



SOYUZ 6 (PTY) LTD: SOYUZ 6 WIND ENERGY FACILITY PROJECT, PIXLEY KA SEME DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Heritage Scoping Study

A 3D rendering of a globe with water splashing over it, symbolizing sustainability and innovation. The globe is positioned in the center of the page, with a large, faint watermark of the Exigo logo overlaid on it.

Innovation in Sustainability

Prepared for: **Soyuz 6 (Pty) Ltd**

Prepared by: **Exigo Sustainability**



Email info@exigo3.com
Tel +27 012 751 2160
Fax +27 086 607 2406

Postnet Suite 74,
Private Bag X04,
Menlo Park, 0102

Vat nr: 4910184854
Registration nr: 2006/011434/07

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www.exigo3.com

HERITAGE SCOPING STUDY (HS) FOR THE SOYUZ 6 WIND ENERGY FACILITY PROJECT, PIXLEY KA SEME DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Conducted on behalf of:

CES
Soyuz 6 (Pty) Ltd

Compiled by:

Nelius Kruger (BA, BA Hons. Archaeology Pret.)

Reviewed by:

Ryan Jonas (CES)

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I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
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- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA, AMAFA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
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Date: 25 July 2022

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EXECUTIVE SUMMARY

This report details the results of a Heritage Scoping Study (HS) study for the proposed Soyuz 6 Wind Energy Facility (WEF) Project in the Pixley ka Seme District Municipality, Northern Cape Province. The WEF will comprise of up to 75 turbines with a contracted capacity of up to 480 MW, as well as related infrastructure over an anticipated permanent footprint of up to 150ha with additional temporary (construction) footprint of up to 65ha. The HS primarily assesses potential impacts on heritage resources emanating from the WEF development by investigating heritage signatures and potential site distribution and occurrence in the immediate surroundings of the affected area. Ultimately, the scoping predicts and assesses the level of impact that the development might have on the heritage landscape and the process aims to align the project planning in such a way that there will be minimal impact on heritage resources. The HS is conducted by means of a study of background information on the area’s archaeology, a detailed aerial survey of the proposed project impacted areas as well as a field assessment. The HS report includes background information on the area’s archaeology, its representation in Southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies.

Project Title	Soyuz 6 Wind Energy Facility Project
Project Locations	Relative Midpoint: S31.050025° E23.680599°
1:50 000 Map Sheet	3023DC, 3023DD, 3123BA, 3123BB
Farm Portion / Parcel	Various farms portions and parcels.
Magisterial District / Municipal Area	Pixley ka Seme District Municipality
Province	Northern Cape Province

A number of academic archaeological and historical studies have been conducted in this section of the Northern Cape Province and these studies all infer a rich and diverse archaeological landscape, representative of most phases of human and cultural development in Southern Africa. The cultural landscape of the Britstown region encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages through Colonial expansion, warfare and historical rural farming.

This scoping study established that the cultural landscape of the Soyuz 6 Wind Energy Facility project includes two broad layers, with the most recent, Colonial Period and more recent settlement and development over the past few hundred years having the most visually evident modifying effect on the landscape. Impacts related to this cultural layer include roads and associated bridges, single vehicle tracks, railway lines and associated bridges and structures, agricultural clearings for cultivation, farming activities, farmsteads, quarries, dams, fencing, overhead power lines, transmission/receiver masts and wind turbines. This layer also includes remnants of the Anglo Boer war. The second layer underlying the historic period is comprised of the three Stone Age periods spanning the period from a few hundred years ago to the early periods of stone tool making archaic humans at least 1.5 million years ago. Although the prehistoric cultural landscape is the least evident and often invisible, temporally, it makes up for the bulk of human occupation of the region. Given that most of the archaic human (Earlier Stone Age or ESA) and human (Middle Stone Age or MSA, Later Stone Age or LSA to recent) occupation of this area involves the Stone Age era, it can be argued that a significant cultural layer in this area involves the pre-colonial cultural landscape and its sense of place.

As such, heritage landscapes and sites of varied heritage significance occur - or are likely to occur within the project areas demarcated for the Soyuz 6 Wind Energy Facility. Generally, heritage resources in the project area are most probably localised and spatially confined and project impact areas can easily be micro sited during the EIA phase to avoid sensitive heritage resources where necessary. The following observations on the heritage potential of the project area are made based on desktop and site observations:

Archaeology:

- In the project area, shallow soils cover a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provide suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. MSA and LSA tool scatters are known to occur along water courses, pans and dry river beds and such material have been found in the project area. These tools might include formal tools such as blades, scrapers, adzes and points and microliths as well as debitage.
- Mountain crests, small hills and foothills and rock outcrops occur in the project area, for example Bakenskop, Speelmanskop, Arendskop, Vaalberg and Daskop. Occupation sites dating to the Later Stone Age (LSA) associated with Hunter Gatherers and Herders are known to occur in such locales. Here, scatters of stone artefacts such as stone tools, ostrich eggshell, fragments of pottery and beads are common. Crudely built Herder stone wall enclosures might remain in these areas. In addition, Historical Period fortifications in the form of temporary stone barricades and defences are known to occur on low rises around Britstown and De Aar.
- MSA and LSA tool scatters are also known to be found near outcrops and geomorphological exposures where source rock was exploited for the manufacturing of stone tools. Large boulders, frequently dolerite occurring throughout the project area, are commonly associated with Hunter Gatherer and Herder rock art in the form of engravings. In addition, stone "gongs" are often found in these areas on koppies and rocky outcrops.
- All archaeological sites and artefacts are protected under the National Heritage Resource Act (NHRA 1999) and, depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains in the project areas might range from low to high.

Colonial / Historical Period and Built Environment:

- In this landscape, farmsteads and werfs dating to the last centuries often hold historically significant buildings and features such as farm houses, corbelled huts, sheds, stone kraals, and "dorsvloers" (threshing floors). The old Lekkervlei, Wonderboom, Deelfontein, Blaauwbank, farmsteads occur in the project area. An analysis of historical topographical maps and aerial photographs indicate the presence of the werfs from at least 1950 and the compounds are older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the Brittan landscape. Highly sensitive burial sites are also known to occur around farmstead complexes. Small-scale farming and agriculture are prevalent around farmsteads in the project areas. Here, potential historical farmscapes might be encountered.
- Railway sidings occur in the project area at Plaatfontein and Sterkaar. An analysis of historical topographical maps and aerial photographs indicate the presence of the sidings from at least 1950 and the sites are older than 60 years and generally protected under the National Heritage Resource Act

(NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the project landscape.

- Occasional remains of “veewagterhuise” or shepherds’ huts dating to the Colonial Period are scattered across farms in this landscape. These buildings are usually constructed out of undressed sandstone blocks and glass, rusted metal fragments, fragments of ceramics, earthenware and bone are often found in middens associated with these huts. Even though these occurrences are often poorly preserved, they might be protected under the National Heritage Resource Act (NHRA 1999) if older than 60 years.
- The remains and remnants of Anglo-Boer War battlegrounds, field hospitals, concentration camps and cemeteries are found in this landscape and such sites are protected under the National Heritage Resource Act (NHRA 1999) where they are of Provincial heritage significance. Anglo-Boer War remnants might be present in the project area.
- Digging and / or quarrying seem to have occurred at single localities in the project area. Here, one might encounter remnants of historical mining and quarrying but the significance of such sites is not always apparent.

Cultural Landscape

- Generally, the proposed project area and its surrounds are characterized by rural Karoo farmlands, flatter grass plains and low mountain vegetation. Mountains and hills on the target properties for the project are indicated on topographic maps with unique names such as “Bakenskop”, “Speelmanskop”, “Arendskop”, “Vaalberg” and “Daskop” and other landscape features indicated, include “Grootdam”, “Sandhoek”, “Drielingdam”. “Harpuisplaat”, “Bassie se Dam”, “Groenleegte”, “Skilpaddam”, “Deelfontein”, “Die Brak”, “Die Vlei”, “Rondedam” and “Dutoitsdam” . Cognisance should be taken of the fact that these features might hold certain intangible heritage value or they might be regarded as sites of “Living Heritage” in the cultural landscape.

Cemeteries / Burial Sites

- Burial sites frequently occur around farmstead complexes within family cemeteries, for example possibly at the Lekkerlei, Wonderboom, Deelfontein, Blaauwbank, farmsteads but in some instances packed stones or rocks indicate the presence of informal pre-colonial burials in this landscape. In addition, human remains and burials are often found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is therefore important to remember that it is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface.
- Cemeteries, burial places and graves are viewed to have a high significance and they are protected under the National Heritage Resource Act (NHRA 1999).

The following recommendations are made based on the potential heritage risk of the Soyuz 6 Wind Energy Facility project area.

- The HS should be expanded to an integrated Phase 1 Heritage Impact Assessment (HIA) including findings of a walkdown of final project impact areas to document all sites, features and objects.
- Under no circumstances may any artefacts be removed, destroyed or interfered with by anyone on the site; and Contractors and workers shall be advised of the penalties associated with the unlawful

removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.

- The term “Living Heritage” can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or its surroundings and due cognisance should be taken of these sites of “Living Heritage” in the cultural landscape.
- It is recommended that all graves and cemeteries that might occur in the project surrounds be conserved and excluded from impact emanating from any future development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local authorities, adherence to any local laws and / bylaws, and correct grave relocation methodologies.
- It is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.
- Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

It should be noted that this HS and site sensitivity included above are based on off-site desktop findings and partial field observations and the heritage impact emanating from the proposed Soyuz 6 WEF remains tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999) during the EIA.

NOTATIONS AND TERMS/TERMINOLOGY

Absolute dating: Absolute dating provides specific dates or range of dates expressed in years.

Archaeological record: The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact: Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the Southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

Assemblage: A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

Context: An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context*, disturbance or displacement by later ecological action or human activities occurred.

Cultural Heritage Resource: The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape: A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM): A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Feature: Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Lithic: Stone tools or waste from stone tool manufacturing found on archaeological sites.

Matrix: The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Midden: Refuse that accumulates in a concentrated heap.

Microlith: A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

Monolith: A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Phase 1 CRM Assessment: An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study: In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure: A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Provenience: Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association*, the co-occurrence of an artefact with other archaeological remains; and *superposition*, the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling: A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Scoping Assessment: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

Site (Archaeological): A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Stratigraphy: This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Systematic Sampling: A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
HS	Heritage Scoping
IAPS	Integrated Algal Ponding System
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
WSF	Waste Storage Facility
YCE	Years before Common Era (Present)

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1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability was commissioned for a Heritage Scoping Study (HS) subject to a Risk Assessment process for the proposed Soyuz 6 Wind Energy Facility Project in the Pixley ka Seme District Municipality, Northern Cape Province. The rationale of this HS is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

Exigo Sustainability's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, Mr Nelius Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated HS report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA).

1.3 Project Brief

The applicant Soyuz 6 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 60km south of Britstown within the Emthanjeni Local Municipality and the Pixley ka Seme District Municipality in the Northern Cape Province.

Five additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained in Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Soyuz 1 WEF, Soyuz 2 WEF, Soyuz 3 WEF, Soyuz 4 WEF and Soyuz 5 WEF.

A preferred project site with an extent of approximately 125 000 ha has been identified as a technically suitable area for the development of the six WEF projects. It is proposed that each WEF will comprise of up to 75 turbines with a contracted capacity of up to 480 MW. It is anticipated that each WEF will have an actual (permanent) footprint of up to 150 ha.

The Soyuz 6 WEF project site covers approximately 17 800 ha and comprises the following farm portions:

- Remaining Extent of Portion 3 of the Farm No. 16.
- Remaining Extent (Portion 0) of the Farm No 16.
- Remaining Extent (Portion 0) of the Farm No 141.
- Remaining Extent (Portion 0) of the Farm No. 148.
- Portion 4 of the Farm No. 16.

- The Farm No. 157.
- The Farm No. 156.
- Portion 2 (a portion of Portion 13) of the Farm Wonderboom No. 13.
- Portion 1 of the Farm Wonderboom No. 13.
- Remaining Extent of Portion 1 of the Farm Sterkfontein No. 12.

The Soyuz 6 WEF project site is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 480 MW:

- Up to 75 wind turbines with a maximum hub height of up to 160 m and a rotor diameter of up to 200 m;
- A transformer at the base of each turbine;
- Concrete turbine foundations;
- Turbine, crane and blade hardstands;
- Temporary laydown areas (with a combined footprint of up to 14 ha) which will accommodate the boom erection, storage and assembly area;
- Battery Energy Storage System (with a footprint of up to 5 ha);
- Cabling between the turbines, to be laid underground where practical;
- Two on-site substations with a combined footprint of up to 4 ha in extent to facilitate the connection between the wind farm and the electricity grid;
- Access roads to the site and between project components inclusive of stormwater infrastructure. A 12 m road corridor may be temporarily impacted upon during construction and rehabilitated to 6m wide after construction. The WEF will have a total road network of up to 125 km.
- A temporary site camp establishment and concrete batching plants (with a combined footprint of up to 2 ha); and
- Operation and Maintenance buildings (with a combined footprint of up to 2 ha) including a gate house, security building, control centre, offices, warehouses, a workshop and visitor's centre.

In order to evacuate the energy generated by the WEF to the national grid, a separate Basic Assessment will be undertaken to assess two grid connection alternatives:

- Alternative 1: A 132 / 400kV overhead powerline (OHL) within a 500 m assessment corridor from the Switching Station on site to a proposed new 132 / 400 kV MTS located north of the WEF and adjacent to the Hydra – Kronos 400 kV line.
- Alternative 2: A 132 / 400 kV overhead powerline (OHL) within a 500 m assessment corridor from the Switching Station on site to a proposed new 132 / 400 kV MTS located south of the WEF and adjacent to the Droerivier - Hydra 400 kV line.

The EA applications for the wind farm project and grid connection infrastructure are being undertaken in parallel as they are co-dependent, i.e. one will not be developed without the other.

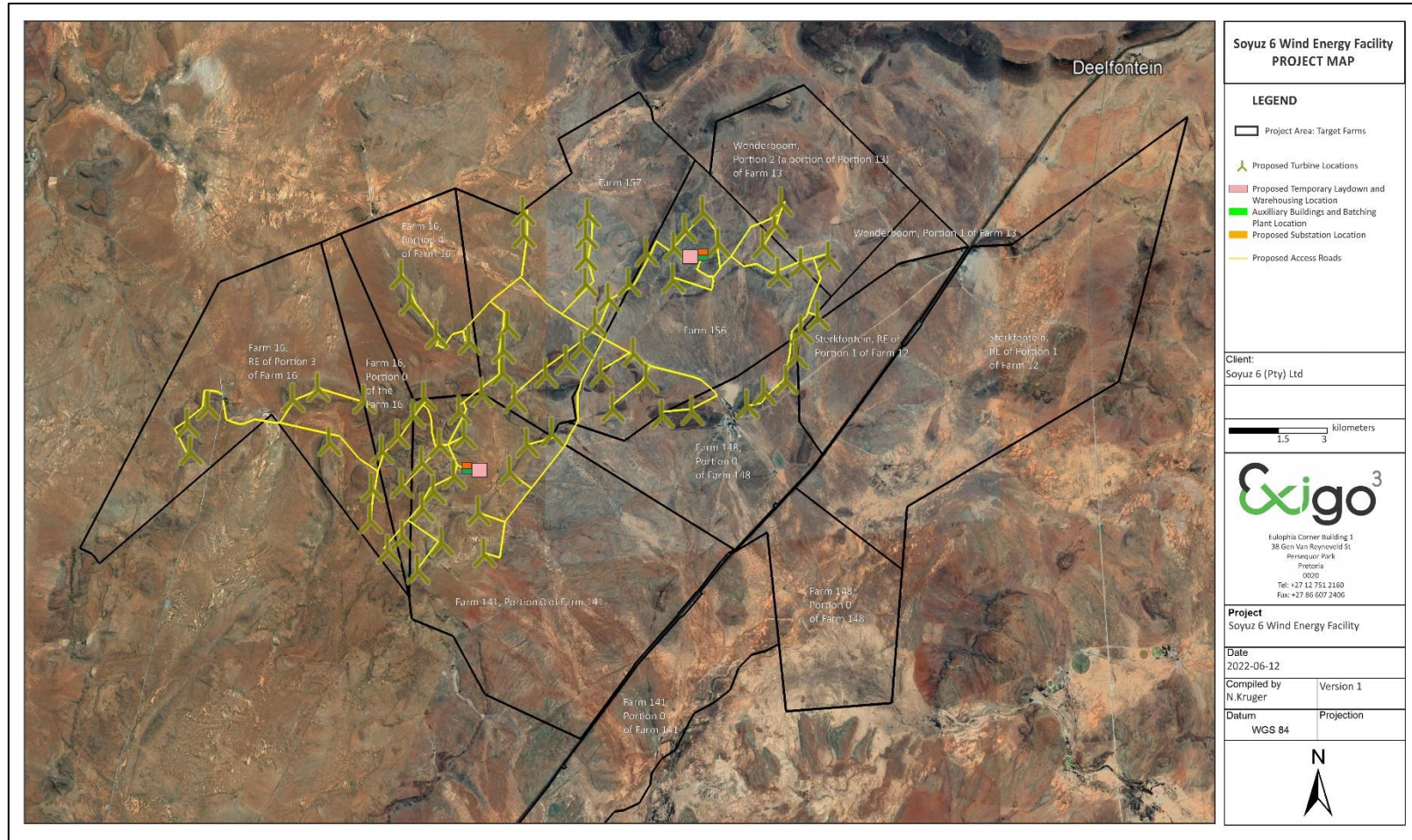


Figure 1-1: Map indicating the properties and project components for the proposed Soyuz 6 Wind Energy Facility project.

1.4 Terms of Reference

Heritage specialist input into the environmental impact grading is essential to ensure that, through the management of change, developments still conserve our heritage resources. Heritage specialist input can play a positive role in the development process by enriching an understanding of the past and its contribution to the present. It is also a legal requirement for certain development categories which may have an impact on heritage resources (Refer to Section 2.5.2). The heritage component is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources. Based hereon, this project functioned according to the following **terms of reference** for heritage specialist input:

- Provide a description of the heritage landscape of the project area in terms of cultural context and provenience by means of a detailed desktop background study;
- Provide a description of known and documented historical archaeological artefacts, structures (including graves) and settlements – if present - in the project area by means of a detailed desktop study;
- Compile the above into a broad heritage baseline for the project area and discuss the nature and degree of significance of this heritage baseline landscape;
- Provide a level of probability of site distribution and occurrence in the project area.
- Estimate the extent and severity of potential developmental impacts on the heritage landscape as a result of the planned development and associated actions;
- Drawing on findings from this desktop assessment, guide the project planning in terms of potential heritage impact.
- Recommend further heritage assessment requirements for the project based on the heritage landscape and its estimated sensitivity.
- Provide an integrated Heritage Scoping Report complying to SAHRA's minimum standards for Heritage Impact Assessment Studies and Reporting and the National Heritage Resources Act, 1999.

1.5 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

1.5.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and its provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act No 25 of 1999 (section 35) the following features are protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and paleontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

With regards to activities and work on archaeological and heritage sites this Act states that:

“No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority.” (34. [1] 1999:58)

and

“No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and*

palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

- (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;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."*

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves and burial grounds are commonly divided into the following subsets:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant local authorities.

c. National Heritage Resources Act No 25 of 1999, section 35

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

1.5.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently

threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

1.5.3 International Finance Corporation

Since the project is to lenders standards, the survey and assessment needs to meet the standards set out by the International Finance Corporation (IFC). Of relevance to this project is IFC Performance Standard (PS) 8 and the accompanying guidance notes which are used to guide cultural heritage properties and sites of archaeological, historical, cultural, artistic, and religious significance. The aim of this PS is to guide companies in protecting cultural heritage from adverse impacts of project activities and supporting its preservation. It also promotes the equitable sharing of benefits from the use of cultural heritage (IFC, 2012b).

The PS requires that:

- The client identifies and protect cultural heritage by ensuring that internationally recognized practices for the protection, field-based study, and documentation of cultural heritage are implemented.
- Where the risk and identification process determine that there is a chance of impacts to cultural heritage, the client must retain competent professionals to assist in the identification and protection of cultural heritage.
- Baseline studies should include a literature review, stakeholder engagement and consultation, in-field surveys and other relevant assessments.
- The client is responsible for siting and designing a project to avoid significant adverse impacts to cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. Chance Find Procedures should be developed.
- Where a project may affect cultural heritage, the client will consult with Affected Communities within the host country who use, or have used within living memory, the cultural heritage for long-standing cultural purposes.
- Where the client has encountered tangible cultural heritage that is replicable and not critical, the client will apply mitigation measures that favor avoidance. Where avoidance is not feasible, the client will apply a mitigation hierarchy as specified in the PS.
- Most cultural heritage is best protected by preservation in its place, since removal is likely to result in irreparable damage or destruction of the cultural heritage. The client will not remove any nonreplicable cultural heritage, unless all conditions specified in the PS are met.
- The client should not remove, significantly alter, or damage critical cultural heritage. In exceptional circumstances when impacts on critical cultural heritage are unavoidable, the client will use a process of Informed Consultation and Participation (ICP) of the Affected Communities as described in PS 1.
- Legally protected cultural heritage areas are important for the protection and conservation of cultural heritage, and additional measures are needed for any projects that would be permitted under the applicable national law in these areas. In circumstances where a proposed project is located within a legally protected area or a legally defined buffer zone, the client, in addition to the requirements for critical cultural heritage, will meet the following requirements:

- Comply with defined national or local cultural heritage regulations or the protected area management plans;
 - Consult the protected area sponsors and managers, local communities and other key stakeholders on the proposed project; and
 - Implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area.
- Where a project proposes to use the cultural heritage, including knowledge, innovations, or practices of local communities for commercial purposes, the client will inform these communities of (i) their rights under national law; (ii) the scope and nature of the proposed commercial development; and (iii) the potential consequences of such development.

South African Environmental Legislation and Heritage Legislation in particular are rigorous and aligned with the principals set out in the IFC. As such, the requirements listed above have been addressed in this report, with the exception of stakeholder engagement which is addressed in the EIA.

A detailed guideline of statutory terms and requirements is supplied in Addendum 1.

2 REGIONAL CONTEXT

2.1 Area Location

The Soyuz 6 Wind Energy Facility Project area is located south of the town of Britstown and west of De Aar in the Pixley ka Seme District Municipality, Northern Cape Province (see Figure 2-1).

The project is situated on the following farm portions:

- Remaining Extent of Portion 3 of the Farm No. 16.
- Remaining Extent (Portion 0) of the Farm No 16.
- Remaining Extent (Portion 0) of the Farm No 141.
- Remaining Extent (Portion 0) of the Farm No. 148.
- Portion 4 of the Farm No. 16.
- The Farm No. 157.
- The Farm No. 156.
- Portion 2 (a portion of Portion 13) of the Farm Wonderboom No. 13.
- Portion 1 of the Farm Wonderboom No. 13.
- Remaining Extent of Portion 1 of the Farm Sterkfontein No. 12

The study area appears on 1:50 000 Map Sheet 3023DC, 3023DD, 3123BA, 3123BB and a key location point of the proposed project area is:

- **Relative Midpoint: S31.050025° E23.680599°**

2.2 Area Description: Receiving Environment

The environment around Britstown is characterised by flat undulating Karoo vegetation comprised out of relatively sparse scrub and grasses, with dolerite hills in the surrounding landscape. Large portions of the land are currently devoted to livestock farming but a number of solar and wind energy facilities are to be constructed on farms around Britstown. Shallow soils cover a combination of calcrete, shale and dolerite

substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces.



Figure 2-1: View of the landscape in the project area, looking west. Note the presence of dolerite stone outcrops.



Figure 2-2: View of general surroundings in the project area.



Figure 2-3: Vast grasslands and open plains over much of the project area.



Figure 2-4: View of exposed surfaces along a shallow drainage line in the project area.

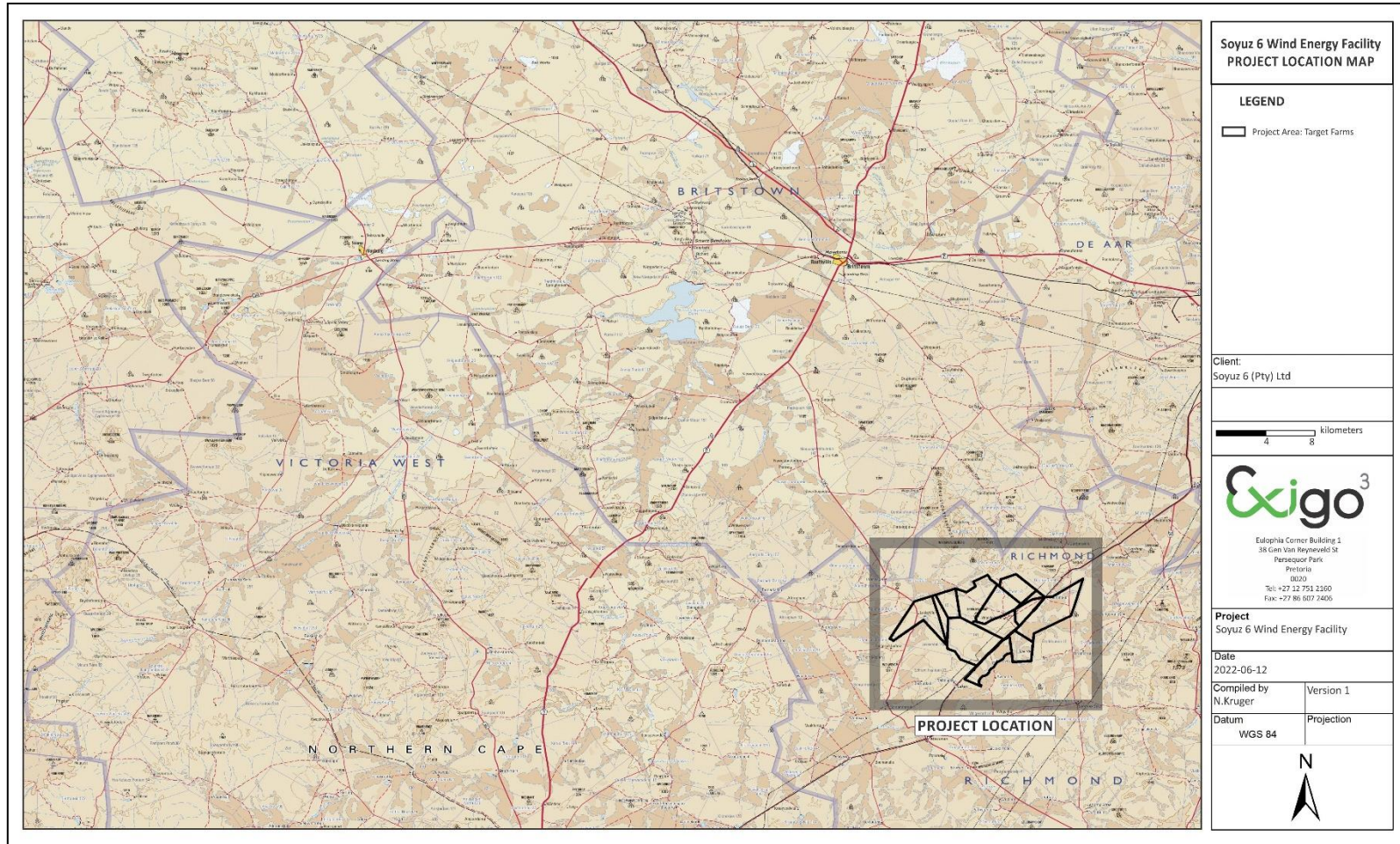


Figure 2-5: 1:250 000 Map representation of the location of the Soyuz 6 Wind Energy Facility project subject to this Heritage Scoping study.

3 METHOD OF ENQUIRY

3.1 Sources of Information

Data from detailed desktop studies, aerial surveys, the careful examination of cartographic material as well as site inspections were employed in the off-site and on-site scoping analysis of the project area.

3.1.1 Desktop Study

A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the project area and the larger landscape of this section of the Northern Cape Province. The desktop study examined a number of archaeological and historical impact assessments available from the South African Heritage Resources Agency Information System (SAHRIS). It was established that no commercially driven HIAs have been conducted in Soyuz project area and research coverage of surrounding regions seem sporadic (refer to Figure 3-1). However, the following heritage assessments pertaining to the De Aar WEF project situated east of the Soyuz project were of particular interest:

- Kaplan, J. 2010. Archaeological Scoping Study for a proposed wind energy facility on the Maanhaarberge & Kombuisfonteinberge, De Aar. Report prepared for DJ Environmental Consultants. ACRM.
- Kaplan, J. 2010. Archaeological Impact Assessment for a proposed photovoltaic power generation facility in De Aar in the Northern Cape Province. Report prepared for DJ Environmental Consultants. ACRM.
- Almond, J. 2010. Palaeontological Impact Assessment: Desktop Study for the proposed windfarm at Maanhaarberg near De Aar, Northern Cape Province. Natura Viva cc, Cape Town

In addition, the following heritage studies were consulted with regards to the Soyuz WEF project:

- Kruger, N. 2019. Archaeological Impact Assessment (AIA) for the Britstown 800 Emthanjeni 4114 Housing Development in the Northern Cape Province. Exigo Sustainability.
- Morris, D. 2007. Archaeological Impact Assessment of proposed extension of the Hydra substation at De Aar, Northern Cape Province. Report prepared for Bohlweki Environmental Kimberley: McGregor Museum
- Morris, D. 2006. Revised archaeological specialist input for the proposed Hydra Gamma 765v Transmission line along the existing 400kv corridor near De Aar and Victoria West, Northern Cape Province, including assessment for the extension of the existing 765 Kv Hydra substation, on Eskom owned land. Report prepared for Bohlweki Environmental Kimberley: McGregor Museum
- Morris, D. 2004. Phase 1 Archaeological Specialist Input for the proposed Hydra-Gamma 765 transmission line along the 'eastern' (existing) 400 Kv corridor near De Aar and Victoria West. Report prepared for Bohlweki Environmental. Kimberley: McGregor Museum.
- Morris, D. 2000. Assessment of impact of the proposed telecommunications project, Kimberley-De Aar network. Report prepared for Telkom.
- Morris, D. 2001. Archaeological resources in relation to the 'western' option (vacant servitude) for the proposed Hydra-Gamma 765KV transmission line near De Aar and Victoria West, Northern Cape. A desktop study with preliminary limited field observations. Report prepared for Bohlweki Environmental. Kimberley: McGregor Museum.
- Morris, D. n.d. 'Etchings' and 'intaglios' in the Upper Karoo: Part 1: The engravings at Springbok Oog. Kimberley: McGregor Museum.
- Morris, D and Beaumont, P. 2004. Portable engravings at Springbok Oog and the archaeological

context of rock art of the Upper Karoo, South Africa. In Dowson, T. A., & Lewis-Williams, J. D. (eds). Contested images: diversity in Southern African rock art research. Johannesburg: Witwatersrand University Press

3.1.2 Aerial Representations and Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied to assist the foot site surveys where depressions, variation in vegetation, soil marks and landmarks were examined. Specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments.

3.1.3 Mapping of sites

Merging data generated during the desktop study and the aerial survey, sites and areas of heritage importance were plotted on 1:50 000 topographic maps of the larger Britstown area using ArcGIS 9.3. These maps were then superimposed on high-definition aerial representations in order to graphically demonstrate the geographical locations and distribution of sensitive areas. Information on areas with dense clusters of heritage sites were expanded in the text employing academic and research-based literature.

3.1.4 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological surveys of the project area were conducted in May 2022. In order to arrive at a heritage baseline for the project landscape, certain areas demarcated for development as well as potential heritage sensitive zones identified at desktop level, were surveyed on foot by means of a transect survey. GPS reference points identified during remote sensing was also visited and random spot checks were made (see detail in Section 3.1.2 and Section 3.1.3). Using a Garmin GPS objects and structures of archaeological / heritage value were recorded and photographed with a Digital camera. Real time aerial mapping and positioning by means of a hand-held tablet-based Google Earth application was also employed on site to investigate possible disturbed areas during the survey

3.2 Limitations

The Soyuz 6 WEF project area extends over vast surface areas and focused site surveys and ground truthing of final impact areas are not feasible within the scope of this Scoping assessment. As such, the HS based heritage potential and potential fatal flaws on desktop level data as well as selected site observations. An implied limitation is the fact that the scoping was undertaken employing secondary information and data generated through off-site methods (e.g., aerial survey, literature review), informed by partial field observations. The study infers a level of probability of the presence of cultural, historical, or archaeological sites of significance but findings are not necessarily a complete representation of the heritage landscape of the project area as the possibility exists that individual sites could be missed due to the sometimes inaccurate and often subjective nature of desktop data – or even the lack thereof. In addition, the subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations on aerial imagery and maps. Detailed field assessments as part of the EIA-level Heritage Impact Assessment (HIA) will provide a more complete representation of the presence of sites of significance and representative potential heritage impacts.

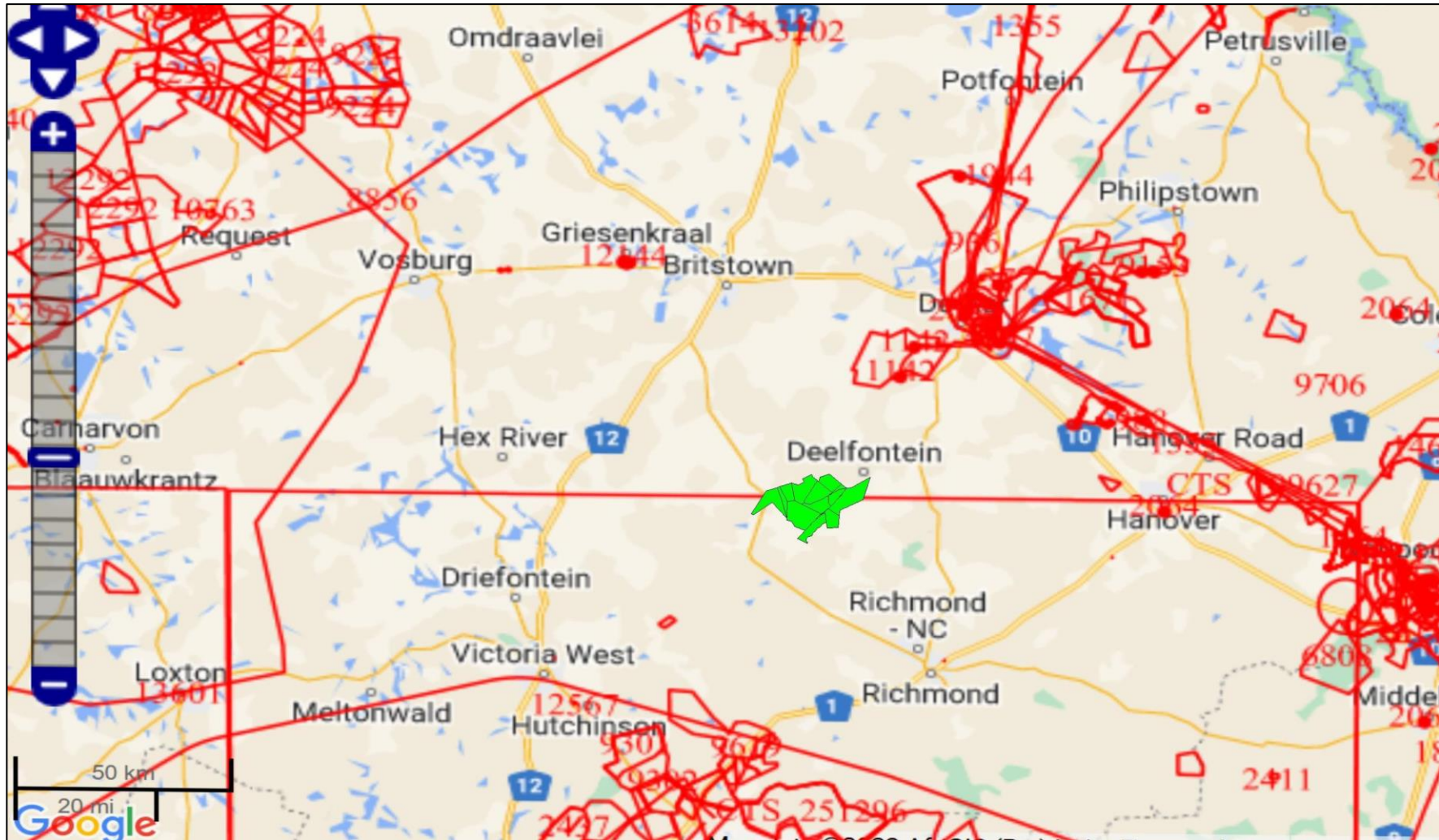


Figure 3-1: Regional map indicating coverage of the project area (green polygons) by commercially driven heritage assessments and research projects (red outlines) (<https://sahris.sahra.org.za/map/reports>).

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

Archaeology in Southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across Southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens sapiens</i> including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

4.1.1 The Stone Ages

- The Earlier Stone Age (ESA)

The Earlier Stone Age, from between 1.5 million and 250 000 years ago, refers to the earliest that *Homo sapiens sapiens*' predecessors began making stone tools. The earliest stone tool industry was referred to as the Olduvai Industry, originating from stone artefacts recorded at Olduvai Gorge, Tanzania. The Acheulian Industry, the predominant Southern African Early Stone Age Industry, which replaced the Olduvai Industry approximately 1.5 million years ago, is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. Bifaces emerged in East Africa more than 1.5 million years ago but have been reported from a wide range of areas, from South Africa to northern Europe and from India to the Iberian coast. Earlier Stone Age deposits typically occur on the flood-plains of perennial rivers. These ESA open sites sometimes contain stone tool scatters and manufacturing debris ranging from pebble tool choppers to core tools such as handaxes and cleavers. These groups seldom actively hunted, and relied heavily on the opportunistic scavenging of meat from carnivore kill sites. The most well-known Early Stone Age site in Southern Africa is Amanzi Springs, situated about 10km north-east of Uitenhage, near Port Elizabeth (Deacon 1970). In a series of spring deposits a large number of stone tools were found in situ to a depth of 3-4m. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old.

- The Middle Stone Age (MSA)

The Middle Stone Age (MSA) spans a period from 250 000-30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism.

Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across Southern Africa dating within the last 120 000 years (Thompson & Marean 2008). The large handaxes and cleavers were replaced by smaller stone artefacts called the MSA flake and blade industries. Surface scatters of these flake and blade industries occur widespread across Southern Africa although rarely with any associated botanical and faunal remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may in rare cases be associated with MSA occurrences (Gess 1969). These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material. The MSA is distinguished from the ESA by the smaller-sized and distinctly different stone artefacts and *chaine operatoire* (method) used in manufacture, the introduction of other types of artefacts and evidence of symbolic behaviour. The prepared core technique was used for the manufacture of the stone artefacts which display a characteristic faceted striking platform and includes mainly unifacial and bifacial flake blades and points. The Howiesons Poort Industry (80 000-55 000 years ago) is distinguished from the other MSA stone artefacts: the size of tools are generally smaller, the range of raw materials include finer-grained rocks such as silcrete, chalcedony, chert and hornfels, and include segments, backed blades and trapezoids in the stone toolkit which were sometimes hafted (set or glued) onto handles. In addition to stone artefacts, bone was worked into points, possibly hafted, and used as tools for hunting (Deacon & Deacon 1999). Other types of artefacts that have been encountered in archaeological excavations include tick shell beads, the rim pieces of ostrich eggshell (OES) water flasks, ochre-stained pieces of ostrich eggshell and engraved and scratched ochre pieces, as well as the collection of materials for purely aesthetic reasons. The majority of MSA sites occur on flood plains and sometimes in caves and rock shelters. Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom remain preserved in the archaeological record. Limited drive-hunting activities are associated with the MSA.

- The Later Stone Age (LSA)

The Later Stone Age (LSA) spans the period from about 20 000 years ago until the colonial era, although some communities continue making stone tools today. The period between 30 000 and 20 000 years ago is referred to as the transition from the MSA to LSA; although there is a lack of crucial sites and evidence that represent this change. By the time of the Later Stone Age the genus *Homo*, in southern Africa, had developed into *Homo sapiens sapiens*, and in Europe, had already replaced *Homo neanderthalensis*. The LSA is marked by a series of technological innovations, new tools and artefacts, the development of economic, political and social systems, and core symbolic beliefs and rituals. The stone toolkits changed over time according to time-specific needs and raw material availability, from smaller microlithic Robberg, Wilton Industries and in between, the larger Albany/Oakhurst and the Kabeljous Industries. Bored stones used as part of digging sticks, grooved stones for sharpening and grinding and stone tools fixed to handles with mastic also become more common. Fishing equipment such as hooks, gorges and sinkers also appear within archaeological excavations. Polished bone tools such as eyed needles, awls, linkshafts and arrowheads also become a more common occurrence. Most importantly bows and arrows revolutionized the hunting economy. It was only within the last 2000 years that earthenware pottery was introduced. Before then tortoiseshell bowls were used for cooking and ostrich eggshell (OES) flasks were used for storing water. Decorative items like ostrich eggshell and marine/fresh water shell beads and pendants were made. Hunting and gathering made up the economic way of life of these communities; therefore, they are normally referred to as hunter-gatherers. Hunter-gatherers hunted both small and large game and gathered edible plant foods from the veld. For those that lived at or close to the coast, marine shellfish and seals and other edible marine resources were available for the gathering. The political system was mainly egalitarian, and socially hunter-gatherers lived in bands of up to twenty people during the scarce resource availability dispersal seasons and aggregated according to kinship relations during the

abundant resource availability seasons. Symbolic beliefs and rituals are evidenced by the deliberate burial of the dead and in the rock art paintings and engravings scattered across the Southern African landscape. Sites dating to the LSA are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

4.1.2 The Iron Age Farmer Period

- Early Iron Age (Early Farming Communities)

The Early Iron Age (also Early Farmer Period) marks the movement of Bantu speaking farming communities into South Africa at around 200 A.D. These groups were agro-pastoralists that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Artefact evidence from Early Farmer Period sites is mostly found in the form of ceramic assemblages and the origins and archaeological identities of this period are largely based upon ceramic typologies and sequences, where diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. Early Farmer Period ceramic traditions are classified by some scholars into different “streams” or trends in pot types and decoration that over time emerged in Southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). More specifically, in the northern regions of South Africa at least three settlement phases have been distinguished for prehistoric Bantu-speaking agro-pastoralists. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400-AD 600. The second phase of Diamant is dated to AD 600-AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900-AD 1200. Early Farmer Period ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. The Early Iron Age continued up to the end of the first millennium AD.

- Middle Iron Age / K2 Mapungubwe Period (early Later Farming Communities)

The onset of the middle Iron Age dates back to ± 900 AD, a period more commonly known as the Mapungubwe / K2 phase. These names refer to the well-known archaeological sites that are today the pinnacle of South Africa’s Iron Age heritage. The inhabitants of K2 and Mapungubwe, situated on the banks of the Northern Cape, were agriculturalists and pastoralists and were engaged in extensive trade activities with local and foreign traders. Although the identity of this Bantu-speaking group remains a point of contestation, the Mapungubwe people were the first state-organized society Southern Africa has known. A considerable amount of golden objects, ivory, beads (glass and gold), trade goods and clay figurines as well as large amounts of potsherds were found at these sites and also appear in sites dating back to this phase of the Iron Age. Ceramics of this tradition take the form of beakers with upright sides and decorations around the base (K2) and shallow-shouldered bowls with decorations as well as globular pots with long necks. (Mapungubwe). The site of Mapungubwe was deserted at around 1250 AD and this also marks the relative conclusion of this phase of the Iron Age.

- Later Iron Age (Later Farming Communities)

The late Iron Age of Southern Africa marks the grouping of Bantu speaking groups into different cultural units. It also signals one of the most influential events of the second millennium AD in Southern Africa, the difaqane. The difaqane (also known as “the scattering”) brought about a dramatic and sudden ending to centuries of stable society in Southern Africa. Reasons for this change was essentially the first penetration

of the Southern African interior by Portuguese traders, military conquests by various Bantu speaking groups primarily the ambitious Zulu King Shaka and the beginning of industrial developments in South Africa. Different cultural groups were scattered over large areas of the interior. These groups conveyed with them their customs that in the archaeological record manifest in ceramics, beads and other artefacts. This means that distinct pottery typologies can be found in the different late Iron Age groups of South Africa.

- **Bantu Speaking Groups in the South African interior**

It should be noted that terms such as "Nguni", "Sotho", "Venda" and others refer to broad and comprehensive language groups that demonstrated similarities in their origins and language. It does not imply that these Nguni / Sotho groups were homogeneous and static; they rather moved through the landscape and influenced each other in continuous processes marked by cultural fluidity.

Ethnographers generally divide major Bantu-speaking groups of Southern Africa into two broad linguistic groups, the Nguni and the Sotho with smaller subdivisions under these two main groups. Nguni groups were found in the eastern parts of the interior of South Africa and can be divided into the northern Nguni and the southern Nguni. The various Zulu and Swazi groups were generally associated with the northern Nguni whereas the southern Nguni comprised the Xhosa, Mpondo, Thembu and Mpondomise groups. The same geographically based divisions exist among Sotho groups where, under the western Sotho (or Tswana), groups such as the Rolong, Hurutshe, Kwena, Fokeng and Kgatla are found. The northern Sotho included the Pedi and amalgamation of smaller groups united to become the southern Sotho group or the Basutho. Other smaller language groups such as the Venda, Lemba and Tshonga Shangana transpired outside these major entities but as time progressed they were, however to lesser or greater extent influenced and absorbed by neighbouring groups.

4.1.3 Pastoralism and the last 2000 years

Until 2000 years ago hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2000 years ago the social dynamics of the Southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. One of these groups, the Khoekhoe pastoralists or herders entered Southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of Southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

4.1.4 Historical and Colonial Times and Recent History

The Historical period in Southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in Southern Africa.

4.2 The Northern Cape Landscape: Specific Themes.

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age and Colonial Period occurrences. In addition to prehistoric remnants, the archaeological record reflects the development of a rich colonial frontier, characterised by farming and later, a number of war conflicts, particularly the Anglo Boer War (or the South African War) left behind the remnants of battlefields, skirmishes and concentration camps.

4.2.1 The Stone Ages

Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the landscape, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Even though the Northern Cape landscape is exceptionally rich in Stone Age and rock art sites, the area has probably been relatively marginal in terms of human settlement for most of its history. A few major archaeological and historical studies have been conducted in the Northern Cape. Most notable are projects undertaken by Garth Sampson and his colleagues in the Seekoei Valley. In addition, archaeologists from the McGregor Museum have focused attention on the Upper Karoo and the northern periphery of the Karoo as well as some survey work in the Victoria West-De Aar region (Morris, 1994; Morris, 2000b).

The first inhabitants of this area were the /Xam (Bushmen). These tiny, self-sufficient people depended entirely on the land for their needs. The plains teemed with game, so they neither sowed nor kept livestock. Indigenous plants provided a variety of edible bulbs and bark for further nutritional and medicinal requirements. With their stamina, tenacity and endurance the little /Xam moved widely through the Karoo. At places where they sought shelter and rest from their wanderings, the /Xam left an artistic wealth of rock engravings. These petroglyphs tell us what this world was like when it was theirs. The Karoo is renowned for its wealth of Stone Age remains spanning at least half a million years of human history. Rock art makes up a distinctly visible element of this legacy, and predominantly dates from the last 10 000 years. South Africa's heritage of Stone Age Art, among the richest in the world, is found in the form of engravings (petroglyphs) and paintings. Both forms are found in the Great Karoo. Engravings predominate, but finger paintings, often no more than ochre daubs, are often found in caves, shelters and overhangs. The nearest site in the Britstown area occurs on the farm Brakwater. Other sites are on the farms Keurfontein, Maritzdam and Omdraaivlei. The site at Maritzdam Holiday Farm is spread across about three hectares. Among the petroglyphs here are engravings of elephant, giraffe, reptiles, a variety of buck and a series of stick-like people.

Finger paintings occur in a small overhang west of the Keurfontein farm house. These are simple finger painted designs similar to those most commonly found in the Northern Cape. Most are plain rows of smears or dots, usually in red or orange ochre and sometimes in white or black. Mostly, this art form appears to date from the last 500 years. The imagery in the engravings at Keurfontein is based on animals. Mostly large mammals, such as eland, other antelope, rhino and elephant are depicted. But there are also engravings of people, objects and geometric figures. Different techniques were used. The oldest engravings in this area, hairline or fineline with incised outline and detail, date back 2 000 to 8 000 years. Then there are the pecked engravings. In these the rock crust has been chipped away to create the image and are generally considered younger than the "finelines". Then there are the scraped engravings. In most of these the rock surface has been scraped away to create the image, which sometimes appears polished. Among these drawings are some scraped, speck-like images thought to have been created by Xhosas who moved to the Karoo in the late 1700s. Rock gongs, like those on Keurfontein, are normally flattish dolerite rocks that are balanced naturally on three or more points. Usually found at the tops of koppies, they emit a ringing sound when struck. Most have ancient strike marks on them, but many have been discovered without marks. These gongs are almost always associated with rock engraving sites in the Karoo, but no ethnographic explanations exist for their use. It has been suggested that "Bushman pianos" were used in rituals. Multiple strike marks on some gongs suggest that several people used them simultaneously.

4.2.2 Later History and Colonial Period

The small haven of Britstown along the diamond route across the plains was named after a man who loved the Karoo, Hans Brits. He once accompanied Dr David Livingstone, famous son-in-law of the great missionary

Robert Moffat, on a journey to the north. Livingstone originally came to South Africa to help the Moffats at their mission in Kuruman, and it was on a journey to the north that he met Brits. They took a liking to each other, and Brits decided to travel with him. But, Livingstone did not get on with the Moffats, so he soon announced his intentions of travelling deeper into Africa, a decision that led to him becoming probably the continent's most famous explorer. Brits decided against a life of exploration, and returned to the Karoo. Hans Brits then settled on a farm he named Gemsbokfontein, which is where Britstown now stands. Soon after the discovery of diamonds at Hopetown and Kimberley, Brits realised that he and his neighbours could earn good money serving the growing traffic along the Diamond Way. So Brits arranged for a town to be laid out on a portion of his farm. As a tribute to him it was named Britstown. The thinking was to establish a point between Victoria West and Kimberley that could provide travellers on the Diamond Way with accommodation and refreshment as well as fresh horses and fodder.

In 1877, a group of men headed by T P Theron, purchased a section of Hans Brits's farm to establish a community centre with a church. This accomplished, they handed over the management of the fledgling settlement to church wardens. Traffic through the town increased when gold was discovered in "The Ridge of White Waters" in the old Transvaal Republic. Many of the fabled mining magnates, such as Cecil John Rhodes, passed through Britstown. In time, the town became a major junction on the route to the then South West Africa (Namibia). The last of the gentlemen's wars, the Anglo-Boer War, did not leave Britstown untouched. Shortly before the Battle of Paardeberg, Lord Roberts ordered General Settle, commander of the Orange River Station, to form three small columns and to check the course of the Rebellion. A three-pronged advance was planned. The 450-strong Western Column, under Colonel Charles Parsons, was to march on Carnarvon and Kenhardt from Victoria West. Colonel Adye was to concentrate the centre column, about 550 men, at Britstown, while General Settle, with 600 men, was to take the right flank and move due west from the Orange River Station. His objective was to clear the river, hold the drifts and cut off the advance of a Boer commando led by Commandant Liebenberg. But the action did not proceed as planned. On March 6, 1900, Colonel Adye and his men moved out of Britstown. About 20 miles from the village, as they neared a semi-circle of hills on the farm Houtwater, they were engaged by Commandant Liebenberg and his rebels. Despite his weaker force, Adye attacked, but without securing his flanks. Liebenberg was thus able to surround the British and force them into a hasty retreat. They were driven right back to Britstown with a loss of 21 men. Dr A E Ramsbottom and an ambulance were captured in the engagement. Once Roberts heard that Adye had been repulsed, he took vigorous measures to suppress a rebellion. He immediately sent Kitchener to take command and sent reinforcements of about 3 000 men from Cape Town. Kitchener's plan was similar to Settle's. He aimed to prevent Boer forces under commandants Liebenberg and Steenkamp from crossing the river, so he moved a column from Britstown to Omdraaivlei. But the Boer leaders moved quickly and evaded capture by charging for Prieska and crossing the Orange River there. Towards the end of December, 1900, Britstown was one of 14 districts in the Cape Colony to be placed under martial law.

A Boer force under Hertzog, who had occupied Philipstown, tried to march on Britstown on December 16, 1900, but was forced to abandon the plan as Settle's columns were stationed nearby. Troops again arrived in Britstown in February, 1901. On the 16th, Kitchener ordered Major-General Bruce Hamilton, from De Aar, and Bethune, from Richmond Road, to converge on Britstown. Henniker and Knox were also in the area pursuing forces led by commandants Kritzinger and Herzog. Commandant Brand and his men were also in Britstown. They had been sent there by Hertzog to collect provisions while he himself rode north to meet De Wet. Hamilton's forces arrived a few hours after Brand had left. He pursued the Boers to Houtwater, but lost contact with and Brand gained a clear lead. The Smartt Syndicate suffered heavy losses during the Boer war, mainly due to stock losses caused by the Boers cutting the fences and making off with large numbers of stock. From the war records mentioned in the previous paragraphs, Houwater was a much-prized temporary headquarters for the Boer Commandos to feed and water their own horses as it had by now lucerne, oats

and wheat growing under irrigation so grazing was plentiful.

5 HERITAGE SENSITIVITY AND SITE PROBABILITY

In terms of heritage resources, the general landscape around the project area is primarily well known for its Stone Age and Colonial / Historical Period archaeology, the latter related to farming and rural expansion of the past centuries.

5.1 Off-site Survey Findings

Although this area has been occupied by hominins and humans for at least 1.5 million years, the nomadic hunter-gatherer and, to a lesser extent, early pastoralist lifestyles of prehistoric inhabitants leave little to no physical evidence of their presence in the landscape and has an almost negligible modifying effect on it. This is in contrast to the significant alteration to the environment made over the past few hundred years by colonial agricultural and urban settlements of the area. Cultural landscapes are defined and informed by several elements including, but not limited to; natural landscape features, palaeontology, archaeology / anthropology, oral histories, public memory, the built environment and social and written histories. The value of cultural landscapes is determined through professional interpretation and opinion, community and public values as well as environmental and heritage legislation. The cultural landscape of the Soyuz 6 Wind Energy Facility project includes two broad layers, with the most recent, Colonial Period and more recent settlement and development over the past few hundred years having the most visually evident modifying effect on the landscape. Impacts related to this cultural layer include roads and associated bridges, single vehicle tracks, railway lines and associated bridges and structures, agricultural clearings for grazing and cultivation, variety of farming activities, variety of farmsteads, structures and infrastructure, quarries, dams, fencing, overhead power lines, transmission/receiver masts and wind turbines. This layer also includes remnants of the Anglo Boer war.

The second layer underlying the historic period is comprised of the three Stone Age periods spanning the period from a few hundred years ago to the early periods of stone tool making archaic humans at least 1.5 million years ago. Although the prehistoric cultural landscape is the least evident and often invisible, temporally, it makes up for the overwhelming bulk of human occupation of the region. Given that most of the archaic human (ESA) and human (MSA to recent) occupation of this area involves the Stone Age era, it can be argued that a significant cultural layer in this area involves the pre-colonial cultural landscape and its sense of place.

An analysis of historical aerial imagery and archive maps of the Soyuz 6 Wind Energy Facility project area reveals the following (see Figure 5-1 to Figure 5-3):

- Britstown and surrounding farms and roads are indicated on early maps of the region dating to 1899 and 1908.
- Structures or buildings, farmsteads, dams and embankments are indicated on topographical maps of the project target farms dating to 1966 -1970.
- Single agricultural fields occur on these farms – mainly around farmsteads. No graves or cemeteries are indicated on these topographical maps in the project area.
- Early aerial imagery of the project area are unfortunately of limited use due to the low resolution of images and uniformity of the landscape (particularly because the images were captured in monochrome). Still, imagery dating to 1950 indicate that that project area seems to have remained pristine over the past decades with minor signs of historical activity.
- Human activity in the form of farms, homesteads and man-made structures and features seem to be visible on aerial imagery of the project landscape.

5.2 Heritage Potential and Sites

5.2.1 The Heritage Landscape: Palaeontology

According to Almond¹, the majority of the development footprint, including wind turbines as well as ancillary gravel road construction, is underlain by unfossiliferous Karoo dolerite. Non-marine sediments of the Mid Permian Ecca and Lower Beaufort Groups (Karoo Supergroup) crop out on the slopes of the Karoo koppies. The Tierberg, Waterford and Abrahamskraal Formations represented here have a moderate to high palaeontological sensitivity. However, they are largely obscured by Neogene (Late Tertiary) to Recent drift deposits – notably dolerite scree and alluvium - and their fossil potential has been compromised through baking (thermal metamorphism) by the adjacent major dolerite intrusions. The SAHRIS Palaeo Map of the project area indicates that the project falls within areas that range from low to high palaeontological sensitivity (<https://sahris.sahra.org.za/map/palaeo>).

A palaeontological scoping assessment have been commissioned for the Soyuz 6 Wind Energy Facility project.

5.2.2 The Heritage Landscape: Archaeology

The archaeology of the Northern Cape is rich and varied covering long spans of human history. Some areas are richer than others, and not all areas are equally significant. According to Humphreys (1987:117), 'the amount of archaeological research that has been undertaken in the Karoo is in no way proportional to its importance in terms of area in South Africa'. While it is true to say that this part of the Karoo has probably been relatively marginal to human settlement for most of its history, it is in fact exceptionally rich in terms of Stone Age and rock art (Beaumont & Morris 1990; Morris and Beaumont 2004). Archaeologists from the McGregor Museum in Kimberley have focussed much of their attention on the Upper Karoo region and the northern periphery of the Karoo, where most of their academic research has been done. A few Archaeological Impact Assessments have been undertaken (as part of the EIA process) in Victoria West and De Aar (Morris 2000, 2004, 2006, 2007, 2010, 2012, 2019), where these have been required.

Contrary to its arid appearance, the Karoo had a relatively high carrying capacity and teemed with game long before European Colonization. Hunter gatherers (mainly San) successfully occupied the central interior of South Africa during the last 4500 years, subsisting on the large herds of grazing animals that occurred during that time (Sampson 1985; Sampson et al 1989). Late Stone Age archaeological sites dating to the late Holocene (within the last 4000 years) are surprisingly common. Although the Karoo is presently more suited to the keeping of small stock such as sheep and goats, research in the Eastern Karoo has revealed that, at about 1200 – 1400 AD, a climatic fluctuation (known as the Little Ice-Age) may well have caused an increased rainfall in the central Karoo resulting in the area being more suitable for grazing of cattle and occupation by Khoekhoen pastoralist groups. They left behind an archaeological legacy that consists of stone kraal complexes of which several hundred have been recorded in the Zeekoe Valley in the eastern Karoo and the Riet River area in the Northern Cape (Hart 1989). The indigenous people of Karoo waged a bitter war against colonial expansion as they gradually lost control of their traditional land. With the implementation of the commando system in the late 18th and early 19th centuries, the Karoo "Bushmen" were eventually destroyed or indentured into farm labour (Hart 1989).

Remnants of Stone Age archaeology in this landscape are mainly MSA and LSA tools. These tool scatters are often found spread very thinly and unevenly on the surface. MSA tools comprise mainly thick chunky flakes,

¹ Almond, J. 2010. Palaeontological Impact Assessment: Desktop Study for the proposed windfarm at Maanhaarberg near De Aar, Northern Cape Province. Natura Viva cc, Cape Town

chunks, flaked chunks, blade tools and a few retouched flakes mostly on weathered hornfels/lydianite. LSA lithics often comprise mostly unmodified, utilized and retouched flakes, chunks and cores on un-weathered hornfels. Formal tools such as scrapers, points and adzes are found in these contexts. In certain instances, the stone tools occur in association with organic remains or other cultural remains such as pottery or ostrich eggshell or even potable art (refer to Kaplan, 2010). Rock art in the form of engravings on large boulders – often dolerite – as well as stone “gongs” are often found in these areas on rock outcrops and koppies. Kaplan (2010) located several rock engravings on the Swartkoppies Mountains east of the project areas where imagery of eland and ostriches were pecked on dolerite boulders.

Depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains ranges from low to high on a regional level.



Figure 5-1: MSA tools from found by Kruger (2019) near Britstown.



Figure 5-2: MSA tools from found by Kruger (2019) near Britstown. Note secondary retouch and usewear marks on an end scraper (left), a [point (centre) and a scraper (right).



Figure 5-3: Rock engravings located on the Swartkoppies Mountains east of the project area, by Kaplan (2010).

5.2.3 The Heritage Landscape: Historical Period

The first "Trekboers" moved through the landscape during the early 19th century but it was only in 1876 that Britstown was established as a Dutch Reformed Church parish. The town became an important staging point along the Diamond Way linking Cape Town with the diamond fields in Kimberley and later the gold fields along the Witwatersrand and the landscape was divided into farms towards the end of the 1800's. As a result, important historical remnant in this area are farmsteads and associated features. Farmsteads are complex features in the landscape made up of different yet interconnected elements. Typically, these farmsteads consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and family cemeteries. Farm buildings are generally single storied but town houses often reached two floors. Walls are thick and built with stone and the ridged roof, thatched or tiled, are terminated at either end by simple linear parapet gables. In some instances, outbuildings would be in the same style as the main house, if they date to the same period. Roads and tracks, stock pens and wind mills occur on farms across the project landscape.

Farms also hold the remains of "veewagtershuise" or shepherd's huts, typically single roomed buildings constructed out of undressed sandstone blocks. The huts occur in the veld where they served as temporary shelter for livestock sheperds. Material culture such as glass, metal fragments and fragments of ceramics and earthenware are often found at these sites. Infrastructure and industrial heritage such as roads, bridges, railway lines, electricity lines and telephone lines are also feature in this landscape. In addition, infrastructure associated with the Anglo Boer War (fortifications, block houses – e.g. at Merriman, the remains of field hospitals, burial sites) occur around De Aar and Britstown. A good example is the remains of the Imperial Yeomanry Hospital, the Yeomanry Hotel and war burial ground at Deelfontein along the eastern periphery of the project area.

Historical / Colonial Period remnants are generally viewed to have a medium to high significance on a regional level.



Figure 5-4: The old Yeomanry Hotel near the site of the Anglo Boer War Imperial Yeomanry Hospital in the project landscape.



Figure 5-5: An Anglo-Boer War blockhouse at Merriman in the project landscape.

5.2.4 The Heritage Landscape: Cemeteries

Apart from the formal cemeteries that occur in municipal areas (e.g. in Britstown), informal burial sites occur in the project landscape. These might range from family graveyards at farmsteads to individual unmarked graves in the veld and war graves.

The various cemeteries, burial places and graves are viewed to have a high significance on a local level.



Figure 5-6: Anglo-Boer War graves at the site of the old Imperial Yeomanry Hospital at Deelfonetein in the project landscape.



Figure 5-7: Examples of two informal burial sites located in the larger project landscape by Kaplan (2010).

5.2.5 Soyuz 6 Wind Energy Facility: Heritage Potential

From the above it is evident that the Soyuz 6 Wind Energy Facility is situated in a landscape rich in heritage remnants. Generally, heritage resources in the project area are most probably localised and spatially confined and project impact areas can easily be micro sited during the EIA phase to avoid sensitive heritage resources where necessary. The following observations on the heritage potential of the project area are made based on desktop and site observations:

Archaeology:

- In the project area, shallow soils cover a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provide suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. MSA and LSA tool scatters are known to occur along water courses, pans and dry river beds and such material have been found in the project area. These tools might include formal tools such as blades, scrapers, adzes and points and microliths as well as debitage.

- Mountain crests, small hills and foothills and rock outcrops occur in the project area for example Bakenskop, Speelmanskop, Arendskop, Vaalberg, Daskop, . Occupation sites dating to the Later Stone Age (LSA) associated with Hunter Gatherers and Herders are known to occur in such locales. Here, scatters of stone artefacts such as stone tools, ostrich eggshell, fragments of pottery and beads are common. Crudely built Herder stone wall enclosures might remain in these areas. In addition, Historical Period fortifications in the form of temporary stone barricades and defences are known to occur on low rises around Britstown and De Aar.
- MSA and LSA tool scatters are also known to be found near outcrops and geomorphological exposures where source rock was exploited for the manufacturing of stone tools. Large boulders, frequently dolerite occurring throughout the project area, are commonly associated with Hunter Gatherer and Herder rock art in the form of engravings. In addition, stone “gongs” are often found in these areas on koppies and rocky outcrops.
- All archaeological sites and artefacts are protected under the National Heritage Resource Act (NHRA 1999) and, depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains in the project areas might range from low to high.

Colonial / Historical Period and Built Environment:

- In this landscape, farmsteads and werfs dating to the last centuries often hold historically significant buildings and features such as farm houses, corbelled huts, sheds, stone kraals, and “dorsvloers” (threshing floors). The old Lekkervlei, Wonderboom, Deelfontein, Blaauwbank, farmsteads occur in the project area. An analysis of historical topographical maps and aerial photographs indicate the presence of the werfs from at least 1950 and the compounds are older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the Britstown landscape. Highly sensitive burial sites are also known to occur around farmstead complexes. Small-scale farming and agriculture are prevalent around farmsteads in the project areas. Here, potential historical farmscapes might be encountered.
- Railway sidings occur in the project area at Plaatfontein and Sterkaar. An analysis of historical topographical maps and aerial photographs indicate the presence of the sidings from at least 1950 and the sites are older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the project landscape.
- Occasional remains of “veewagterhuise” or shepherds’ huts dating to the Colonial Period are scattered across farms in this landscape. These buildings are usually constructed out of undressed sandstone blocks and glass, rusted metal fragments, fragments of ceramics, earthenware and bone are often found in middens associated with these huts. Even though these occurrences are often poorly preserved, they might be protected under the National Heritage Resource Act (NHRA 1999) if older than 60 years.
- The remains and remnants of Anglo-Boer War battlegrounds, field hospitals, concentration camps and cemeteries are found in this landscape and such sites are protected under the National Heritage Resource Act (NHRA 1999) where they are of Provincial heritage significance. Anglo-Boer War remnants might be present in the project area.
- Digging and / or quarrying seem to have occurred at single localities in the project area. Here, one might encounter remnants of historical mining and quarrying but the significance of such sites is not always apparent.

Cultural Landscape

- Generally, the proposed project area and its surrounds are characterized by rural Karoo farmlands, flatter grass plains and low mountain vegetation. Mountains and hills on the target properties for the project are indicated on topographic maps with unique names such as "Bakenskop", "Speelmanskop", "Arendskop", "Vaalberg" and "Daskop" and other landscape features indicated include "Grootdam", "Sandhoek", "Drielingdam". "Harpuisplaat", "Bassie se Dam", "Groenleegte", "Skilpaddam", "Deelfontein", "Die Brak", "Die Vlei", "Roneddam" and "Dutoitsdam". Cognisance should be taken of the fact that these features might hold certain intangible heritage value or they might be regarded as sites of "Living Heritage" in the cultural landscape.

Cemeteries / Burial Sites

- Burial sites frequently occur around farmstead complexes within family cemeteries, for example possibly at the Lekkervlei, Wonderboom, Deelfontein, Blaauwbank, farmsteads but in some instances packed stones or rocks indicate the presence of informal pre-colonial burials in this landscape. In addition, human remains and burials are often found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is therefore important to remember that it is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface.
- Cemeteries, burial places and graves are viewed to have a high significance and they are protected under the National Heritage Resource Act (NHRA 1999).



Figure 5-8: Examples of MSA blades, scarpers and flakes located in the project landscape.



Figure 5-9: Examples of MSA blades, scrapers, adzes and flakes located in the project landscape.



Figure 5-10: Examples of MSA blades, scrapers and flakes located in the project landscape.



Figure 5-11: Use wear and secondary retouch visible on points (left and centre) and a blade (right) from the project landscape.



Figure 5-12: An MSA blade P9eft) and a core (right) from the project landscape.



Figure 5-13: Striations and markings on a dolerite rock in the project landscape.



Figure 5-14: The remains of a Colonial Period farmhouse in the project landscape.



Figure 5-15: An old shed at a Colonial Period farmstead in the project landscape.



Figure 5-16: The remains of a “veewagtershut” or a shepherd’s hut in the project landscape.



Figure 5-17: Material culture located at a “veewagtershut” or a shepherd’s hut in the project landscape. Left is a gun cartridge and a fire hearth (centre) and an ash midden (right) is visible.

5.3 Site Risks and Impact Probability

The synthesis of data in this report suggests a landscape rich in cultural heritage resources and a further medium probability of the occurrence of cultural heritage sites could be expected in the project area. The following table provides a rough outline as to archaeological remains to be expected within the project impact area based on the wealth of archaeological evidence in these regions:

Time Period	Sites Examples	Characteristic Material Culture	Archaeological Footprint	Probability of site occurrence
Palaeontology and Fossils	Makapansgat	Fossilized faunal and botanical remain.	Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete	High Probability

			formations. Exposed by road cuttings and quarry excavation.	
Earlier Stone Age	Tshipise Mapungubwe Bosbokpoort	Large hand axes, cleavers, cores and residue material.	Buried unless disturbed.	Medium Probability
Middle Stone Age	Uitenpast Maremani Tshipise Ha-Dowe Mapungubwe	Specialised formal stone tools such as points, blades and scrapers. Cores and residue.	Surface scatters, found in erosion gullies, dongas and open scatters.	High Probability
Later Stone Age	Mapungubwe Machete Ratho	Specialised formal microlithic stone tools such as points, blades and scrapers as well as cores and residue. Rock Art.	Usually associated with rock shelters. Artefacts occur in buried deposits or surface scatters.	High Probability
Early Iron Age	Broederstroom	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, fauna.	Generally buried with few ceramics on surface.	Improbable
Middle Iron Age	Mapungubwe Pontdrif Kromdraai	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, trade goods such as porcelain, some stone walling.	Sites are primarily open, visible kraals, grain bin foundations and ceramic scatters.	Improbable
Later Iron Age	Magaliesberg Kaditswene Molokwane	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, trade goods such as porcelain, extensive stone walling.	Khami/Venda sites specifically have a high visibility due to the stone walling and visible ceramic scatters kraal.	Improbable
Mining / Metallurgy	Rooiberg Verdun	Residues associated with metallurgy including slag, ore, metal objects, and hammer stones.	Sites are primarily open, visible stone enclosures in secluded areas.	Medium Probability
Rock Art and Markings	Waterberg Olieboomspoort	Fine line and finger paintings, grooves, cupules, engravings.	Usually associated with rock shelters and outcrops.	High Probability
Colonial	Schoemansdal	Foundation	Colonial period sites	High Probability

Period: Structures	Valdezia Mission Makapansgat	structures, house remains.	generally have a high visibility due to preservation and visible material remains scatters.	
Colonial Period: Middens / Dumps	Schoemansdal Valdezia Mission Makapansgat	Glass, porcelain, potsherds, metal objects such as tin cans.	Colonial period sites generally have a high visibility due to preservation and visible material remains scatters.	High Probability
Battle and military sites	Fort Westfort Wonderboom Fort	Artefacts associated with conflict including spears, arrow heads, ammunition, rifles.	It is sometimes hard to identify sites of conflict as a result of the short duration and limited impact that such events incur.	High Probability
Burials over 100 years	Schoemansdal Makapansgat Maremani	Stone cairns, circles and ovals.	Prehistoric burials are sometimes hard to identify as they frequently occur in cattle kraals or as parts of stone wall structures.	High Probability
Burials younger than 60 years	Ga -Rankuwa	Marble head stones	More recent burials can be identified by headstones and grave dressings frequently present on these structures.	High Probability

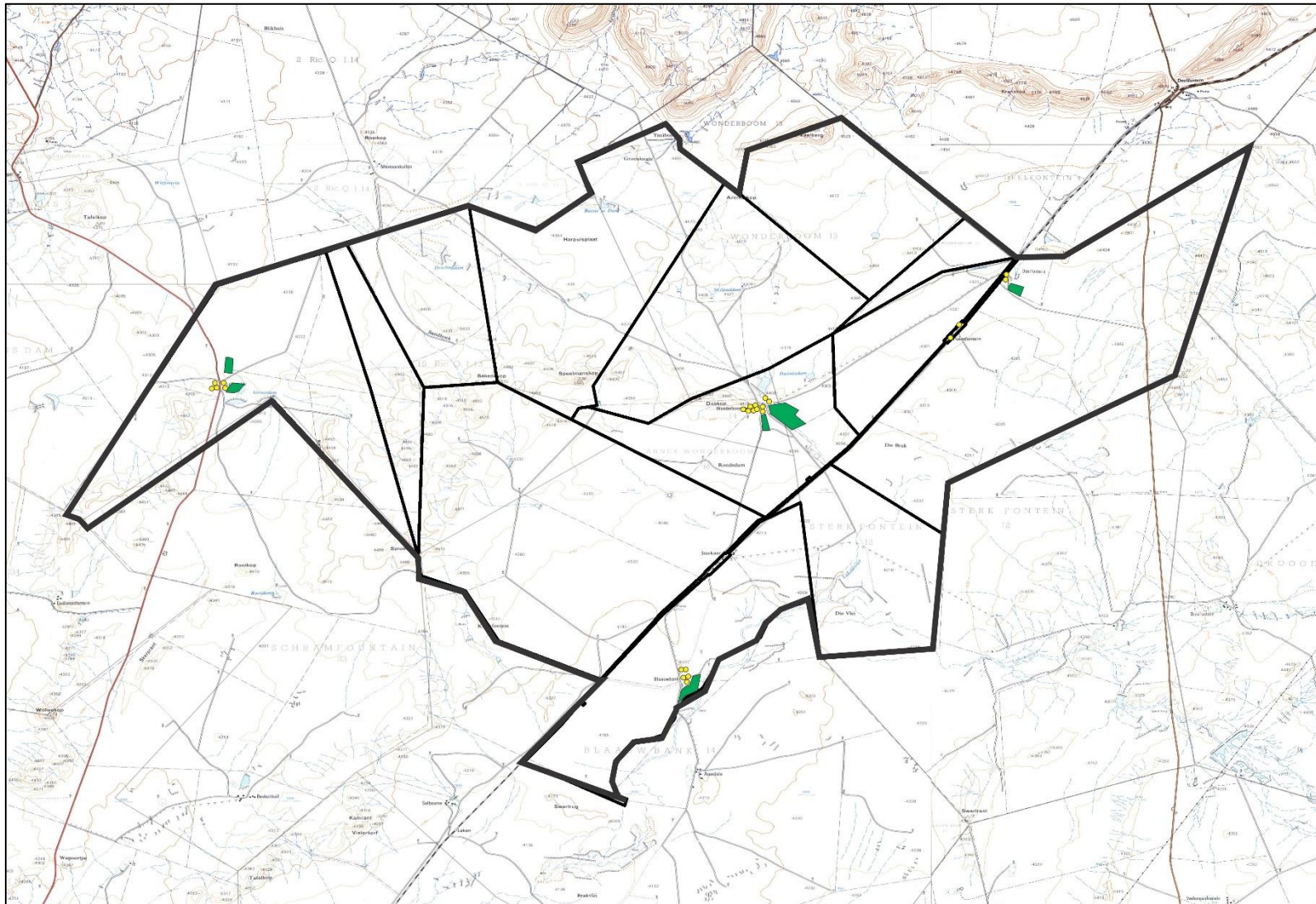


Figure 5-18: Remote sensing of potential heritage sites on a composite historical topographic map (1950 – 1970) of the project area (black outline). Yellow dots indicate farmsteads and man-made structures, green circles quarries / diggings and green polygons indicate cultivated fields.



Figure 5-19: The Britstown region indicated on “The Great Britain War Office Map of the Cape Colony: Britstown 1907”.



Figure 5-20: The Britstown region indicated on "The Imperial Map of South Africa. South African War, 1899-1902 - Britstown Region".

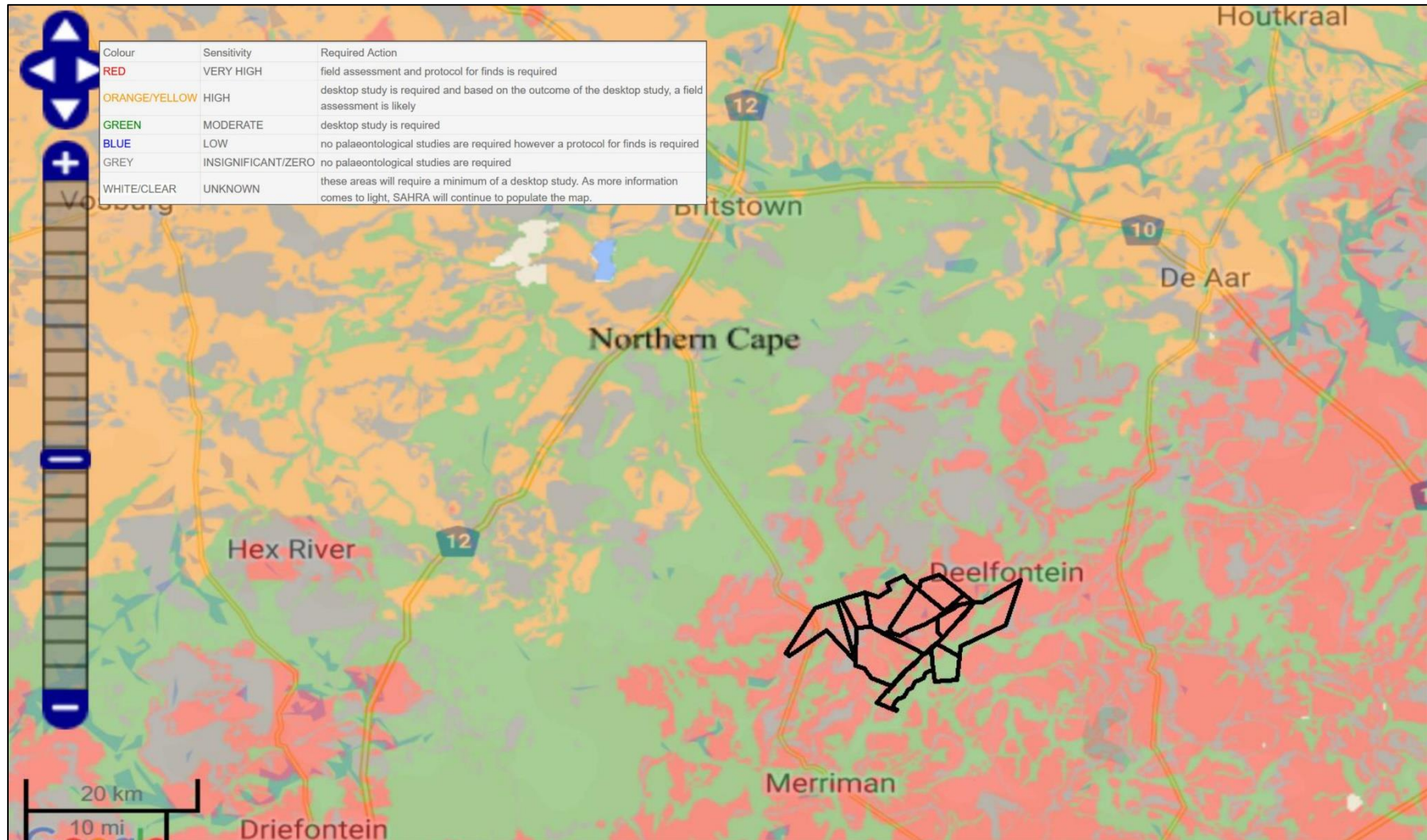


Figure 5-21: The SAHRIS Palaeo Map of the project area (black outline) indicating the fossil sensitivity of the project area. The corridor falls within area that range from low to high palaeontological sensitivity (<https://sahris.sahra.org.za/map/palaeo>).

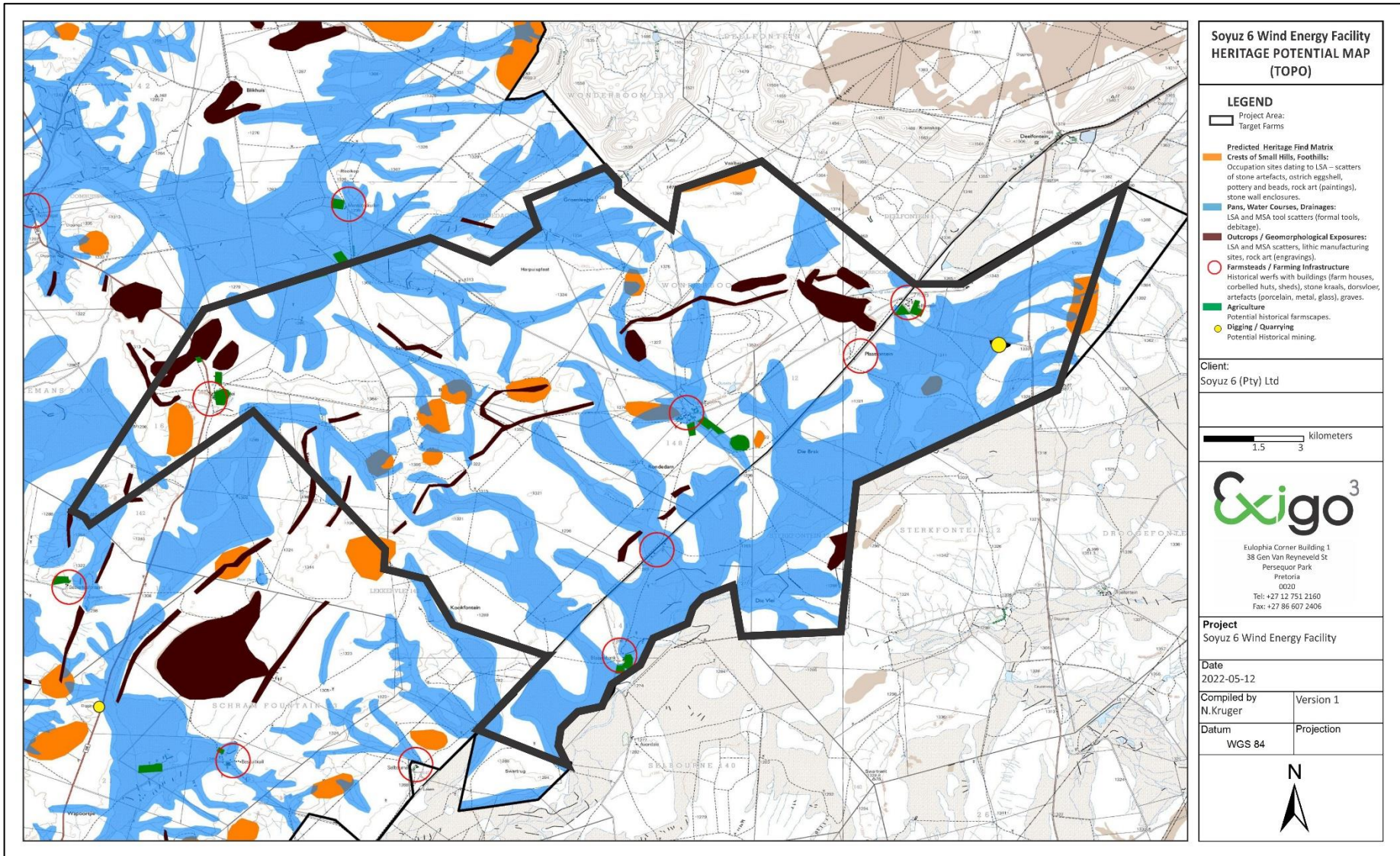


Figure 5-22: Map of the implied heritage potential of the Soyuz 6 Wind Energy Facility Project properties.

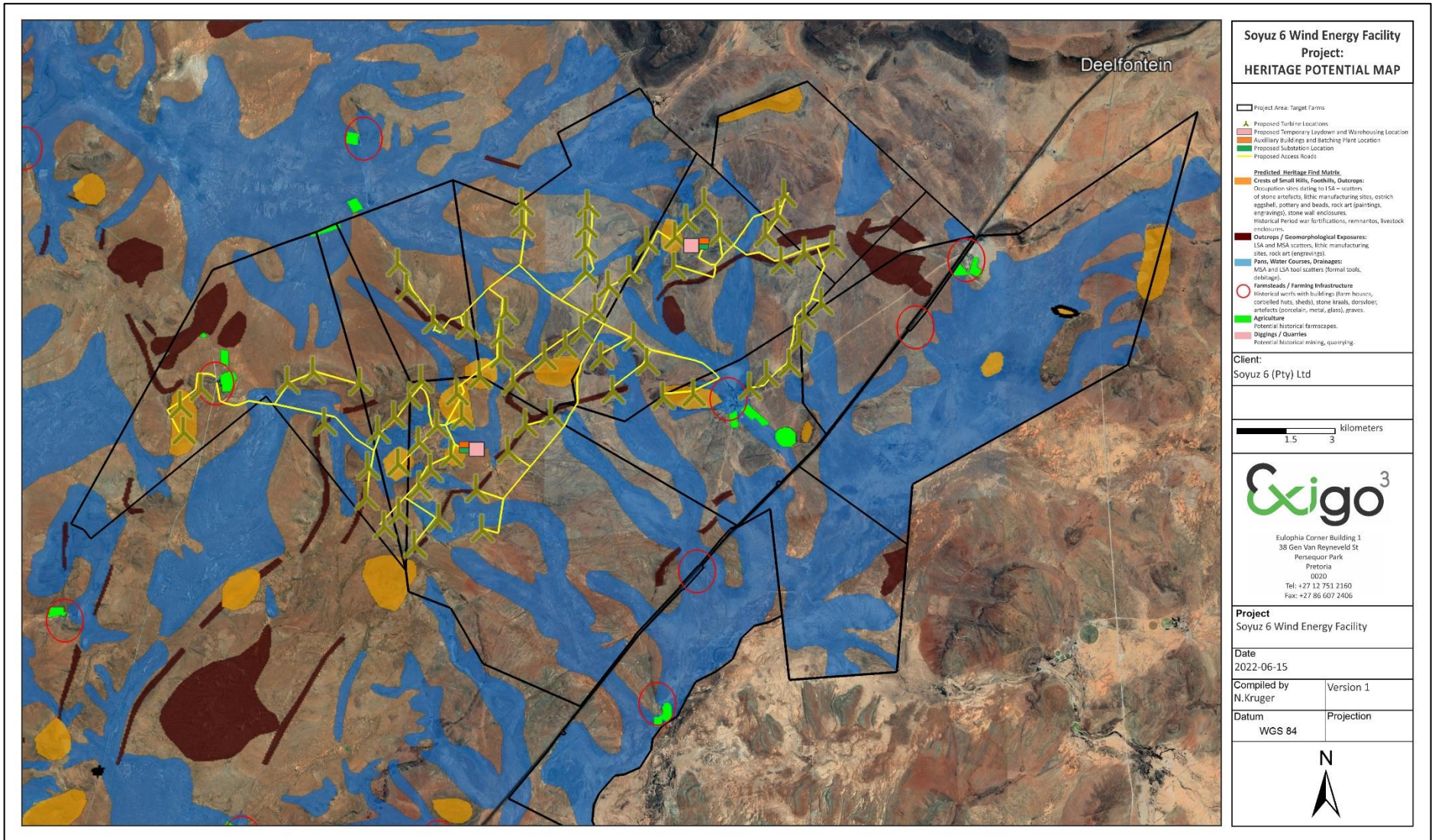


Figure 5-23: Aerial representation of the heritage potential of the target properties in relation to of the Soyuz 6 Wind Energy Facility Project infrastructure components.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings²

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of the Addendum.

6.1.1 General assessment of impacts on resources

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

6.2 Direct impact rating

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g., loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access (refer to Addendum 2: Impact Assessment Methodology) for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected).

Desktop observations in terms of the heritage landscape indicate that the general landscape around the project area is primarily well known for its Stone Age archaeology and Colonial / Historical Period Built Environment resources related to farming and rural expansion of the past centuries. The following section summarizes potential impacts to the heritage landscape of the study area (refer to Addendum 2).

6.2.1 Palaeontology

According to Almond (2010), the majority of the development footprint, including wind turbines as well as ancillary gravel road construction, is underlain by unfossiliferous Karoo dolerite. Non-marine sediments of the Mid Permian Ecca and Lower Beaufort Groups (Karoo Supergroup) crop out on the slopes of the Karoo koppies. The Tierberg, Waterford and Abrahamskraal Formations represented here have a moderate to high palaeontological sensitivity. However, they are largely obscured by Neogene (Late Tertiary) to Recent drift deposits – notably dolerite scree and alluvium - and their fossil potential has been compromised through baking (thermal metamorphism) by the adjacent major dolerite intrusions. The fossil impact significance of the project will be further elucidated in the PDA commissioned for the development.

² Based on: Winter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

6.2.2 Archaeology

Stone Age material is known to occur in the project area. These Stone Age scatters are Generally Protected depending on artefact ratios, average size and the occurrence of fossils directeurs. Rock Art might be encountered in mountainous regions, hills and caves – and particularly on dolerite rock exposures. As such, impact on archeologically sites and material might occur and it should be noted that surface artefact deposits may be identified during vegetation which may be indicative of subsurface anthropogenic members or lenses. Archaeological monitoring, to record the presence of possible artefact deposits or sites should be implemented at the time of vegetation clearing. In the event of identification of significant subsurface archaeological deposits relevant recommendations regarding suitable mitigation measures should be made.

NATURE OF IMPACT: Impact could involve displacement or destruction of archaeological material in the proposed Soyuz 6 Wind Energy Facility Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGINITUDE	Major - Minor	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	High - Low	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: To be established at EIA level – HIA predetermined.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.2.3 Colonial Period, Built Environment

Colonial Period sites such as farmstead remains, houses, industrial and historical urban sites and features relating to the Anglo Boer War bear testimony to Colonial Period occupation of the area and supporting documentary evidence that farms in the general area were being registered from the early-mid 1900's. A continuing cultural tradition is evidenced by ongoing farming across the landscape, primarily cattle and game farming, resulting in re-use, repairs and low keyed upgrades of farming infrastructure which often fuse distinction between infrastructural remains of heritage significance (or older than 60 years) and those assigned to the contemporary period (or post-dating 60 years of age). Any alteration or amendment to a structure / building older than 60 years should be conducted subject to an SAHRA Built Environment Permit. It should also be noted that should the project impact directly on any farming infrastructure, a list should be kept by the developer documenting the type of infrastructure (dam, water trough etc.), coordinate, and photographic image and the list be submitted as part of the environmental compliance documentation to the Environmental Control Officer (ECO) / archaeologist appointed to do archaeological and cultural heritage monitoring.

NATURE OF IMPACT: Impact could involve the damage or destruction of built environment features in the proposed Soyuz 6 Wind Energy Facility Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major - Minor	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	High / Low	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: To be established at EIA level – HIA predetermined.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.2.4 Cultural Landscape

Generally, the proposed project area and its surrounds are characterized by rural Karoo farmlands. Flatter grass plains and low mountain vegetation. Further away from the project area, the landscape displays undulating foothills with flatter plains in-between. This landscape stretches over many kilometres and the proposed project might result in impacts on the or the landscape sense of place in terms of visual aspects.

NATURE OF IMPACT: Impact could involve impacts on the or the landscape sense of place in terms of visual aspects in the proposed Soyuz 6 Wind Energy Facility Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	High - Low	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: To be established at EIA level – HIA predetermined.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.2.5 Graves / Human Burials Sites

In the rural areas of the Northern Cape Province graves and cemeteries often occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. Graves might occur in the project area and impact might occur. Should any human bones be found during the course of further development; the find should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial, they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

NATURE OF IMPACT: Impact could involve damage or destruction of human burials in the proposed Soyuz 6 Wind Energy Facility Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGINITUDE	Minor	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	High	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: To be established at EIA level – HIA predetermined.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.3 Heritage Impact

The landscape around the project area is primarily well known for the occurrence of Stone Ages sites with evidence of pastoralism, rock art as well as a Colonial frontier denoting farmer expansion and warfare. Even though sensitive heritage receptors are likely to occur in the project area, these can be avoided by micro-siting the final project footprint impact areas during the EIA phase of the project to avoid sensitive heritage resources where necessary.

Initial Impacts and ratings for the Soyuz 6 WEF:

Impact statement	Impact rating	Mitigation Rating	Option Rating	Comments
Heritage Issues				
Archaeology	Low - High	Achievable	Site option preferred	Sensitive sites can easily be avoided by micro-siting the final project impact footprint areas during the EIA phase to avoid sensitive heritage resources where necessary.
Impact statement	Impact rating	Mitigation Rating	Option Rating	Comments
Heritage Issues				
Colonial Period / Built Environment	Low - High	Achievable	Site option preferred	Sensitive sites can easily be avoided by micro-siting the final project impact footprint areas during the EIA phase to avoid sensitive heritage resources where necessary.
Impact statement	Impact rating	Mitigation Rating	Option Rating	Comments
Heritage Issues				
Cultural Landscape	Moderate - High	Achievable	Site option preferred	Sensitive sites can easily be avoided by micro-siting the final project impact footprint areas during the EIA phase to avoid sensitive heritage resources where necessary.
Impact statement	Impact rating	Mitigation Rating	Option Rating	Comments
Heritage Issues				
Burial Sites	High	Achievable	Site option preferred	Sensitive sites can easily be avoided by micro-siting the final project impact footprint areas during the EIA phase to avoid sensitive heritage resources where necessary.

7 RECOMMENDATIONS

The Northern Cape Province has a long and extensive Colonial Period settlement history. Archaeological, palaeontological and/or cultural sites of significance are likely to be present within the Soyuz 6 Wind Energy Facility project areas. The protection and / or mitigation of sites of high heritage value is essential to avoid the loss of sites of cultural importance. In addition, the correct identification and recovery of sites of archaeological, palaeontological and/or cultural importance could potentially provide a better understanding of the heritage and/or geological history of the area.

Heritage resources in the project area are most probably localised and spatially confined and project impact areas can easily be micro sited during the EIA phase to avoid sensitive heritage resources where necessary. Here, a detailed archaeological walkthrough of final project impact areas will be required as part of a Heritage Impact Assessment subject to the EIA Phase. Here, final project layouts can be adjusted to satisfactorily avoid any sensitive areas or alternatively, heritage resources that cannot be avoided and that are directly impacted by the proposed development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the environmental management plan, whence they can be managed.

It should be noted that this HS and site sensitivity included above are based on off-site desktop findings and partial field observations and the heritage impact emanating from the proposed Soyuz 6 WEF remains tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999) during the EIA.

The following recommendations are made based on the potential heritage risk of the project area.

- The HS should be expanded to an integrated Phase 1 Heritage Impact Assessment (HIA) including findings of a walkdown of final project impact areas to document all sites, features and objects.
- Under no circumstances may any artefacts be removed, destroyed or interfered with by anyone on the site; and Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.
- The term "Living Heritage" can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or its surroundings and due cognisance should be taken of these sites of "Living Heritage" in the cultural landscape.
- It is recommended that all graves and cemeteries that might occur in the project surrounds be conserved and excluded from impact emanating from any future development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local authorities, adherence to any local laws and / bylaws, and correct grave relocation methodologies.
- It is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.

- Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

It must be emphasised that the conclusions and recommendations expressed in this heritage scoping and sensitivity investigation are primarily based on desktop study findings and is thus not representative of the Project area's complete archaeological and historical legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately. With reference to the potential impacts that may occur as a result of the operational activities of the proposed development it should be noted that such impacts are considered to be of a similar nature to those related to the construction phase.

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9 ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND

9.1 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

9.1.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as the "60-years clause". Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

- (d) *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (e) *destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*

- (f) *trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (g) *bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."*

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

- (h) *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;*
- (i) *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;*
- (j) *bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."*

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

9.1.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a

development categorised as:

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

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.”

And:

“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- (k) The identification and mapping of all heritage resources in the area affected;
- (l) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
- (m) an assessment of the impact of the development on such heritage resources;
- (n) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (o) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (p) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (q) plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64).”

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Heritage Scoping Studies (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than

60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects. Heritage resources management and conservation

9.2 Assessing the Significance of Heritage Resources

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable*. Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

- Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA (MP-PHRA).
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 60 years.
- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

A fundamental aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information, which would otherwise be lost.

10 ADDENDUM 2: IMPACT ASSESSMENT METHODOLOGY

10.1 Issues Identification Matrix

Impacts were rated and assessed using an Impact and Risk Assessment Methodology provided by CES, for the Scoping Phase of the EIA process in accordance with the requirement of EIA Regulations. Here, two parameters and five factors are considered when assessing the significance of the identified issues, and each is scored. **Significance** is achieved by ranking the five criteria presented in Table 1 below, to determine the overall significance of an issue. The ranking for the “effect” (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 2 below, to determine the overall significance of the issue. The overall significance is either negative or positive.

- **Duration** - The temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

- **Extent** - The spatial scale defines the physical extent of the impact.

- **Consequence** - The consequence scale is used in order to, as far as possible, objectively evaluate how severe a number of negative impacts associated with the issue under consideration might be, or how beneficial a number of positive impacts associated with the issue under consideration might be.

- The **probability** of the impact occurring - The likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

- **Reversibility / Mitigation** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from easily achievable to very difficult. The four categories used are listed and explained in Table 1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty

10.2 Assessing Impacts

The CES rating scale used in this assessment takes into consideration the following criteria, and includes the new criteria for assessing post mitigation significance (residual impacts), by incorporating the principles of reversibility and irreplaceability:

- **Nature of impact** (Negative or positive impact on the environment).
- **Type of impact** (Direct, indirect and/or cumulative effect of impact on the environment).
- **Duration, Extent, Probability** (see Table 4 below)

Table 4: Duration, Extent, Probability

Duration (Temporal Scale)		Score
Short term	Less than 5 years	1
Medium term	Between 5-20 years	2
Long term	Between 20 and 40 years (a generation) and from a human perspective also permanent	3
Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	4
Extent (Spatial Scale)		
Localised	At localised scale and a few hectares in extent	1
Study Area	The proposed site and its immediate environs	2
Regional	District and Provincial level	3
National	Country	3
International	Internationally	4
Probability (Likelihood)		
Unlikely	The likelihood of these impacts occurring is slight	1
May Occur	The likelihood of these impacts occurring is possible	2
Probable	The likelihood of these impacts occurring is probable	3
Definite	The likelihood is that this impact will definitely occur	4

- Severity or benefits

Table 5: Severity of Benefits

Impact Severity <i>(The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)</i>		Score
Very severe	Very beneficial	4
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.	
Severe	Beneficial	3
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.	
Moderately severe	Moderately beneficial	2
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.	
Slight	Slightly beneficial	1
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.	
No effect	Don't know/Can't know	
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.	

* In certain cases it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know

The scores for the three criteria in Table 4 and Table 5 above are added to obtain a composite score. They must then be considered against the severity rating to determine the overall significance of an activity. This is because the severity of the impact is far more important than the other three criteria. The overall significance is then obtained by reading off the matrix presented in the table below. The overall significance is either negative or positive (Criterion 1) and direct, indirect or cumulative (Criterion 2).

Table 6: Composite Duration, Extent, Probability Scores

		COMPOSITE DURATION, EXTENT & PROBABILITY SCORE									
		3	4	5	6	7	8	9	10	11	12
SEVERITY	Slight	3	4	5	6	7	8	9	10	11	12
	Mod severe	3	4	5	6	7	8	9	10	11	12
	Severe	3	4	5	6	7	8	9	10	11	12
	Very severe	3	4	5	6	7	8	9	10	11	12

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Table 7: Overall Significance

OVERALL SIGNIFICANCE <i>(The combination of all the above criteria as an overall significance)</i>	
VERY HIGH NEGATIVE	VERY BENEFICIAL
<p>These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.</p> <p><i>Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.</i></p> <p><i>Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.</i></p>	
HIGH NEGATIVE	BENEFICIAL
<p>These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.</p> <p><i>Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.</i></p> <p><i>Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.</i></p>	
MODERATE NEGATIVE	SOME BENEFITS
<p>These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.</p> <p><i>Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.</i></p>	
LOW NEGATIVE	FEW BENEFITS
<p>These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.</p> <p><i>Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.</i></p> <p><i>Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.</i></p>	
NO SIGNIFICANCE	
<p>There are no primary or secondary effects at all that are important to scientists or the public.</p> <p><i>Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.</i></p>	
DON'T KNOW	
<p>In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.</p> <p><i>Example: The effect of a particular development on people's psychological perspective of the environment.</i></p>	

10.3 Post Mitigation Significance

Once mitigation measure are proposed, the following criteria are then used to determine the overall post mitigation significance of the impact:

- Reversibility: The degree to which an environment can be returned to its original/partially original state.
- Irreplaceable loss: The degree of loss which an impact may cause.

Mitigation potential: The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 8 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 8: Mitigation Potential

Reversibility	
<i>Reversible</i>	<i>The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.</i>
<i>Irreversible</i>	<i>The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.</i>
Irreplaceable loss	
<i>Resource will not be lost</i>	<i>The resource will not be lost/destroyed provided mitigation measures are implemented.</i>
<i>Resource will be partly lost</i>	<i>The resource will be partially destroyed even though mitigation measures are implemented.</i>
<i>Resource will be lost</i>	<i>The resource will be lost despite the implementation of mitigation measures.</i>
Mitigation potential	
<i>Easily achievable</i>	<i>The impact can be easily, effectively and cost effectively mitigated/reversed.</i>
<i>Achievable</i>	<i>The impact can be effectively mitigated/reversed without much difficulty or cost.</i>
<i>Difficult</i>	<i>The impact could be mitigated/reversed but there will be some difficulty in ensuring effectiveness and/or implementation, and significant costs.</i>
<i>Very Difficult</i>	<i>The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.</i>

11 ADDENDUM 3: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

11.1 Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these. The following matrix is used for assessing the significance of each identified site/feature.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa’s history or pre-colonial history.			
It possesses unique, uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa’s natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa’s natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
2.2 Field Register Rating			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			
Specific community			

11.2 Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

Significance of the heritage resource

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. sitespecific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Intensity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts of very high significance should be a central factor in decision-making.

11.3 Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

HERITAGE CONTEXT	TYPE OF DEVELOPMENT			
	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected

NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.

HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT
<p>Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources</p> <p>Context 2: Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.</p> <p>Context 3: Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources</p> <p>Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.</p>	<p>Category A: Minimal intensity development</p> <ul style="list-style-type: none"> - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. <p>Category B: Low-key intensity development</p> <ul style="list-style-type: none"> - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2 - Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). <p>Category C: Moderate intensity development</p> <ul style="list-style-type: none"> - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%)

	<p>Category D: High intensity development</p> <ul style="list-style-type: none"> - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)
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11.4 Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

No further action / Monitoring

Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.

Avoidance

This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.

Mitigation

This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.

Compensation

Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.

Rehabilitation

Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.

Enhancement

Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should, however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored