



Figure 18: Rocky slope comprising sandstone-mudstone rock fragments.



Figure 19: Flat lying Karroo sediments with gabbro-dolerite sill at the top of Klipkraal se Berg (near southwestern farm boundary).



Figure 20: Resistant gabbro outcrop at top of hill with commonly occurring rounded boulders in the northern portion of the additional proposed wind farm area.



Figure 21: Aeolian orange-brown sands on low-lying plain.



Figure 22: Deflation zone commonly observed within low-lying plains in the study area.



Figure 23: Large dry dam observed in the study area.



Figure 24: Deflation zone with typical mud cracks.



Figure 25: Typical erosion of orange-brown soils at base of hill (near western farm boundary).



Figure 26: One of numerous borrow pit in the study area.



Figure 27: Typical bioturbation occurring in the region.



Figure 28: Dry stone walling observed within the study area.



Figure 29: View of Klipkraal main farmhouse and farm labourers' accommodation.



Figure 30: Close-up of the Klipkraal main farmhouse.



Figure 31: Farm track observed on the property (facing north).



Figure 32: Fencing demarcating farm grazing areas.

7. BACKGROUND RESEARCH

The previous section provided a topographical description of the proposed development area. This section seeks to describe the historical origins of the receiving environment. The examination of heritage databases, historical data and cartographic resources represents a critical additional tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Therefore, an internet literature search was conducted, and relevant archaeological and historical texts were also consulted. Relevant topographic maps and satellite imagery were studied.

7.1 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 various years (1972, 1986, 2005) were 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, ruins 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.

The relevant topographical maps include:

- Extract from Cape of Good Hope, **1836. (Figure 33)**
- Extract from South Africa (with) Environs of the Cape, **1883 (Figure 34)**
- Beaufort West, **1901 (Figure 35)**
- Beaufort West, **1901. 3rd ed (Figure 36)**
- First Edition- 3221BB Topographical Sheet was based on aerial photography undertaken in 1965, was surveyed in **1972** and was drawn in 1973 by the Director – General of Surveys.
- Second Edition- 3221BB Topographical Sheet Published by the Chief Director of Surveys and Mapping, Mowbray, **1986**

Furthermore, from the Chief Surveyor-General database (<http://csg.dla.gov.za/>) the following Farm was surveyed:

- Farm Klipfontein 447 was surveyed by (Sgd.) Capt. Bird in June 1830 for the Widow of Johan George Seiberhagen (**Figure 37**)

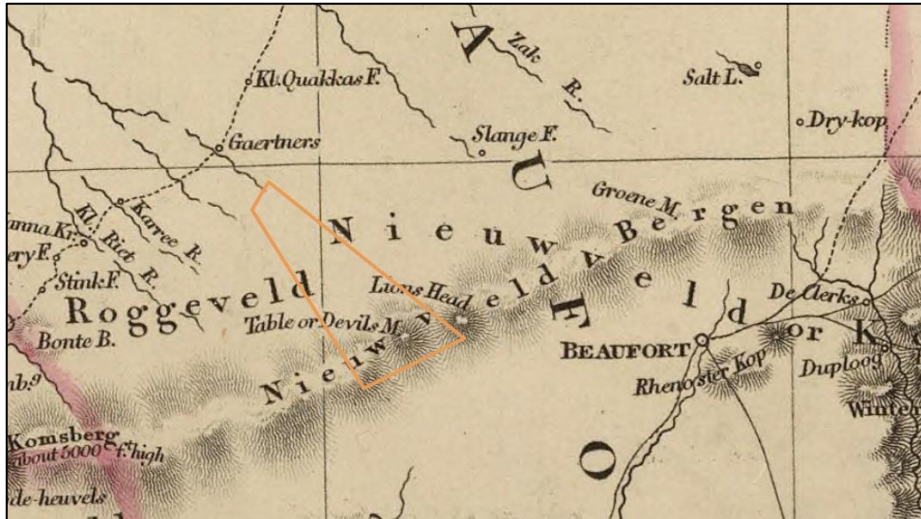


Figure 33: Extract from the Topographical map Cape of Good Hope dating 1836. The approximate location of the *Klipkraal WEF* study area is indicated (orange polygon). (Publisher: John Arrowsmith)⁴

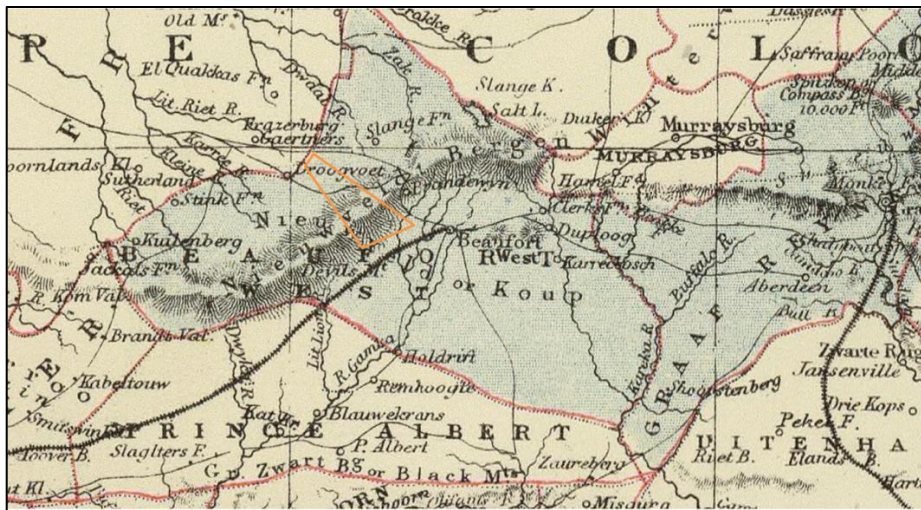


Figure 34: Extract from South Africa (with) Environs of the Cape Topographical map dating to 1883. The approximate location of the study area is indicated (orange polygon). (Publisher: Letts, Son & Co.)⁵

⁴ https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~33872~1170024:Cape-of-GoodHope-?sort=Pub_Date%2CPub_List_No_InitialSort&qvq=w4s:/where%2FAfrica%25252C%2BSouthern%2FSouth%2BAfrica;q:%22%20;sort:Pub_Date%2CPub_List_No_InitialSort;lc:RUMSEY~8~1&mi=6&trs=34

⁵ https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~31457~1150413:South-Africa-?sort=Pub_Date%2CPub_List_No_InitialSort&qvq=w4s:/where%2FAfrica%25252C%2BSouthern%2FSouth%2BAfrica;q:%22%20;sort:Pub_Date%2CPub_List_No_InitialSort;lc:RUMSEY~8~1&mi=21&trs=34

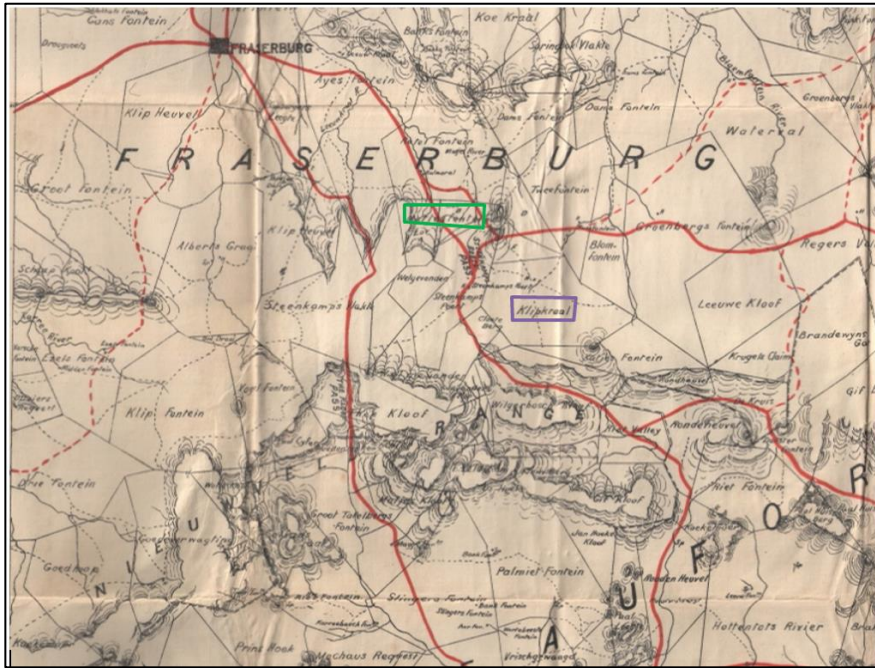


Figure 35: Extract from the Topographic map Beaufort West, dating to 1901 showing several farm names in the project area (Matjes Fontein: green polygon; Klipkraal: purple polygon)⁶.

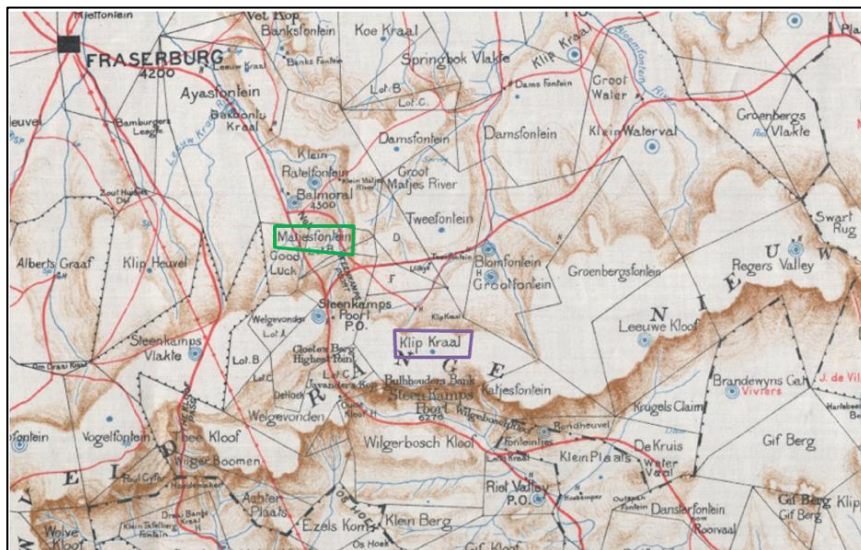


Figure 36: Extract from the 3rd edition Topographic map Beaufort West, dating to 1901 showing several farm names in the project area (Matjes Fontein: green polygon; Klipkraal: purple polygon) (University of Cape Town Libraries).

⁶ Board, C. "Certainly better than nothing at all" : a re-examination of the Imperial map of South Africa 1899-1902. Proceedings of the 21st International Cartographic Conference, Durban, 2003. Available online: http://icaci.org/files/documents/ICC_proceedings/ICC2003/Papers/109.pdf (accessed 15 Sept. 2021)., "This map is not to be considered as absolutely accurate."

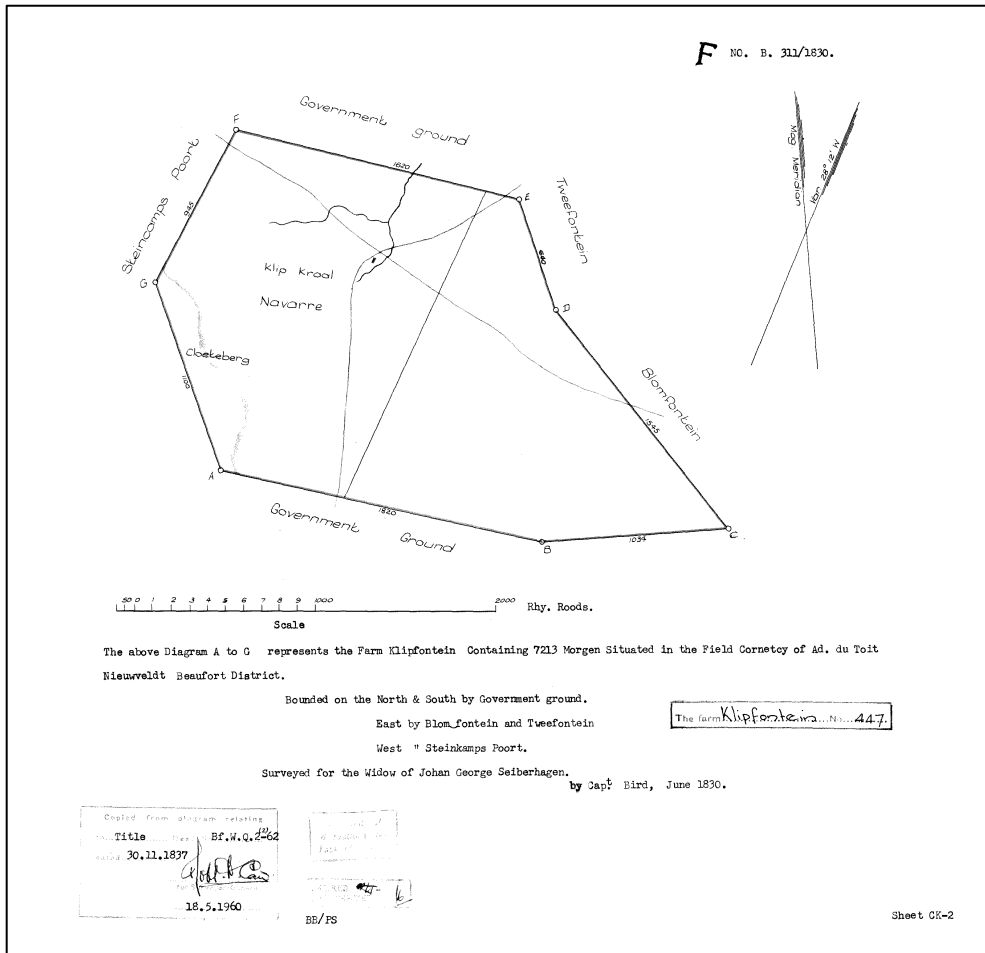


Figure 37 SG-Diagram from the Chief Surveyor-General database for Farm Klipfontein 447 was surveyed by (Sgd.) Capt. Bird in June 1830 for the Widow of Johan George Seiberhagen.

7.1.1 1: 50 000 Topographical Map 3221BB - First Edition 1972

A section of the First Edition of the 3221BB Topographical Sheet is depicted in **Figure 38**. The map was compiled from aerial photography undertaken in 1965, was surveyed in 1972 and was drawn in 1973 by the Director – General of Surveys.

One kraal was identified within the area proposed for wind turbines and one farmstead was identified adjacent to the area proposed for wind turbines. The farmstead and structures depicted are likely to be at least 50 years old.

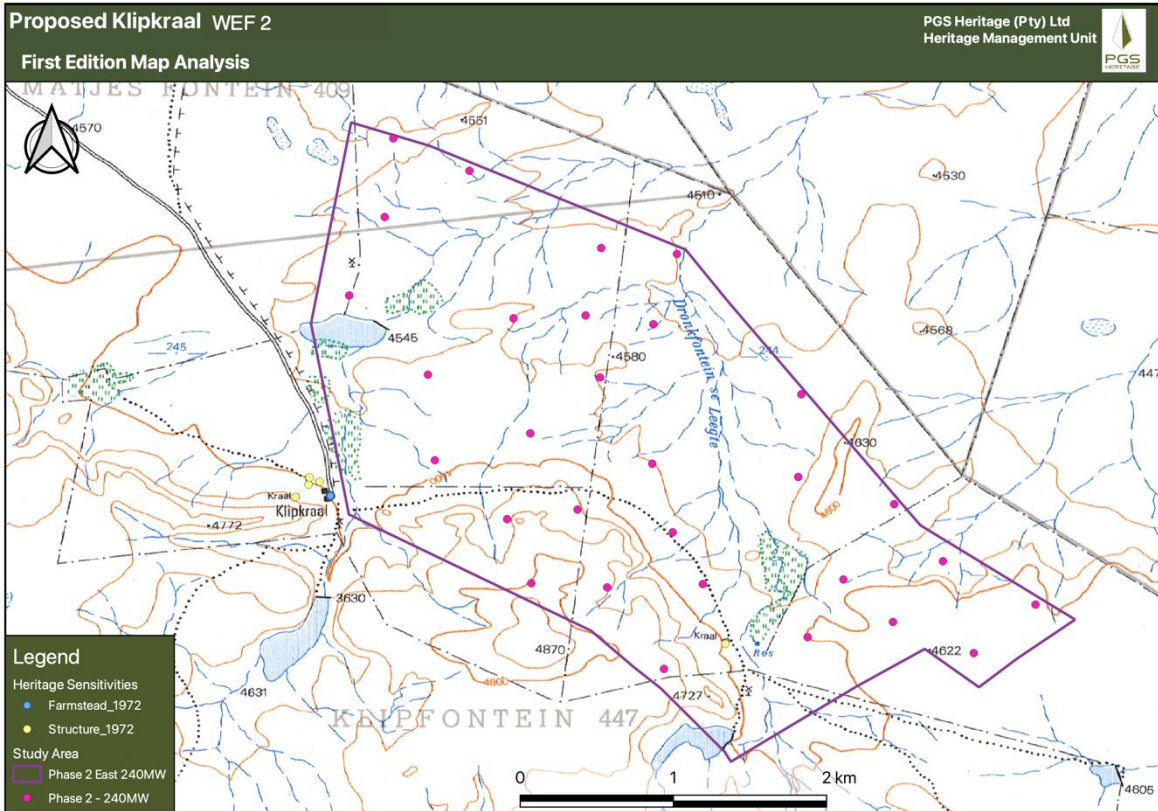


Figure 38: Section of the topographical map 3221BB – First Edition, showing the historical structures (incl. farmstead; red polygon) located within and adjacent to the proposed development area.

7.2 Aspects of the area’s history

7.2.1 Previous Heritage Studies in the area

It is well known that the Karoo contains a long and rich archaeological record dating from the ESA to the historic period. However, vast areas of the region, including the immediate vicinity of the study area, have yet to be subjected to systematic analytical research. As a result, the discussion below is based on research undertaken in areas which are further afield.

Scatters of ESA through to LSA artefacts have been widely reported in the general vicinity of Beaufort West. This is a result of the erosional nature of the environment, which tends to leave artefacts exposed on the surface rather than buried beneath layers of sediment. To date, heritage studies in this region have shown that these artefacts have occurred in secondary contexts, often associated with gravel deposits, having been subjected to erosion of the soils in which they were once deposited (Dreyer 2005; Halkett 2009; Kaplan 2006, 2007; Orton 2010; Webley & Hart 2010a, 2010b; Webley & Lanham 2011). Although context is generally poor, the Karoo is still regarded as a region that is very rich in archaeological and historical heritage.

More intensive occupation of the Karoo started around 13 000 years ago during the LSA (Webley and Hart, 2010c). Distinctive stone tool assemblages, referred to as the Lockshoek have been identified in the region and characteristic of this period is large knife-like tools with natural backing. Large scrapers are also common. The Lockshoek industry disappears abruptly around 9000 years ago (Webley & Hart, 2010c). The Karoo seems to have been largely unoccupied until 4500 BP, presumably as a result of drier conditions.

Historical resources, such as farmsteads, kraals and graves, are also observed within the Beaufort West region (Halkett 2009; Webley & Hart 2010b). To the northeast of Beaufort West, rock engravings have been identified on dolerite boulders that are characteristic of parts of the Karoo (Orton, 2010; Parkington *et al.*, 2008). The lack of caves and rock shelters in the Karoo region, results in the majority of archaeological sites in the area being classified as open-air sites (which may contain stone artefacts, ostrich eggshell fragments and ceramics). As such, the artefacts are generally not *in-situ* and organic remains are rarely preserved.

A review of SAHRIS has revealed that a very limited number of other archaeological studies have been performed within close proximity to the study area:

- **Dreyer, C. 2004. *Archaeological and historical investigation of the proposed developments at the sewerage dams, Fraserburg, Northern Cape.*** *The study area is located approximately 20km northwest of the current study area. No archaeological or historical material was found in the inspected area.*
- **Webley, L. & Hart, T. 2010c. *Scoping Archaeological Impact Assessment: Proposed prospecting on Blydevooruitzicht 299 (site 5), Fraserburg, Northern Cape.*** *Webley and Halkett (The Archaeology Contracts Office, ACO) were appointed by Tasman Pacific Minerals (Pty) Ltd to conduct a scoping AIA report. The project area was situated 20km north of Fraserburg on the road to Williston (40km northwest from the current study area). Two stone artefact scatters and a small stone shepherd's house were identified outside of the proposed drill area on the Blydevooruitzicht North site. On the Blydevooruitzicht South site, a dense cluster of stone artefacts, ostrich eggshell fragments and three potsherds were identified outside of the proposed drilling area.*
- **Webley, L. & Hart, T. 2010d. *Scoping Archaeological Impact Assessment: Proposed Prospecting on Kooker's Grafts Vlakke 221 and Slingers Fontein 491 (Site 45), Fraserburg, Northern Cape.*** *Webley and Halkett (The Archaeology Contracts Office, ACO) were appointed by Tasman Pacific Minerals (Pty) Ltd to conduct a scoping AIA report. The project area located off the gravel road between Fraserburg and Carnarvon. On Kooker's Grafts Vlakke they identified a number of Middle and Later Stone Age artefact scatters. They also identified a single "Lockshoek" scraper. There was also a small stone kraal and stone "oven" suggesting that a shepherd may have lived in the area for a while, presumably during*

the 20th century. On Slingers Fontein they identified a few scatters of stone tools (Early and Middle Stone Age) on the site; however, the densest accumulation of stone tools occurred outside of the study area around a large pan. There also identified a stone structure, presumably a shepherd's overnight hut dating to the 20th century, on a ridge.

- **Orton, J. 2022. Heritage Impact Assessment: Proposed Hoogland 3 Wind Farm and Hoogland 4 Wind Farm, Beaufort West magisterial District, Western Cape and Fraserburg Magisterial District, Northern Cape.** Orton was appointed by SLR South Africa Consulting (Pty) Ltd, on behalf of Red Cape Energy (Pty) Ltd, to conduct a HIA report. The project area was situated approximately 50km east of Fraserburg (approx. 30km northeast of the current study area).” Large numbers of heritage resources occur in the area with the majority being historical archaeological sites and engravings. The former includes ruined stone-walled structures of varying types and functions, ash and rubbish middens and other features related to historical occupation. The engravings include a variety of images but with horses and other animals the most common. Geometric images, carts and cars, people and Nine men’s morris gameboards also occur in the engravings. Other resources include fossils, Stone Age artefact scatters (mostly LSA but also rare ESA/MSA), Stone Age rock engravings, graves and graveyards, buildings, the cultural landscape and places associated with living heritage (the latter are mostly recent engraving sites).”

The studies listed below were conducted around the wider vicinity of study area of this report (ordered in descending order from closest to furthest):

- **Vidamemoria Heritage Consultants. 2012. Heritage Impact Assessment: DR 2308 Central Karoo, Beaufort West – Central Karoo District Municipality, Western Cape.** Vidamemoria was appointed by Aurecon South Africa (Pty) Ltd to conduct a HIA for a proposed borrow pit. The study area was located approximately 40km southwest of Beaufort West (40km south-southeast of the current study area). Low density scatters of mixed MSA and LSA artefacts were observed in a secondary context and were of low archaeological heritage significance.
- **Dreyer, C. 2005. Archaeological and historical investigation of the proposed residential developments at the farms Grootfontein 180 & Bushmanskop 302, Beaufort West, south-western Cape.** The study area is located approximately 20km west of Beaufort West (50km southeast of the current study area). Scattered and isolated lithics were found in the area. A trihedra, Acheulian or Victoria West I hand axe, a bifacial worked Oldowan chopper with minimal retouch, a number of isolated flakes and core flakes and several small assemblages of LSA scrapers were identified. On the flood plain near the Sand River, fragments of ostrich eggshell and one single ostrich eggshell bead were also identified.
- **Nilssen, P. 2010. Archaeological Impact Assessment: Proposed upgrade of Merweville Water Treatment Works, Merweville, Beaufort West Municipality, Central Karoo.**

Nilssen was appointed by Aurecon South Africa (Pty) Ltd to conduct an AIA. The study area was within Merweville (65km south-southwest of the current study area). Apart from an old cemetery, no tangible heritage resources were recorded in the study area.

- **Deacon, H.J. 2005. Archaeological/Palaeontological Assessment: Merweville-Prince Albert Road 'Far North' Quarry Site.** Deacon was appointed by the client Site Plan Consulting. The study site was located 10km from Merweville (70km south-southwest of current study area). A stone slab with engravings of three female figures was known to occur on the property. There were isolated occurrences of stone artefacts but none in a context that would warrant further investigation.
- **Orton, J. 2011. Heritage Impact Assessment for a proposed Photo-Voltaic Facility on Steenrots Fontein 168/1, Beaufort West Magisterial District, Western Cape. University of Cape Town: Archaeology Contracts Office.** The UCT Archaeological Contracts Office was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct a HIA. The study area was approximately 5km south of Beaufort West (70km southeast of the current study area). Most of the archaeological material was likely MSA (background scatters) and the artefacts were generally weathered. Historical material included fragments of a bottle and fragments of an annular ware bowl. All of the finds were recorded as low significance.
- **Webley, L. & Halkett, D. 2015. Archaeological Impact Assessment: Proposed Uranium Mining and Associated Infrastructure on Portions of the Farms Quaggasfontein and Rystkuil* near Beaufort West in the Western Cape and De Pannen near Aberdeen in the Eastern Cape.** Webley and Halkett were appointed by Ferret Mining & Environmental Services (Pty) Ltd, on behalf of a client, to conduct an AIA report. Archaeological material comprised small numbers of ESA artefacts, scatters of MSA and occasional LSA. The study area was approximately 5km east of Beaufort West (75km southeast of the current study area). The majority were manufactured on indurated shales (hornfels) and some artefacts were manufactured from a chert band. Artefact numbers were very low and of low significance. One LSA site, Site D009, was located on the banks of a little stream. Amongst the identified lithics, was a characteristic LSA drill and thumbnail scraper.
- **Nilssen, P. 2011. Archaeological Impact Assessment. Proposed Beaufort West Photovoltaic (Solar) Park: southern portion of properties; 2/158 Lemoenkloof, RE 9/161 Kuilspoor, RE 162 Suid-lemoensfontein and RE 1/163 Bulskop, Beaufort West, Western Province.** The study area was approximately 8km southeast of Beaufort West (80km southeast of the current study area). The finds included numerous isolated and very low-density scatters of Stone Age artefacts ranging in age from the ESA to the LSA. Due to their temporally mixed nature and the absence of other faunal/cultural remains, these finds were considered to be of low heritage significance. There were also several archaeological occurrences that represented isolated events that were recorded as medium to high heritage significance.

- **Cape Archaeological Survey (CAS) cc and Associates. 2016. Heritage Impact Assessment: Proposed Construction of Two Power Lines & Three Substations for the Mainstream Wind Energy Facility. Land Parcel Beaufort West, Remainder of Farm Trakaskuilen No 15, Portion 1 Trakaskuilen No 15, Portion 1 of Witpoortje No 16.** CAS was appointed by SiVest Environmental Division on behalf of their client Mainstream Renewable Power South Africa (Pty) Ltd to conduct an AIA report. The study area was situated on the N12 between Beaufort West and Klaarstroom (approximately 100km southeast of the current study area). Several MSA open sites, positioned on the summit areas of low ridges and koppies, were identified. There was also a general background presence of MSA with occasional flakes or cores observed in the open. There was little evidence of LSA activity in the area. Most of the raw material used was a fine-grained chert with a reddish outer patina (grey when flaked). In terms of colonial period archaeology, there were several farm complexes with buildings, historic dumps and derelict structures. The area hadn't been systematically studied or researched, so the archaeological sensitivity of the proposed wind farm on archaeological features was seen as high.
- **Fourie, W. 2018. AIA: Proposed Construction of a Linking Station, two (2) Power Lines and two (2) On-site Substations for the Beaufort West and Trakas Wind Farms, near Beaufort West in the Western Cape Province.** PGS Heritage (Pty) Ltd (PGS) was appointed by SiVEST to undertake an Archaeological Impact Assessment (AIA). The study area was located approximately 50km south of Beaufort West (100km southeast of the current study area). Two archaeological sites and seven findspots were identified. The archaeological resources identified during the fieldwork comprised a large number of Stone Age surface artefact scatters. These were primarily from the MSA, although both LSA and earlier ESA material was identified. All of these artefact assemblages occurred in heavily deflated and eroded areas, so their scientific potential and heritage significance is somewhat lowered.
- **Halkett, D. 2009. An archaeological assessment of uranium prospecting on portions 1, 3 and 4 of the farm Eerste Water 349, and remainder of the farm Ryst Kuil 351, Beaufort West.** ACO Associates was appointed by Ferret Mining and Environmental Services (Pty) Ltd to undertake a scoping survey. The study area was located approximately 110km southeast of the current study area. Heritage sites were quite sparse in the area. Pre-colonial stone age sites (ESA, MSA and LSA) and colonial sites related to farming and settlement (incl. cemeteries, small, ruined dwellings, stone kraal, fragments of annular ware and transfer printed refined earthenware ceramics) were identified. There were patinated and polished ESA/MSA artefacts made of hornfels and siltstone. LSA material is rarer but one scatter of LSA material was identified in close proximity to a dry river course.
- **Kinahan, J. 2008. Archaeological Baseline Survey of the Proposed Ryst Kuil Uranium Project.** Kinahan was appointed by Turgis Consulting (Pty) Ltd on behalf of UraMin-Mago-Lukisa JV Company (Pty) Ltd to conduct an archaeological baseline survey. The study area

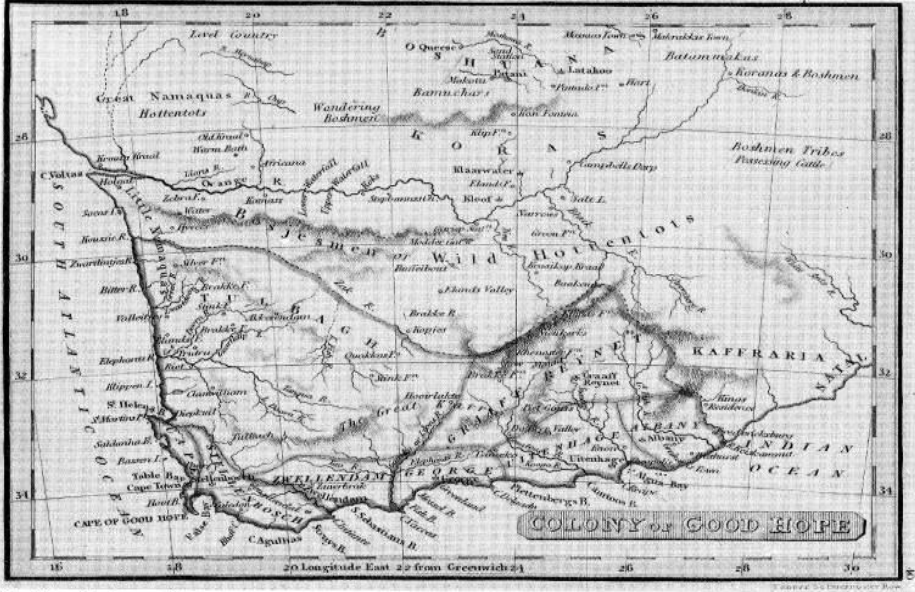

was located approximately 45km southeast of Beaufort West. In general, the study area was characterised by a low density of surface material, with much displacement by sheet erosion. None of the ESA material (isolated quartzite artefacts) were in-situ as all showed evidence of fluvial transport. Isolated MSA finds were observed. These finds probably formed part of a continuous surface scatter, but lateral disturbance may have greatly exaggerated the distribution and number of these sites. The lack of focal points in the landscape means that there were no major MSA site concentrations. MSA artefacts were dominated by quartzite and hornfels. There was also some evidence of Levallois core production and a few Howieson's Poort segments found at a number of sites. Isolated and local scatters of LSA materials were also apparent. A number of these sites were associated with lithic raw material sources (chert and hornfels outcrops). Late pre-colonial sites included a number of suspected hut circles and short lengths of stone walling, as well as possible burial cairns. Historic stone structures (dry-stone construction and mud-brick construction) along with imported items (crockery and rifle cartridges) were also noted.

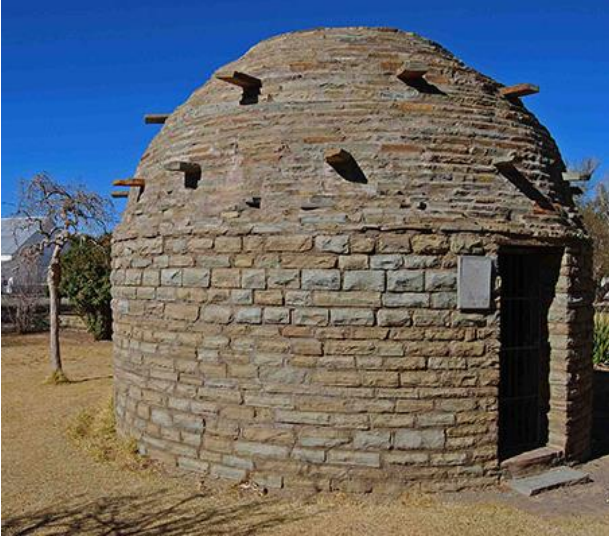

7.2.2 Archaeological and Historical Background

Table 4: Summary of archival data found on the general area

DATE	DESCRIPTION
<p>Early Stone Age (2.5 million to 250 000 years ago)</p>	<p>The Earlier Stone Age (ESA) is the first 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.</p> <p>Isolated ESA lithics, including occasional hand axes have been reported from the area surrounding Beaufort West, but they are generally quite ephemeral. Kinahan (2008) identified 7 ESA sites during an assessment of Ryst Kuil. He recorded isolated quartzite artefacts and commented that "none of the ESA material was considered to be in primary context and therefore of little research value".</p> <p><i>No Early Stone Age sites are known within the immediate vicinity of the study area. However, this is probably due more to a lack of research on the surroundings of the study area rather than a lack of sites.</i></p>
<p>Middle Stone Age (250 000 to 40 000 years ago)</p>	<p>The Middle Stone Age (MSA) 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 further associated with modern humans and complex cognition (Wadley, 2013).</p> <p>Within the region around Beaufort West, heritage reports have shown that MSA artefacts are widespread and occur in isolated as well as relatively dense concentrations over large areas. According to Kinahan (2008), the MSA sites in the area of his assessment (Ryst Kuil) "probably formed part of a continuous surface scatter almost without focal points". He noted that the MSA artefacts were mainly made from quartzite and hornfels.</p> <p><i>No Middle Stone Age sites are known within the immediate vicinity of the study area. However, this is probably due more to a lack of research on the surroundings of the study area rather than a lack of sites.</i></p>

DATE	DESCRIPTION
<p>Later Stone Age (40 000 years ago to the historic past)</p>	<p>The Later Stone Age (LSA) is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths.</p> <p>According to heritage reports conducted in the Beaufort West region, LSA artefacts are not as common as ESA and MSA stone artefacts in the area. Artefacts are generally made from hornfels and in some cases chert which was most likely sourced from a chert horizon that caps some of the low hills in the area. LSA artefacts are generally located close to dry river courses (Kinahan, 2008; Halkett, 2009). There have also been hut circles and stone kraals identified which have been interpreted as representing pre-colonial pastoralist groups.</p> <p><i>No Later Stone Age sites are known in the vicinity of the study area. However, this is in all likelihood rather due to a lack of research focus on the surroundings of the study area than a lack of sites.</i></p>
<p>18th – 19th Century</p>	<p>Beaufort West historically was an important centre for sheep farming, trade and transport. This was also an area of interaction between various cultural groups.</p> <p>During the eighteenth and early nineteenth century the Koup was one of the last refuges of the San. A shortage of surface water meant that populations of San hunter-gatherers, and later Khoekhoe pastoralists were confined to areas with springs. During the second half of the 18th century, farmers started moving northward into the Karoo, settling in areas known as the Nuweveld Plateau and the Koup (Figure 39, Figure 40). The first Europeans to arrive in the region were Trekboers who arrived in 1759.</p> <p>This time was characterised by conflict and the dispossession of the San as more trekboere/migrant stock farmers moved onto the San's traditional hunting lands. The San were forced to move out of the area into what is today known as Bushmanland.</p> <div data-bbox="454 1010 1331 1599" data-label="Figure"> </div> <p>Figure 39: Trekboer and colonial expansion by 1717-1788 in the study region (Reference: Guelke & Shell 1992: 818).</p>

DATE	DESCRIPTION
	 <p>The Cape Colony, 1820</p> <p>Figure 40: Early map of the Cape illustrates the expansion of farmers towards the east and northeast Karoo (Reference: Watson, R.L. 1990).</p>
1780	<p>The first Europeans to settle in the Fraserburg area arrived in 1780. The first settler to be recorded as living in this part of the Karoo was Willem Steenkamp. The mountain range, Steenkampsberg, situated south of Fraserburg was named after this early settler.</p>
19 th century	<p>The historically significant corbelled houses are unique to the Karoo area (Figure 41). They were built by early trekboers in the early 1800s as dwellings and granaries. The early settlers made use of the only building material abundantly available in the area, which was rock. A replica corbelled house was constructed in front of the Fraserburg town hall in 1991 (Figure 42).</p>  <p>Figure 41: Historic photograph of a Corbelled house (https://fraserburgtourism.co.za/attractions/).</p>



DATE	DESCRIPTION
	 <p data-bbox="456 792 1259 853">Figure 42: Replica Corbelled House outside the Fraserburg Town Hall (https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/)</p>
1803	<p data-bbox="357 880 1361 965">The remains of the early mission that was established to spread Christianity to the early inhabitants of the district, can be seen just outside Fraserburg at Kerkplaas⁷. The church and home of the Reverend J.J Kicherer was built in 1803 by the London Missionary Society.</p>  <p data-bbox="507 1404 1206 1476">Figure 43: An undated photograph of a structure (http://www.karoohoogland.gov.za/fraserburg-photo-gallery/)</p>
1825	<p data-bbox="357 1518 1361 1648">In 1825, the Scottish cleric Reverent Colin Fraser came to serve the Dutch Reformed congregation in Beaufort West as a minister. When he first arrived in Beaufort West, there was not a church available for his services. For many years, he held his services under a wagon canvas strung between two trees⁸. Five years later a church was finally constructed in Beaufort West.</p>
1851	<p data-bbox="357 1657 1361 1823">There was a substantial number of stock farmers in the district west of Beaufort West and in 1851, a parish was established for the Dutch Reformed Church. Fraserburg was founded in West Nuweveld and established on the farm Rietfontein⁹. The village was named after the Scottish cleric Reverent Colin Fraser and a church elder, Meyerburg (Raper, 2004). Fraser was in fact the father of the wife of the President of the Orange Free State, President M.T. Steyn¹⁰.</p>

⁷ <https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/>

⁸ <https://aridareas.co.za/roses-s-roundup/rev-colin-frasers-rural-ministry/>


⁹ <https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/>

¹⁰ <https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/>

DATE	DESCRIPTION
	 <p data-bbox="363 869 1350 925">Figure 44 : Reverend Colin Fraser (https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/)</p>
1856	<p data-bbox="357 952 1361 1115">In 1856, the Old Parsonage (Ou Pastorie) in Fraserburg was built for the Reverend Carl Arnoldus Bamberger. He was the first minister to the newly established congregation¹¹. The church house is typical Cape Dutch in appearance, it has a reed roof, yellowwood floorboards, whitewashed walls and small windowpanes. The front entrance and discharge pipes are elaborate and four of the interior walls are curved. The ceiling boards were also made of yellowwood, but they were replaced with pine in the early 1900s due to warping¹².</p> <p data-bbox="357 1144 1361 1200">At one stage, it was the only formal building in the village. Today, the building houses a museum collection and a fossil exhibit.</p>  <p data-bbox="424 1787 1294 1816">Figure 45: Ou Pastorie Museum (https://fraserburg.co.za/about-fraserburg/).</p>
1857-1860	<p data-bbox="357 1843 1361 1921">Ostrich farming, in particular, feather 'farming', gained some economic importance in the region and supplemented the merino wool trade. The success of the ostrich feather industry in the Eastern Cape influenced farmers in the Northern Cape. Stone pens were built in order to</p>

¹¹ <https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/>

¹² <https://fraserburg.co.za/about-fraserburg/>



DATE	DESCRIPTION
	enclose ostrich nesting habitats which were located along small drainages and rivers (Beyleveld, 1967).
1858	<p>During the 19th century, the only transport in the region was by horse and horse drawn carriage. The post was delivered to Fraserburg by stagecoach from Beaufort West and the majority of farmers in the district only visited the town about four times a year for the Church Communion¹³.</p> <p>In 1858, a post office was established in Fraserburg.</p>
1859	In 1859, a magistrate's office was opened in Fraserburg.
1860	A police station was opened in Fraserburg in 1860. The town's first medical doctor also arrived in the same year.
1861	<p>In 1861, a hexagonal stone bell tower was built by a local artisan, Adam Jacobs. The 9m tall bell tower is known as the Peperbus ("Pepperpot"). It was constructed to serve as a market house and the bell was rung for the market. Through time, the tower was also utilised by multiple individuals and groups.</p> <p>In 1861, it was used as the magistrate's private office by Mr Balston. In 1862, it served as a council chamber when the village attained municipal status. In 1866, the tower became the town's first library in 1866. It became the School Board office in 1951 and later it was used as a storeroom¹⁴. The bell tower was proclaimed a National Monument in 1971 and it's now a Northern Cape provincial heritage site.</p>  <p style="text-align: center;">Figure 46: Die Peperbus (https://fraserburg.co.za/about-fraserburg/).</p>
1862	On 6 June 1862, the town was declared a municipality ¹⁵ .
1870	In 1870, the town's first attorney and noted Afrikaans author, H.W.A. Cooper moved to the town. It was in Fraserburg, that he wrote the "Boerebrievens" (farmers letter) in the Afrikaans newspaper <i>Het Volksblad</i> . Cooper was an Englishman who wrote under the pseudonym Samuel Zwaartman ¹⁶ .

¹³ <https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/>



¹⁴ "THE PEPPERPOT - Businesses in The Karoo". www.karoo-information.co.za. Retrieved 2021-09-13.

¹⁵ <https://fraserburgtourism.co.za/attractions/>

¹⁶ "Fraserburg". Karoo Hoogland. Retrieved 13 September 2021.

DATE	DESCRIPTION
	 <p data-bbox="443 705 1273 763">Figure 47: Henry William Alexander Cooper (https://www.karoo-southafrica.com/western-upper-karoo/fraserburg/history-of-fraserburg/).</p>
1870	<p data-bbox="357 790 1361 925">In 1870, a powder magazine was erected by John Findlay. It was used to store ammunition in case war should break out with the neighbouring Korannas under leadership of Kupido Pofadder and Klaas Springbok. It was also used by the British troops during the Anglo-Boer War¹⁷. The roof is dome-shaped to limit danger from fire. The powder magazine still stands on the edge of the town.</p>  <p data-bbox="539 1379 1174 1438">Figure 48: Historic photograph of the powder magazine (https://fraserburgtourism.co.za/attractions/).</p>

¹⁷ <http://www.karoohoogland.gov.za/fraserburg-tourist-attractions/>

DATE	DESCRIPTION
	 <p data-bbox="432 707 1283 741">Figure 49: Powder Magazine (https://fraserburgtourism.co.za/attractions/).</p>
1938	<p data-bbox="357 790 1318 846">In 1938, Fraserburg's first power station was installed with 7 Lister Blackstone generators. The seven Lister Blackstone engines can still be seen in the town.</p>  <p data-bbox="687 1335 1026 1361">Figure 50: Old Power Station.</p>

7.3 Findings of the historical desktop study

The findings can be compiled as follows and have been combined to produce a heritage sensitivity map for the broader Klipkraal WEF project area based on the desktop assessment (**Figure 51**).

7.3.1 Heritage Screening

A Heritage Screening Report was compiled using the Department of Environment, Forestry and Fisheries 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 directly affected area has a low sensitivity rating (**Figure 9**).

The field work in the study area demonstrates that there are heritage resources of heritage significance (such as historical structures) that are located in the broader region and warrant conservation. The low rating as provided by the Environmental Screening Tool possibly reflects scarcity of heritage reports conducted in the region.

7.3.2 Heritage Sensitivity

The sensitivity maps were produced by overlying:

- Satellite Imagery;
- Current Topographical Maps;
- First edition Topographical Maps dating from the 1960's

This enabled the identification of possible heritage sensitive areas around the proposed development area that included:

- Structures/Buildings
- Archaeological Heritage sites
- Graves/burial ground

By superimposition and analysis, it was possible to rate these structure/areas according to age and thus their level of protection under the NHRA. Note that these structures refer to possible tangible heritage sites as listed in **Table 5**.

Table 5: Tangible heritage site in the study area

Name	Description	Legislative protection
Architectural Structures/Dwellings	Possibly older than 60 years	NHRA Sect 3 and 34
Archaeological sites	Artefacts and/or structures/sites	NHRA Sect 3 and 35 and Sect 27

Observation of the previous heritage reports has shown that archaeological sites are in abundance in the surrounding areas and especially near certain landscape features. This factor needs to be held in consideration.

7.3.3 Possible Heritage Finds

The evaluation of satellite imagery and the analysis of the studies previously undertaken in the area has indicated that certain areas may be sensitive from a heritage perspective. Archaeological surveys and studies in the area have shown rocky outcrops, dry riverbeds, riverbanks and confluence to be prime localities for archaeological finds and specifically Stone Age sites (Kinahan, 2008; Halkett, 2009; Webley & Halkett, 2015). The analysis of the studies conducted in the area assisted

in the development of the following landform to heritage find matrix in **Table 6**. Dry river courses have been referenced as having possible heritage sensitivity within the study area.

Table 6: Landform type to heritage find matrix

LAND FORM TYPE	HERITAGE TYPE
Crest and foot hill	LSA and MSA scatters
Pans/ dry river courses	LSA/MSA scatters
Outcrops	Occupation sites dating to LSA
Farmsteads	Historical archaeological material

The following areas within the study area have been referenced as having possible heritage sensitivity:

Drainage lines/ Dry water course

Drainage lines, such as dry riverbeds, erosion dongas as well as sheet erosion has been shown to yield rich archaeological deposits due to the exposure of archaeological material as well as the fact that human settlement is drawn to water sources in arid regions (Kruger 2012; Orton 2012; PGS 2012).

Ridges/Outcrops

Numerous ridges, koppies and mountains have been identified in the study area and are associated with human settlement and activity. Stonewalling from herders, rock engravings and knapping sites associated with Later Stone Age manufacturing technology is known to occur in these areas (Arthur, 2008, Kruger 2012; Orton 2012; PGS 2011 and 2012, Van Ryneveld 2008).

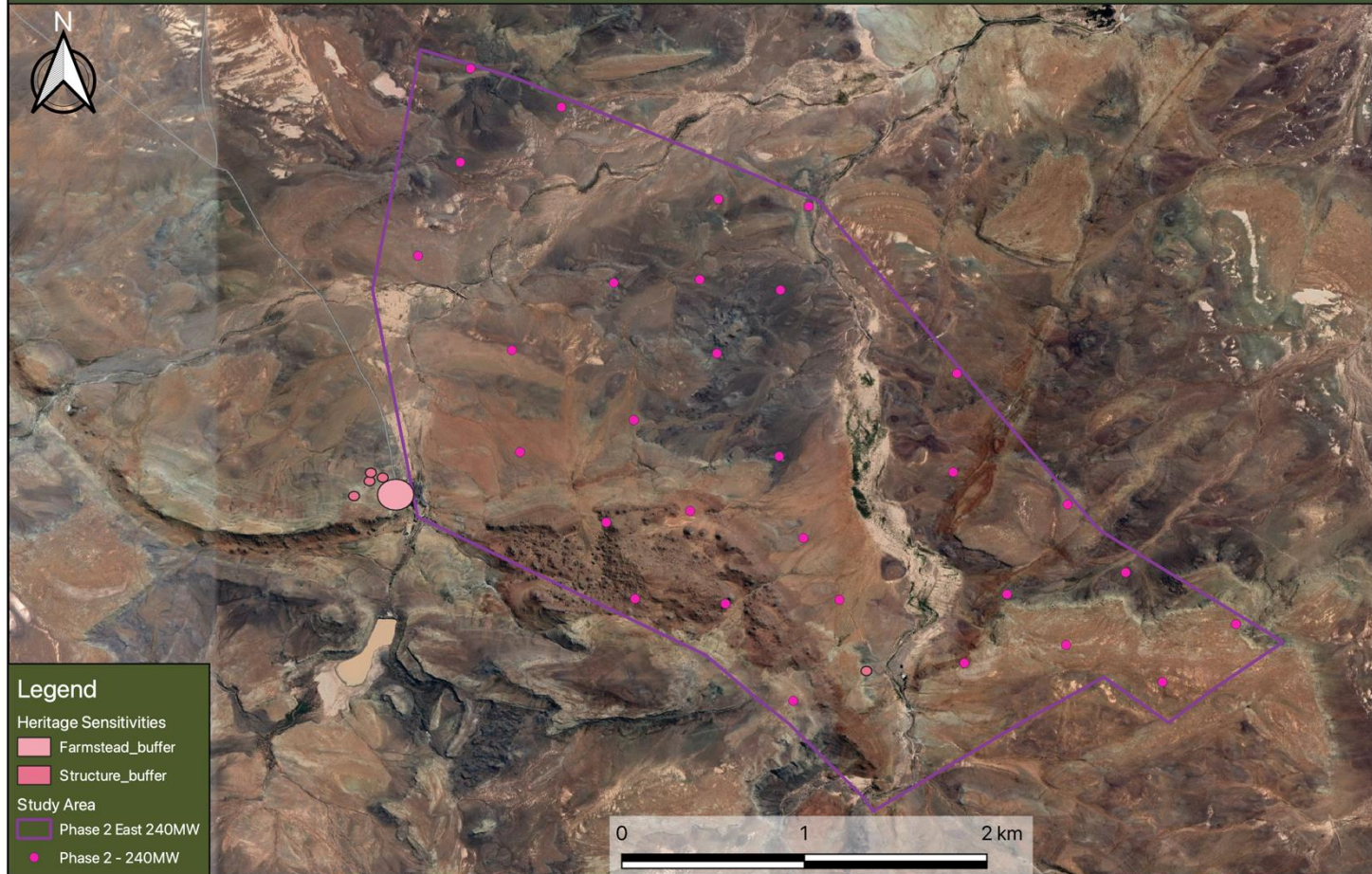


Figure 51: Heritage Sensitivity map indicating possible sensitive areas within the proposed project area.

8. FIELDWORK FINDINGS

A selective survey of the study area was conducted from the 22nd-27th September 2021. Due to the nature of cultural remains, with the majority of artefacts occurring below surface, one archaeologist from PGS and a field assistant conducted a vehicle and foot-survey of the proposed development area. The fieldwork was logged with GPS devices to provide a tracklog of the area covered (**Figure 52**). Approximately 130km of the larger assessment region was traversed.

The fieldwork conducted in September 2021, identified heritage resources that were then classified as either find spots, structures (incl. historical farmsteads) or graves. Three (1) sites were identified within an area which has been allocated for the proposed Klipkraal WEF 2 development area¹⁸. The Low density MSA scatter (**FS-03**), stone shepherds' shelter (**K08**) and stone ruin farmstead (**K-05**) were situated a substantial distance away from the proposed wind turbines within the study area (**Figure 54**).

¹⁸ 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.



Survey Tracklogs

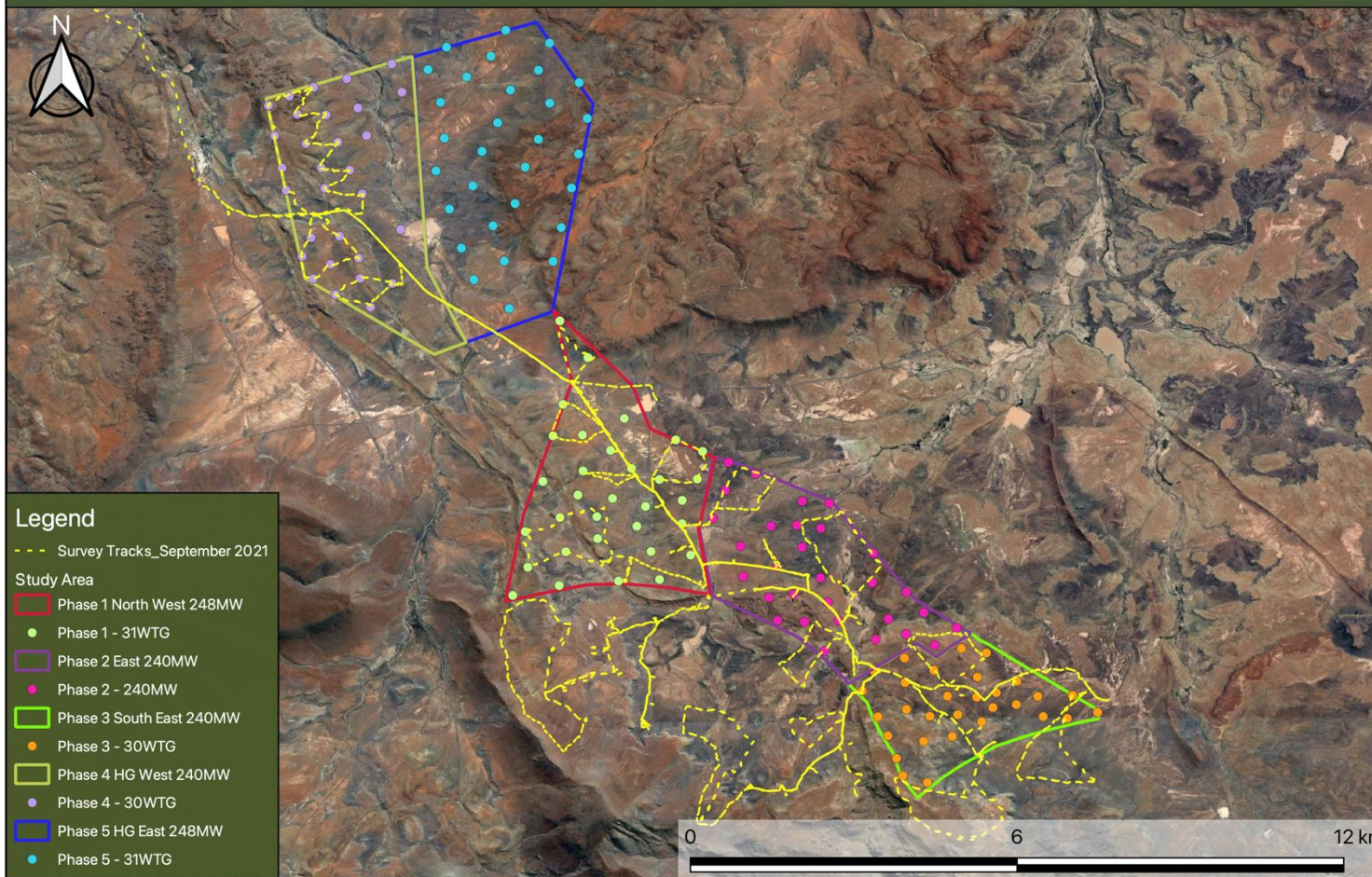


Figure 52: Track log recordings from the field surveys conducted in September 2021.

Proposed Klipkraal WEF

Heritage Resources

PGS Heritage (Pty) Ltd
Heritage Management Unit

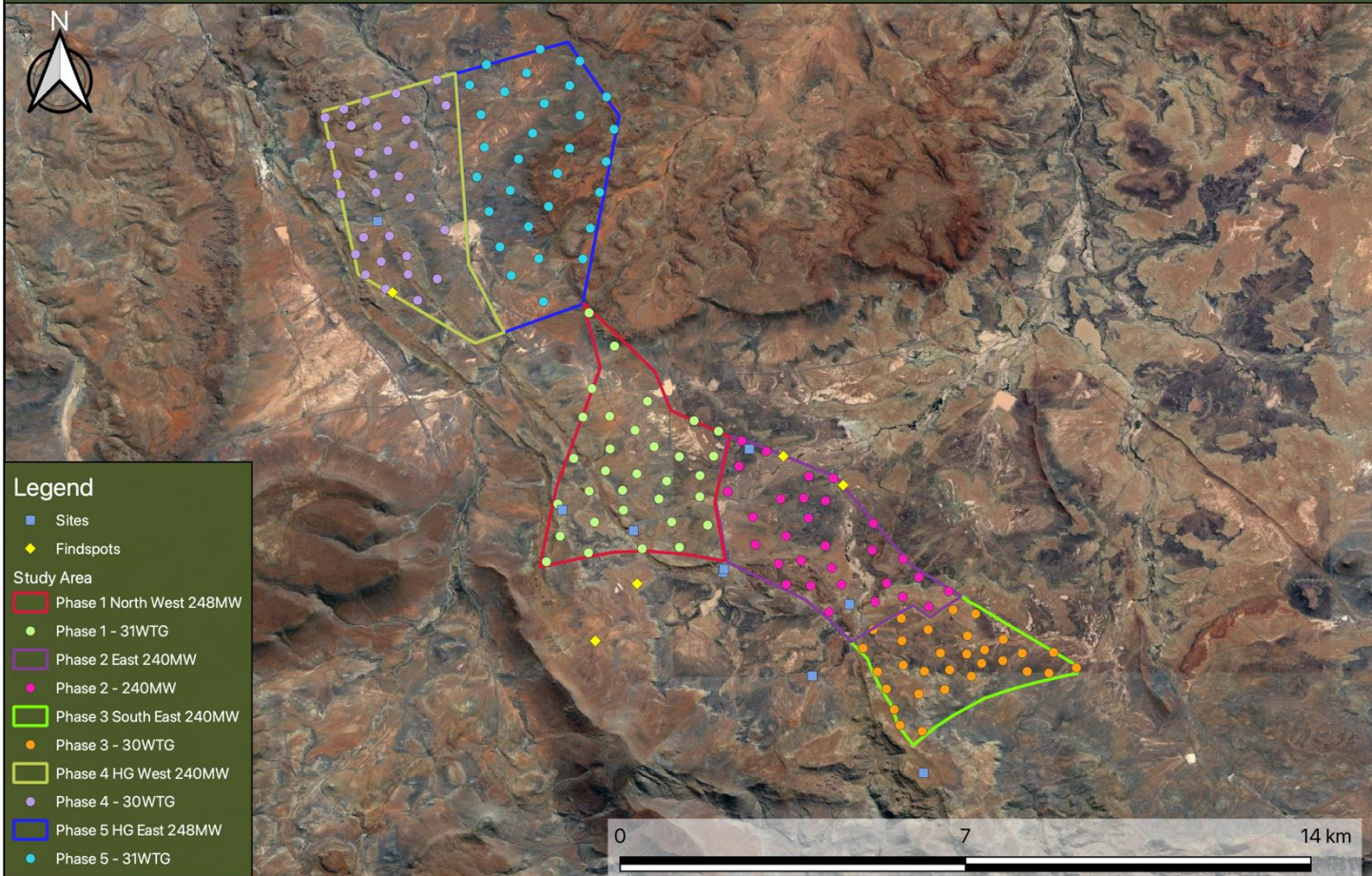


Figure 53: Heritage resources (findspot: yellow diamond; site: blue square) identified within the larger Klipkraal WEF region.



Heritage Resources

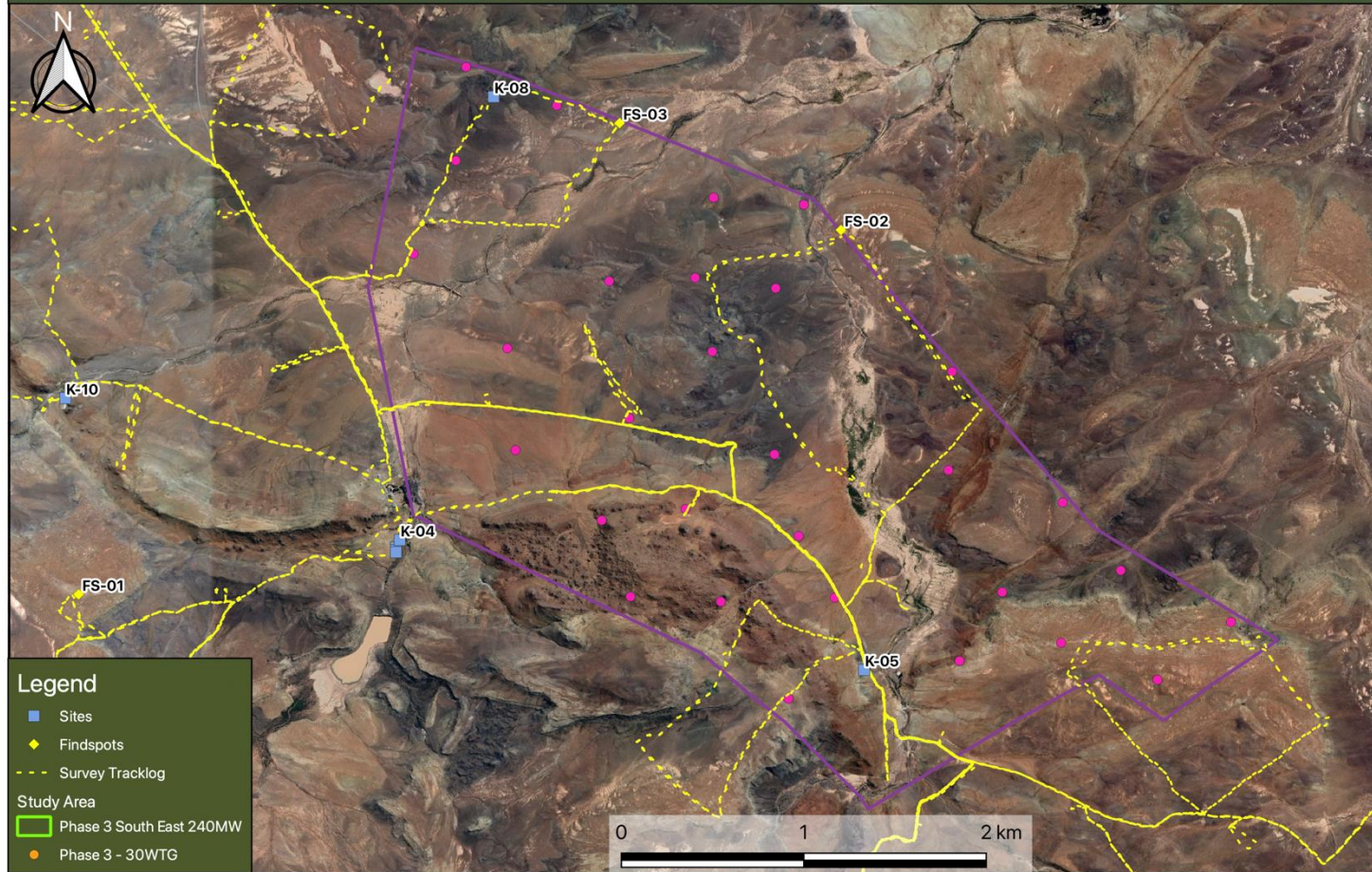


Figure 54: Heritage resources identified within the Klipkraal WEF 2 region.

8.1 Find spots identified during the 2021 assessment

Find spots (**Table 7**) were only documented where more than 5 identifiable modified lithics were observed within a 5-metre radius. Most of the find spots identified within the Klipkraal WEF region were found to coincide with deflated plain zones which were characterised by low density scatters of lithics consisting mainly of flakes and cores. This observation also correlates with the findings of the previous heritage studies undertaken in the Beaufort West region. Raw materials utilised included silcrete, hornfels, quartzite and dolerite. Mostly MSA artefacts were identified, although some ESA and LSA artefacts were observed within the Klipkraal WEF study area.

Table 7: Find spot

Site Number	Lat	Lon	Description	Sensitivity	Heritage Rating
FS-03	-32.074950°	21.796680°	Low density MSA scatter	Low	NCW



8.2 Sites identified during the 2021 assessment

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
K-05	-32.106720°	21.810890°	<p>The site comprises a stone ruin farmstead with two stone ruins and a stone kraal. The site is located adjacent to an existing farm track, approximately 300m east of a proposed turbine. The structures are built out of the local sandstone.</p> <p>The main ruin consists of two rooms (Figure 55, Figure 56) and there are additional remnants of rooms (possibly five rooms) located to the north of the main ruin (Figure 57, Figure 60). A large stone kraal (+- 20x20m) is located west of the ruins (Figure 61). There are also spent cartridges and broken fragments of glass and ceramics scattered around the site, along with rusted metal pieces (Figure 58, Figure 59).</p> <p>Only a kraal is depicted at this locality on the 3221BB topographical sheet dating to 1972 (Figure 62), but it is likely that the stone ruin farmstead is older than these map depictions. It's possible that this site represents one of the earliest white settlements in the area and as such is of historic significance.</p> <p>Extent: approximately 40m x 100m</p> <p>Recommendation: At this stage the assessment is only based on the proposed locations for wind turbines. Therefore, as K-05 is located more than 300m away from these turbines, no mitigation is required, as no impact is expected.</p> <p>If development of other WEF infrastructure (e.g. access roads) occurs within 30m of K-05 the site will need to be satisfactorily studied and recorded before impact occurs. Recording of the structures i.e. (a) map indicating the position and footprint of all the structures (b) photographic recording of all the structures (c) measured drawings of the floor plans of the principal buildings.</p>	MEDIUM	IIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
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Figure 55: General views of the main stone ruin at the site K-05 (facing west).

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p data-bbox="147 1114 1106 1182">Figure 56: General view of the main stone ruin at the site K-05 (facing north towards the additional ruin).</p>		 <p data-bbox="1144 1114 2078 1182">Figure 57: General view of the foundation of an additional stone room north of the main ruin.</p>





Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
					

Figure 58: Remnants of a metal boiler identified at site K-05.

Figure 59: Sample of metal, glass and ceramic fragments observed at site K-05.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p data-bbox="264 855 987 922">Figure 60: View of the additional room foundations at site K-05 (facing south towards main ruin).</p>		 <p data-bbox="1133 855 2085 887">Figure 61: View of the stone kraal west of the stone ruin at site K-05 (facing south).</p>

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
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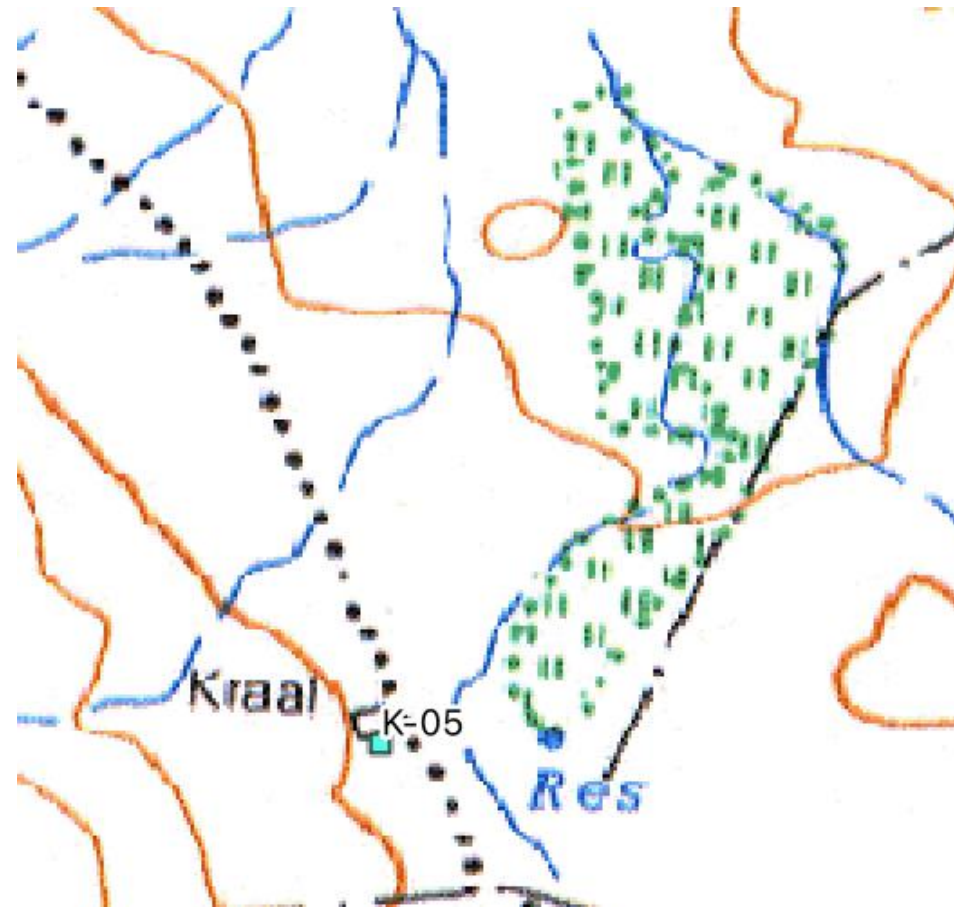



Figure 62: 3221BB topographical sheet surveyed in 1972 depicts a kraal at K-05.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
K-08	-32.073420°	21.789360°	<p>The site comprises a small collapsed stone shepherd's shelter (or <i>veewagterhuis</i>), which is constructed from local sandstone (Figure 63). It is located in a valley approximately 160m southwest of a proposed turbine. These types of sites are quite common in the Karoo landscape. There were metal fragments scattered around the structure. The site is rated as IIIC as it has low research potential.</p> <p>Recommendation: As K-08 is located outside of the development area proposed for wind turbines, no mitigation is required, as no impact is expected.</p>	LOW	IIIC
					
<p>Figure 63: General view of the collapsed stone shepherd's shelter at site K-08.</p>					

8.3 Sites identified during the 2022 assessment

An additional survey of the Klipkraal WEFs 1-3 final development area was conducted by a qualified archaeologist (Henk Steyn) and field assistant (Xander Fourie) from PGS (8-10 November 2022). This has been requested by the SAHRA, as it was noted that the initial survey of the study area, as part of the HIA, was minimal (**Figure 64, Figure 65**).

Four (4) additional heritage resources were recorded within the study area during this fieldwork (**Figure 66**). These included:

- One (1) site with old irrigation infrastructure (**0187**) was rated as having low heritage significance.
- One (1) site with the remains of a stone kraal (**0184**) that was rated as having low heritage significance.
- One (1) Findspot (**0185**) was rated as having low heritage significance.
- One (1) possible grave site (**0186**) was rated as having medium-high heritage significance.

Proposed Klipkraal WEF 2

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Final Proposed Layout

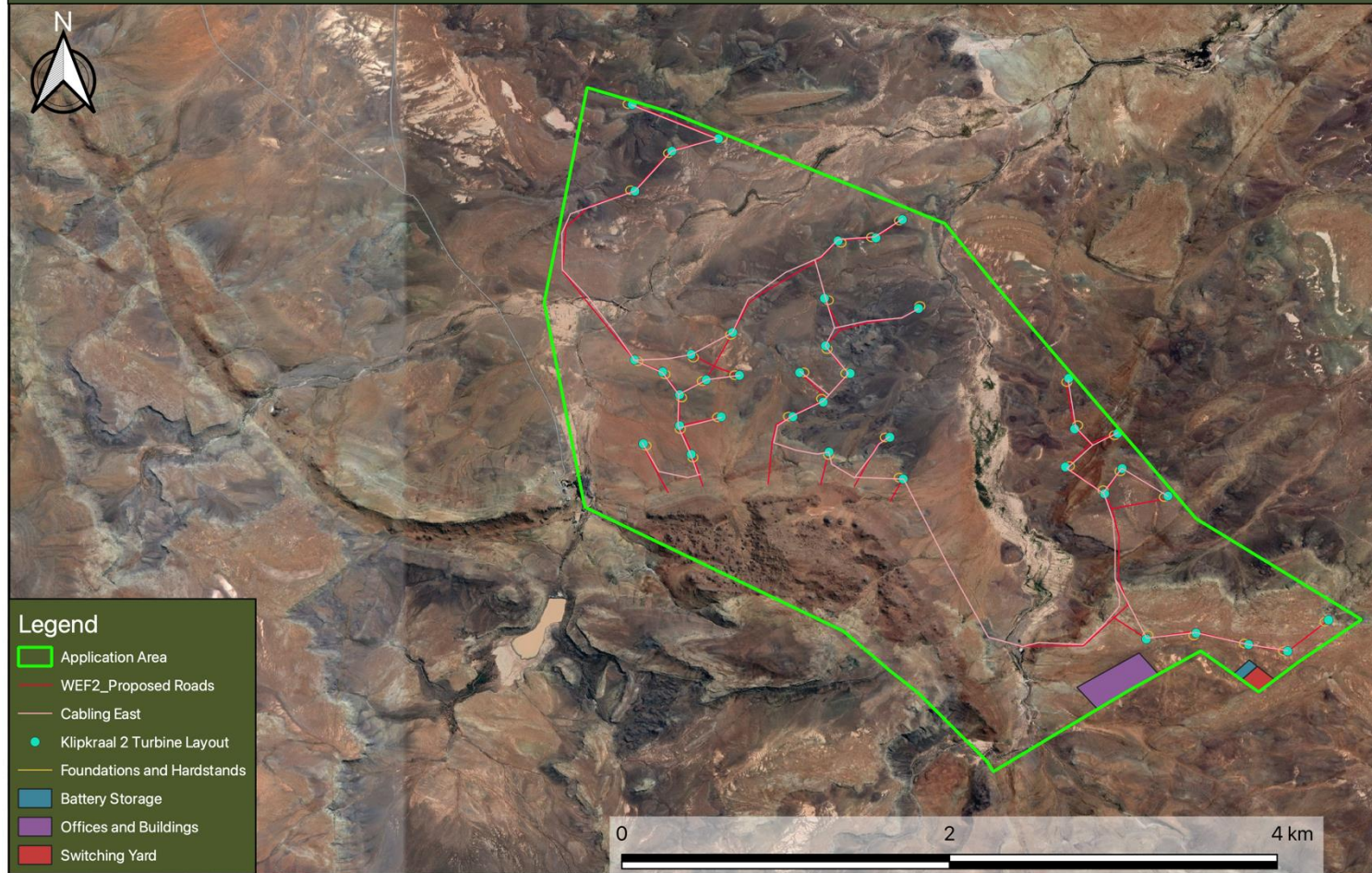


Figure 64: Final proposed development area.

Proposed Klipkraal WEF 2

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Final Proposed Layout and Combined Survey Tracks

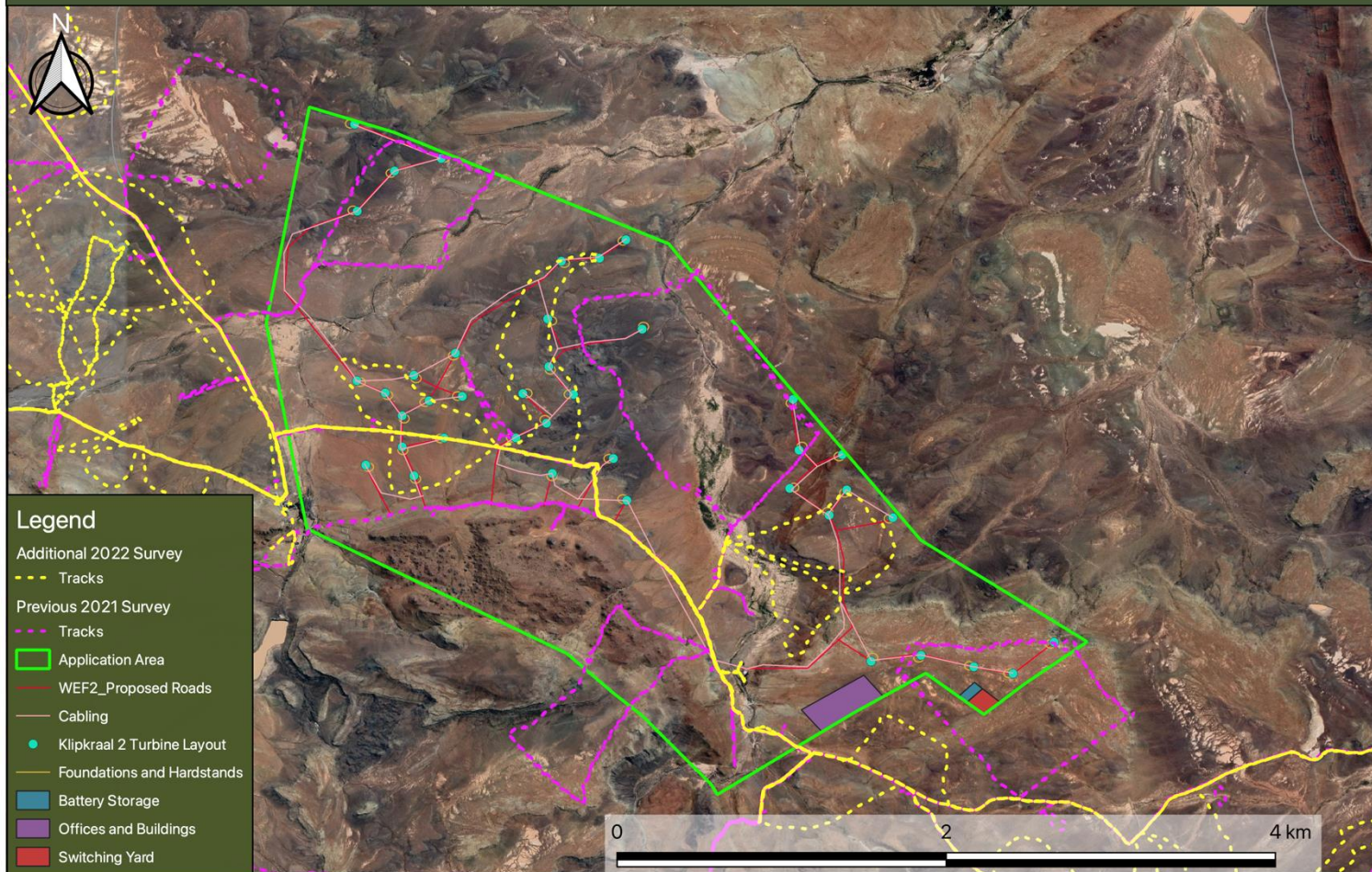


Figure 65: Final proposed development area relative to all the survey tracks.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout and Combined Heritage Resources

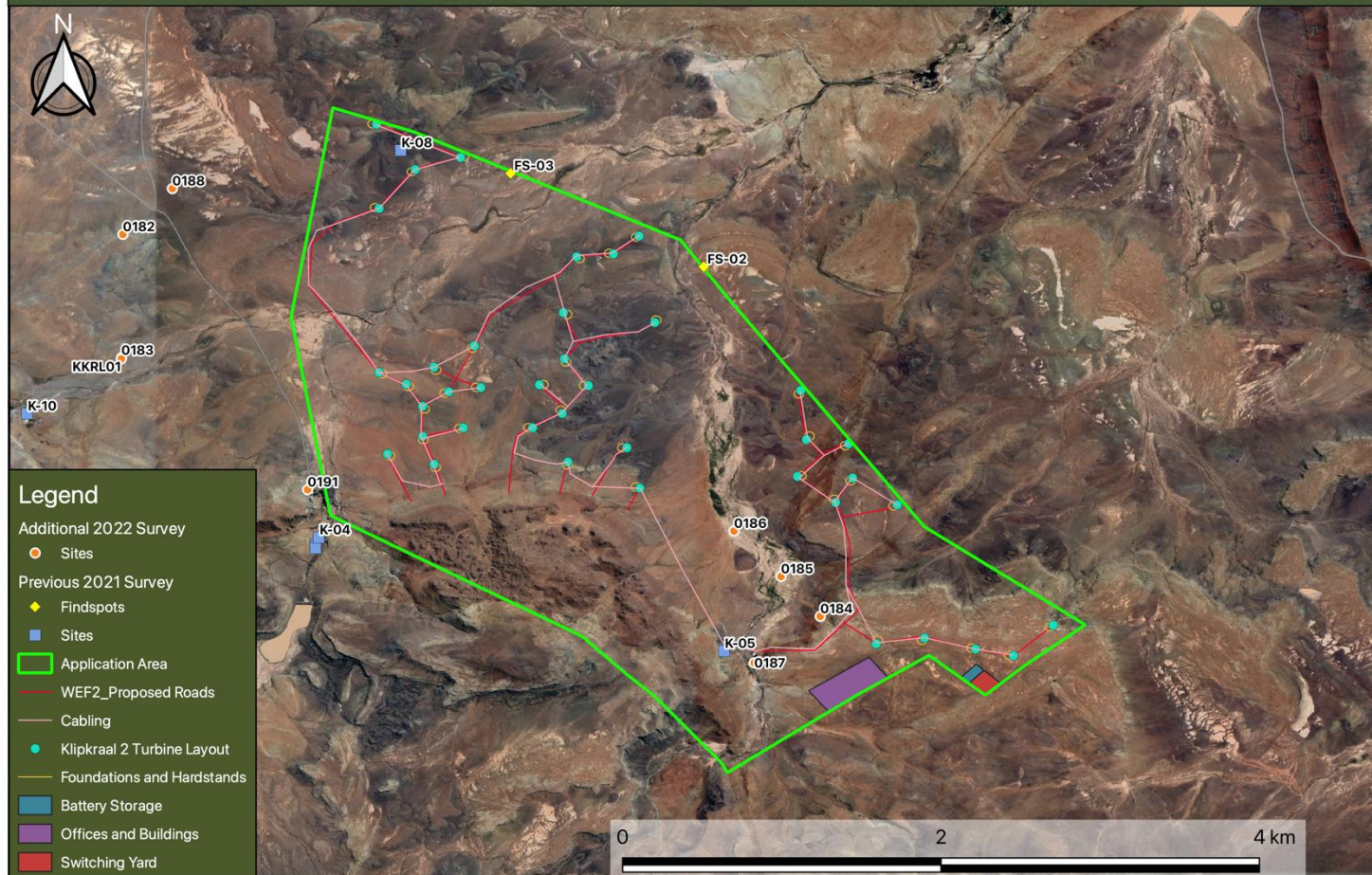


Figure 66: Final proposed development area relative to the locality of the heritage resources identified within the study area.


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
0184	-32.104415°	21.817297°	<p>The site comprises the remains of a kraal, which is constructed from local sandstone. It is situated on the north facing slope. There are walls remaining on three sides. It appears that there had no been a north-facing stone wall. The site is within proximity of historic cultivated lands (and associated water infrastructure).</p> <p>The site is rated as IIIC as it has low research potential.</p> <p>Recommendation: As the site is located outside of the development area proposed for infrastructure, no mitigation is required, as no impact is expected.</p>	LOW	IIIC
 <p>Figure 67: General setting of the kraal identified at site 0184.</p>					



Figure 68: Views of the kraal at site 0184.

0185	-32.101763°	21.814683°	The site comprises a findspot.	LOW	IIIC
0186	-32.098740°	21.811557°	<p>The site comprises a stone feature which is a possible grave. The feature appears to be out of place as there are no other stone within the environs. It is located in a sandy area which is likely to be a flood plain. The only indication that it is possibly a grave is the upright stone.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. The site is of Generally Protected A (GP. A) or High/Medium Significance.</p>	HIGH-MEDIUM	IIIA-IIIB

			<p>Recommendation:</p> <ul style="list-style-type: none"> ▪ As the site is located outside of the development area proposed for infrastructure, no mitigation is required, as no impact is expected. ▪ Until such time that the presence of a grave at the site has been tested, the stone feature must be viewed as containing a grave. ▪ The possible grave should be demarcated with a 50-meter buffer and should be avoided and left in situ. ▪ A Grave Management Plan should be developed for the grave which also need to be approved by SAHRA BGG. ▪ If the site cannot be avoided, then an application will be required for a test excavation and/or GPR permit to determine if the site contains graves. ▪ If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations. ▪ If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required. 		
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Figure 69: Views of the possible grave identified at 0186.

0187	-32.107511°	21.812899°	<p>The site comprises the remains of old irrigation infrastructure (aqueduct, dam and windmills). It is located close to K-05.</p> <p>Recommendation: As the site is located outside of the development area proposed for infrastructure, no mitigation is required, as no impact is expected.</p>	LOW	IIIC
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Figure 70: Views of the infrastructure identified at site 0187.

8.4 Sensitivity assessment outcome

From the desktop assessment medium to low heritage sensitive areas were identified in the broader region. The heritage sensitive areas identified during the desktop search consisted of a farmstead and buildings.

During the surveys, a combined total of seven heritage sites were identified.

- The stone ruin farmstead (**K-05**) was rated as having medium heritage significance (rating: IIIB);
- The stone shepherds' shelter (**K-08**) was rated as having low heritage significance (rating: IIIC);
- The Low density MSA scatter (**FS-03**) was rated as having low heritage significance (rating: IIIC).

- One (1) site with old irrigation infrastructure (**0187**) was rated as having low heritage significance.
- One (1) site with the remains of a stone kraal (**0184**) that was rated as having low heritage significance.
- One (1) Findspot (**0185**) was rated as having low heritage significance.
- One (1) possible grave site (**0186**) was rated as having medium-high heritage significance.

9. PALAEOLOGY

According to the PIA conducted by Banzai Environmental (Butler, 2022) the geology of the Klipkraal WEF 2 project area is covered by 1: 250 000 geology sheet Sutherland 3220 (1983) (Council of Geoscience, Pretoria) (**Figure 71**). This map indicates that the south-western portion as well as a small portion in the development is underlain by Jurassic Dolerite (Jd, red) while the rest of the footprint is underlain by the Teekloof Formation (Pte; green) of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup).

The PalaeoMap of the South African Heritage Resources Information System (

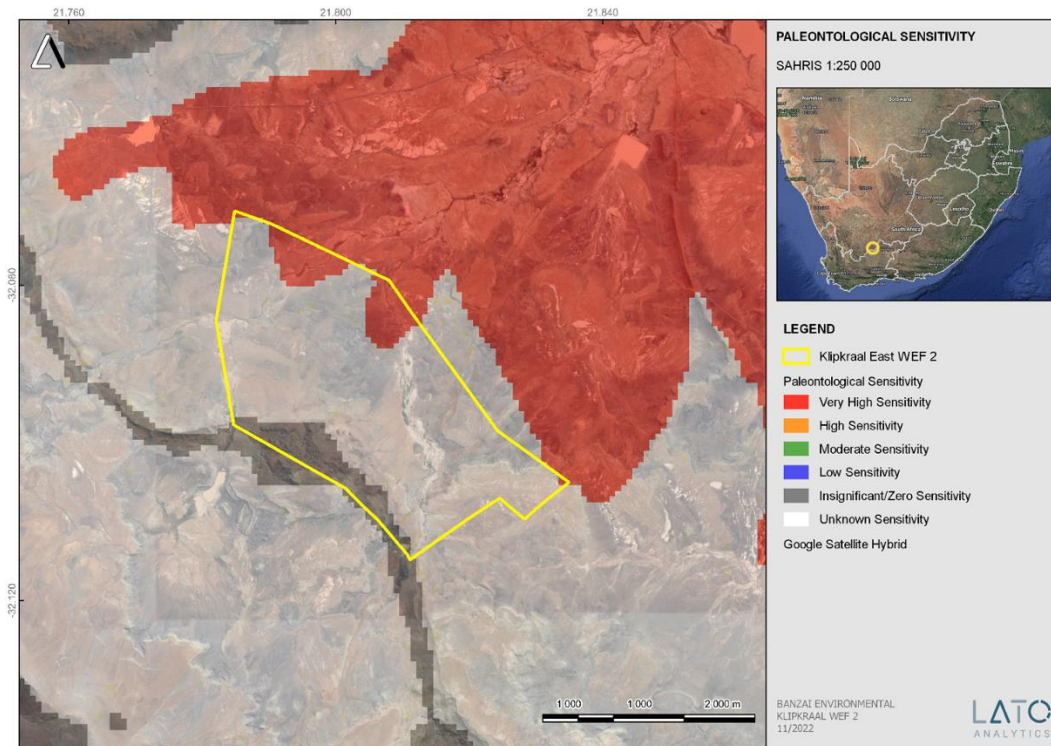


Figure 72) indicates that the Palaeontological Sensitivity of the Jurassic Dolerite is Zero as it is igneous in origin and thus unfossiliferous while that of the Adelaide Subgroup is Very High (Almond and Pether, 2009; Almond *et al.*, 2013). Large areas in the development are underlain by white and indicates that these areas have not been allocated so a specific Palaeontological Sensitivity. This

Map differs considerable from the Geological Map (Figure 71,

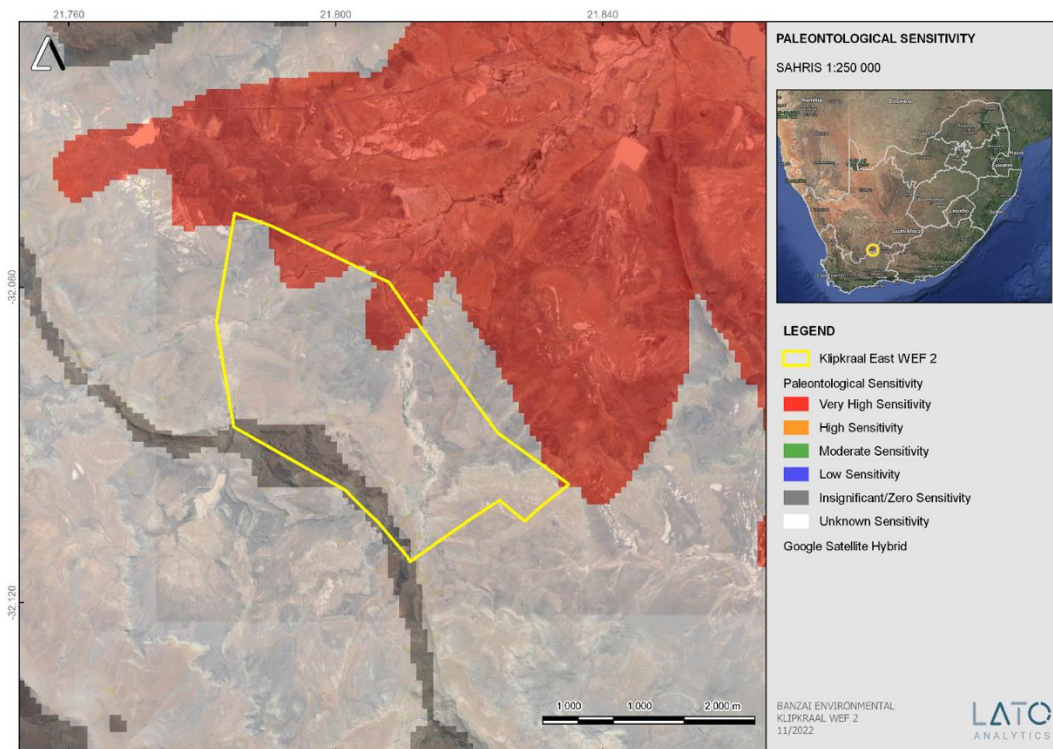


Figure 72).

Updated Geology (Council of Geosciences, Pretoria; **Figure 73**) refines the geology of the 1983 Geological Map and indicates that the entire Klipkraal WEF 2 is underlain by the Middleton Formation (Adelaide Subgroup, Beaufort Group).

An overall 2-day site-specific field survey of the development footprint was conducted on foot and by motor vehicle between 24-26 September 202.

Several fossiliferous sites were identified during the site visit.

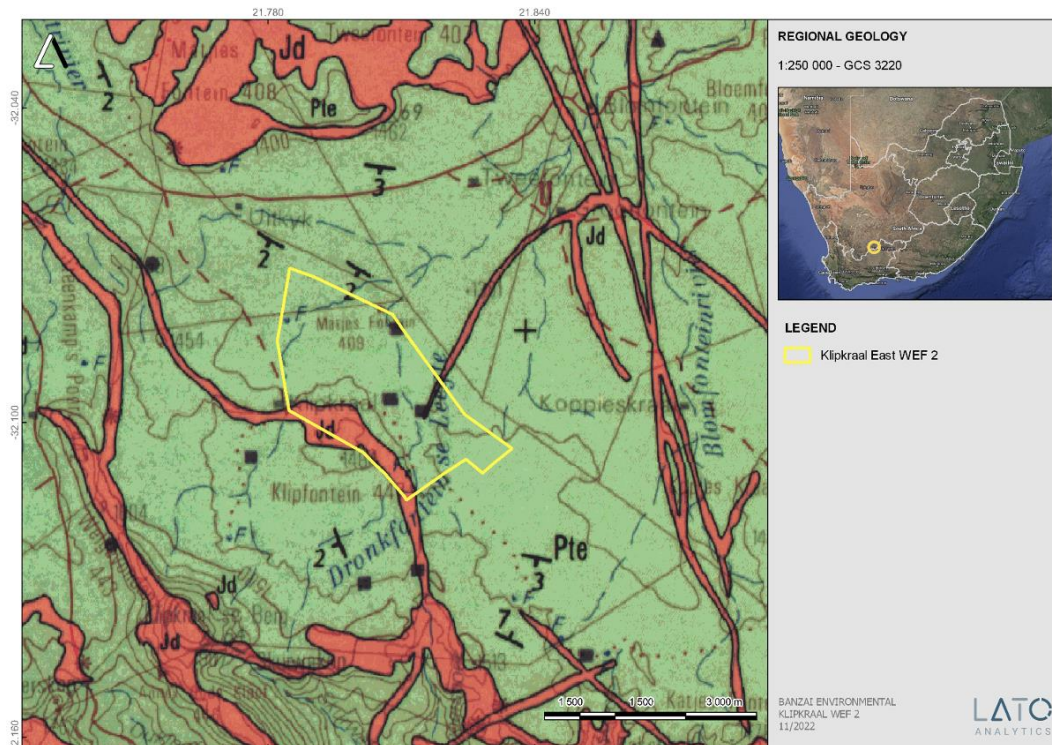


Figure 71: Extract of the 1:250 000 Sutherland 3220 (1983) Geological map (council of Geoscience, Pretoria) indicating that the development is underlain by the Teekloof Formation (Pte, green) of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup, while the most south-western margin as well as an area in the development is underlain by Jurassic dolerite (Jd, red).

Table 8: Legend of the 1:250 000 Sutherland 3220 (1983) Geological map (council of Geoscience, Pretoria).

JURASSIC		PERMIAN		
JURA		PERM		
OPEENVOLGING KAROO SEQUENCE	GROEP BEAUFORT GROUP	Teekloof	Mudstone, siltstone, sandstone; sandstone-rich Poortjie Member at base Moddersteen, sliesteën, sandsteen; sandsteenryke Poortjied aan basis	
		Abramskraal (Pa)	Mudstone, siltstone, sandstone, thin cherty beds (lowermost red mudstone ---) Moddersteen, sliesteën, sandsteen, dun chertagtige lae (onderste rooi moddersteen ---)	
		Waterford (Pw)	Sandstone, siltstone, mudstone, shale Sandsteen, sliesteën, moddersteen, skalie	
	GROEP ECCA GROUP	*Kooedoosberg	Sandstone, siltstone, shale Sandsteen, sliesteën, skalie	
		*Kookfontein	Shale, siltstone, thin sandstone beds Skalie, sliesteën, dun sandsteen lae	
		*Skoorsteenberg (Ps)	Sandstone, siltstone, shale Sandsteen, sliesteën, skalie	
		Tierberg	Shale Skalie	
			Jd	Dolerite Doleriet

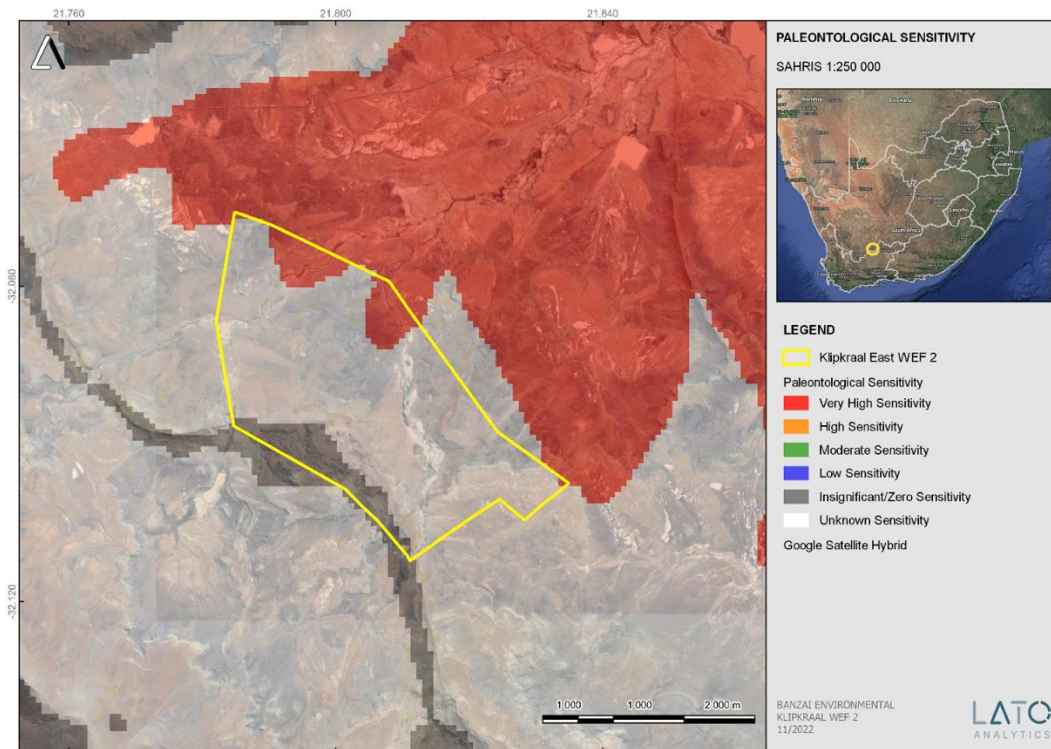


Figure 72: Extract of the 1: 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed Klipkraal WEF 2 development.

Table 9: Palaeontological Sensitivity according to the SAHRIS PalaeoMap (Almond et al, 2013; SAHRIS website)

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

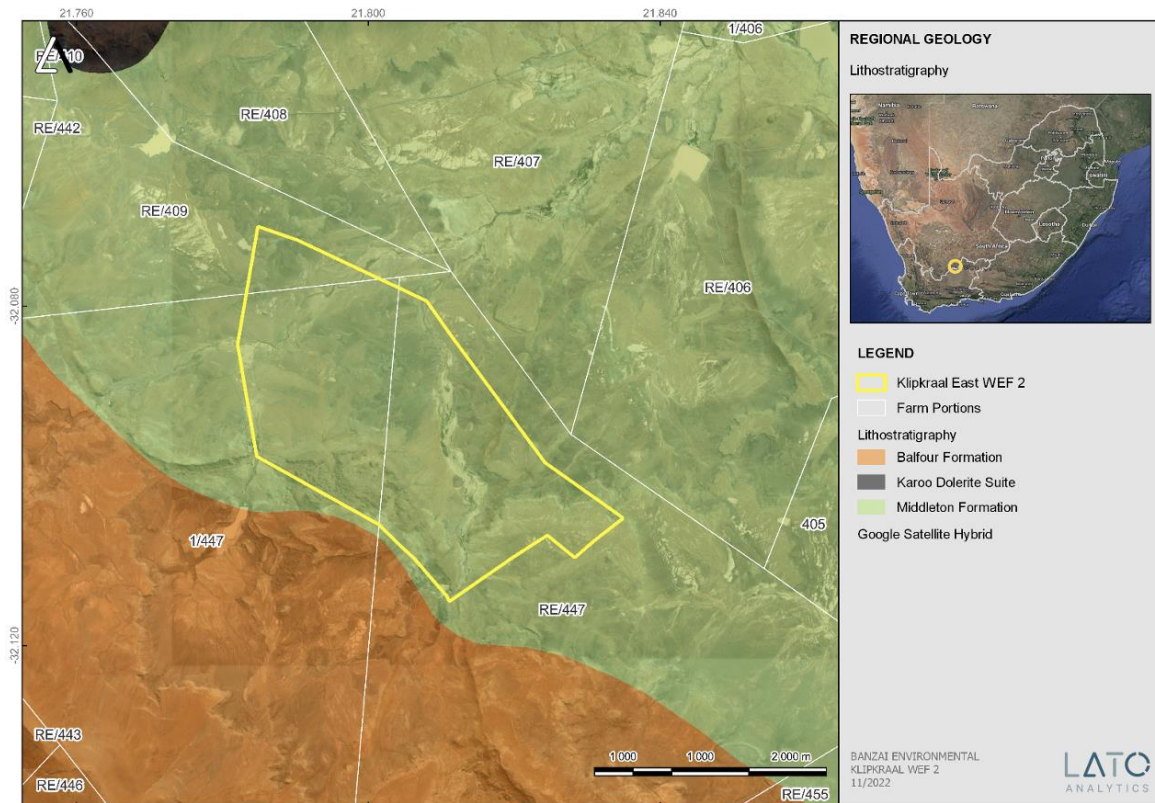


Figure 73: Updated geology (compiled by the Council of Geosciences, Pretoria) indicates that the entire Klipkraal WEF 2 is underlain by the Middleton Formation (Adelaide Subgroup, Beaufort Group, Karoo Supergroup).

Age	Gp	West of 24° E	East of 24° E	Free State / KwaZulu-Natal	Vertebrate Assemblage Zones	Vertebrate Subzones		
JURASSIC	STORMBERG		Drakensberg Gp	Drakensberg Gp	Massospondylus			
			Clarens Fm	Clarens Fm				
			upper Elliot Fm	upper Elliot Fm				
TRIASSIC	Tarkastad Subgp		lower Elliot Fm	lower Elliot Fm	Scalenodontoides			
			Molteno Fm	Molteno Fm				
			Burgersdorp Fm	Driekoppen Fm	Cynognathus	<i>Cricodon-Ufudocyclops</i> <i>Trirachodon-Kannemeyeria</i> <i>Langbergia-Gargainia</i>		
		Katberg Fm	Verkykerskop Fm	<i>Lystrosaurus declivis</i>				
		BEAUFORT	Adelalide Subgp	Teekloof Fm	Palingkloof M.	Harrismith M.	Daptocephalus	<i>Lystrosaurus maccaigi-Moschorhinus</i>
					Elandsberg M.	Schoondraai M.		
Ripplemead M.	Rooinekke M.							
Daggaboersnek M.	Frankfort M.							
Oudeberg M.								
ECCA			Balfour Fm	Normandem Fm	Cistecephalus			
			Steenkampsvlakte M.					
			Oukloof M.					
			Hoedemaker M.	Middleton Fm	<i>Endothiodon</i>	<i>Tropidostoma-Gorgonops</i> <i>Lycosuchus-Eunotosaurus</i>		
			Poortjie M.					
Abrahamskraal Fm	Koonap Fm	Volksrust Fm		<i>Tapinocephalus</i>	<i>Diictodon-Styracocephalus</i> <i>Eosimops-Glanosuchus</i>			
				<i>Eodicynodon</i>				
Waterford Fm	Waterford Fm							
			Tierberg/Fort Brown	Fort Brown				

Figure 74: Vertebrate biozonation range chart for the Main Karoo Basin of South Africa.



Figure 75: Vertebrate front limb partially exposed (GPS -32.136389 21.791111).



Figure 76: Well preserved ripple marks (GPS -32.094722 21.802778).



Figure 77: Fragmented Vertebrate skull (GPS -32.121944 21.830000).

It is also 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 size of the study area and the subterranean nature of some heritage sites. The impact assessment conducted for heritage sites assumes the possibility of finding heritage resources during the project life and has been conducted as such.

Three project phases have been identified by SiVEST namely the Pre-Construction Phase, Construction Phase and Operational Phase. As site clearing activities of all the development footprint areas are grouped under the Pre-Construction Phase, the highest level of impact on the identified heritage sites is expected during this phase. No impacts are expected during the Operational Phase. All the identified heritage sites are expected to be destroyed in terms of the pre-mitigation impact assessments undertaken below, whereas only those sites not mitigated by amendments to the proposed development footprints will also be destroyed in terms of the post-mitigation impact assessment calculations undertaken below.

The following impact rating tables are based on the proposed WEF development layout within the region.

10.2 Identification of impacts

The pre-construction and construction phase of the proposed WEF will entail extensive surface clearance as well as excavations into the superficial sediment cover and underlying bedrock (e.g. for widened or new access roads, wind turbine foundations, hardstanding areas, on-site substation, underground cables, construction laydown area, O&M building and BESS). Construction of the facility may adversely affect potential archaeological and fossil heritage within the development footprint by damaging, destroying, disturbing or permanently sealing-in fossils preserved at or beneath the surface of the ground that are then no longer available for scientific research or other public good. The possible pre-construction impacts calculated on the tangible cultural heritage resources is overall VERY HIGH - MODERATE NEGATIVE rating but with the implementation of the recommend buffers and management guidelines will be reduced to a MEDIUM - LOW NEGATIVE impact.

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

10.3 Impact Assessment Ratings

Table 10: Assessment of the Impact of Proposed Development on Heritage Sites

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Pre-Construction/Construction Phase																				
Unidentified heritage resources	Due to the size of the area assessed, there's a possibility of encountering heritage features in un-surveyed areas does exist.	1	3	4	2	4	2	28	-	Medium	1. A management plan, after a walkdown of the final layout, for the heritage resources needs then to be compiled and approved for implementation during construction and operations.	1	3	4	2	4	1	14	-	Low
Palaeontological Resources	Damage, disturbance, destruction or sealing-in of legally-protected, scientifically valuable fossil heritage at or beneath the ground surface within the road footprint,	2	4	4	4	4	4	72	-	Very High	1. Palaeontological Walkdown is recommended during the EIA phase. 2. Most recorded fossil sites can be	2	4	4	4	4	2	34	-	Medium

10.4 Overall Impact Rating

It is the author's considered opinion that this additional load on the overall impact on heritage resources will be **low**. With a detailed and comprehensive regional dataset this rating could possibly be adjusted and more accurate.

11. General Recommendations and Mitigation Measures

11.1 Construction phase

The project will encompass a range of activities during the construction phase, including vegetation clearance, excavations and 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 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.

11.2 Chance find 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.
- 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.

11.3 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 development activities, could uncover the following:

- High density concentrations of stone artefact
- unmarked graves

11.4 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 11** gives guidelines for lead times on permitting.

Table 11: 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 construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

11.5 Heritage Management Plan for EMPr implementation

Table 12: Heritage Management Plan for EMPr implementation

Area and site no.	Mitigation measures	Phase	Target
General project area	<ul style="list-style-type: none"> Implement a chance find procedures in case where possible heritage finds are uncovered. 	Construction and operation	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA
Possible graves (0186)	<ul style="list-style-type: none"> The site should be demarcated with a 50-meter buffer and the grave should be avoided if any construction is to happen close to it. 	Construction through to Operational	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA
Historical Stone Ruin Farmstead that was rated as medium heritage significance (K-05)	<ul style="list-style-type: none"> At this stage, the site is more than 50m away from proposed infrastructure, thus no mitigation is required. In terms of general conservation of the historical stone ruins, a 30m no-go buffer zone is recommended. If any development occurs within 30m of the sites, the structures will need to be satisfactorily studied and recorded before impact occurs. Recording of the structures i.e. (a) map indicating the position and footprint of all the structures (b) photographic recording of all the structures (c) measured drawings of the floor plans of the principal structures. 	Pre-construction	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA
Historical Structure that were rated as low heritage significance (K-08, 0184, 0187)	<ul style="list-style-type: none"> No mitigation required. 	Pre-construction	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA
Low density surface scatter/Findspot (FS03, 0185) that was rated as low heritage significance	<ul style="list-style-type: none"> No mitigation required. 	Pre-construction	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA
Palaeontological Finds	<ul style="list-style-type: none"> A pre-construction palaeontological heritage walkdown of the final WEF layout. The appointed Palaeontologist will also have to include a Chance Find Protocol for the Klipkraal WEF 2 development and training of accountable supervisory personnel by a qualified palaeontologist in the recognition of fossil heritage is necessary. 	Pre-construction/ Construction	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 of NHRA.

In the last few decades extensive research and collecting have been conducted by palaeontologists in this part of the basin and the Fraserburg area was found to be highly fossiliferous. A three day-site-specific field survey of the development footprint was conducted on foot 24-26 September 2021. Various fossiliferous sites, where fossils were found to be well-preserved, has been identified in the development footprint.

12.3 Recommendations

The calculated impact as summarised in **Section 9** of this report confirms the impact of the Klipkraal WEF 2 will be reduced from **VERY HIGH - MODERATE NEGATIVE** rating to a **MEDIUM - LOW NEGATIVE** impact rating with the implementation of the mitigation measures. This finding in addition to the implementation of a chance finds procedure, as part of the EMP, will mitigate possible impacts on unidentified heritage resources.

The following mitigation measures will be required if associated infrastructure does encroach upon the identified heritage sites:

The following mitigation measures will be required:

- 30m buffer zone around historical farmstead
- 50m buffer around graves
- It is essential that a walk down survey of the final footprint of the new Klipkraal WEF 2 and associated grid connection infrastructure be conducted.
- A management plan for the heritage resources then needs to be compiled and approved for implementation during construction and operations.

In terms of the PIA:

As the site visit was conducted in 2021 the layout of the WEF was not yet known. The specific layout of the Klipkraal WEF 2 development was thus not investigated in detail.

It is thus recommended that a Palaeontological Walkdown of the development is conducted when the layout of the roads and turbines have been established.

The appointed Palaeontologist will also have to include a Chance Find Protocol for the Klipkraal WEF 2 development and training of accountable supervisory personnel by a qualified palaeontologist in the recognition of fossil heritage is necessary.

12.4 General

The overall impact of the Klipkraal WEF 2, on archaeological and fossil heritage, is seen as **very high to medium** before mitigation. Once the recommendations have been implemented, the impacts can be mitigated to a **Medium to Low** level.

12.5 Additional Survey

An additional survey of the Klipkraal WEFs 1-3 final development area was conducted by a qualified archaeologist (Henk Steyn) and field assistant (Xander Fourie) from PGS (8-10 November 2022). This has been requested by the SAHRA, as it was noted that the initial survey of the study area, as part of the HIA, was minimal (**Figure 78, Figure 79**).

Four (4) additional heritage resources were recorded within the study area during this fieldwork (**Figure 80**). These included:

- One (1) site with old irrigation infrastructure (**0187**) was rated as having low heritage significance.
- One (1) site with the remains of a stone kraal (**0184**) that was rated as having low heritage significance.
- One (1) Findspot (**0185**) was rated as having low heritage significance.
- One (1) possible grave site (**0186**) was rated as having medium-high heritage significance.

From an archaeological and historical structure perspective, the proposed footprint areas will not change the impact on the identified heritage resources in the HIA. As such the recommended mitigation measures as described in the report remain.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout

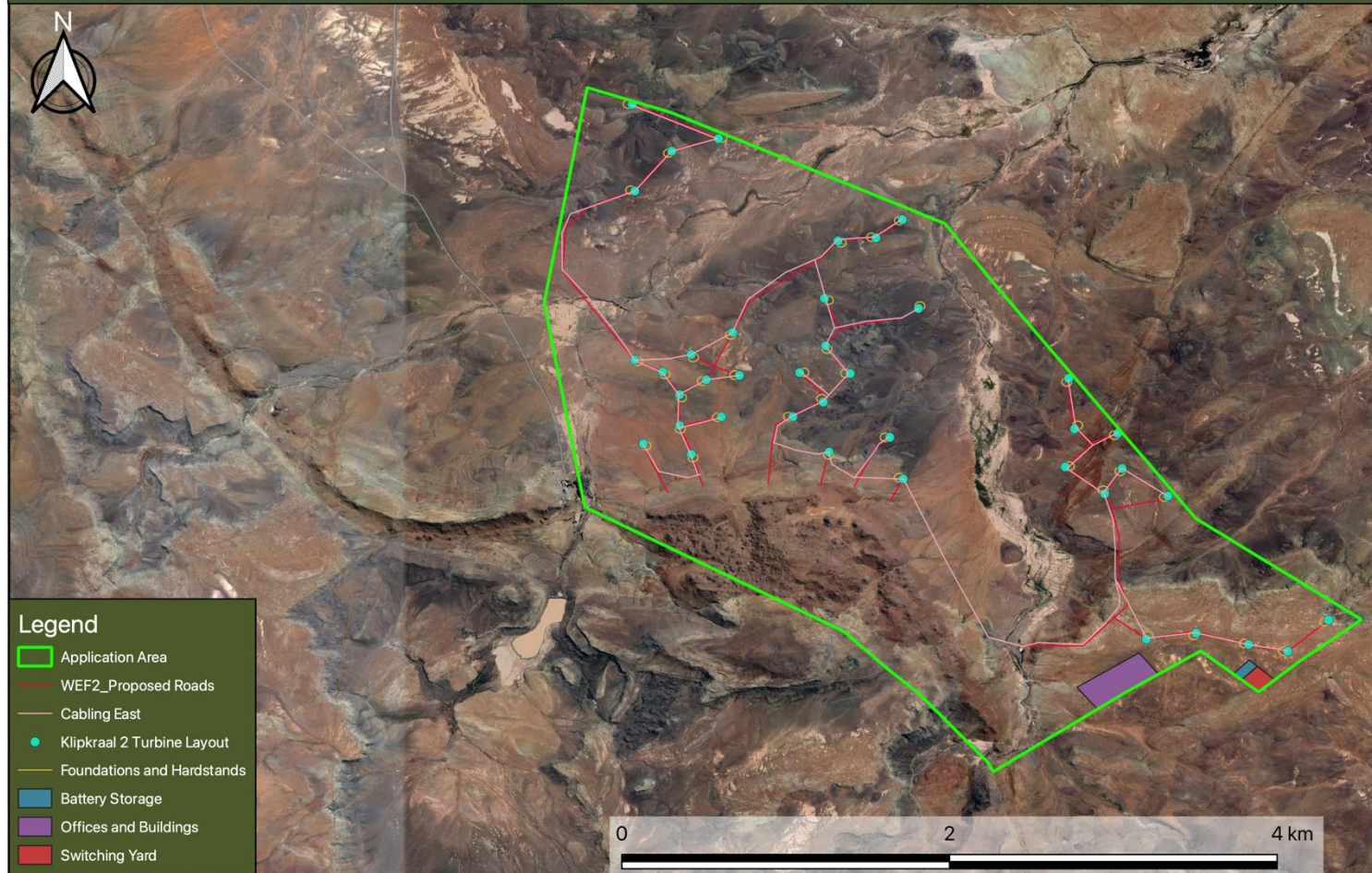


Figure 78: Final proposed development area.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout and Combined Survey Tracks

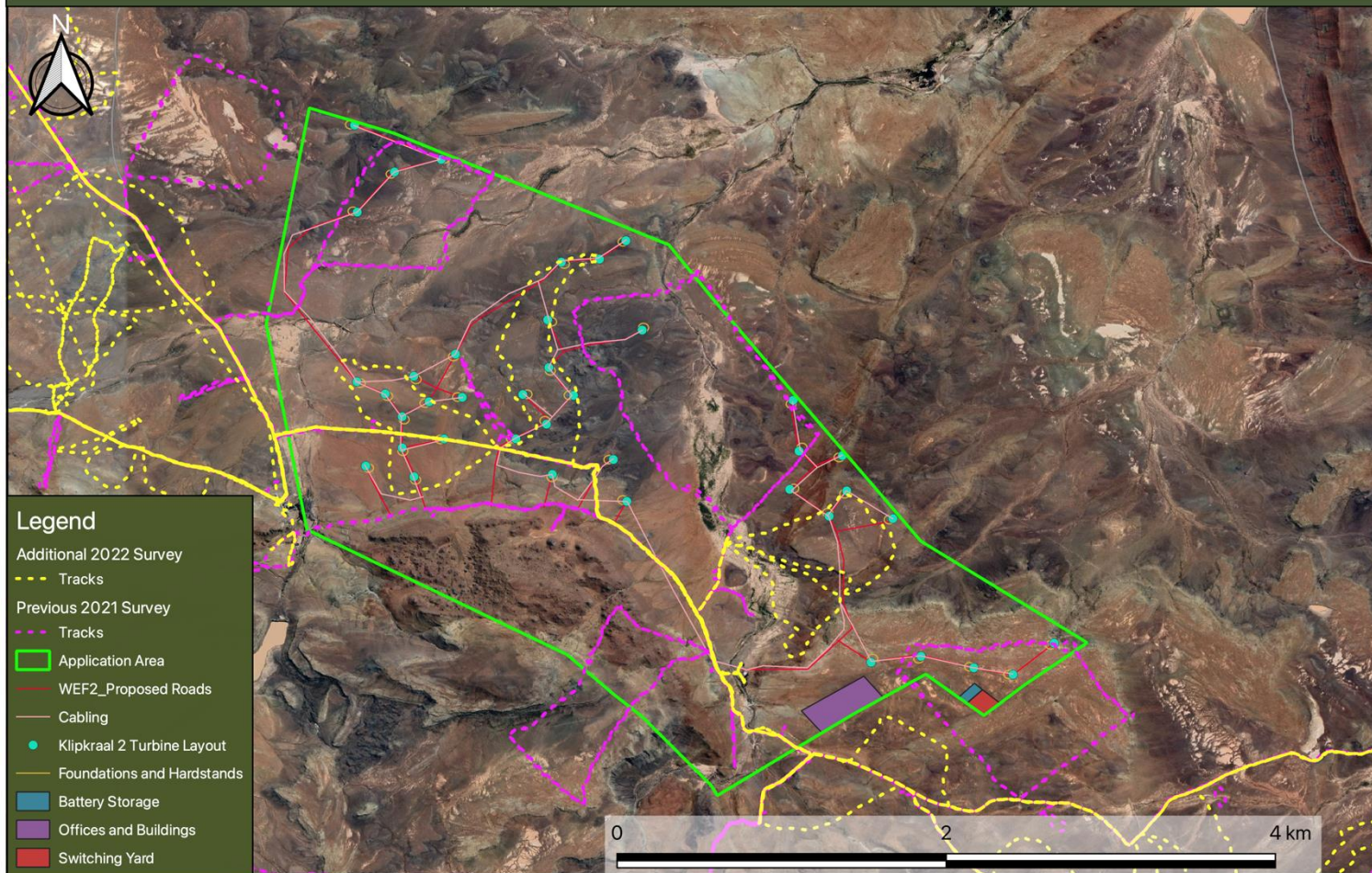


Figure 79: Final proposed development area relative to all the survey tracks.

Proposed Klipkraal WEF 2

PGS Heritage (Pty) Ltd
Heritage Management Unit



Final Proposed Layout and Combined Heritage Resources

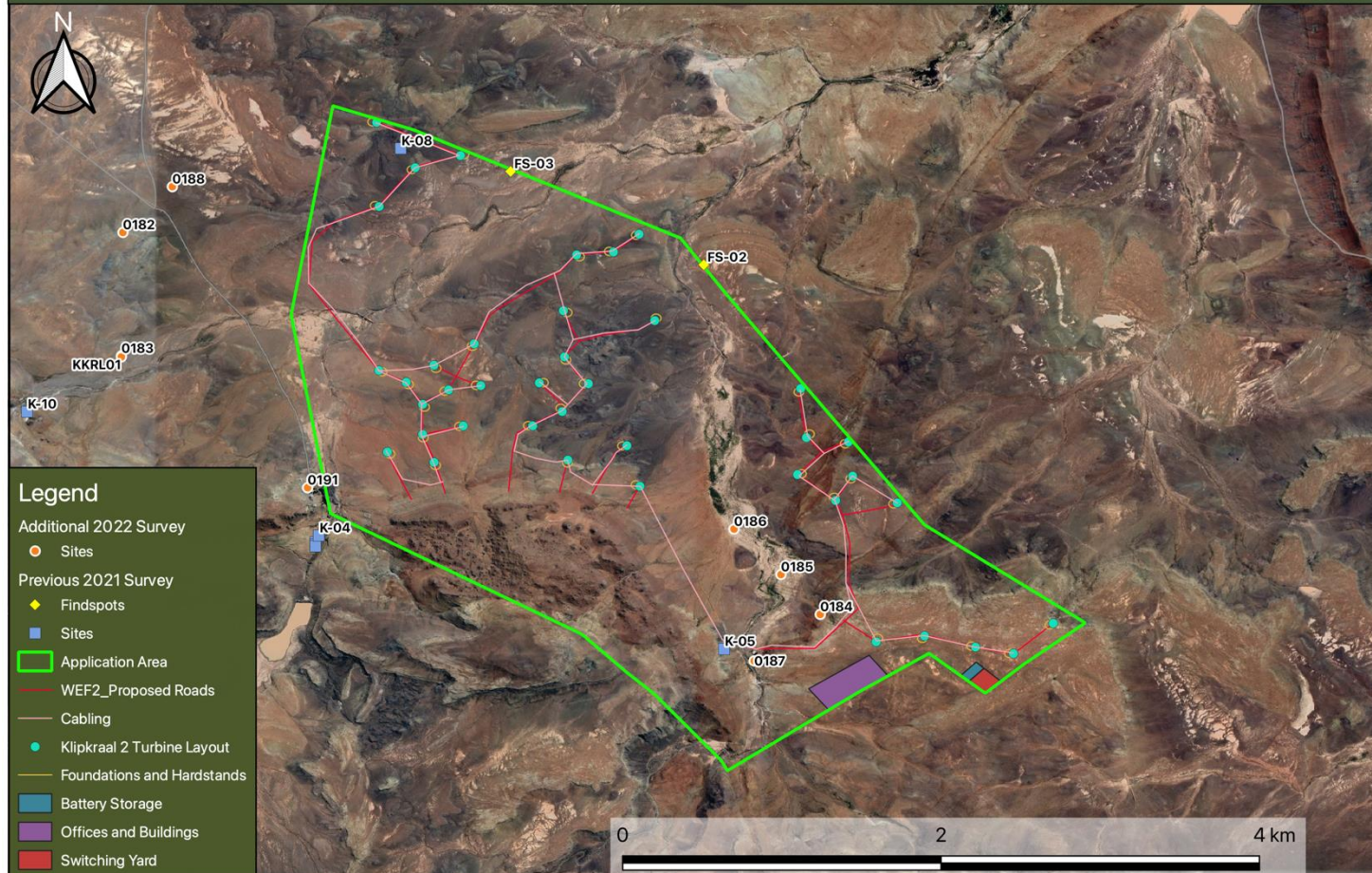


Figure 80: Final proposed development area relative to the locality of the heritage resources identified within the study area.

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APPENDIX A – CV

NIKKI MANN

-Professional Archaeologist, PGS Heritage

Key Qualifications:

MSc Archaeology (phytolith analysis) - University of Cape Town - 2017

BSc Honours Archaeology - University of Cape Town – 2014

Bachelor of Science (BSc) - University of Cape Town - Majors in Archaeology, and Environmental and Geographical Science -2013

Professional Archaeologist – Association of Southern African Professional Archaeologists (ASAPA)

Archaeological Experience

- 2021- Current – Archaeologist – PGS Heritage (Pty) Ltd
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Gunstfontein Wind Energy Facility (WEF) and overhead powerline, near Sutherland, Northern Cape, South Africa. – Position: Archaeological Specialist (November 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Proposed development of an overhead powerline for the approved Oya PV Facility, between Sutherland and Matjiesfontein, Northern and Western Cape, South Africa. – Position: Archaeological Specialist (October 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Proposed development of infrastructure for the approved Kudusberg Wind Energy Facility (WEF), between Sutherland and Matjiesfontein, Northern and Western Cape, South Africa. – Position: Archaeological Specialist (October 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Proposed Square Kilometre Array (SKA) fibre optic cable, between Beaufort West and Carnarvon, Northern and Western Cape, South Africa. (September 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Kolkies PV (Photovoltaics) Project, north of Touws River, Western Cape, South Africa. – Position: Archaeological Specialist (September 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Pienaarspoort Wind Energy Facility (WEF) Project 1 and 2, north-west of Matjiesfontein, Western Cape, South Africa. – Position: Archaeological Specialist (September 2020).
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Swellendam Wind Energy Facility (WEF), Swellendam, Western Cape, South Africa. – Position: Archaeological Specialist (August 2020).
- **Phase 2 Archaeological Mitigation**: Proposed development of infrastructure in the Port of Ngqura within the Coega Industrial Development Zone (IDZ), Nelson Mandela Bay Municipality, Eastern Cape, South Africa: Contract Archaeologist, excavation of Later Stone Age (LSA) shell middens (July 2020). Contracted to work with PGS Heritage.

- Polihali Dam Heritage Management Project, Lesotho: Junior field archaeologist, excavation of Later Stone Age (LSA) sites (May 2019- May 2020) as part of PGS Heritage.
 - Duties included excavation of rock shelters, site supervision, site recording, photography, lab work, section drawing and digital illustration (Inkscape and Photoshop), assisting in report writing and implementation of HSE practices.
- Ledi-Geraru Research Project, Ethiopia: excavation of Early Stone Age (ESA) sites (February-March 2020; Directed by Dr David R. Braun)
- Gorras Farm, Northern Cape, South Africa: excavation of middens next to a corbelled building; Historical site (October 2018; supervised by Simon Lee Hall and UCT PhD student Ms Vuyiswa Thembelihile Lupuwana)
 - Duties included excavation of middens and surface collection.
- **Phase 2 Archaeological Mitigation:** Proposed development of boreholes and associated pipelines for the Langebaan Aquifer within the Hopefield Private Nature Reserve, Hopefield, Western Cape. - Position: Archaeological specialist (August 2018).
- Koobi Fora Field School, Kenya: Intern, excavation of Early Stone Age (ESA) and Middle Stone Age (MSA) sites (June-July 2018; Directed by Dr David R. Braun, Kathryn Ranhorn (Postdoctoral Research Fellow at Harvard University) and Jonathan Reeves (PhD student at The George Washington University))
- Data extraction to SAHRIS (South African Heritage Resource Agency) for CTS Heritage (April 2018)
- Phase 1 Archaeological Impact Assessment (**Phase 1 AIA**): Matjiesfontein Road Extension Project, Matjiesfontein, Western Cape. – Position: Archaeological Specialist (April 2018).
- Ledi-Geraru Research Project, Ethiopia: excavation of Early Stone Age (ESA) sites (February-March 2018; Directed by Dr David R. Braun)
- Ferrycarrig, Irish National Heritage Park, Wexford, southeast Ireland: Excavation of ringwork castle site associated with the Anglo-Norman invasion of Ireland (January 2018; Directed by Dr Denis Shine and Dr Stephen Mandal)

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, Mozambique, Malawi, Mauritius and the Democratic Republic of the Congo

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:		
Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

APPENDIX C: Site Sensitivity Verification Report (IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020)

1. Introduction

PGS Heritage (Pty) Ltd (PGS) has been appointed by SiVest (PTY) Ltd (hereafter referred to as “SiVEST”), on behalf of Aura Development Company (Pty) Ltd (hereafter referred to as ‘Aura’), to undertake a Heritage Impact Assessment that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed construction of the Klipkraal Wind Energy Facility (WEF) near the towns of Beaufort West and Fraserburg in the Northern Cape Province of South Africa.

The proposed wind farms make up a larger wind energy facility (WEF) (with associated BESS) which will be referred to as the Klipkraal WEF, consisting of up to five (5) phases, with a combined generation capacity of up to approximately 1 500 MW, as follows:

- Klipkraal Wind Energy Facility 1: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 2: up to 300MW + BESS (**this application**)
- Klipkraal Wind Energy Facility 3: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 4: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal Wind Energy Facility 5: up to 300MW + BESS (part of a separate EIA process which forms part of separate application)
- Klipkraal On-site Switching / Collector Substation and associated 132kV/400kV Power Line (part of a separate BA application).

In accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

2. Site sensitivity verification

The site sensitivity verification of the proposed Klipkraal WEF is based on:

- A desktop review of (a) the relevant 1:50 000 scale topographic map 3221BB – Current and historical editions (1972, 1986, 2005), (b) Google Earth© satellite imagery, (c) published

historical and archaeological literature, as well as (d) several previous HIA and AIA assessments undertaken in the general vicinity of the study area.

- A field assessment of the Klipkraal WEF project area by the author and field assistant during the period 22 to 27 September 2021.

3. Outcome of site sensitivity verification

It is well known that the Karoo contains a long and rich archaeological record dating from the ESA to the historic period. However, vast areas of the region have yet to be subjected to systematic analytical research.

The evaluation of satellite imagery and the analysis of the studies previously undertaken in the area has indicated that certain areas may be sensitive from a heritage perspective. Archaeological surveys and studies in the area have shown rocky outcrops, dry riverbeds, riverbanks and confluence to be prime localities for archaeological finds and specifically Stone Age sites (Kinahan, 2008; Halkett, 2009; Webley & Halkett, 2015).

Scatters of ESA through to LSA artefacts have been widely reported in the general vicinity of Beaufort West. This is a result of the erosional nature of the environment, which tends to leave artefacts exposed on the surface rather than buried beneath layers of sediment. To date, heritage studies in the area have shown that these artefacts have occurred in secondary contexts, often associated with gravel deposits, having been subjected to erosion of the soils in which they were once deposited (Dreyer 2005; Halkett 2009; Kaplan 2006, 2007; Orton 2010; Webley & Hart 2010a, 2010b; Webley & Lanham 2011). Although context is generally poor, the Karoo is still regarded as a region that is very rich in archaeological and historical heritage.

The field work in the study area demonstrates that burial grounds and historical structures of heritage significance warrant conservation.

4. National Environmental Screening Tool

The Archaeological and Cultural Heritage Sensitivity Map for the Klipkraal WEF project area prepared using the DFFE screening tool indicates a **Low Sensitivity** rating for the study area (**Figure 9**). The low rating as provided by the Environmental Screening Tool possibly reflects scarcity of heritage reports conducted in the region. The field work that was conducted in the study area demonstrates that there are in fact some heritage resources of heritage significance that warrant conservation.

Therefore, the DFFE screening tool sensitivity map in **Figure 9** is not fully supported based on the findings of this fieldwork.

5. Conclusion

The Archaeological and Cultural Heritage sensitivity of the Klipkraal WEF has been evaluated, based on desktop studies and a site visit. It is concluded that the low rating as provided by the Environmental Screening Tool likely reflects the scarcity of heritage reports conducted in the region.