

HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION AND OPERATION OF A 400KV SUBSTATION FOR THE DE AAR 2 SOUTH WIND ENERGY FACILITY, DE AAR, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act (No.
25 of 1999) as part of a Basic Assessment)

Prepared for

Arcus Consultancy Services South Africa (Pty) Ltd

On behalf of

Mulilo De Aar 2 South (Pty) Ltd

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Final



ACO Associates cc
Archaeology and Heritage Specialists

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1 CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a <i>curriculum vitae</i> ;	Preface pages and Appendix B
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 3, Page 5
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 10: Terms of Reference
(cA) an indication of the quality and age of base data used for the specialist report;	Section 12: Methodology
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 15: Impact Assessment
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 12.2: Archaeological Field Assessment
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 12: Methodology
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 14: Heritage Resources
(g) an identification of any areas to be avoided, including buffers;	Section 16: Proposed Mitigation Measures
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figures 6 and 7
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 12.3: Restrictions and Assumptions

(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 15: Impact Assessment
(k) any mitigation measures for inclusion in the EMPr;	Section 16: Proposed Mitigation Measures
(l) any conditions for inclusion in the environmental authorisation;	Section 16: Proposed Mitigation Measures
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 16: Proposed Mitigation Measures
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 17: Conclusion
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
(p) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	

2 DETAILS OF THE SPECIALIST

This study has been undertaken by John Gribble BA Hons, MA (ASAPA) and Gail Euston-Brown BA of ACO Associates CC, archaeologists and heritage consultants.

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3 CONSULTANT DECLARATION OF INDEPENDENCE

I, John Gribble, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

A handwritten signature in black ink, appearing to read 'J. Gribble', enclosed within a large, stylized circular flourish.

Name of company (if applicable): ACO Associates CC

Date: 17 August 2020

4 EXECUTIVE SUMMARY

ACO Associates CC was appointed by Arcus Consultancy Services South Africa (Pty) Ltd, on behalf of Mulilo De Aar 2 South (Pty) Ltd to carry out a heritage impact assessment for the proposed construction and operation of a 400 kV substation for the authorised De Aar 2 South wind energy facility, east of De Aar in the Northern Cape.

The project comprised an archaeological walkover survey and desktop assessment of the Proposed Development Site and the production of this heritage impact assessment which addresses the impacts of the project on heritage resources. The igneous bedrock which characterises the Proposed Development Site meant that a palaeontological impact assessment was not required.

The Proposed Development Site was surveyed by ACO Associates between 11-13 February 2020 as part of the survey for the De Aar 2 South wind energy facility grid connection (separate application process). The area surveyed and assessed for this report is undeveloped agricultural land which contains some existing electricity supply infrastructure.

Findings: The ACO walkover survey of the site identified a number of archaeological occurrences comprising Middle and Late Stone Age archaeological material on and around the Proposed Development Site. No historic period stone structures, Khoikhoi stone kraal complexes, rock engravings or historical period archaeological material was noted.

The apparently ubiquitous nature of the Middle Stone Age artefacts scattered widely across the landscape, and the fact that much of this material was found to be in secondary or disturbed context, means that the combined overall impact of activities associated with this project on Middle Stone Age material will be low.

The Later Stone Age material appears to be more contextually coherent than the Middle Stone Age material and is thus of greater archaeological significance. Should these sites be lost or damaged as a result of the construction, operation or decommissioning of the Proposed Development, the impact significance would be medium.

The cumulative impacts on archaeological sites and materials and the cultural landscape of the Proposed Development and other developments, both existing and planned, within the De Aar area was assessed to be of medium and high significance respectively, but the implementation of measures to mitigate project level impacts can do much to reduce cumulative impact.

The application of measures to mitigate potential loss or damage to archaeological Later Stone Age sites and material in and around the Proposed Development Site, however, would reduce the impact significance to low.

This assessment recommends that:

- a 30 m exclusion zone be implemented around LSA site at JG013, within which no construction activities may occur during the construction, operation and decommissioning of the Proposed Development. If the site cannot be avoided during construction it is recommended that it is archaeologically recorded and collected

before any work on the Proposed Development Site commences, after which the necessity for an exclusion zone falls away;

- the stream valley immediately to the west of the Proposed Development Site and the archaeological sites it contains are designated a no-go area during construction, operation and decommissioning and staff and contractors must be made aware of this. No archaeological material may be collected or removed from the area; and
- in the event of anything unusual of a cultural heritage nature being encountered during the construction of the Proposed Development, the project archaeologist and SAHRA must be notified immediately so that mitigation can be determined and be implemented if necessary.

Should any human remains be encountered at any stage during the construction of the Proposed Development, work in the vicinity must cease, the remains must be left *in situ* but made secure, and the project archaeologist and SAHRA must be notified immediately so that appropriate mitigation can be determined and be implemented.

Conclusion: Provided that the mitigation measures set out above are implemented, the overall impact of the proposed De Aar 2 South WEF 400 kV substation and associates infrastructure is tolerable and generally of low heritage significance and the proposed activity is considered acceptable.

5 ACKNOWLEDGEMENTS AND THANKS

ACO Associates wishes to acknowledge the help and support of Geit and Fia van der Merwe of Slingershoek, who graciously allowed us access to their property for the survey for the proposed BESS.

6 GLOSSARY

Archaeology: Remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

Cultural landscape: The combined works of people and natural processes as manifested in the form of a landscape

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

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

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

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

Hornfels: A type of indurated shale used in the production of stone tools in the Karoo.

Late Stone Age: The archaeology of the last 20 000 years associated with fully modern people.

Lithology: The description of the physical characteristics of a rock unit, visible at outcrop, in hand or in core samples.

Lockshoek: A non-microlithic tool industry named by Sampson which is present in the Karoo and dates from the late Pleistocene/early Holocene, c. 10 000 years ago. The industry is contemporary with the Oakhurst/Albany Industries and is characterised by large sidescrapers, frontal scrapers, endscrapers, thick backed adzes and a wide variety of ground stone implements.

Midden: A pile of debris, normally shellfish and bone that have accumulated as a result of human activity.

Middle Stone Age: The archaeology of the Stone Age between 20 000-300 000 years ago associated with early modern humans.

Miocene: A geological time period (of 23 million - 5 million years ago).

National Estate: The collective heritage assets of the Nation

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

Pleistocene: A geological time period (of 3 million – 10 000 years ago).

Pliocene: A geological time period (of 5 million – 3 million years ago).

SAHRA: South African Heritage Resources Agency – the compliance authority which protects national heritage.

Smithfield: This term was coined in 1929 for a number of interior stone tools assemblages, made on indurated shale, and dating to the last 2000 years of the Later Stone Age. Various variants have been identified in different parts of the country but the term has not been clearly defined.

Structure (historic): Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.

Wilton: A Late Stone Age microlithic industry dating to between 6000 and 4000 years ago.

7 ACRONYMS

BA	Basic Assessment
BESS	Battery Energy Storage System
DA2S	De Aar 2 South
DEFF	Department of Environment, Forestry and Fisheries
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
LSA	Late Stone Age
MSA	Middle Stone Age
Mya	Million years ago
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WEF	Wind Energy Facility

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8 INTRODUCTION

ACO Associates CC (ACO) was appointed by Arcus Consultancy Services South Africa (Pty) Ltd (Arcus), on behalf of Mulilo De Aar 2 South (Pty) Ltd (Mulilo) to carry out a heritage impact assessment (HIA) for the proposed construction and operation of a 400 kV substation for the authorised De Aar 2 South wind energy facility (DA2S WEF), east of De Aar in the Northern Cape (Figure 1 and Figure 2).

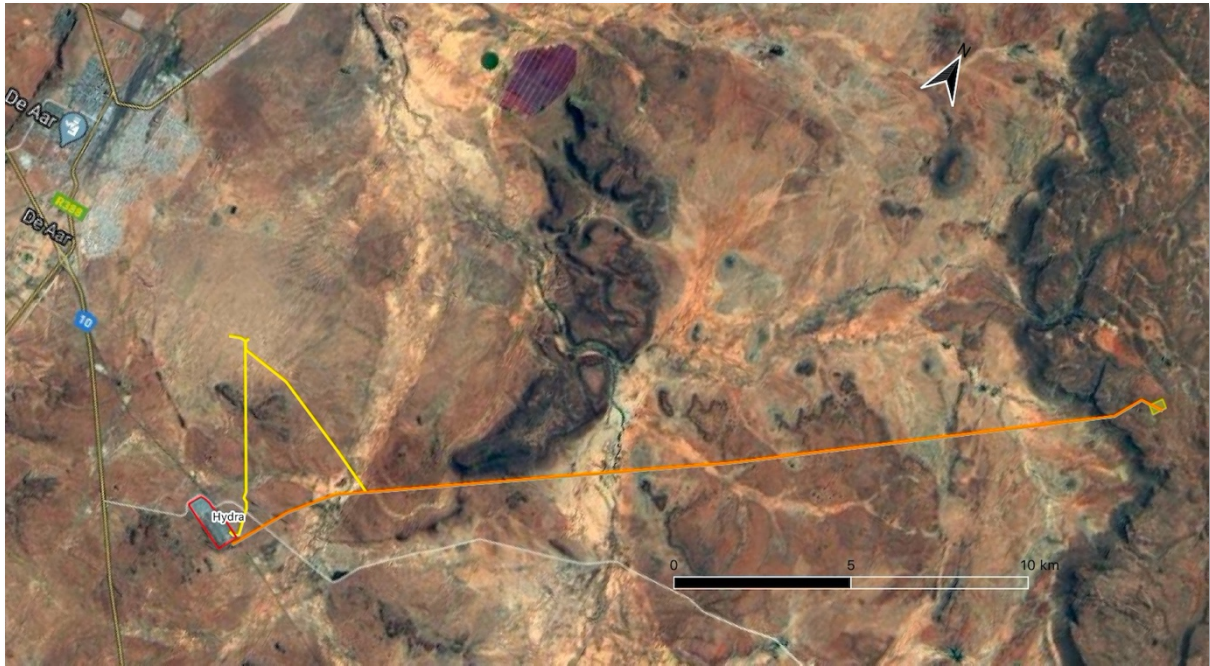


Figure 1: General location of the proposed 400 kV substation for the De Aar 2 South WEF. The BESS (yellow polygon) is located at the north-eastern terminus of the proposed grid connection routes (orange and yellow lines) between the Hydra Substation (red polygon) and the authorised De Aar 2 South WEF, which is undergoing a separate environmental application process. The town of De Aar is in the top left corner of the image (Source: Google Earth).

9 DEVELOPMENT PROPOSAL

Mulilo are proposing the construction and operation of a 400kV substation as part of the infrastructure development for the authorised DA2S WEF.

The substation development will consist of the substation itself, a battery energy storage facility and ancillary infrastructure including internal roads and access, welfare facilities (ablutions, maintenance rooms, security hut etc.), stormwater infrastructure, temporary construction areas and perimeter fencing. It will also involve the clearance of vegetation within the <20 Ha footprint of Proposed Development Area.

Together these project components are referred to hereafter as the Proposed Development and will be constructed within the WEF, at the start of the grid connection lines to the Hydra Substation. The Proposed Development will have a footprint of approximately 8.6 hectares (Ha).



Figure 2: Location of the Proposed Development Site (yellow square) on the mountain plateau at the terminus of the grid connection line. The Slingershoek farm werf is circled in red on left of the image (Source: Google Earth).

10 TERMS OF REFERENCE

ACO Associates was commissioned to produce a HIA as part of a Basic Assessment (BA) process for this project, as required by the National Environmental Management Act (No. 107 of 1998) (NEMA), as amended.

The HIA aims to identify heritage resources which may be impacted during the various phases of the project, assess their significance and provide recommendations for mitigation.

Reference to the South African Heritage Resources Information System (SAHRIS) palaeo-sensitivity map (see <https://sahris.sahra.org.za/map/palaeo>) and to the palaeontological desktop study by Bamford (2020), commissioned for the DA2S WEF grid connection HIA, indicates that the Proposed Development Site is situated on dolerite (Figure 3) which contains no fossils because they do not occur in intrusive, volcanic rock.

The Proposed Development Site thus has no palaeontological potential or sensitivity and palaeontology has been excluded from this assessment.

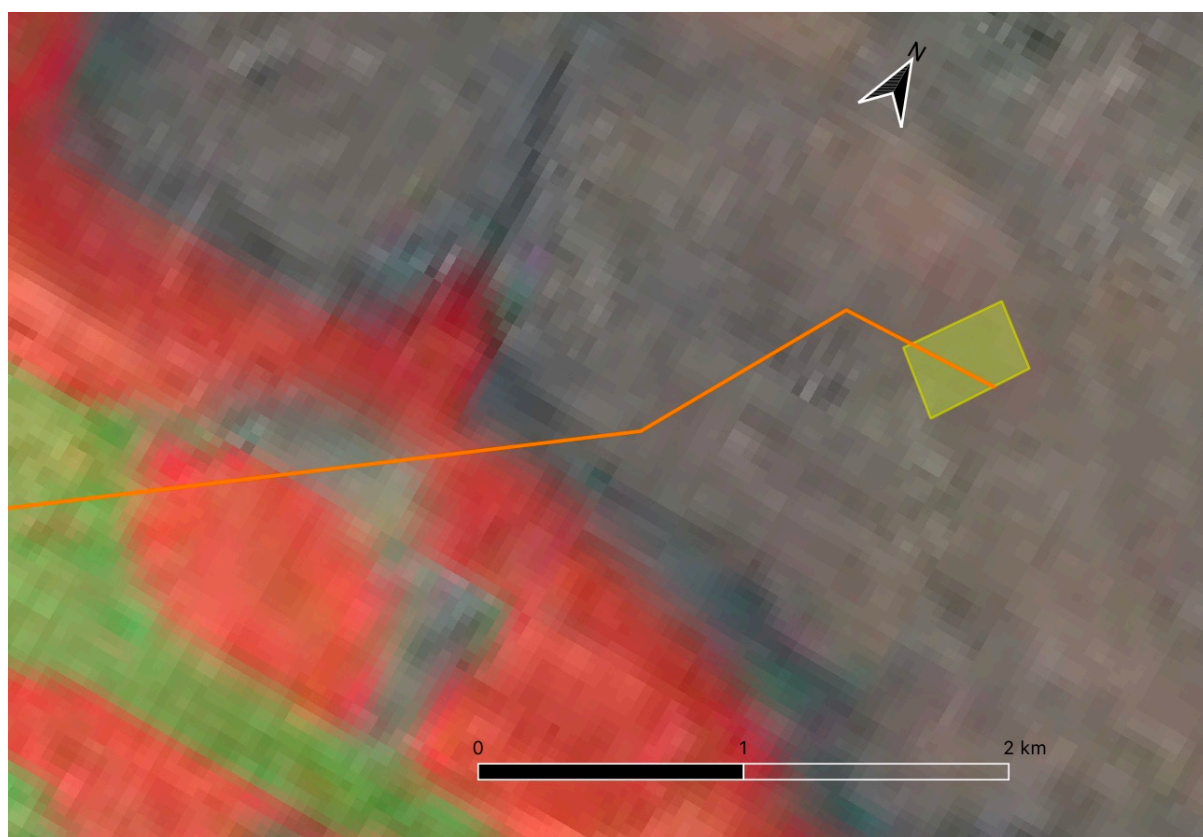


Figure 3: Proposed Development Site (yellow rectangle) superimposed on detail of SAHRA's palaeo-sensitivity map. The dolerite massif is clearly visible as the grey area on the right of the image. Red = high paleontological sensitivity, green = moderate, and grey = zero/insignificant (Source: <https://sahris.sahra.org.za/map/palaeo>).

This document therefore includes the following:

- A desk-top level literature review to assess the potential for archaeological, cultural and historic sites in the Proposed Development Site; and

- The results of archaeological field work to identify and document heritage resources that may be affected by the Proposed Development.

The results of this work are integrated in this HIA report along with an assessment of the sensitivity and significance of heritage resources within and around the Proposed Development Site, an evaluation of the potential impacts on these resources of the construction, operation and decommissioning of the project, and recommendations for measures to mitigate any negative impacts of the project on them.

The HIA must be submitted for comment to the South African Heritage Resources Agency (SAHRA) and the Northern Cape Provincial Heritage Resources Authority (Ngwao-Boswa Jwa Kapa Bokone), the relevant statutory commenting bodies under the NEMA.

11 RELEVANT LEGISLATION

11.1 National Heritage Resources Act (No 25 of 1999)

The National Heritage Resources Act (NHRA) came into force in 2000 with the establishment of the SAHRA, replacing the National Monuments Act (No. 28 of 1969 as amended) and the National Monuments Council as the national agency responsible for the management of South Africa's cultural heritage resources.

The NHRA reflects the tripartite (national/provincial/local) nature of public administration under the South African Constitution and makes provision for the devolution of cultural heritage management to the appropriate, competent level of government. In the Northern Cape this is the Northern Cape Provincial Heritage Resources Authority, Ngwao-Boswa Jwa Kapa Bokone. At present, however, archaeological and palaeontological heritage management in the Northern Cape is being managed on an agency basis by SAHRA.

The NHRA gives legal definition to the range and extent of what are considered to be South Africa's heritage resources. According to Section 2(xvi) of the Act a heritage resource is "*any place or object of cultural significance*". This means that the object or place has aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

In terms of the definitions provided in Section 2 of the NHRA, heritage resources potentially relevant to this assessment are:

- Material remains of human activity which are in a state of disuse and are in or on land [which includes land under water] and which are older than 100 years, including artefacts, human and hominid remains and artificial features;
- Rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years;
- Any fossilised remains or fossil trace of animals or plants which lived in the geological past [other than fossil fuels or fossiliferous rock intended for industrial use] and any site which contains such fossilised remains or trace;

- Any movable property of cultural significance which may be protected in terms of any provisions of the NHRA, including any archaeological artefact or palaeontological specimen; and
- Intangible heritage such as traditional activities, oral histories and places where significant events happened.

As per the definitions provided above, these cultural heritage resources are protected by the NHRA and a permit from SAHRA (currently) is required to destroy, damage, excavate, alter, deface or otherwise disturb any such site or material.

It is also important to be aware that in terms of Section 35(2) of the NHRA, all archaeological objects and palaeontological material is the property of the State and must, where recovered from a site, be lodged with an appropriate museum or other public institution.

Section 38 of the NHRA requires a Heritage Impact Assessments (HIA) for certain kinds of development. In relation to this project, the relevant activity is a development which will change the character of a site exceeding 5000 m² in extent (Section 38(1)(c)(i)).

11.1.1 Grading of Heritage Resources

The South African heritage resources management system is based on grading, which provides for assigning the appropriate level of management responsibility to a heritage resource.

Grading, according to Winter & Oberholzer (2014) is *“generally based on the intactness, rarity and representivity of the resource, as well as its role in the larger landscape or cultural context”*.

Heritage resources are graded according to criteria specified in Section 3 of the NHRA which suggests the following criteria for assigning heritage significance:

- Importance in the community or pattern in South Africa’s history;
- Possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- Potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- Importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Importance in demonstrating a high degree of creative or technical achievement during a particular period;
- Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- Significance in relating to the history of slavery in South Africa.

The generally accepted heritage resource grades are shown in Table 1 below.

Table 1: Grading of heritage resources (Source: Baumann & Winter 2005: Box 5).

Grade	Level of significance	Description
1	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
2	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.
3A	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3A heritage resources.
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources.

11.2 National Environmental Management Act (No 107 of 1998)

The National Environmental Management Act (NEMA) provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals that are likely to have a negative effect on the environment.

Regulations governing the environmental authorisation process have been promulgated in terms of NEMA and include the EIA Regulations, 2014 as amended (GNR R326/2017) and Listing Notices 1 – 3 (GNR 324, 325 and 327/2017). These regulations were amended in April 2017 by Government Notices 324, 325, 326 and 327.

The development proposed for this project triggers a number of activities in the Listing Notices and, in terms of GNR 325 therefore, the project will be subject to a Basic Assessment process and Mulilo will be required to obtain a positive Environmental Authorisation from the Department of Environmental, Forestry and Fisheries (DEFF) prior to commencement of the proposed activities.

12 METHODOLOGY

This study was commissioned as a heritage impact assessment and attempts to assess the impacts of the Proposed Development on the heritage resources of the area.

12.1 Archaeological Desktop Review

A number of previous published archaeological reports and unpublished archaeological, heritage and palaeontological impact assessments have been conducted for projects in the vicinity of De Aar and the Proposed Development (see Figure 4).

The following reports, available on the SAHRIS online platform (<https://sahris.sahra.org.za/>) or in ACO's project archive, were reviewed and have contributed to this assessment:

- Archaeological Scoping Study: Establishment of an Ammunition Disposal Plant, Sinclair's Dam 133, De Aar, Northern Cape, South Africa (ArchaeoMaps Heritage Consultancy, 2008);
- Archaeological Impact Assessment: Establishment of an Ammunition Disposal Plant, Sinclair's Dam 133, De Aar, Northern Cape, South Africa (ArchaeoMaps Heritage Consultancy, 2009);
- Archaeological impact assessment proposed Photovoltaic Power Generation Facility in De Aar, Northern Cape (Agency for Cultural Resource Management, 2010);
- Archaeological impact assessment of a proposed wind energy facility near De Aar, Northern Cape (Agency for Cultural Resource Management, 2010);
- Heritage scoping assessment for the proposed establishment of the ACED De Aar Solar Energy Facility, Northern Cape Province (J van Schalkwyk, 2011);
- Proposed De Aar Wind Energy Facility on the North and South Plateau, Northern Cape Province (Archaeology Contracts Office, 2011);
- Heritage Scoping Report for the proposed establishment of the Inca Energy PV Power Plant, De Aar, Northern Cape Province (Van Schalkwyk, 2011);
- Archaeological impact Assessment: proposed establishment of the Inca Solar Energy Facility, De Aar, Northern Cape (Heritage Contracts and Archaeological Consulting, 2011);
- Concentrated Solar Power EIA, De Aar: Heritage Impact Assessment (PGS, 2011 & 2012);
- Heritage Impact Assessment Scoping Report for De Aar Solar One Photovoltaic Power Plant, Northern Cape (Bekker, 2012a);
- Phase 2 Heritage Impact Assessment De Aar Solar One Photovoltaic Power Project (Bekker, 2012b);
- Proposed establishment of a solar energy facility near De Aar, Northern Cape Province: Phase 1 Archaeological Impact Assessment Report (Kruger, 2012);
- Proposed solar power generation facilities on the remaining extent of the farm Vetlaagte No. 4, De Aar, Northern Cape Province: Palaeontological specialist study - combined desktop and field-based assessments (Almond, 2012);
- Two wind energy facilities on the Eastern Plateau near De Aar, Northern Cape Province proposed by Mulilo Renewable Energy (Pty) Ltd: palaeontological specialist study - combined desktop and field-based assessments (Almond, 2012b);
- Proposed Mulilo Renewable Energy PV2, PV3 and PV4 photovoltaic energy facilities on Farms Paarde Valley, Badenhorst Dam and Annex Du Plessis Dam near De Aar, Northern Cape Province. Palaeontological specialist study: combined desktop and field-based assessments (Almond, 2012a);
- Heritage Impact Assessment for three solar energy facilities at De Aar, Western Cape (sic) (Orton 2012);
- Proposed Photovoltaic (solar) energy facilities on du Plessis Dam Farm near De Aar: Palaeontological specialist study - combined desktop and field-based assessments, (Almond, 2013);
- Heritage Impact Assessment for multiple proposed solar energy facilities on De Aar 180/1 (Badenhorst Dam farm), De Aar, Northern Cape (Orton and Webley 2013a);
- Heritage Impact Assessment for multiple proposed solar energy facilities on Du Plessis Dam 179, De Aar, Northern Cape (Orton and Webley 2013b);

- Proposed construction of a 132 kV transmission line from the Longyuan Mulilo De Aar 2 North Wind Energy Facility on the Eastern Plateau (De Aar 2) near De Aar, Northern Cape (PGS, 2014);
- Archaeological impact assessment for the proposed Castle Wind Energy Facility, De Aar, Northern Cape (Heritage Contracts and Archaeological Consulting, 2014);
- Heritage Impact Assessment: Walkdown of final layout of the Longyuan Mulilo De Aar 2 North Wind Energy Facility, Northern Cape Province (ACO Associates, 2014);
- Addendum: Proposed Wind Energy Facility situated on the Eastern Plateau (South) near De Aar, Northern Cape Province (ACO Associates, 2015);
- Heritage Impact Assessment: Proposed Grid Connection for the De Aar 2 South Wind Energy Facility, De Aar, Northern Cape (ACO Associates, 2020)
- Archaeological Impact Assessment: proposed photovoltaic power generation facility in De Aar, Northern Cape (Archer, no date); and
- A Palaeontological Desktop Study of the area to be affected by the proposed Photovoltaic Power Project on Portion 3 of farm Hartebeestplaats 135 (Brink, no date).

The Proposed Development Site is located approximately 25 km from the north-western boundary of the study area of the Zeekoei Valley Archaeological Survey (ZVAS), a major archaeological study undertaken by a team led by Garth Sampson in the late 1970s and early 1980s (see Figure 5). The project surveyed 5 000 square kilometres of the catchment of the Zeekoe River (from the Sneeuberg Mountains to the Gariep River Valley) and recorded some 10 000 archaeological sites representing a history of human occupation covering at least 250 000 years. Sampson identified seven industries or phases of human history within his study area, each of which are legible on the landscape today, and each of which represent a pre-colonial layer of the human history of the Karoo (Sampson, 1985).

12.2 Archaeological Field Assessment

A physical survey of the area of the Proposed Development was undertaken by archaeologists John Gribble and Gail Euston-Brown of ACO Associates, as part of the survey for the De Aar 2 WEF grid connections conducted between 11-13 February 2020.

The footprint of the Proposed Development Site and other relevant data such as farm boundaries and tracks were loaded onto hand-held GPS receivers (using the WGS84 datum) carried by each member of the field team. Travelled tracks were logged and waypoints were entered into the GPS at the location of any identified heritage resources (Figure 6).

Although the veld was lush following recent rain in the area this did not influence the outcome of the study as ground visibility was generally good.

All heritage resources located were recorded and photographs were taken of most finds. Resources were graded according to the Baumann and Winter (2005) system set out in the guidelines for involving heritage practitioners in Environmental Impact Assessments (EIA) and referred to above (Table 1).

No trial holes were dug and all observations were based on visible surface material. No archaeological material was removed from the project area, but instead was recorded and photographed *in situ*.

Appendix A contains the detail of the observations made in the field.

The analysis of heritage resources, which were exclusively pre-colonial archaeological material, is based upon the experience of the team members who are familiar with the standard classification systems for artefactual material in use to the degree that they can roughly date and characterise an archaeological site based on its visible content and artefacts.

12.3 Restrictions and Assumptions

The Proposed Development Site was readily accessible and despite recent rains, surface visibility was generally good in the indigenous vegetation covering the site.

Although it was not possible in the time available to exhaustively survey the entire site, the coverage achieved, the results of the previous survey in the vicinity for the DA2WEF by Webley and Orton (2011), the topography of the site and the archaeological material that was recorded in areas surveyed, together indicate that it is unlikely that this represents a constraint on veracity and results of this HIA.

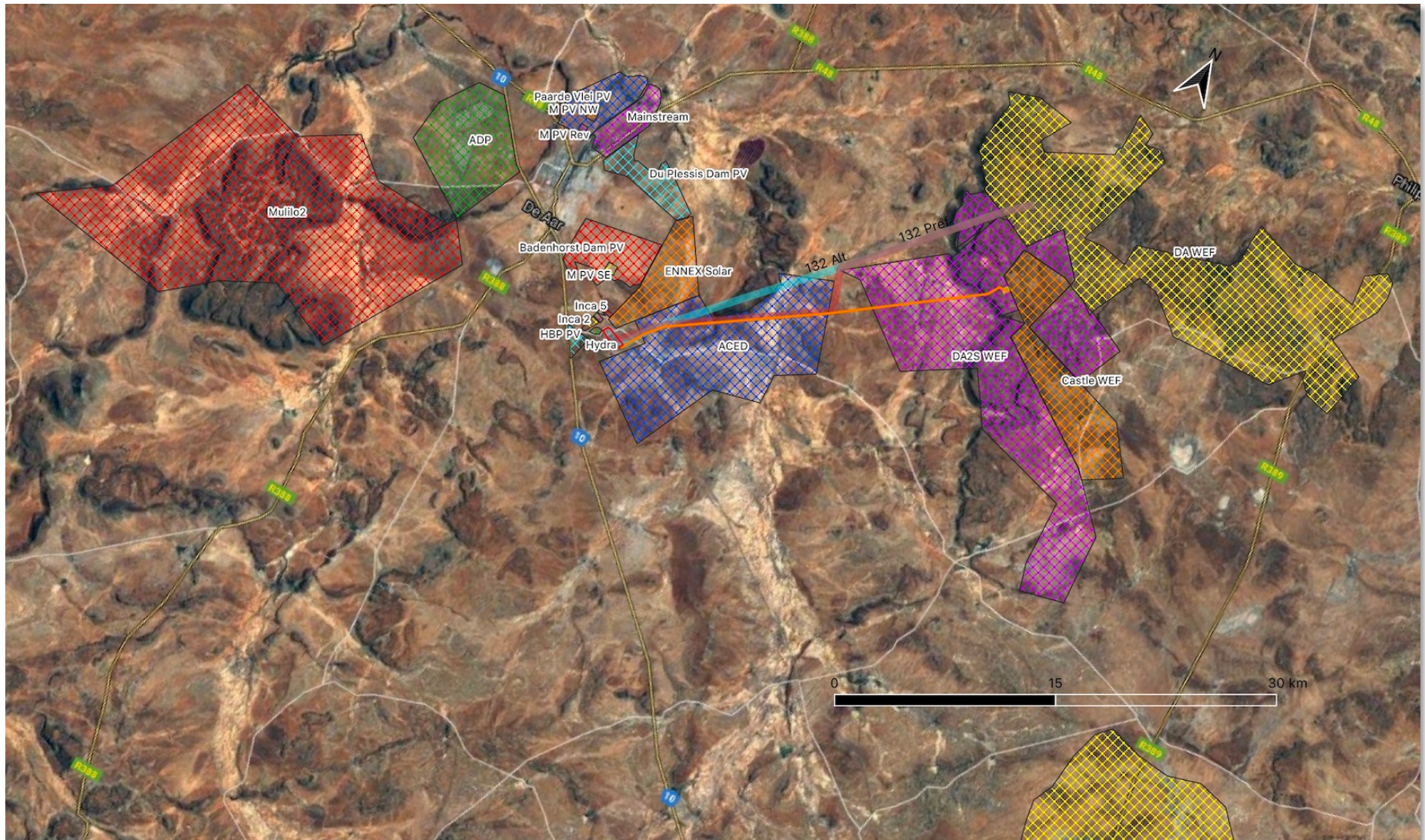


Figure 4: Previous heritage assessments carried out in the De Aar area with relevance to the assessment for the Proposed Development . The northern portion of the ZVAS is the yellow polygon at the bottom right of the image (Source: Google Earth).

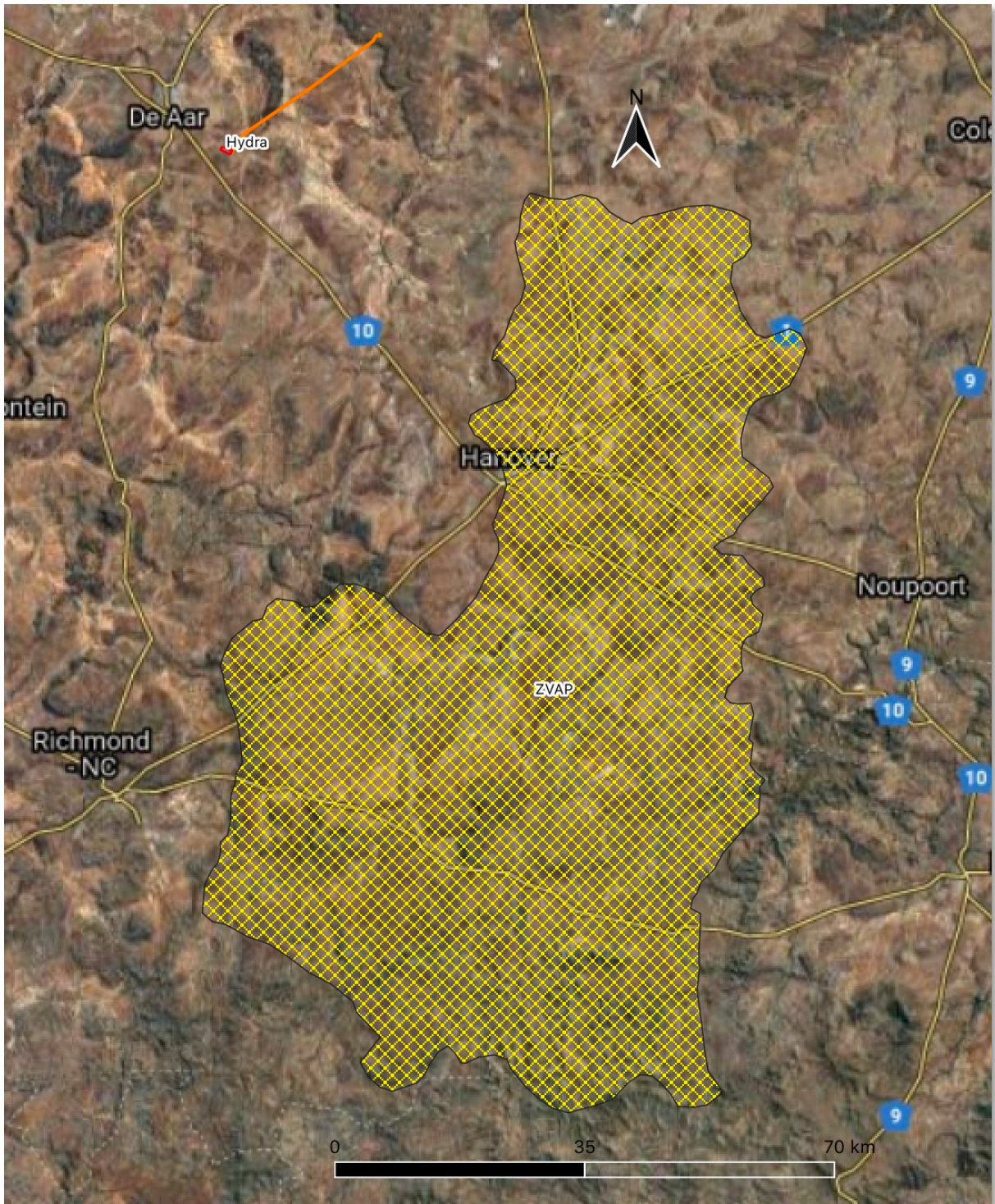


Figure 5: Proximity of the proposed Proposed Development Site to the Zeekoei Valley Archaeological Survey study area (After Sampson 1985).

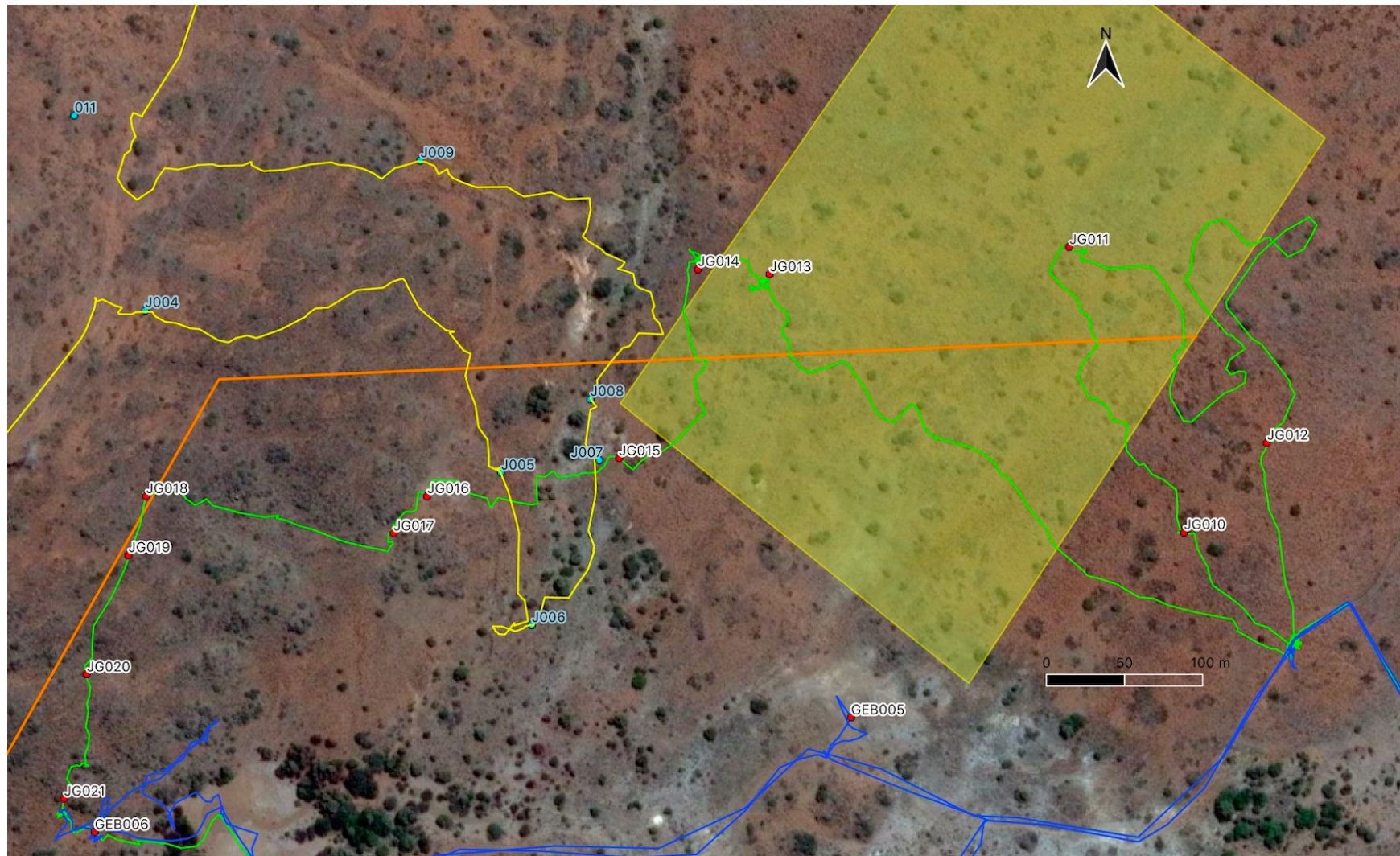


Figure 6: ACO Associates 2020 survey tracks (dark blue and green) and waypoints (red) overlaid on the Proposed Development Site and surrounding area. Also indicated are the trackplots (yellow) and waypoints (blue) recorded by ACO Associates during their 2011 survey for the DA2S WEF (Source: Google Earth).

13 RECEIVING ENVIRONMENT

The area of the Northern Cape around De Aar is characterised by wide plains interspersed with koppies and mountains formed by igneous intrusions.

The Proposed Development Site is situated on a flat mountain plateau which rises at least 100 m above the surrounding plains. The plateau is generally flat with rocky outcrops and is covered in typical Karoo scrub and grasses (Plate 1). According to Webley and Orton (2011:15) the plateau does not have a local name nor are any of the streams named. The plateau is chiefly used for the grazing of livestock and some farmers are introducing game to the area as well.

The Proposed Development Site is located on an open sandy area which slopes gently to the south-west towards seasonal streambeds which bound the area to the west and south (Figure 6).



Plate 1: View across the Proposed Development Site to the south-east showing the vegetation cover and nature of the ground surface. The survey vehicles are visible in the distance.

13.1 *Archaeological Context*

Our understanding of the pre-colonial archaeology of the Upper Karoo is derived in large part from the exhaustive archaeological survey of the Zeekoe River Valley by Prof Garth Sampson (1985, 1992, 2015) of Southern Methodist University in the United States referred to earlier.

This large-scale and detailed survey produced a comprehensive and unparalleled body of archaeological information which can be extrapolated to this HIA to inform our understanding of the pre-colonial heritage of the area to be affected by the proposed grid connections.

The ZVAS identified a long sequence of archaeological material in the Upper Karoo indicating the occupation of the region by our forebears since the Early Stone Age (ESA) Acheulian (after 1 million years ago), through multiple Middle Stone Age (MSA) phases, four Later Stone

Age (LSA) phases to herder sites, many with low stone-walled kraals and Khoenkhoen-like, thin-walled ceramics, dating to within the last 2000 years (Sampson 1985, 2015:3).

The Acheulian sites of the ESA in the Zeekoe River Valley are reported by Sampson (1985) as clustering close to sources of tool-making stone raw material, rather than close to sources of water and tend to be found on the flats rather than on ridges and hills.

The many Middle Stone Age artefact occurrences reported by Sampson (1985) are almost exclusively “open sites”, a factor probably of the lack of rock shelters and overhangs in the Karoo geology. He describes the open sites as occurring in erosion features along stream banks, but makes it clear that MSA artefacts are widely distributed across the landscape in the form of “ancient litter” and are frequently found on the edges of pans, streams and at the base of small hills or koppies.

Sampson (1985) recorded thousands of Later Stone Age sites in the Zeekoe River Valley, which are attributed to the ancestors of the San peoples and, after 2000 years ago, to Khoekhoen pastoralists. As with the MSA sites, the LSA material is generally found in the open due to the scarcity of rock shelters and comprise large scatters of stone tools. Other traces of the San presence in the Karoo can be found as rock engravings on dolerite boulders (Webley and Orton 2011:14).

The earlier phase of the LSA dates to around 10 000 years ago and is described by Sampson (1985) as the Lockshoek. This industry is contemporary with the Oakhurst/Albany Industries found elsewhere in the country, and is characterised by large sidescrapers, frontal scrapers, endscrapers, thick backed adzes and a wide variety of ground stone implements. These sites are overwhelmingly found near water points (Webley and Orton 2011:14).

The Lockshoek is followed by the ‘Interior Wilton’ which Sampson describes as including small convex scrapers, adzes, drills, reamers as well as ceramics in the final phase of the IW. Unlike the Lockshoek, Interior Wilton sites are found on hills and ridges with commanding views of rivers and valleys (Webley and Orton 2011:14).

The Interior Wilton is followed by the Smithfield which is characterised by abundant endscrapers made on elongated flakes, often with extensive trimming down the margins. Sampson’s Smithfield is generally associated with ceramics (Webley and Orton 2011:14).

The introduction of pastoralism (sheep, goats and, later, cattle) roughly 2000 years ago, along with the arrival of the Khoekhoen may have resulted in changes in land use. It is suggested the Khoekhoen followed a transhumant lifestyle, and are likely to have utilized the grazing opportunities of the Karoo on a seasonal basis (Webley and Orton 2011:14).

By the early 18th century the San appear to have retreated to the Great Karoo ahead of the expansion north and east from the Dutch settlement around the Cape of mobile colonial stock farmers or trekboers. Here they managed to eke out an existence which includes hunting, gathering and raiding the livestock of the trekboers, resulting in the “Bushman War”. Eventually kommandos dispatched from regional centres such as Graaff Reinet prevailed and the “wild bushman” of the Karoo were rendered extinct by the early 19th century (Webley and Orton 2011:14).

The most recent archaeological layer in the Karoo landscape relates to the historical occupation of the area by stock farmers of European descent from the late 18th century, but is a layer which is not well-documented. These European pastoralists, were highly mobile – hence the name trekboers – moving between winter and summer grazing on and off the Great Escarpment. Land ownership was informal and only became regulated after the implementation of the quitrent system of the 19th century, used by the Government to control the lives and activities of the farmers. However, judging by the kinds of artefacts and structures found on the landscape, many of the farms in the Upper Karoo are likely to have been used before land was formally granted or loaned in the early 19th century (Sampson and Sampson, 1994).

The town of De Aar was established on the farm of that name in the last two decades of the 19th century, at the site of an important junction on the Cape Government Railways' line between the Kimberley diamond fields and Cape Town. In 1899 the Friedlander brothers, who ran a trading store and hotel at the junction, purchased the farm and after the end of the South African War surveyed the land for the establishment of a town. The municipality was created a year later (https://en.wikipedia.org/wiki/De_Aar).

14 HERITAGE RESOURCES

The archaeological survey of the Proposed Development Site and surrounding area documented only a handful of pre-colonial sites and lithic scatters. No colonial period archaeological material or structures were recorded and no other heritage resources noted.

14.1 Pre-colonial Archaeology

14.1.1 Early Stone Age (ESA)

No ESA material was identified in the 2020 ACO survey, or in the survey by Webley and Orton (2011) for the DA2S WEF which covered an area adjacent to the Proposed Development Site.

14.1.2 Middle Stone Age (MSA)

MSA material was encountered in and around the Proposed Development Site during the 2020 ACO survey and during the earlier survey of the area adjacent to the site by Webley and Orton (2011).

The MSA artefacts were made on a now very heavily patinated and weathered hornfels. Although black when broken or flaked, hornfels acquires a reddish-brown protective skin or patination with exposure to the elements and the MSA material recorded during the survey was both heavily patinated and edge-worn (see for example Plate 2 and Figure 6).



Plate 2: Heavily patinated hornfels MSA lithics from rainwater runnel at waypoint JG012 (Photo: J Gribble).

The artefacts include flakes, blades and snapped blades. There were few diagnostic MSA elements, apart from occasional triangular flakes with dorsal ridges removed or long blades with parallel dorsal scars. Some flakes and blades have signs of utilisation damage. No bifacially worked points (Stillbay) or artefacts typical of the Howieson's Poort were seen. No other associated archaeological material (bone, ostrich eggshell, etc.) was found with the MSA lithics.

Similar to what has been described by Sampson (1985) in the Zeekoe Valley and by Kruger (2012), Orton (2012) and Webley and Orton (2011, 2013a; 2013b) for a number of other projects in the area, much of the MSA material was found lying on harder, gravelly substrate in areas of where the orange sand that mantles the landscape has been eroded by water or deflated by wind.

Discrete, clearly definable MSA sites were difficult to identify because material is generally visible only in areas where the overlying orange sand has been stripped or eroded away and because the landscape is liberally spread with material, a type of "ancient litter" (Webley and Orton 2011).

The scattered MSA material (JG010, JG012) encountered during the 2020 survey has been graded as **Not Conservation Worthy** (NCW) while the more dense MSA lithic occurrences (JG014, JG015, GEB005) have been graded **3C**.

14.1.3 Late Stone Age (LSA)

LSA material was encountered in and around the Proposed Development Site during the 2020 ACO survey and by Webley and Orton (2011).

The LSA artefact assemblages encountered are all made on hornfels and include occasional MSA lithics that have been reworked. Most of the LSA artefacts have a pale grey patina or are black and sharp, suggesting that they were relatively recently flaked.

A Smithfield industry endscraper (or duckbill scraper) (Plate 3 and Figure 6) possibly made on a MSA blade was noted at JG011, as was a small site in the lee of a boulder outcrop containing early Holocene, Lockshoek lithics, dating to c.10 000 years ago (JG013) (Plate 4 and Figure 6). Both of these occurrences are located within the Proposed Development Site.

Both industries are typical of what is expected in this part of the Karoo according to Sampson (1985). None of the LSA sites are associated with any pottery.

The site at JG013 has been graded **3C**, while the scatter at JG011 is considered to be **NCW**.



Plate 3: LSA endscraper made on hornfels. Possibly made on an MSA blade (Photo: J Grtibble).



Plate 4: Example of LSA lithics encountered on the site recorded at waypoint JG013. The lithic second from the top on the left is an MSA flake (Photo: J Gribble).

Webley and Orton (2011) reported similar types of finds in the area to the west of the Proposed Development Site (see Figure 6, which tends to confirm a widespread litter of MSA lithics and LSA scatters across the plateau.

14.1.4 Stone Features and Kraals

No stone features or kraals were encountered during the survey of the Proposed Development Site or within its immediate vicinity.

14.1.5 Engravings and Rock Art

No rock art or engravings were recorded during the survey of the Proposed Development Site or within its immediate vicinity.

14.2 Graves, Cairns and Stone Features

No graves or cairns were encountered during the survey of the Proposed Development Site or within its immediate vicinity.

14.3 Historical Archaeology

No historical archaeological sites or features were encountered during the survey of the Proposed Development Site or within its immediate vicinity.

14.4 Built Environment

No historical buildings were noted during the survey of the Proposed Development Site or in its immediate vicinity.

14.5 Cultural Landscape

The cultural landscape within which the Proposed Development will be situated consists of a Karoo landscape of vast open plains covered in low scrub and grasses. Interspersed on these plains are low ridges and small hills. In the case of the Proposed Development Site, the facility will be constructed on a plateau which rises about 100m above the plains. The widespread distribution of archaeological material on the plateau suggests that this upland landscape was an archaeological landscape of significance to prehistoric peoples with Middle and Later Stone age people leaving nearly 300 000 years' worth of human debris on the land surface.

Historically, the upland plateau was less settled by colonial trekboere and farmers, who tended to settle in the plains and use the uplands for grazing. The plateau landscape retains a wilderness quality, with minimal infrastructure such as roads and power lines crossing the area.

15 IMPACT ASSESSMENT

15.1 Nature of Impacts

Heritage resources are highly context sensitive and the main cause of impacts to such sites is physical disturbance of the material itself and its context.

The Proposed Development can have a number of direct and indirect impacts on the heritage resources and qualities of an area.

During construction the following physical impacts to the landscape and any heritage resources that lie in or on it can be expected:

- Excavations for foundations;
- Leveling of the ground;
- Construction of roads or tracks to service the Proposed Development and its longer term operation and maintenance;
- Creation of working and lay-down areas during construction; and
- Introduction of vehicles, machinery and people into the environment.

Lastly, the introduction of a substantial industrial feature can have an impact on the cultural landscape.

The best method for managing impacts to significant heritage resources is avoidance or exclusion of the site from activities associated with the project. If this is not possible, then some form of mitigation will be required to manage the impacts. This is generally considered

a second best approach as *in situ* preservation, wherever possible is always the preferred option.

15.2 Extent of Impacts

The fieldwork undertaken to inform this assessment identified MSA and LSA lithic material considered to be either not conservation worthy or of a generally relatively low, local archaeological significance, within and around Proposed Development Site.

The impacts to archaeological material in the area arising from the construction, operation, and decommissioning of the Proposed Development will be limited to the footprint of the facility.

15.3 Significance of Impacts

Based on the information that has been collected, indications are that the significance of impacts on heritage resources arising from the construction, operation, and decommissioning of the Proposed Development will be as follows:

- **Scattered MSA lithics:** The volume and apparently ubiquitous nature of the MSA artefacts scattered across the landscape, including within the Proposed Development Site, and the fact that much of this material is in secondary, or disturbed context, means that the combined overall impact significance of activities associated with the Proposed Development on scattered MSA material will be **low**;
- **LSA material:** LSA archaeological material was noted within the Proposed Development Site and along the seasonal streams in the vicinity of the site. This material appears to be more contextually coherent than the MSA material recorded and is of greater archaeological significance. If these sites are lost or damaged as a result of the construction, operation or decommissioning of the Proposed Development, the impact significance would be **medium**, prior to the application of mitigation measures.

The application of measures to mitigate potential loss or damage to archaeological LSA sites and material in and around the Proposed Development Site, however, would reduce the impact significance to **low**.

15.4 Cumulative Impacts

Cumulative impacts or effects, can be described as “*changes to the environment that are caused by an action in combination with other past, present and future human actions*”. They are the result of multiple activities whose individual direct impacts may be relatively minor but which, in combination with others result are significant environmental effects (DEAT 2004:5)

Archaeological sites and material are potentially at risk from cumulative impacts, given their widespread occurrence and exposure across the landscape. At an individual project level impacts to these sites and materials may not appear to be significant, but the cumulative effects of multiple developments on archaeological resources in an area can be high. The implementation of measures at individual project level can, however, do much to mitigate and reduce cumulative impacts.

Multiple human activities, both existing and planned, in the vicinity of De Aar, of which the construction of the Proposed Development is one, can erode the integrity of these resources through their physical damage or destruction.

The widespread, and ubiquitous nature of particularly the MSA archaeological material, much of which is no longer in primary archaeological context, both within the Proposed Development Site and the wider landscape around De Aar suggests that the cumulative impacts of the Proposed Development and other projects in the area is likely to be of **medium** significance.

In respect of the cultural landscape, the mountain plateau where the Proposed Development is to be constructed is a relatively untouched cultural landscape. The construction of the Proposed Development, the grid connection and the DA2S WEF, taken together with the existing powerlines that cross the plateau will together have a **high** cumulative impact on this landscape.

15.5 The No-Go Alternative

Not implementing the proposal will result in no impacts to heritage resources.

15.6 Impact Assessment Summary

The likely impacts of the construction, operation, and decommissioning of the Proposed Development on archaeological sites and material are assessed as follows:

Table 2: Impact Assessment – Archaeological Material

Impact Phase: Proposed Development Construction, Operation and Decommissioning							
Possible impacts to archaeological sites and materials							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	Local	Permanent	Low	Negative	Low/Medium	High	High
With Mitigation	Local	Permanent	Low	Neutral/Positive	Low	Low	High
Can the impact be reversed?			No - impacts to archaeological resources cannot be reversed, but can be mitigated.				
Will impact cause irreplaceable loss or resources?			No - the archaeological occurrences recorded are well represented in other areas and provided the recommended mitigation measures are implemented, there should be no irreplaceable loss of resources.				
Can impact be avoided, managed or mitigated?			Yes – impacts can be avoided or mitigated through the implementation of the mitigation measures listed below.				
Mitigation measures:			<ul style="list-style-type: none"> It is recommended that a 30 m exclusion zone be implemented around LSA site at JG013 within which no construction activities may occur during the construction, operation and decommissioning of the Proposed Development. If the site cannot be avoided during construction it is recommended that it is archaeologically recorded and collected before any 				

	<p>work on the Proposed Development Site commences, after which the necessity for an exclusion zone falls away.</p> <ul style="list-style-type: none"> • To safeguard the integrity of the archaeological sites recorded in this area, the streambed to the west of the Proposed Development Site must be considered a no-go area for staff and contractors during the construction, operation and decommissioning of the Proposed Development; • Construction and operations staff are not to collect or remove any archaeological artefacts from the site. • Any chance discoveries of human remains or archaeological material must be reported to the project archaeologist and SAHRA.
Can any residual risk be monitored/managed?	Yes – the continued avoidance of JG013 and the sites around the stream to the west of the Proposed Development Site during the lifetime of the Proposed Development will ensure that residual risk can be managed and is of low significance.
Will this impact contribute to any cumulative impacts?	<p>Yes – There will be cumulative impacts of medium and high significance on archaeological sites and materials and the cultural landscape respectively, arising from the construction of the Proposed Development and other developments, both existing and planned, within the De Aar area.</p> <p>The implementation of measures to mitigate project level impacts can do much to reduce cumulative impacts.</p>

16 PROPOSED MITIGATION MEASURES

The field survey identified a number of archaeological occurrences and sites in and around the Proposed Development Site. In most cases this material was difficult to define as discrete sites and can be viewed as part of a widespread archaeological litter across the landscape which becomes visible in areas where erosion or deflation of the overlying soils occurs.

It is recommended that the small Lockshoek LSA site at JG013 is subject to the implementation of a 30 m exclusion zone, within which no construction activities may occur during the construction, operation and decommissioning of the Proposed Development (Figure 7). If the site cannot be avoided during construction it is recommended that it is archaeologically recorded and collected before any work on the Proposed Development Site commences, after which the necessity for an exclusion zone falls away.

In respect of the sites recorded in the stream valley immediately to the west of the Proposed Development Site, these are close enough to potentially be impacted or suffer damage as an indirect result of its construction, operation and decommissioning. It is recommended that this shallow valley be designated a no-go area during construction, operation and decommissioning (Figure 7). Staff and contractors must be made aware of this, and of the fact that no archaeological material may be collected or removed from the area.

In the event of anything unusual of a cultural heritage nature being encountered during the construction of the Proposed Development, the project archaeologist and SAHRA must be notified immediately so that mitigatory action can be determined and be implemented if necessary.

Should any human remains be encountered at any stage during the construction of the Proposed Development, work in the vicinity must cease, the remains must be left *in situ* but made secure and the project archaeologist and SAHRA must be notified immediately so that mitigatory action can be determined and be implemented.

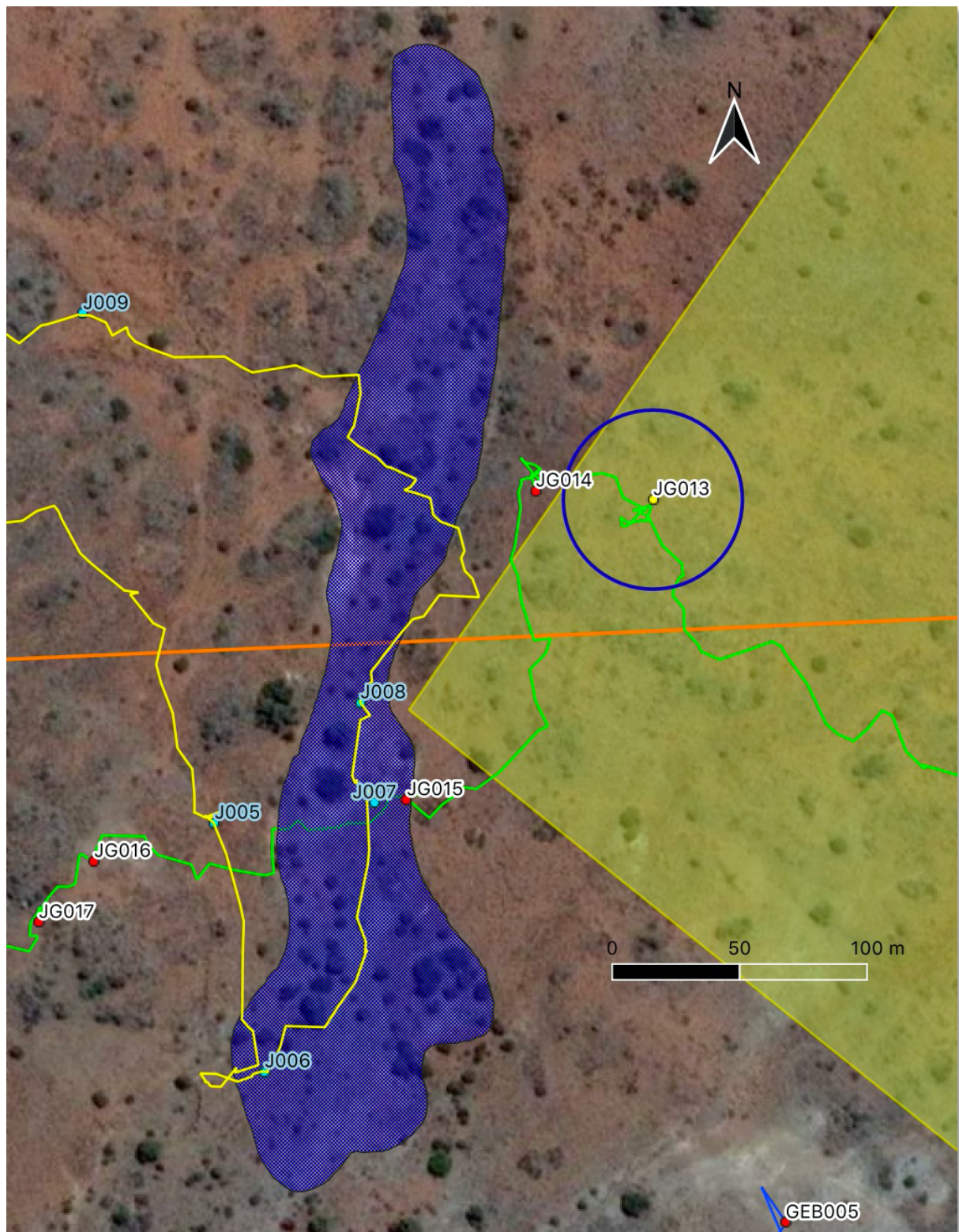


Figure 7: 30 m buffer around site JG013 (blue circle) and no-go area within the streambed adjacent to the Proposed Development Site (shaded blue) (Source: Google Earth).

17 CONCLUSION

Provided that the mitigation measures set out above are implemented, the overall impact of the proposed construction of the **De Aar 2 South WEF 400 kV substation and associated infrastructure is tolerable and of low heritage significance** and the proposed activity is considered acceptable.

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18.1 Online Sources



De Aar, https://en.wikipedia.org/wiki/De_Aar (Accessed on 2 March 2020)

19 APPENDIX A: 2020 FIELD-BASED ARCHAEOLOGICAL OBSERVATIONS

Green highlights = mitigation required.

Waypoint	Latitude	Longitude	Description	Grade	Photograph
JG010	-30.590711°	24.280878°	Walked from road to BESS - litter of patinated and worn MSA everywhere. In orange sand.	NCW	
JG011	-30.589299°	24.280219°	Endscraper in BESS. Nearby lithics in eroded channels/rivulets	NCW	

JG012	-30.590268°	24.281356°	MSA scatter in rainwater runnel	NCW	
JG013	-30.589434°	24.278496°	Scatter of LSA hornfels lithics in sandy, sloping hollow between rocky outcrops. Some possibly on earlier MSA flakes of which there are examples present. Possibly Smithfield - large sidescraper type flake. Also broken blade with endscraper retouch (crossmend). Site overlooks river gully. All material in orange sand. Exposed by erosion.	3C	

JG014	-30.589408°	24.278082°	Dense MSA slope wash on side of river gully below JG013. Very waterworn. In dolerite cobbles and scree.	3C	
JG015	-30.590345°	24.277628°	Further MSA lithics and later, possibly Smithfield (including endscrapers) in erosion wash and runnels.	3C	
GEB005	-30.591628°	24.278963°	Scatter of worn, patinated MSA flakes in deflation hollows. Area ± 10 x 10 m	3C	

20 APPENDIX B: HIA SPECIALIST CURRICULUM VITAE

Name: John Gribble
Profession: Archaeologist
Date of Birth: 15 November 1965
Parent Firm: ACO Associates cc
Position in Firm: Senior Archaeologist
Years with Firm: 2+
Years of experience: 30
Nationality: South African
HDI Status: n/a

Education:

1979-1983 Wynberg Boys' High School (1979-1983)
1986 BA (Archaeology), University of Cape Town
1987 BA (Hons) (Archaeology), University of Cape Town
1990 Master of Arts, (Archaeology) University of Cape Town

Employment:

- ACO Associates, Senior Archaeologist and Consultant, September 2017 – present
- South African Heritage Resources Agency, Manager: Maritime and Underwater Cultural Heritage Unit, 2014 – 2017 / Acting Manager: Archaeology, Palaeontology and Meteorites Unit, 2016-2017
- Sea Change Heritage Consultants Limited, Director, 2012 – present
- TUV SUD PMSS (Romsey, United Kingdom), Principal Consultant: Maritime Archaeology, 2011-2012
- EMU Limited (Southampton, United Kingdom), Principal Consultant: Maritime Archaeology, 2009-2011
- Wessex Archaeology (Salisbury, United Kingdom), Project Manager: Coastal and Marine, 2005-2009
- National Monuments Council / South African Heritage Resources Agency, Maritime Archaeologist, 1996-2005
- National Monuments Council, Professional Officer: Boland and West Coast, Western Cape Office, 1994-1996

Professional Qualifications and Accreditation:

- Member: Association of Southern African Professional Archaeologists (No. 043)
- Principal Investigator: Maritime and Colonial Archaeology, ASAPA CRM Section
- Field Director: Stone Age Archaeology, ASAPA CRM Section
- Member: Chartered Institute for Archaeologists (CIfA), United Kingdom
- Class III Diver (Surface Supply), Department of Labour (South Africa) / UK (HSE III)

Experience:

I have nearly 30 years of combined archaeological and heritage management experience. After completing my postgraduate studies, which were focussed on the vernacular architecture of the West Coast, and a period of freelance archaeological work in South Africa and aboard, I joined the National Monuments Council (NMC) (now the South African Heritage Resources Agency (SAHRA)) in 1994. As the Heritage Officer: the Boland I was involved in day to day historical building control and heritage resources management across the region. In 1996 I became the NMC's first full-time maritime archaeologist in which role was responsible for the management and protection of underwater cultural heritage in South Africa under the National Monuments Act, and subsequently under the National Heritage Resources Act.

In 2005 I moved to the UK to join Wessex Archaeology, one of the UK's biggest archaeological consultancies, as a project manager in its Coastal and Marine Section. In 2009 I joined Fugro EMU Limited, a marine geosurvey company based in Southampton to set up their maritime archaeological section. I then spent a year at TUV SUD PMSS, an international renewable energy consultancy based in Romsey, where I again provided maritime archaeological consultancy services to principally the offshore renewable and marine aggregate industries.

In August 2012 I set up Sea Change Heritage Consultants Limited, a maritime archaeological consultancy. Sea Change provides archaeological services to a range of UK maritime sectors, including marine aggregates and offshore renewable energy. It also actively pursues opportunities to raise public awareness and understanding of underwater cultural heritage through educational and research projects and programmes, including some projects being developed in South Africa.

Projects include specialist archaeological consultancy for more than 15 offshore renewable energy projects and more than a dozen offshore aggregate extraction licence areas.

In addition to managing numerous UK development-driven archaeological projects, I have also been involved in important strategic work which developed guidance and best practice for the offshore industry with respect to the marine historic environment. This has included the principal authorship of two historic environment guidance documents for COWRIE and the UK renewable energy sector, and the development of the archaeological elements of the first Regional Environmental Assessments for the UK marine aggregates industry. In 2013-14 I was lead author and project co-ordinator on the Impact Review for the United Kingdom of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. In 2016 I was co-author of a Historic England / Crown Estate / British Marine Aggregate Producers Association funded review of marine historic environment best practice guidance for the UK offshore aggregate industry (.

I returned to South African in mid-2014 where I was re-appointed to my earlier post at SAHRA: Manager of the Maritime and Underwater Cultural Heritage Unit. In July 2016 I was also appointed Acting Manager of SAHRA's Archaeology, Palaeontology and Meteorites Unit.

I left SAHRA in September 2017 to join ACO Associates as Senior Archaeologist and Consultant.

I have been a member of the ICOMOS International Committee for Underwater Cultural Heritage since 2000 and have served as a member of its Bureau since 2009. I am currently the secretary of the Committee.

I have been a member of the Association of Southern African Professional Archaeologists for more than twenty years and am accredited by ASAPA's CRM section. I have been a member of the UK's Chartered Institute for Archaeologists (CIfA) since 2005, and served on the committee of its Maritime Affairs Group between 2008 and 2010. Since 2010 I have been a member of the UK's Joint Nautical Archaeology Policy Committee.

I am currently a member of the Advisory Board of the George Washington University / Iziko Museums of South Africa / South African Heritage Resources Agency / Smithsonian Institution 'Southern African Slave Wrecks Project' and serve on the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee.

Books and Publications:

Gribble, J. and Scott, G., 2017, *We Die Like Brothers: The sinking of the SS Mendi*, Historic England, Swindon

Lloyd Jones, D., Langman, R., Reach, I., Gribble, J., and Griffiths, N., 2016, Using Multibeam and Sidescan Sonar to Monitor Aggregate Dredging, in C.W. Finkl and C. Makowski (eds) *Seafloor Mapping along Continental Shelves: Research and Techniques for Visualizing Benthic Environments*, Coastal Research Library 13, Springer International Publishing, Switzerland, pp 245-259.

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**SITE VERIFICATION REPORT: PROPOSED CONSTRUCTION AND
OPERATION OF A 400KV SUBSTATION FOR THE DE AAR 2 SOUTH
WIND ENERGY FACILITY, DE AAR, NORTHERN CAPE**

Prepared for
Arcus Consultancy Services South Africa (Pty) Ltd

On behalf of
Mulilo De Aar 2 South (Pty) Ltd

August 2020

Version 2.0

Final



ACO Associates cc
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Introduction

The Screening Tool Report generated for the proposed De Aar 2 South WEF 400 kV substation and Associated Infrastructure (Proposed Development), dated 30 April 2020, identifies the following heritage-related environmental sensitivities in relation to the project:

- a medium sensitivity in respect of archaeology and cultural heritage, ascribed on the basis of the Proposed Development Site being located on a mountain or ridge; and
- a medium sensitivity in respect of palaeontology, ascribed on the basis of the Proposed Development Site being associated with rock units with a medium paleontological sensitivity.

Based on this identification of environmental sensitivities, the list of specialist assessments identified for inclusion in the Basic Assessment report for the Proposed Development also included archaeology and cultural heritage and palaeontology.

Initial Site Sensitivity Verification Report Requirements

As required by the *General requirements for undertaking an Initial Site Sensitivity Verification where no specific assessment protocol has been Identified*, published in the Government Gazette (No. 45421) on 10 May 2019, an Initial Site Sensitivity Verification is required to confirm or dispute the potential environmental sensitivity of the site as identified by the environmental screening tool for the specific environmental theme being considered.

The Initial Site Sensitivity Verification must be undertaken through the use of:

- a desk top analysis, using satellite imagery; and
- a preliminary on-site inspection.

The results must be recorded in a report that:

- confirms or disputes the identified environmental sensitivity;
- contains a motivation and evidence of either the verified or different environmental sensitivity; and
- is submitted together with the relevant reports prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

Site Sensitivity Verification: Archaeology and Cultural Heritage

The proposed Proposed Development will be situated on a mountain plateau which rises at least 100 m above the surrounding plains (Figure 1). The plateau is generally flat with rocky outcrops and is covered in typical Karoo scrub and grasses.

Desk Top Analysis

Desk-based research for number of development projects in the vicinity (see for example, Webley and Orton 2011; Heritage Contracts and Archaeological Consulting 2014; Webley and Halkett 2014, 2015; Gribble and Euston-Brown 2020) and detailed information about the archaeology of the Upper Karoo derived from the exhaustive archaeological survey of the Zeekoe River Valley by Sampson (1985, 1992, 2015) (Figure 2) can inform our understanding of the archaeology and cultural heritage of the area to be affected by the Proposed Development.



Figure 1: 3D view showing the Proposed Development (orange rectangle) on mountain plateau above the surrounding plains (Source: Google Earth).

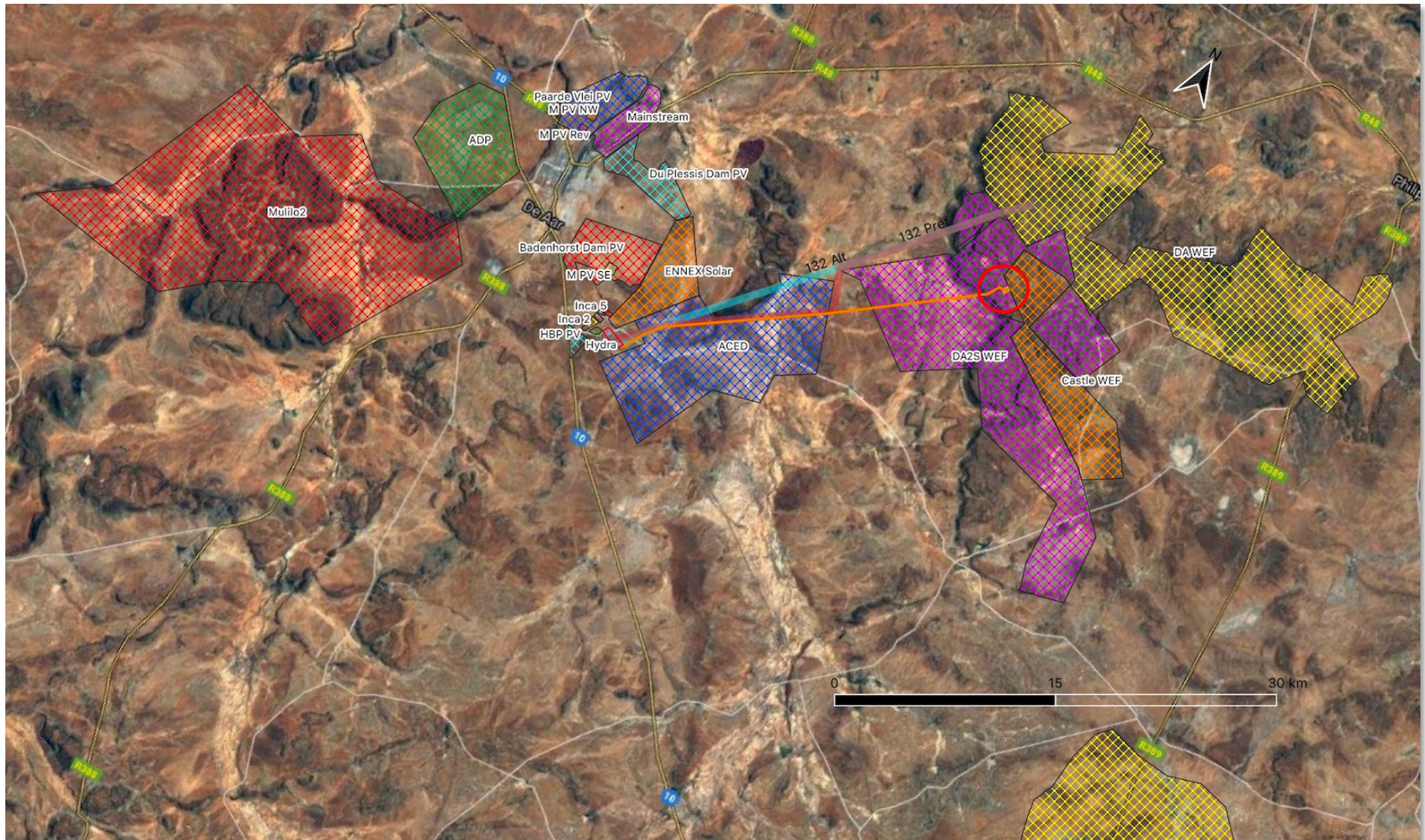


Figure 2: Previous heritage assessments carried out in the De Aar area with relevance to the assessment for the Proposed Development (circled in red). The northern portion of the ZVAS is the yellow polygon at the bottom right of the image (Source: Google Earth).

The Zeekoe Valley Archaeological Survey (ZVAS) and other surveys in the De Aar area have identified a long sequence of archaeological material in the Upper Karoo. These indicate the occupation of the region by our forebears since the Early Stone Age (ESA) Acheulian (after 1 million years ago), through multiple Middle Stone Age (MSA) phases (c. 300 000 – 30 000 years ago), four Later Stone Age (LSA) phases to herder sites, many with low stone-walled kraals and Khoenkhoen-like, thin-walled ceramics, dating to within the last 2000 years (Sampson 1985, 2015:3).

Archaeological sites in the Upper Karoo are generally open sites due to the scarcity of rock shelters in the region and comprise large scatters of stone tools, with bone and other non-lithic material sometimes preserved on the more recent, Later Stone Age sites.

Evidence suggests that ESA sites cluster close to sources of tool-making stone raw material, rather than close to sources of water, and tend to be found on the flats rather than on ridges, or mountaintops (Sampson 1985).

MSA sites and material are widely distributed across the landscape of the Upper Karoo in the form of “ancient litter” and are frequently found on the edges of pans, streams and at the base of small hills or koppies. The various surveys for development projects in the vicinity of the Proposed Development Site referred to above have recorded widespread occurrences of MSA lithics across the landscape in this area. This material tends to be exposed as a lag deposit on harder, gravelly substrate in areas of where the orange sand that mantles the landscape has been eroded by water or deflated by wind. Discrete, clearly definable MSA sites are difficult to identify since material is generally visible only in areas where the overlying orange sand has been stripped away, and because the landscape is so liberally spread with material (Webley and Orton 2011).

Sampson (1985) recorded thousands of LSA sites in the Zeekoe River Valley and many more are reported in the previous heritage impact assessments in vicinity of the Proposed Development Site. These sites are attributed to the ancestors of the San peoples and, after 2000 years ago, to Khoekhoen pastoralists. Other traces of the San presence in the Karoo can be found as rock engravings on dolerite boulders (Webley and Orton 2011).

LSA sites are found in a variety of loci but tend to be concentrated near water points or sources, or on hills and ridges with commanding views of rivers and valleys (Webley and Orton 2011).

The most recent archaeological and heritage layer in the Karoo landscape relates to the historical occupation of the area by stock farmers of European descent from the late 18th century. These European pastoralists were highly mobile – hence the name trekboers – moving between winter and summer grazing on and off the Great Escarpment. Land ownership was informal and only became regulated after the implementation of the quitrent system of the 19th century, used by the Government to control the lives and activities of the farmers.

Judging by the kinds of artefacts and structures associated with the historical occupation of the Upper Karoo and the area around the Proposed Development Site – stone-walled kraals,

farm buildings, graveyards, etc. - found on the landscape many of the farms in the Upper Karoo are likely to have been used before land was formally granted or loaned in the early 19th century (Sampson and Sampson, 1994).

The available evidence suggests that with the possible exception of ESA material, archaeological sites and material dating to all other periods can be expected on and around the Proposed Development Site.

On-Site Inspection

An archaeological survey of the Proposed Development Site and surrounding area (Figure 3) was undertaken by ACO Associates in February 2020. The survey was conducted to inform the Heritage Impact Assessment (HIA) required by the South African Heritage Resources Agency, as part of the Basic Assessment process.

The survey documented a handful of MSA lithic scatters and LSA sites and stone scatters in and around the Proposed Development Site. No colonial period archaeological material or structures were recorded, and no other heritage resources noted.

Finding

Together, the information presented above **confirms** the identification of the Proposed Development Site by the Screening Tool as an area of archaeological and cultural heritage significance.

Site Sensitivity Verification: Palaeontology

Desk Top Analysis

The map of the relative palaeontological theme sensitivity for the Proposed Development Site is missing from the Screening Report.

According to a palaeontological desktop study by Bamford (2020), commissioned for the DA2S WEF grid connection HIA, the Proposed Development Site is situated on an intrusive igneous outcropping which can contain no fossils because they do not occur in volcanic rock.

Reference to the South African Heritage Resources Information System (SAHRIS) palaeo-sensitivity map (see <https://sahris.sahra.org.za/map/palaeo>) supports Bamford's conclusions indicating that the Proposed Development Site is an area with no palaeontological potential or sensitivity (Figure 4).

Finding

The information presented above **disputes** the identification of the Proposed Development Site by the Screening Tool as an area of palaeontological significance and suggests that a palaeontological assessment should not be included in the list of specialist assessments identified for inclusion in the Basic Assessment report for the Proposed Development.

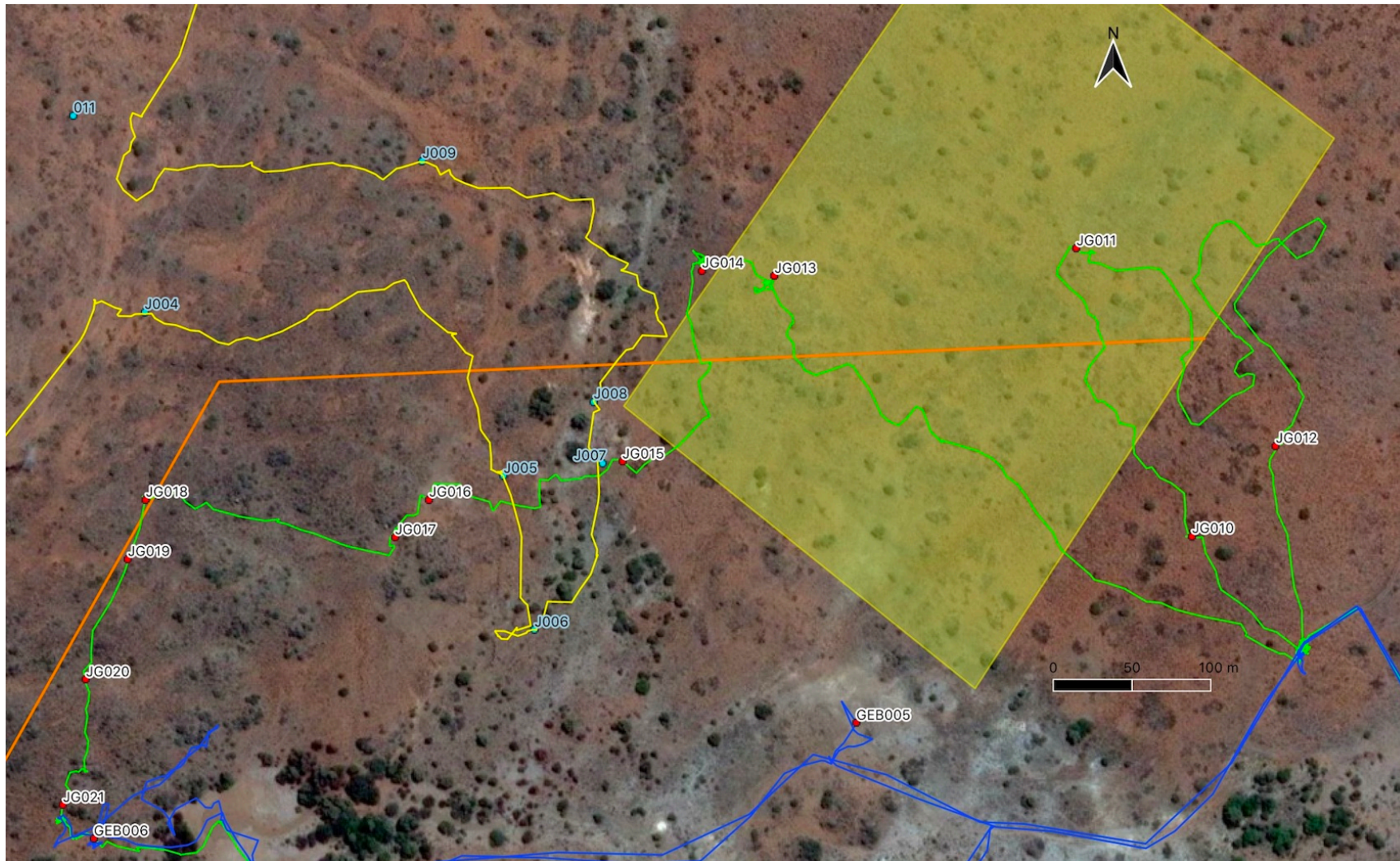


Figure 3: ACO Associates 2020 survey tracks (dark blue and green) and waypoints (red) overlaid on the Proposed Development Site and surrounding area. Also indicated are the trackplots (yellow) and waypoints (blue) recorded by ACO Associates during the 2011 survey for the DA2S WEF (Source: Google Earth).

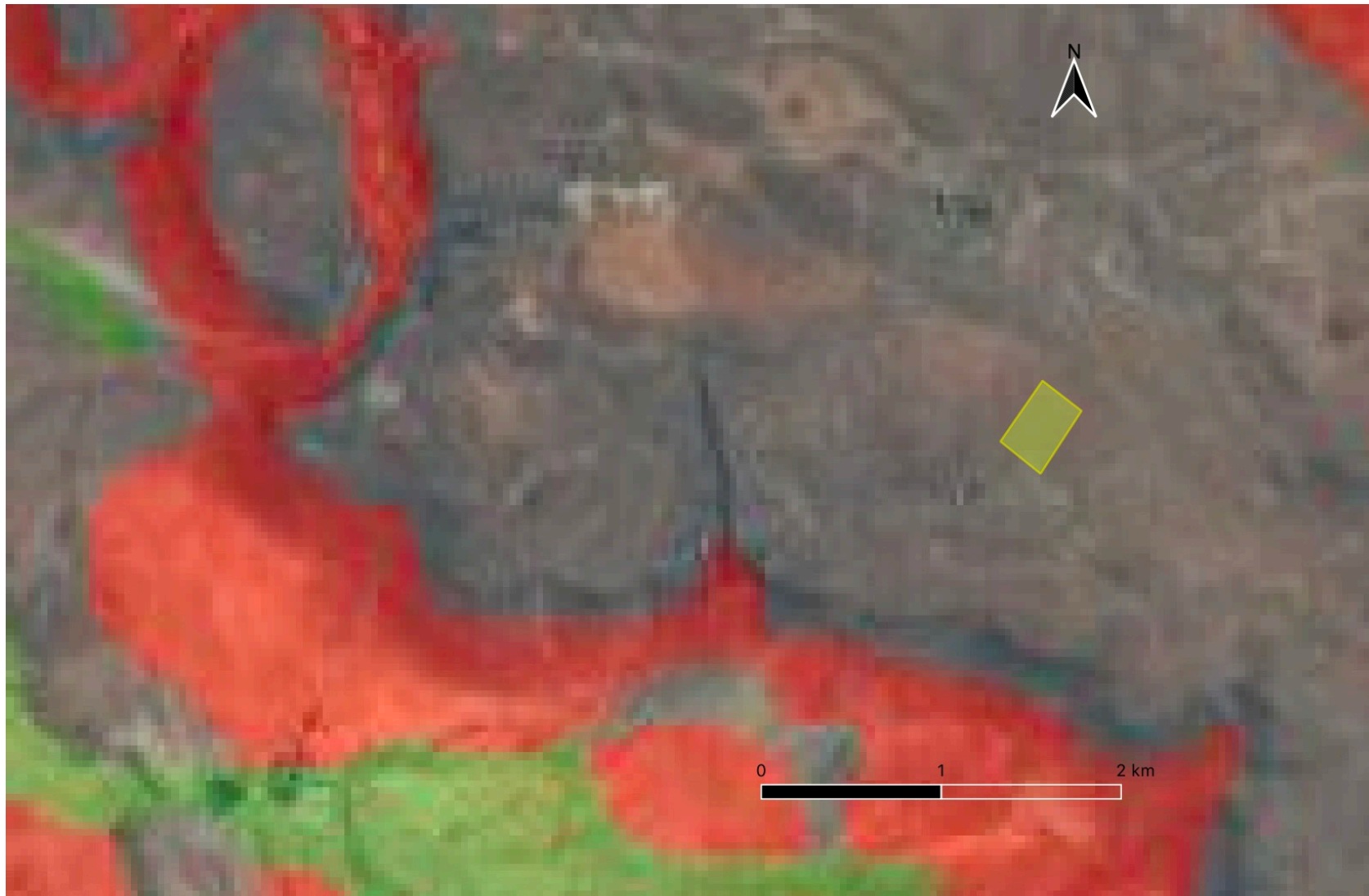


Figure 4: The Proposed Development Site (yellow rectangle) superimposed on detail of SAHRA's palaeo-sensitivity map. The dolerite massif is clearly visible as the grey area covering most of the right of the image. Red = high paleontological sensitivity, green = moderate, and grey = zero/insignificant (Source: <https://sahris.sahra.org.za/map/palaeo>)

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Proposed Construction of the up to 400 kV De Aar 2 South Transmission Lines and Switching Station, Northern Cape Province

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

<p>Postal address: Department of Environmental Affairs Attention: Chief Director: Integrated Environmental Authorisations Private Bag X447 Pretoria 0001</p> <p>Physical address: Department of Environmental Affairs Attention: Chief Director: Integrated Environmental Authorisations Environment House 473 Steve Biko Road Arcadia</p> <p>Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at: Email: EIAAdmin@environment.gov.za</p>

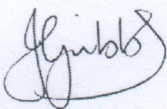
1. SPECIALIST INFORMATION

Specialist Company Name:	ACO Associates cc		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition
			100%
Specialist name:	John Gribble		
Specialist Qualifications:	MA Archaeology		
Professional affiliation/registration:	Association of Southern African Professional Archaeologist (ASAPA) (Membership number 43)		
Physical address:	Unit D17, Prime Park, Mocke Road, Diep River		
Postal address:	Unit D17, Prime Park, Mocke Road, Diep River		
Postal code:	7800	Cell:	078 616 2961
Telephone:	021 706 4104	Fax:	N/A
E-mail:	john.gribble@aco-associates.com		

2. DECLARATION BY THE SPECIALIST

I, John Gribble, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

ACO Associates cc

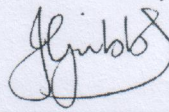
Name of Company

26 August 2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, John Gribble, ~~swear under oath~~ / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



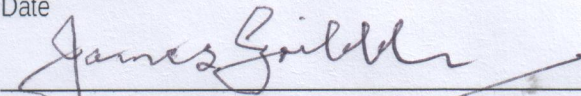
Signature of the Specialist

ACO Associates cc

Name of Company

26 August 2020

Date



Signature of the Commissioner of Oaths

26 August 2020

Date

Rev. James Gribble
COMMISSIONER OF OATHS
MARRIAGE OFFICER (V3146) - REPUBLIC OF SOUTH AFRICA
"Windfall", 123 Woodgate Road, Plumstead 7800