Phase 1a Archaeological Impact Assessment

Scoping Phase

Proposed Impofu West Wind Farm, Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province

Conducted in terms of Section 38 of the National Heritage Resource Act (No. 25 of 1999)

prepared for

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1. Executive Summary

Red Cap Energy Pty Ltd (hereafter Red Cap) is overseeing the proposed development of up to three adjoining wind farms, namely Impofu North, Impofu East and Impofu West, and the respective associated infrastructure. The Environmental Impact Assessment process for the three Impofu Wind Farms and the Basic Assessment process for the associated Grid Connection are being facilitated by Aurecon South Africa (Pty) Ltd (hereafter Aurecon).

Presented here is the archaeological component of the Scoping Phase EIA process for the Impofu West Wind Farm, as triggered by Section 38 of the National Heritage Resources Act (Act 25 of 1999; NHRA), that is being undertaken in order to ensure compliance with heritage legislation as well as that of the National Environmental Management Act (Act 107 of 1998; NEMA).

The study area is under rural and agricultural settlement. Large parts of the landscape, particularly along the coastal plain and areas adjacent to water sources are transformed by farming activities. Further human-related impacts of the more recent past include roads, single vehicle tracks, quarries, dams, variety of farming activities, variety of structures and infrastructure, fencing, overhead power lines, transmission/receiver masts, wind turbines and so on.

The development site is situated west of Humansdorp in the Kouga Local Municipality of the Eastern Cape Province. Surrounded by four operational wind farms, the development site falls within an existing and growing renewable energy landscape. Because of the excellent local wind regime, the site is in one of the best areas for wind farming in South Africa. The development aims to assist in meeting the ever-increasing demand for energy through harvesting this renewable resource.

The scope of the archaeological impact assessment for the Impofu West Wind Farm includes:

- 41 wind turbines, each of 3-5 MW generation capacity, and associated hardstand sites;
- The Impofu West on-site substation associated with the Impofu West Wind Farm, as well as the switching station adjacent to the on-site substation;
- Internal access roads;
- Underground and aboveground cables;
- Two small river crossings on District Road 01774, just south of the Tsitsikamma Community Wind Farm and to the west of the Impofu West site, may need to be upgraded for the transportation of abnormal loads to the Impofu West site; and
- The 132 kV overhead power line that connects the on-site switching station to the collector substation.

The latest proposed development layout assessed in this report was modified and refined during, and as a result of the iterative screening phase where alternatives were screened out based on a variety of constraints. This assessment, therefore, focuses only on the latest development proposal and comments on the No-Go option. The latest Impofu West Wind Farm layout of 29 March 2018 was also adjusted according to inputs and concerns provided by this author, Eastern Cape Heritage Consultants as well as preliminary conditions of support from the Gamtkwa Khoisan Council.

The Public Participation Process, in terms of the National Heritage Resources Act, will be advertised and run as part of the Environmental Impact Assessment (EIA) process.

Interested & Affected Parties, including the Gamtkwa Khoisan Council, will provide feedback regarding this report and others related to the proposed wind farms development.

The overall purpose of a Phase 1a Archaeological Impact Assessment is to evaluate the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures. This study was undertaken in accordance with best practice principles and meets standards required by heritage authorities in terms of the National Heritage Resources Act, No. 25 of 1999.

The most sensitive portion of the Impofu Wind Farms site, from an archaeological and heritage standpoint, is the coastal strip where archaeological resources are abundant up to a distance of about 5 km from the shoreline. This stretch is described as a pre-colonial cultural landscape and is highly valued by scientists and the Gamtkwa Khoisan Council. Due to the scarcity of rock shelters and caves in the study area, archaeological sites are rare further inland and are expected to cluster on higher lying areas overlooking the relatively flat to undulating surroundings. Many finds reported inland of the pre-colonial cultural landscape consist of isolated Stone Age specimens or very low density scatters of Stone Age artefacts that occur in disturbed contexts and devoid of any faunal remains or other cultural materials. For the most part, such heritage resources are rated to be of low significance.

Due to the current drought, and recent harvesting of crops on the majority of the farms within the Impofu West Wind Farm boundary, archaeological visibility was unusually good for this part of the country, which is usually densely covered by crops and vegetation that severely restrict archaeological visibility. Considerable stretches, however, were densely covered by vegetation and thus limited archaeological visibility. Nevertheless, sufficient survey coverage and detailed inspection of exposed surfaces, disturbances such as quarries, borrow pits, erosion gullies, road cuts, agricultural test pits, geotechnical test pits and animal burrows allowed for an adequate assessment and a reasonable prediction of the nature and types of archaeological resources that lie buried beneath vegetation cover.

A comprehensive archaeological foot survey of the Impofu Wind Farms site was conducted over a 20 day period from 12 March to 5 April 2018, and 5 of these days were spent on the Impofu West Wind Farm site. Identified and recorded archaeological resources and observations for the Impofu West site include:

1) Historic period disused feeding / watering trough made of modern materials, low significance and not conservation worthy (**IW4**) – no further studies or mitigation of this find is required;
2) Stone Age quarrying / flaking of outcropping quartzite (**IW5**), avoided in latest development layout and no further investigations required (but see recommendations given below);
3) LSA & MSA stone artefacts in sand quarry, considered to be of low significance (IW6) - no further studies or mitigation of this find is required (but see recommendations given below); and
4) *In situ* MSA and ESA stone artefacts in quarry (**IW7**) – avoided in latest development layout (but see recommendations given below).

Results and inputs received through the iterative screening and preliminary design process, desktop studies, preliminary meetings, workshops and consultations have enabled Red Cap to proactively resolve several heritage-related concerns and to avoid several archaeological finds. The main ones for Impofu West being:

1) the exclusion of the previously undisturbed and archaeologically sensitive area west of Brandewynkop and stretching to the shoreline as indicated as a No-Go

zone in Figures 3 and 5 has helped to reduce the visual and physical impact of the wind farm on this undisturbed portion of the pre-colonial cultural landscape (5km wide coastal strip);

2) the exclusion of the area immediately east of the Tsitsikamma River (all proposed development is more than 2.5 km from the Tsitsikamma River) has resulted in a marked reduction in the potential direct impacts on archaeological resources and will also help to reduce the visual impact of wind turbines on the aesthetic value of the cultural landscape;
3) the avoidance of Stone Age quarry sites and associated low density Stone Age artefact scatters at **IW1**, **IW2** and **IW3** (Figure 7) has had the positive impact of preserving these heritage resources for Interested and Affected Parties (I&APs), future generations and scientists; and
4) the avoidance of *in situ* ESA and MSA materials in the quarry originally observed by Dr Almond at **IW7** (Figure 6) has had the positive impact of preserving these heritage resources for I&APs, future generations and scientists.

The No-Go option of the proposed project not being developed (i.e. the *status quo* remains) will involve continued low significance and/or unknown significance negative impacts due to natural processes and agricultural activities on archaeological resources, and because the proposed development impacts are considered to be low overall, can be controlled as well as monitored, then there is no preference of one over the other.

Existing and future wind farms in the area could have a significant negative cumulative impact on archaeological resources unless these were documented, mitigated or conserved according to their significance and to ensure that the impact on the archaeology of the area is minimised. Where appropriate, representative examples of the archaeological record must be conserved for I&APs, future generations, and scientists. Through the implementation of management and mitigation measures such as those presented below, the cumulative negative impact of wind farm developments on the archaeological record and cultural landscape is greatly reduced. The positive cumulative impact on heritage resources is that the impact assessments required for wind farm developments have greatly expanded our record and improved our understanding of archaeological material in the area and have provided an opportunity to conserve them for present and future generations. This is not possible if uncontrolled piecemeal developments as well as natural processes were to take place.

A further cumulative negative impact of wind turbines is on the aesthetic and visual value of the natural and cultural landscape. This and the potential impact on buried heritage resources within the pre-colonial cultural landscape are the main negative cumulative impacts associated with the proposed development. Although the proposed Impofu West Wind Farm will be situated in an existing and growing renewable energy landscape with numerous wind turbines in the immediate surroundings, the elimination of turbines from the archaeological No-Go area shown in Figures 3 & 5, as well as the one kilometre long stretch immediately east of the Tsitsikamma River, has helped to reduce this negative impact. Furthermore, the below proposed archaeological monitoring in the pre-colonial cultural landscape during the construction phase will further assist in reducing potential negative impacts to heritage resources. There are positive and negative cumulative impacts as described above, but provided that management and mitigation measures are implemented, then the negative cumulative impacts are considered to be low.

Overall, from an archaeological standpoint, but provided that the recommended mitigation measures are implemented, there are no fatal flaws associated with the proposed latest Impofu West Wind Farm layout and the development will have a negligible impact on

the archaeological value of the area. If the recommended mitigation measures are implemented, then negative impact to archaeological resources will be negligible and there is potential for positive impact. Without mitigation, negative impacts on archaeological resources will range from minor through moderate to major.

Therefore, provided that the below recommendations are implemented, there are no objections to the proposed Impofu West Wind Farm layout proceeding to the EIA phase of the application for Environmental Authorisation.

Recommendations made below should be included as conditions of authorisation and should form part of the Environmental Management Programme for the development.

Heritage Resources and Recommendations:

1. Historic period disused feeding or watering trough is of low significance and not conservation worthy (**IW4**). No further studies, mitigation or management measures are required. If necessary, the broken structure may be damaged or destroyed without a permit from ECPHRA.

2. Stone Age quarry at **IW5**: This is a good example of Stone Age quarrying and is considered to be of low to medium significance and given a field rating of Generally Protected C. The preparation of the hard stand and construction of proposed turbine WTG28W will not directly impact **IW5**, but because the site is in close proximity to development, it is recommended that it be enclosed with a temporary fence for the construction phase of development. Fencing should be a temporary standard 4 strand 1.2 m cattle fence with large clear "NO-GO AREA" signs attached from the top strand every 15 m. These measures must be supervised by an archaeologist and must be in place prior to the construction phase of the wind farm development. The temporary fencing should be removed after construction. It is recommended that no signage or fencing is used after construction as this may attract unwanted attention and possible damage to the archaeological occurrence. It was noted that the hard stand area for proposed turbine WTG28W, including surface and near-surface sediments, is already significantly transformed by agricultural activities and therefore archaeological monitoring of construction at this locality is not warranted.

3. LSA & MSA stone artefacts at the sand quarry (**IW6**) as well as the isolated combination hammer stone / grind stone / anvil found in the geotechnical test pit at the proposed turbine location WTG38W are considered to fall within the pre-colonial cultural landscape along the 5km wide coastal strip: This part of the landscape in the southern part of the Impofu West Wind Farm is identified as an archaeologically sensitive area by, among others, Eastern Cape Heritage Consultants (Binneman & Reichert 2017), the Gamtkwa Khoisan Council (Gamtobakwa Khoisan Council 2017) and this author The proactive exclusion of wind farm development activities from the previously undisturbed No-Go area indicated in Figures 3 & 5, as well as the one kilometre long stretch immediately east of the Tsitsikamma River, has helped to reduce the visual impact on the pre-colonial cultural landscape. Because of the archaeological sensitivity of this area and to avoid or minimize negative impacts of construction on buried heritage resources, it is recommended that archaeological monitoring be undertaken in the area south of the dashed white line shown in Figures 6 & 9. Archaeological monitoring should be managed by a suitably qualified and accredited professional archaeologist during the construction phase of development.

4. Although the *in situ* ESA and MSA stone artefacts in the quarry at **IW7** are avoided by the latest Impofu West Wind Farm layout, it cannot be ruled out that higher

densities of *in situ* ESA and MSA artefacts of medium to high significance lie buried in these ancient aeolian sediments. Therefore, it is recommended that the surrounding area of the Impofu West Wind Farm site within the dashed white ellipse shown in Figure 6 undergoes archaeological monitoring by a suitably qualified and accredited professional archaeologist during the construction phase.

5. The EMPr must include the requirement for archaeological monitoring in all areas identified as needing archaeological monitoring during construction. The contractor must supply the suitably accredited professional archaeologist that will oversee the monitoring with a construction programme at least 4 weeks before construction starts to ensure the monitoring can be properly planned.

6. A general overarching mitigation requirement is that before the 132kV overhead grid connection to the collector substation is constructed, a final micrositing walkthrough must be undertaken to ensure that any unforeseen impacts due to this line are mitigated by micrositing the power line route and pylon placements.

7. Archaeological induction should be performed, in tandem with environmental induction, by a professional and suitably experienced archaeologist prior to the construction phase of development to ensure that all persons working on the wind farm site are familiar with the types of heritage resources that may be exposed during construction and the necessary steps to follow in the event that archaeological resources are unearthed.

8. In the event that vegetation clearing and earthmoving activities expose archaeological or palaeontological resources, then such activities must stop immediately and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and/or the South African Heritage Resources Agency (SAHRA) must be notified immediately. These heritage resources are protected by Section 35(4) of the NHRA (Act 25 of 1999) and may not be damaged or disturbed in any way without a permit from the relevant heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned and completed before construction continues in the affected area and will be at the expense of the developer.

9. In the event of exposing human remains during construction, then the find should be protected from further disturbance and work in the immediate area should be halted. The find will fall into the domain of SAHRA and must be reported to them, and will require inspection by a professional archaeologist to undertake mitigation, if needed. Any disturbance to a human burial older than 60 years will require a permit in terms of Section 36 (3)(a). Graves and burial grounds are the property of the state and may require excavation and curation in an approved institution. Any work associated with the find will also be at the cost of the developer.

2. Name, Expertise and Declaration

I, Peter Nilssen (PhD in archaeology, University of Cape Town 2000), herewith confirm that I am a Professional member - in good standing - of the Association of South African Professional Archaeologists (ASAPA), including the Cultural Resource Management section of the same association since 1989 (ASAPA professional member # 097). I am an accredited Principal Investigator for archaeozoology (specialist analysis), coastal, shell midden and Stone Age archaeology; Field Director for Colonial Period archaeology; and Field Supervisor for Iron Age archaeology and Rock Art. I have worked as a professional archaeologist in Cultural Resource Management since 1989 and have completed more than 200 heritage-related impact assessments and mitigation projects that were approved by provincial and national heritage authorities. My CV accompanies this report.

As the appointed independent specialist (archaeologist) for this project hereby declare that I:

- act as an independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 982) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- am aware that a false declaration is an offence in terms of regulation 48 of GN No. R. 982.

Signature of the specialist:

Name of company: Dr Peter Nilssen

Professional Archaeologist and Specialist Heritage Practitioner

Date: **2 July 2018**

NEMA requirements for Specialist Reports		
Appendix 6	**Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended**	**Section**
1 (1)(a)	(i) the specialist who prepared the report; and	Title page & Section 2; as well as the accompanying CV
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 2
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 4.3
(cA)	an indication of the quality and age of the base data used for the specialist report;	desktop study up to 2018 and fieldwork data obtained in September 2017 and March/April 2018; see Section 4.6 and section 5
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4.4 & Section 6
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4.6 and Section 5.4
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	Section 4.6
(f)	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4.6 and Section 5.4
(g)	an identification of any areas to be avoided, including buffers;	Section 5.4
(h)	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 5.4 and associated Figures and Plates
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 4.7
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 5
(k)	any mitigation measures for inclusion in the EMPr;	Section 5.4
(l)	any conditions for inclusion in the environmental authorisation;	Section 7
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 7
(n)	a reasoned opinion-	Section 7
	(i) whether the proposed activity or portions thereof should be authorised; and	
	(iA) regarding the acceptability of the proposed activity or activities; and	
	(ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	consultation with Gamtkwa Khoisan Council will depend on their findings in reviewing this report
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not yet done
(q)	any other information requested by the competent authority.	Not at this time
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

4. Introduction

4.1. Background to Development Proposal

Red Cap Energy Pty Ltd (hereafter Red Cap) is overseeing the proposed development of up to three adjoining wind farms, namely Impofu North, Impofu East and Impofu West, and the respective associated infrastructure. Red Cap Impofu West Pty Ltd (details on title page) is the entity responsible for the Impofu West wind farm. The Environmental Impact Assessment (EIA) process for the three Impofu Wind Farms and the separate Basic Assessment (BA) process for the associated Grid Connection are being facilitated by Aurecon South Africa Pty Ltd (details on title page; hereafter Aurecon). All project background information and proposal specifications presented in this report were supplied by Red Cap and Aurecon. This Phase 1a Archaeological Impact Assessment focuses on the Impofu West Wind Farm (the other Impofu wind farms and grid connection will be assessed separately).

The archaeological component of the EIA process, as triggered by Section 38 of the National Heritage Resources Act (Act 25 of 1999; NHRA), is being undertaken by the present author in order to ensure compliance with heritage legislation as well as that of the National Environmental Management Act (Act 107 of 1998; NEMA). The following clauses of the NHRA are relevant to the requirement for a heritage impact assessment for the proposed Impofu West Wind Farm development: Section 38(1) (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; (c) any development or other activity which will change the character of a site (i) exceeding 5 000 m^2 in extent; or (ii) involving three or more existing erven or subdivisions thereof. See Appendix A for more information on heritage legislation relevant to this project and to heritage resources discussed in this report.

The proposed, consolidated development site for the three Impofu Wind Farms is about 15500 ha in extent and is situated west of Humansdorp and St. Francis Bay in the Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province (Figures 1, 2 & 3). The consolidated site is bordered in the west by the operational Gibson Bay and Tsitsikamma Community Wind Farms and in the east by the operational Kouga Wind Farm, while construction of the Oyster Bay Wind Farm on the eastern boundary is imminent (Figure 4). Because of the excellent local wind regime, the site is in one of the best areas for wind farming in South Africa. The development aims to assist in meeting the ever-increasing demand for energy through harvesting this renewable resource.

The preliminary boundaries of the Impofu Wind Farms are shown in Figure 3 and the latest wind farm layout, dated 29 March 2018, indicates that a total of 129 wind turbines, and associated infrastructure, are currently distributed across the three wind farms as follows: Impofu North has 47 turbines, Impofu East has 41 turbines and Impofu West has 41 turbines (see Figure 5). However, a maximum of up to 120 wind turbines will be constructed across the three wind farms. The latest turbine and infrastructure layout for Impofu West is shown in Figure 5. At this time the megawatt (MW) capacity of turbines is not finalised, but is likely to be from 3-5 MW. Therefore, the assessment of 129 potential turbine locations across the three Impofu Wind Farm sites is considered worse than the worst-case scenario, as it is not yet known which turbines will be constructed.

4.2. Proposed Development Infrastructure

Each circular turbine foundation will be about 20-25 m in diameter within a temporary disturbed area of about 100 x 50 m for the hardstand, construction area and a crane pad for installation, while the permanent hardstand footprint for maintenance will be about 50 x 30 m within the original larger disturbed area for each turbine. Due to rapidly changing technology the turbine model and specifications are currently unknown. The following detail of the rotor swept area envelope is the potential worst-case extent (although not applicable to archaeological assessments):

1. Rotor diameter: maximum of 150 m (75 m blade / radius)
2. Hub height: range from 90 to 120 m
3. Tip height: maximum based on 120 m hub + 75 m blade = 195 m
4. Tip height: minimum of 30 m (and not lower)

The resulting envelope is between 30 m up to 195 m; 150 m wide, with a hub height within this between 90-120 m high.

Associated and supporting infrastructure on site includes roads, underground and overhead medium voltage (MV) power lines (33 kV or lower) and substations (including control, operation, workshop, storage buildings / areas).

The internal gravel roads will be about 6 m wide with possible side drains and of a specification to accommodate the abnormal trucks to deliver the turbine components. Where possible, existing roads will be used and upgraded to avoid extra clearance of natural or agricultural land. In excessively steep areas, short sections of the roads may be surfaced with bitumen or concrete.

The wind farm applications will include the 33 or lower kV MV lines to transfer the power generated from the turbines to the three respective on-site substations (each with a transformer). These lines would mostly be underground cables, but where necessary, such as crossing drainage lines or steep kloofs, short sections of overhead power lines will be used. A 132kV overhead power line will connect the wind farm switching station to the collector switching station.

The three substations, namely Impofu North, Impofu West and Impofu East substations will have associated switching stations (the switching stations are part of the grid connection application). Since the switching station component will be owned by Eskom, a physical barrier in the form of a fence will separate the two components.

The total footprint of each substation is approximately 150 x 75 m (11,250 m^2) and the adjoining Eskom switching stations would be of a similar size. The substation area will include the standard substation electrical equipment such as transformers and bus bars, and the area will also house the control, operation, workshop, storage buildings and areas.

4.3. Purpose and Scope of the Study

The overall purpose of a Phase 1a Archaeological Impact Assessment (AIA) is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures. Note that the AIA presented here considered archaeological materials of prehistoric and historic origin as well as the cultural landscape. A separate palaeontological study was undertaken by Dr John Almond. Although a separate visual impact assessment is being undertaken for the project, this report comments on and assesses the visual impact of wind turbines on the cultural landscape. This AIA was

undertaken according to best practice principles and meets standards required by the heritage authorities in terms of the National Heritage Resources Act, No. 25 of 1999.

The objectives of the Archaeological Impact Assessment are:

- To assess the nature and sensitivity of archaeological resources in the affected parts of the receiving environment;
- To identify the impact of the proposed development on such resources as well as options for mitigation and/or management in order to minimize potential negative impacts and to make recommendations for mitigation / management where necessary; and
- To identify archaeological resources and issues that may require further investigation.

This scoping archaeological study is required for the Pre-application Public Participation phase associated with the pre-application Scoping report for the Impofu West Wind Farm project. This archaeological scoping study will also form the basis for community consultation in terms of Section 38 (3) (e) of the NHRA. This report will be made available to all Interested and Affected Parties (I&APs) as part of the Public Participation Process being undertaken for the EIA process. In addition, heritage interest groups such as the Gamtkwa Khoisan Council will then provide feedback as part of the official community consultation to fulfil NHRA requirements. Such feedback may result in further consultation in terms of Section 38 (3) (e) of the NHRA. Because the EIA process is iterative, the wind farm layouts are likely to change according to inputs from various stakeholders, interested and affected parties and specialists. Therefore, the scoping phase is based on the latest available information, and will be amended during the EIA phase should new information be made available.

The archaeological field investigation focused on the latest wind farms layout dated 29 March 2018, which includes turbine and sub-station sites, turbine hard stands, road and cable routes, upgrades and changes to existing district and minor roads, specifically at intersections and at crossings of drainage lines and the 132 kV line that connects the on-site switching station to the collector substation (Figure 5).

Since archaeological resources occur on ground surfaces or in sub-surface sediments, only those aspects of the wind farm development that will impact on surface or sub-surface sediments are considered relevant. The rotor swept area envelope described above, for example, will have no direct impact on archaeological resources, but will have a visual impact on the aesthetic character and value of the surroundings and cultural landscape.

The scope of the archaeological impact assessment for the Impofu West Wind Farm includes:

- 41 wind turbines, each of 3-5 MW generation capacity, and associated hardstand sites;
- The Impofu West on-site substation associated with the Impofu West Wind Farm, as well as the switching station adjacent to the on-site substation;
- Internal access roads;
- Underground and aboveground cables;
- Two small river crossings on District Road 01774, just south of the Tsitsikamma Community Wind Farm and to the west of the Impofu West site, may need to be upgraded for the transportation of abnormal loads to the Impofu West site; and
- The 132 kV overhead power line that connects the on-site switching station to the collector substation.

The baseline conditions for this study were further informed by the detailed desktop study done by Eastern Cape Heritage Consultants (Binneman & Reichert 2017), which summarised the relevant findings from the heritage studies for all the renewable projects and other infrastructure projects in the area (e.g., Anderson 2010, 2011, Binneman 2010a, 2010b, 2011a, 2011b, 2011c, 2011d, 2012a, 2012b, Binneman & Reichert 2015, Kaplan 2016, Nilssen 2014, 2015 and Van Ryneveld 2010, 2013). The valuable information from the Eastern Cape Heritage Consultants desktop study was then built on through this current study and all the relevant information was assessed site specifically and cumulatively, taking account of the fact that these proposed wind farms will be located within an existing renewable energy landscape.

Standard Terms of Reference (ToR) for a Phase 1a Archaeological Impact Assessment:

a) Locate development impact areas including turbine and sub-station sites, turbine hard stands, routes of roads and cables, upgrades and changes to existing district and minor roads, specifically at intersections and at crossings of drainage lines.

b) Conduct a detailed foot survey of the development impact areas to identify and record all archaeological resources.

c) Assess the predicted impacts of the proposed development activities as well as the No-Go option on such resources according to the Aurecon Impact Assessment Methodology.

d) Recommend management and mitigation measures to reduce negative impacts and enhance positive impacts.

e) Indicate if additional studies/ fieldwork are necessary.

f) Prepare and submit a report that meets standards required by Heritage Authorities in terms of Section 38(3) of the National Heritage Resources Act, No. 25 of 1999 as well as NEMA.

4.4. Study Area

Due to the largely homogenous nature of the receiving environment, the following description is for the consolidated Impofu Wind Farms site as a whole, and applies to all three wind farm sites, the boundaries of which may still change during the EIA process. Examples of the affected environment in areas of proposed development activities in the Impofu West Wind Farm site are shown in Plates 1 through 7. Note that there may be errors in the elevation data on some of the photo data stamps. No errors in the camera's GPS location data, however, have been noted. A comprehensive photographic record of the affected environment and identified heritage resources is available on request.

Most of the consolidated Impofu Wind Farms site is situated on the coastal platform of South Africa's Eastern Cape some 100 km west of Port Elizabeth and about 22 km WSW of Humansdorp in the Kouga and Kou-Kamma Local Municipalities, Sarah Baartman District Municipality, Eastern Cape Province (Figures 1, 2 & 3). The white polygon in Figure 2 indicates the location and extent of the three Impofu Wind Farms while the yellow polygons in Figures 3 and 5 show the boundary of the Impofu West Wind Farm.

The Impofu Wind Farms site is centred roughly on S34.07642° E24.54738° (WGS84, latitude and longitude in decimal degrees; 1:250 000 map 3324 PORT ELIZABETH) and at the time of compiling this report includes the following farm portions and farms; 27/732, 15/732, RE/7/732, 946, 945, RE/4/733, 3/733, 5/733, RE/8/358, RE/6/681, RE/7/681, RE/15/681, RE/20/358, 21/358, 1/677, RE/5/715, 6/715, RE/1/716, 3/716, 4/716, 1/717, 3/717, RE/678, RE/2/678, 1/682, 17/732, 18/732, 25/732, 798, 818, RE/675, 1/676, 2/676, RE/677, 799, 846, RE/13/722, 2/720, RE/681, RE/682, 14/732, 21/732, RE/716, RE/2/716, 5/716, 3/676, 2/677, RE/1/678, 2/720, 5/675, 15/358, RE/1/358, 4/675, RE/3/675, RE/3/675,

13/358, RE/15/358, RE/2/358, RE/14/358, RE/14/358, 851, 2/740, 34/732, 33/732, 10/733, RE/6/732, 16/732, 721, 840 and 737.

The operational wind farms of Tsitsikamma Community, Gibson Bay, Kouga and Jeffrey's Bay are located adjacent to and nearby the Impofu Wind Farms site. The construction of the Oyster Bay Wind Farm immediately to the east of the site will commence soon (Figure 4). The Ubuntu and Banna Ba Pifhu Wind Farms have received Environmental Authorisation (EA) (Figure 4). The proposed Impofu Wind Farms are therefore considered to be an addition to an existing and growing renewable energy landscape.

As mentioned, a total of 129 turbine locations have been identified across the three proposed Impofu Wind Farm sites, but not more than 120 of these turbine locations will be developed. While individual wind turbine impact zones are fairly small, the largest area of direct impact will result from access and internal roads that will be used to build and maintain the wind farms. The latest preliminary wind farms layout and focused study areas are based on results and constraints from the screening phase and desktop studies, including inputs from this author, Eastern Cape Heritage Consultants and preliminary inputs from the Gamtkwa Khoisan Council. Because archaeological assessment relies on ground-truthing through detailed site inspection on foot, and given the extensive area under investigation, the fieldwork focused on areas of direct impacts and their immediate vicinities (Figure 5).

The bulk of the Impofu Wind Farms study area is situated on the coastal plain between the shoreline of the Indian Ocean in the south and the south-eastern slopes, foothills and hills of the more mountainous terrain to the north (Figure 2). Only a narrow strip of the affected properties extends to the coastal shoreline, but on heritage and ecological grounds, Red Cap has excluded this portion from development as a No-Go zone. Some of the larger developable areas from which turbine sites were removed by Red Cap are indicated as No-Go zones in Figures 3 and 5 (also see Binneman & Reichert 2017 pg. 18 Fig. 5). The coastal dunes are part of the pre-colonial cultural landscape and commonly contain prehistoric heritage resources and in some instances palaeontological material (Binneman & Reichert 2017 and references therein; Brink 2015; Nilssen 2010 and Nilssen & Smith 2015).

Ancient aeolian sediments on the coastal plain are deeply incised in places by the Kromme, Klipdrift and Tsitsikamma rivers and their associated tributaries exposing the underlying hard rock geological formations described in greater detail in the palaeontological study (Almond 2017). Numerous drainage lines and water sources occur in this area as do man-made dams, including the large Impofu Dam (the wind farms namesake) on the Kromme River to the north (Figure 2).

The main geological units in the area include the Table Mountain Group (with palaeontologically sensitive Cedarberg and Baviaanskloof Formations), the Bokkeveld Group (with palaeontologically sensitive Gydo Formation) and the Algoa Group that is partly represented by the fossil and more recent dunes in the coastal strip (Almond 2011a & 2011b and Binneman 2010). For the most part, hard rock geological sediments - mainly quartzites and sandstones - are covered by top soils, dune sands, ferricretes and calcretes with surface outcrops of quartzites occurring in the study area.

Dominant landscape features include gravelled terraces in the north and remnants of ancient and dynamic dune systems in the south. Today the latter are largely stabilized by alien and dune vegetation. Small remnants of a formerly much larger dynamic dune system stretching from about Klasies River in the west to the Kromme River in the east are still exposed. These include exposed dunes at Geelhoutboom (north-east of Klasies River

Caves), Brandewynkop and the dune field between Oyster Bay and the Kromme River mouth (some dunes visible in Figure 2). For the most part, these exposed dune areas contain abundant archaeological and palaeontological resources where the shifting dune sands are continually burying and exposing sites (Binneman 2010 & 2011a, Deacon & Geleijnse 1988, Nilssen 2010 and ACO UCT 2010).

The predominant land use in the area consists of grazing lands for dairy farming that has dramatically changed the landscape from one formerly vegetated by Tsitsikamma Sandstone Fynbos, Garden Route Shale Fynbos, Coastal Shale Band Vegetation and Southern Cape Dune Fynbos. The Eastern Cape Biodiversity Conservation Plan has designated certain parts of the region as Critical Biodiversity Areas for the protection of endangered vegetation types, ecological corridors and water management areas such as the Tsitsikamma, Klipdrift and Slang Rivers. The coastal strip in this region mostly comprises sensitive dune systems.

The study area is under rural and agricultural settlement. Large parts of the landscape, particularly along the coastal plain and areas adjacent to water sources are transformed by farming activities. Further human-related impacts of the more recent past include roads, single vehicle tracks, quarries, dams, variety of farming activities, variety of structures and infrastructure, fencing, overhead power lines, transmission/receiver masts, wind turbines and so on. The area is transitioning to a renewable energy landscape given the four operational wind farms in the area. Natural processes that have and continue to impact archaeological materials include erosion and bioturbation.

Parts of the southern portion of the Impofu West Wind Farm site is situated in the archaeologically sensitive coastal zone, also referred to as a pre-colonial cultural landscape. The sensitive coastal area has been excluded from the development proposal as indicated in Figures 3 & 5, in addition to keeping development out of the one kilometre long stretch immediately east of the Tsitsikamma River (all proposed development is more than 2.5 km from the Tsitsikamma River) (ACO UCT 2010, Binneman 2010a, 2010b, 2011a, 2011b, 2011c, Binneman & Reichert 2017, Gamtobakwa Khoisan Council 2017, Nilssen 2003, SAHRA APM 2010, and Webley 2003). Most of the area covered by the proposed wind farm development is more than 5km from the present day shoreline and thus lies inland of the archaeologically sensitive coastal zone and pre-colonial cultural landscape.

Archaeological resources that do and may occur in the Impofu West Wind Farm site include historic period infrastructure, structures, cemeteries, graves and cultural materials, Stone Age artefacts in open air and disturbed contexts of mostly Early Stone Age and Middle Stone Age origin, *in situ* Stone Age artefacts in sub-surface sediments, and unmarked burials. If present along river valleys, rock shelters may include archaeological remains of Stone Age and pastoralist origin as well as rock art. Due to the scarcity of rock shelters and caves in the study area, archaeological sites are rare further inland and are expected to cluster on higher lying areas overlooking the relatively flat to undulating surroundings. Many finds reported in this setting comprise isolated Stone Age specimens or very low density scatters of Stone Age artefacts that occur in disturbed contexts and are devoid of any faunal remains or other cultural materials and features. For the most part, such heritage resources are rated to be of low significance (Generally Protected C).

4.5. Legal Requirements

The following legal requirements - relevant to heritage - apply to the proposed wind farm development:

- The National Environmental Management Act, No. 107 of 1998 (NEMA as amended): An Environmental Authorisation is required for Listed Activities in Regulations pursuant to NEMA, and specialist assessments are required to inform the Scoping and EIA phases associated with the Application for Environmental Authorisation for the project;
- The National Heritage Resources Act, No. 25 of 1999 (NHRA): A full Heritage Impact Assessment is not required by the Eastern Cape Provincial Heritage Resources Authority for the proposed project. Only archaeological and palaeontological studies are required (ECPHRA e-mail of 22 & 23 August 2017).

The archaeological component of the EIA process is being undertaken to comply with the following clauses of Section 38(1) of the NHRA which trigger the requirement for a heritage impact assessment: (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; (c) any development or other activity which will change the character of a site (i) exceeding 5 000 m^2 in extent; or (ii) involving three or more existing erven or subdivisions thereof. Because of these triggers, ECPHRA was approached by this author, and ECPHRA confirmed in terms of Section 38(2) (a) that a heritage study was required, and who requested in terms of Section 38(3) that archaeological and palaeontological impact assessments be undertaken and that these studies be done by separate specialists, one for the archaeological component, and one for the palaeontological component. See further details required for the heritage study in terms of the NHRA No 25 of 1999 in Section 38(3) in Appendix A.

4.6. Approach to the Study - Methodology

This assessment was conducted according to best practice principles and in accordance with guidelines and minimum standards required by heritage authorities in respect of the NHRA (HWC 2007, 2016a, 2016b, SAHRA 2017, SAHRA APM 2007, 2012 & 2018), and as set out in Section 13, GN.R982 of NEMA (General requirements for EAPs and Specialists).

4.6.1 Desktop & Literature Review (see section 5.1)

This author has work experience in the affected area and is familiar with the main types of heritage resources and issues (Nilssen 2003, 2010, 2013, 2014, 2015 & 2016 and Nilssen & Smith 2015). A desktop study and literature review was undertaken, which relied in part on this author's experience in the area and also focused on the SAHRIS database up to 2018, which is by no means exhaustive. Previous heritage and archaeological studies in the immediate surroundings have already provided detailed descriptions of the history, heritage and archaeological record of the area (see for example Binneman 2010a, 2011a, 2011b & 2011c and references therein, Van Ryneveld 2010 and references therein and ACO UCT 2010). While giving a broad overview of the archaeological record presented in the above-named reports and as well as those listed in the reference section below, the focus is on presenting key heritage concerns already identified in earlier studies and how they relate to the assessment being conducted here.

The desktop study also involved a detailed inspection of aerial imagery available through Google Earth, as well as high resolution aerial photography supplied by Red Cap. The main aim of examining aerial imagery was to determine which development activities encroached upon previously undisturbed and hence potentially sensitive areas, and to locate man-made structures or ruins for potential future investigation in the event that they were threatened by proposed development activities. Existing disturbances such as quarries and

borrow pits were also located via aerial imagery and later inspected on foot where necessary.

In addition to this, a desktop study for the Impofu Wind Farms and associated Grid Connection was commissioned by Red Cap and completed by Eastern Cape Heritage Consultants (Binneman & Reichert 2017) and was considered in the completion of the Impofu West assessment. The Binneman and Reichert desktop study reports on the most important work and documented archaeological sites in the area up to the year 2017, including archaeological assessments for a wide variety of development activities as well as the existing Tsitsikamma Community, Gibson Bay, Kouga and Jeffreys Bay Wind Farms, as well as the proposed Oyster Bay, Ubuntu and Banna Ba Pifhu Wind Farms (Figure 4). Binneman and Reichert also provided Google Earth mapping for 100 archaeological occurrences and sites in the affected area. As alluded to above, the SAHRIS database is not an exhaustive or up to date record of heritage studies, but given Dr Binneman's and Mr. Reichert's vast experience and in-depth knowledge of the heritage record of the area, we are very unlikely to have missed any of the important heritage resources recorded in the broader study area (Binneman & Reichert 2017).

As part of the desktop study, a basic historic background search (deeds office & archives in Cape Town) was undertaken in 2017 by Stefan de Kock of Perception Planning, but no fatal flaws in terms of the built environment were identified.

4.6.2. Screening Phase (see section 5.2)

In the screening phase, the initial turbine layout and substation localities were examined using Google Earth to identify parts of the study area that looked relatively undisturbed by more recent human activities and with potential to contain archaeological resources. These areas, including all the proposed substation footprints were then accessed by vehicle and inspected on foot over a 6 day period between 6 and 12 September 2017. The focus of this exercise was to become more familiar with the Wind Farms site, to determine if any fatal flaws or No-Go areas are present at currently proposed wind turbine and substation positions and to evaluate the overall archaeological and heritage sensitivity of the affected area. The project team undertook a site visit on 11 September 2017 with members from Aurecon, various specialists appointed to the project, and Red Cap. The project team had a screening workshop for the Impofu Wind Farms in Cape St Francis on 13 September 2017.

4.6.3. Consultation (see section 5.3)

Mr Kobus Reichert, a representative of the Gamtkwa Khoisan Council (GKC) – a registered I&AP – was consulted informally and advised this author that the GKC will provide feedback after they have reviewed this archaeological report. If considered necessary by the Gamtkwa Khoisan Council, further consultation may be conducted during the EIA phase of the project.

The GKC was consulted by Eastern Cape Heritage Consultants on 13 July 2017 regarding their desktop study for the Impofu Wind Farms and Grid Connection projects (Binneman & Reichert 2017). This consultation was an informal preliminary engagement and does not replace the required Public Participation Process of the EIA process or community consultation in terms of section 38(3)(e) of the NHRA (Binneman & Reichert 2017).

4.6.4. Archaeological Foot Survey & Geotechnical Test Pits (see section 5.4)

Because the Impofu Wind Farms site is so large, and because the development footprint will only affect a relatively small portion of the site, it is beyond the scope of this impact assessment to conduct a detailed archaeological foot survey of the entire area.

During the screening phase of the project it became clear that future heritage assessment for the project can realistically focus only on actual proposed impact zones rather than the entire extent of the affected properties. However, given the above-mentioned background information and results of the screening site inspections, it was clear that a detailed investigation was necessary once the revised wind farms layout became available.

Based on the latest Impofu Wind Farms layout provided by Red Cap in March 2018, a focused archaeological survey was conducted by one person over a 20 day period from 12 March to 5 April 2018, of which 5 days was spent on the site for the Impofu West Wind Farm. Apart from existing District and Minor roads, and some of the existing internal farm roads that were traversed by vehicle, all proposed development areas including turbine and hard stand sites, intersections of access roads, internal roads as well as off road underground and overhead power line cable routes were surveyed on foot.

Due to the current drought, and recent harvesting of crops from cultivated fields on the majority of the farms, archaeological visibility was unusually good for this part of the country, which is usually densely covered by crops, grass and vegetation that allow for very poor archaeological visibility. Considerable stretches, however, were densely covered by vegetation and thus restricted archaeological visibility. Nevertheless, adequate survey coverage and detailed inspection of large stretches of exposed surfaces and disturbances such as quarries, borrow pits, erosion gullies, road cuts, agricultural test pits, geotechnical test pits and animal burrows allowed for an adequate assessment, and reasonable prediction of the nature and types of archaeological resources that may lie buried beneath vegetation cover. Only a few very short stretches (up to a maximum of about 50 meters in length) were inaccessible due to impenetrable vegetation and active water courses. None of the inaccessible areas were considered to hold significant archaeological potential.

When identified, archaeological traces were assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, aesthetic appeal, potential for future research, density of finds and the context in which archaeological traces occur. Below is the grading system and recommended mitigation provided by SAHRA (2007). Note that heritage practitioners provide field ratings while the heritage authorities are responsible for grading heritage resources.

Site Significance	**Field Rating**	**Grade**	**Recommended Mitigation**
High Significance	National Significance	Grade I	Site conservation / site development
High Significance	Provincial Significance	Grade II	Site conservation / site development
High Significance	Local Significance	Grade III	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Site conservation or mitigation prior to development or destruction
Medium Significance	Generally Protected B	Grade IV-B	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	Grade IV-C	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Archaeological survey tracks were fixed with a hand held Garmin X30 GPS unit to record the search area (Figures 6, 7, 8 & 9, gpx tracking file is available from author). All identified archaeological occurrences were recorded, mapped and photographed. The

position of identified archaeological occurrences and observations were also fixed by GPS. Digital audio notes, video and a comprehensive, high quality digital photographic record were made with a Nikon Coolpix AW130 camera. Photo localities and directions of views were fixed by the camera's on-board GPS and compass respectively, which are indicated in photographs with data stamps (e.g., Plates 1 through 7). All coordinate, photographic and video data are available on request.

In addition to the above, geotechnical test pits were excavated at turbine localities WTG38, 39, 40 and 41W on 20 March 2018 to determine the nature of sub-surface geological sediments for engineering purposes (Figure 9). This author was requested by Red Cap to ensure that no archaeological materials were present at the surface prior to excavations and to monitor the excavation to ensure that it would be stopped immediately if there was any sign of sensitive archaeological material below the surface. It was also an opportunity to inspect sub-surface sediments to confirm if these areas did show any potential presence of anthropogenic materials and thus if these areas should be avoided or not. Digital audio notes, video and a comprehensive, high quality digital photographic record were also made of this process. Excavations of about one meter wide (excavator bucket width) and up to about four meters long were made to a depth of up to between 4 and 5 meters. Four meters is the anticipated maximum depth of excavations for wind turbine foundation bases.

4.7. Assumptions, Limitations and Gaps in Knowledge

This assessment assumes that all background information and layout plans provided by Red Cap and Aurecon are correct and current. This assessment is specifically for the impact areas given in the Wind Farms layout provided by Red Cap dated 29 March 2018, and does not apply to, and may not be used for any other future developments on the remainder of the affected properties outside the assessed areas as reflected by the combined archaeological survey tracks fixed by GPS (gpx file available on request).

The most significant limitation to the study was restricted archaeological visibility, but sufficient observations were made for the purpose of this assessment. Due to the fact that much of the archaeological record, and that with potentially the best context, is covered by vegetation and surface sediments, this study is limited to such resources exposed on the surface or in disturbed contexts. Consequently, it cannot be ruled out that additional heritage resources may be exposed during the construction phase of the development activity.

Notwithstanding section 4.6.3 above and section 5.3 below, at present there is a gap in knowledge concerning input from the Gamtkwa Khoisan Council, which will be obtained after they have studied the archaeological and palaeontological reports.

The No-Go area indicated in Figures 3 & 5 was excluded from the development proposal and hence from this assessment, and was not investigated during the archaeological foot survey.

5. Results

5.1. Desktop & Literature Review

Most of the references cited and literature consulted during the desktop study are heritage-related impact assessments for a variety of developments that are relevant to the

Impofu Wind Farms study areas and are listed in the reference section below. Studies specifically conducted for wind farm and associated grid connection projects in the surrounding environs include Anderson 2010, Binneman 2010a, 2010b, 2011a, 2011b, 2011c, 2011d, 2011e, 2012a, 2012b, Binneman & Reichert 2015, Kaplan 2016, Nilssen 2014, 2015, 2016 and Van Ryneveld 2010 and 2013.

Based on previous studies in the surrounding environment, it is known that the area contains heritage resources including a variety of historic period structures, associated cultural materials, graves and grave yards, while the prehistoric period, particularly in the areas further than 5km inland from the present day shoreline, is most commonly represented by Early Stone Age and Middle Stone Age stone artefacts in open contexts (e.g., ACO UCT 2010, Anderson 2010, 2011, Binneman 2010b, 2011b, 2011c, 2011d, 2012a, 2012b, 2013a, 2013b, 2013c, Binneman & Reichert 2015, Kaplan 2016, Nilssen 2003, 2014, 2015, 2016, Webley 2003 and Van Ryneveld 2010). Stone Age artefacts in open contexts normally occur in isolation or in very low densities and are devoid of any other cultural and faunal remains, which results in these resources being considered to be of low heritage value from a scientific perspective. An exception to this broader pattern is a large Early Stone Age site that comprises a scatter of thousands of stone artefacts in a previously ploughed and disturbed area immediately north of the Impofu North Wind Farm (Binneman 2010b).

Further details regarding heritage resources occurring in the area are given in the archaeological background section below. As reported by most investigators, the greatest limiting factor to archaeological fieldwork is poor visibility of ground surfaces due to dense vegetation cover.

At the initiation stage of the project, Eastern Cape Heritage Consultants were commissioned by Red Cap to undertake a desktop study for the Impofu Wind Farms and Grid Connection projects (Binneman & Reichert 2017). Their comprehensive study included a review of reports of heritage-related work in the surrounding area from 2006 up to 2017. Dr Binneman's research experience in the area, however, stretches from the 1980's to present. Their desktop study includes the findings and assessments of the existing neighbouring wind farms and their transmission lines as well as those for which Dr Binneman conducted studies, also including other developments like borrow pits etc. Binneman and Reichert produced a Google Earth map with 100 archaeological sites and observations. In their discussion of the Impofu Wind Farms Site, and relevant to Impofu West, they reported the following:

> *"The desktop study identified only a few locations (all north of the southern boundary of the WEF) where Early and Middle Stone Age stone tools were observed. These stone tools were found randomly scattered without any recognised distribution patterns. They were in secondary context and not associated with any other archaeological materials, and therefore are of low cultural significance. Most of the area is also already disturbed by farming activities. Based on our experiences and knowledge gained from other investigations in the immediate area and the wider surrounding region, it would appear that the area in general is of low cultural sensitivity and it is unlikely that any in situ archaeological remains will be exposed during the development.*
>
> *There are, however, areas of concern with regard to the southern area of the proposed footprint ... These areas falls roughly within, what we would call the 'sensitive coastal archaeological zone', and needs to be carefully managed to limit the impact on archaeological resources and the cultural landscape. Ideally, we would like to recommend that no development takes place in these areas. There are small 'undisturbed' dune areas covered by coastal fynbos vegetation to the west of Oyster*

Bay and preferably these areas must be avoided as there is a high possibility that in situ archaeological sites/materials will be damaged/destroyed (See Figure 5 and KMZ file). These areas were also assessed as part of a Heritage Impact Assessment for one of the alternatives for the Gibson Bay grid connection. The heritage specialist did not favour the construction of the grid connection in the undisturbed areas and recommended another alternative (Nielsen 2014). We therefore recommend that the development within the footprint be limited to previously disturbed areas, providing that all activities are closely monitored at all times and that specialist recommendations must be followed regarding any heritage finds.

A further concern is the far south-western corner of the proposed WEF which borders on the Tsitsikamma River and adjacent Geelhoutboom dune area. The world renowned Klasies River Caves are some 5 km to the west. We regard the Geelhoutboom dune system as part of the western extension of the cultural landscape which stretches from the Klasies River in the west to the Krom River in the east. The Geelhoutboom archaeological landscape has been described by Prof. H.J. Deacon as of spectacular proportions and the largest artefact scatter observed along the southern Cape coast. There is a red no go zone of almost one kilometre along the Tsitsikamma River and it is recommended that no turbines are place within this zone to keep the visual impact on this part of the cultural landscape as low as possible" (Binneman & Reichert 2017, pages 17 & 18).

With reference to the above concerns and Red Cap's consultation with representatives of the Gamtkwa Khoisan Council, Red Cap has proactively excluded two large areas of potentially developable land from the wind farm project (see blue polygons in Figure 3) as well as the one kilometre long stretch immediately east of the Tsitsikamma River as described above by Binneman and Reichert in the last paragraph (all proposed development is more than 2.5 km from the Tsitsikamma River). These more sensitive coastal areas and specifically the ones indicated in Figures 3 & 5, as well as the one kilometre long stretch immediately east of the Tsitsikamma River have been accepted by Red Cap as No-Go zones and all turbines and associated infrastructure previously planned in these areas were proactively removed from the Impofu West Wind Farm. Furthermore, given that the aesthetic and visual value of the pre-colonial cultural landscape is already compromised by existing agricultural activities and existing wind farms, the avoidance of the archaeologically sensitive areas described above will help to reduce the overall visual impact of wind turbines on the cultural landscape.

Archaeological Background

Pre-Colonial / Stone Age Period

Several heritage related studies have been conducted along the nearby coastline, which is rich in archaeological resources of Early, Middle and Later Stone Age origin. A strip along the coast of up to 5km wide is particularly rich and is considered to be one of the richest archaeological and pre-colonial cultural landscapes in South Africa (Binneman 2010a, ACO UCT 2010 and SAHRA APM 2010). The archaeology of the adjacent interior is not well known due to a paucity of research (also see Binneman & Reichert 2017).

Early Stone Age (ESA) materials including Acheulian hand axes, cleavers and chopping tools that date from between about 1.5 million and 250 000 years ago is the earliest evidence for human ancestors occupying this area. Such artefacts are usually found among ancient river gravels and on old palaeosols exposed within dune fields like those at Geelhoutboom and Brandewynkop (Deacon & Geleijnse 1988 and Binneman's personal observations). A large scatter comprising thousands of ESA and MSA stone artefacts,

however, was identified in previously ploughed and disturbed sediments to the north of the Impofu Wind Farm site, but this ESA site will not be affected by the proposed Impofu Wind Farms development (Binneman 2010b). While ESA artefacts are common among the dunes immediately east of Thysbaai, they are rare in the dunes a bit further north between Oyster Bay and St Francis Bay and always identified in disturbed or derived contexts where they are usually mixed with artefacts of more recent Stone Age times. Although ESA artefacts were identified in the immediate surroundings of the study area, they are rare, and always found in secondary, derived and mixed contexts, and are therefore considered to be of low significance (also see Van Ryneveld 2010). More recently, however, during an archaeological assessment near Jeffreys Bay, some *in situ* ESA stone artefacts were identified in a similar context to that described below (Kaplan 2016).

During his palaeontological field investigations for the Impofu Wind Farms project, Dr Almond identified *in situ* ESA artefacts in ancient aeolian deposits at a quarry with exposed geological stratigraphy – **IW7** (Almond 2017; see Figure 6 and Plate 8). The stone artefacts are bedded in Plio-Pleistocene aged Nanaga aeolianites that were exposed as a result of recent quarrying activities (Almond 2017). If present in high densities, such *in situ* ESA materials are potentially of greater scientific value than the exposed, displaced and temporally mixed ESA & MSA accumulations at sites like Geelhoutboom (Binneman & Reichert 2017 and Deacon & Geleijnse 1988).

The Middle Stone Age (MSA) starts at about 250 000 years ago and gives way to the Later Stone Age some 30 000 years ago. MSA stone artefacts are characterised by flake and blade industries where evidence for core preparation - also known as the Levallois technique - is seen on prepared or faceted striking platforms of points, flakes and blades. Convergent flakes or points are also one of the markers of the MSA period. The Klasies River Cave complex - a National Heritage Site some 8km west of the SW boundary of the Impofu Wind Farms study area - is the most significant MSA site in the area that contains evidence for human occupation spanning the last 120 000 years. Research at the site has made a significant contribution to our understanding of the origins of modern humans, and therefore, Klasies River Cave is among 5 other South African archaeological sites that are in the process of being nominated for World Heritage Site status with UNESCO.

Stone artefacts of MSA origin occur among the dunes and exposed gravels in the area, with the dunes at Brandewynkop containing numerous MSA stone tools (personal observation; Figure 6). Unfortunately, no other cultural materials or faunal remains are associated with these artefacts at Brandewynkop, but bone and fossil bone is associated with MSA materials in the dunes between Oyster Bay and St Francis Bay (also see Nilssen 2010). SAHRA has declared a delineated area containing Brandewynkop an exclusion area where no development is permitted, and therefore the exclusion or No-Go area is avoided by the Impofu Wind Farms site (Figures 2 & 5). "At the eastern end of the (St Francis Bay) dune field are most remarkable Middle Stone Age 'factory' sites which consisted of large circular piles of flakes and cores. Most of the flake piles represent unique 'moments in time' where large numbers of flakes were produced from a single core" (Binneman 2010a pg 3).

The Later Stone Age (LSA) in this area starts about 30 000 years ago and is characterised by substantial technological improvements over the MSA industries. Advancements on previous technologies and new technologies as well as cultural developments include the widespread occurrence of rock art (cave paintings and rock engravings), decorative objects (ostrich egg shell beads, marine shell pendants and beads, ochre), human burials with grave goods including painted stones, an expanded stone tool kit, microlithic stone tool industries (often associated with composite tools such as bow and arrow technology), bone tools, tortoise carapace bowls, ostrich egg shell containers, fire

making sticks and so on. Many of the LSA sites in the area are shell middens, and although these usually occur within a few hundred metres of the shoreline, they are also found up to 5 km inland.

Binneman has identified, described and dated the below-listed types of LSA archaeological sites and their contents that occur in the dune systems along the 5 km coastal strip. No significant LSA sites have been recorded by previous studies in the immediate vicinity of the present study area.

1. large stone features associated with cooking (one dated to some 300 years ago);
2. shell middens with pottery only and with pottery and domesticated fauna that represent Khoi pastoralists or herders (dated to about 1800 and 1600 years ago respectively);
3. shell middens, without pottery, associated with a quartzite stone industry that Binneman has named the Kabeljous industry, which represent hunter-collector-fishers who lived along the coastal foreland (dated to between about 4700 and 1800 years ago); and
4. shell middens, without pottery, associated with a silcrete or quartz microlithic Wilton Industry that represent hunter gatherers or San who lived mainly in the interior and only visited the coast periodically (dated to between about 5180 and 1900 years ago) (Binneman 2010a pg 4-5).

Pastoralist / Herder Period

The last 2000 years saw a significant shift in the socio-economic setting with the immigration and settlement of KhoiKhoi peoples in the area from about 1800 years ago. As described above in the Later Stone Age section, the most common archaeological traces of the pastoralist / herder lifestyle in the area include large stone features associated with cooking, shell middens with pottery only and shell middens with pottery and domesticated animals (Binneman 2010).

The KhoiKhoi were the first food producing peoples in South Africa who brought domestic stock, pottery / ceramic containers and bowls and associated cultural items into the region. A lifestyle still closely connected with nature would have allowed for likely easy and mutually beneficial relations between KhoiKhoi and hunter-gatherer (San) peoples. Descendants of these first farming peoples, and offspring from converging KhoiKhoi and San families, such as members of the Gamtkwa Khoisan Council, still live in the region today.

Colonial / Historic Period

The most recent inhabitants of the area are mostly of European origin and started settling here from around the late 1700s during the Colonial Period. These latest arrivals have had the most dramatic effect on the environment, particularly in more recent years with large scale cattle / dairy farming where large tracts of indigenous vegetation has been cleared for ploughing and planting of crops and pastures for cattle feed and grazing. Heritage resources related to this period - older than 60 years or of historic significance - include dwellings and associated structures and material culture as well as cemeteries, marked and unmarked human burials (Van Ryneveld 2010). A baseline investigation of the historic built environment was conducted by Stefan de Kock of Perception Planning, and no fatal flaws were identified.

Cultural Landscape

Human occupation and use of the landscape and its features results in a visually more or less evident modification of that landscape. Human use of the environment, however, may have no visually detectible altering effect at all, but nevertheless, this imprinting of human behaviour on the environment, and the relationship between people and

the landscape is what is implied by the term “cultural landscape” (see UNESCO 2008 for definitions, significance and preservation of cultural landscapes).

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 pre-historic inhabitants leaves little to no physical evidence of their presence in the landscape and has a negligible modifying effect on the landscape. This is in stark 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 are determined through professional interpretation and opinion, community and public values as well as environmental and heritage legislation.

The cultural landscape of the affected environment includes three broad layers, with the most recent, colonial 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, single vehicle tracks, 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, wind turbines and so on.

The second layer underlying the historic period and dating to the last 2000 years is the pastoralist or herder period, which in turn is underlain by the third layer comprised of the three Stone Age periods spanning the period from a few hundred years ago to the early periods of tool making archaic humans some 1.5 million years ago. The physical traces associated with herder and hunter-gatherer or Stone Age occupation of the area are described above.

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 the most significant cultural layer in this area involves the pre-colonial cultural landscape and its sense of place.

SAHRA has already recognized the significance of the Thyspunt cultural landscape and will not approve any developments that will have a negative impact on it (SAHRA APM 2010). The Thyspunt cultural landscape, however, is only a fraction of a much larger and equally significant pre-colonial cultural landscape that involves an up to 5km wide coastal strip that extends at least from St Francis Bay in the east to Klasies River in the west (Binneman 2011b & 2011c and ACO UCT 2010). Binneman provides a detailed description of the archaeological riches in this area, which he uses to justify the significance attributed to the pre-colonial cultural landscape in this area (Binneman 2011b & 2011c). Moreover, large stretches of South Africa's coastline are rich and varied cultural landscapes that house the highest quantity and quality of archaeological Stone Age sites in the world. With ever increasing coastal developments and resulting degradation of the coastal strip, it follows that as much as possible of this cultural landscape should be protected for future generations and scientists.

The renewable energy landscape made up of the existing Kouga, Gibson Bay, Tsitsikamma Community and Jeffreys Bay Wind Farms and their associated transmission

lines is the most recent layer of the cultural landscape. These and additional approved wind farms in the surroundings of the study area already encroach on, and have a mostly aesthetic impact on the pre-colonial cultural landscape. The above- and below-mentioned avoidance of the archaeologically sensitive and previously undisturbed areas identified in the Eastern Cape Heritage Consultants desktop study and referred to by the Gamtkwa Khoisan Council will help to reduce the visual impact of the Impofu Wind Farms on the overall cultural landscape (Binneman & Reichert 2017, Gamtobakwa Khoisan Council 2017).

5.2. Screening Phase

Three Stone Age sites were identified at quartzite outcrops during the initial, short fieldwork season for the screening phase (Figures 6 & 7, Plates 9, 10 & 11 and Table 1). The below are broad overviews of the archaeological finds as not much time was available for a detailed examination of ground surfaces and individual stone artefacts. Nevertheless, all these localities are considered to be of low to medium significance as they are temporally mixed and lack any associated cultural or faunal remains. Finds and observations made during the detailed fieldwork for the scoping phase are listed and described in Section 5.4. The archaeological material initially identified by Dr Almond in 2017 at an existing quarry at **IW7** is also discussed further in section 5.4.

1) **IW1** is located more than 150m NE of the internal wind farm road between proposed turbine WTG3 and 4W. The approximate extent of the locality is shown by the red polygon around the labelled marker in Figure 7. The most commonly seen stone artefacts at this low density scatter are of ESA origin and include a crude bifacial hand axe or core, a large piece of flaked quartzite, large flakes and a large hammer stone (Plate 9). Apart from the hammer stone, fractured surfaces on these specimens are heavily patinated and weathered, which suggests great antiquity. A few pieces of possible MSA age were seen, but no artefacts typical of the LSA were identified. The locality was not studied in detail, but since it is avoided by the latest development layout, no further investigation, mitigation or management measures are required.
2) **IW2** is situated nearly 500m to the NE of **IW1** with its approximate extent indicated by the red polygon around the labelled marker in Figure 7. A few examples of flaking or quarrying of quartzite outcrops were seen, but the low density scatter of stone artefacts is dominated by specimens of MSA age (Plate 10). One specimen, shown in Plate 10, was retouched to have two notches on one side of the flake and a retouched distal end, thus making it a combination adze and end scraper. Most of the stone artefacts do not display the heavy weathering seen at **IW1** and are clearly of more recent origin. While dominated by MSA pieces, a few stone artefacts may be of LSA age. Because this locality is avoided by the latest layout for the Impofu West Wind Farm, no further investigation, mitigation or management measures are required.
3) **IW3** is a Stone Age quarry site situated about 250m NW of **IW2**, with its approximate extent indicated by the red polygon around the labelled marker in Figure 7. This locality consists of quartzite outcrops with numerous flake scars indicative of Stone Age people extracting pieces of stone from the outcrop for the manufacture of stone tools (Plate 11). Although numerous flake scars were identified, including several that are heavily weathered and thus of great antiquity, the ground surfaces in the surroundings are covered by vegetation and thus restrict the detection of stone debris and artefacts. This site is avoided by the latest development layout and therefore no further investigation, mitigation or management measures are required.

4) In situ stone artefacts of ESA and MSA age in the exposed geological profiles of a quarry at **IW7** were first identified by Dr Almond during the screening phase (Figure 6 and Plate 8). This locality is avoided in the latest wind farm development, but this author investigated the site again during the fieldwork conducted for the report presented here. This locality and the implications of finds made there are discussed further in section 5.4.

Inputs from the screening phase, such as the archaeological finds described above, have informed the revised development layout and therefore the above heritage resources are avoided by the latest development layout and require no further investigation, mitigation or management measures. No other tangible heritage resources were identified in the impact areas of the proposed Impofu West Wind Farm development during the screening phase.

5.3. Consultation

This report will be used for the public participation process being undertaken for the EIA process. In terms of Section 38(3) (e) of the NHRA, and as mentioned above, this report will be submitted to the Gamtkwa Khoisan Council for their review. After they have reviewed this report, the Gamtkwa Khoisan Council will provide feedback, and further consultation may be arranged if deemed necessary.

Nevertheless, Eastern Cape Heritage Consultants informally consulted the Gamtkwa Khoisan Council with respect to their desktop study (Binneman & Reichert 2017). At this stage the Gamtkwa Khoisan Council have no objections to the Wind Farms proposal, but see their comments and conditions of support below.

Regarding this preliminary and informal consultation, the Gamtkwa Khoisan Council responded with comments in a letter to Eastern Cape Heritage Consultants dated 21 July 2017, which states the following;

"In terms of our Indigenous Knowledge about the general area identified for the proposed Wind Farms we regard the entire area as of cultural significance to our community and all our comments that formed part of previous Wind Farm applications or socio-cultural consultations related to other projects remains valid and applicable to this project. This is also applicable to the grid servitude from the proposed Wind Farm up to the Van Stadens River that marks the western boundary of our ancestral land.

There are no additional archaeological sites or features that we wish to add to the current list that appears in the desktop study but we reserve the right to provide further comments in this regard after we have studied the Heritage Impact Assessment for the proposed project.

We also considered the fact that several Wind Farms have been approved in the area in the past, and as a result of the impact of these Wind Farms on the cultural landscape as well as the impact of previous and current agricultural activities, we have no objections at this stage if this project proceeds on condition that previous undisturbed areas within archaeological sensitive areas will be avoided for the purpose of this development. If it cannot be avoided this must be addressed in the HIA and we reserve the right to reconsider our provisional support for the project should we disagree with any of the recommendations in this regard" (Gamtobakwa Khoisan Council 2017).

Concerning the last paragraph of the above letter, and in consideration of the recommendations in the desktop study undertaken by Eastern Cape Heritage Consultants, Red Cap has accepted the archaeologically sensitive area west of Brandewynkop and stretching down to the shoreline in the south as a No-Go zone (Figures 3, 5 & 6). No wind

farm development activities are proposed in this No-Go zone. Additionally, the one kilometre long stretch immediately east of the Tsitsikamma River has also been avoided in accordance with the recommendations made by Eastern Cape Heritage Consultants (Binneman & Reichert 2017) (all proposed development is more than 2.5 km from the Tsitsikamma River). Because of the exclusion of wind farm development activities from the abovementioned areas, they were excluded from assessment and were not investigated during the archaeological foot survey. Furthermore, and as mentioned elsewhere, the exclusion of these areas from wind farm development has helped to reduce the negative impacts of wind turbines on the aesthetic value of the pre-colonial cultural landscape, as well as the potential negative direct impact of construction on heritage resources, especially in these previously undisturbed portions of the landscape.

5.4. Archaeological Foot Survey & Geotechnical Test Pits

Over a period of 5 days from the 20th to the 27th of March 2018, development impacts of the proposed Impofu West Wind Farm as shown in Figure 5 were surveyed and inspected on foot (Figure 6). Excluding distances covered by vehicle on existing hard surfaced and gravel surfaced access roads, and excluding archaeological survey coverage during the 2017 field season, a distance of 80 km was covered slowly (between 3 and 5 km per hour) by vehicle in previously disturbed areas and on existing internal gravel-surfaced roads, while 60 km was covered on foot. While slow vehicular coverage is acceptable but limited along existing disturbances such as gravel farm roads and cultivated areas, it cannot replace traditional foot survey in previously undisturbed or partially disturbed landscapes. This is especially the case for the detection of archaeological resources such as small features with little vertical relief, graves, artefacts and bones, while larger remnants like above ground structures and features are easier to detect. Although the foot survey may have missed the occasional isolated stone artefacts in areas of fair to poor archaeological visibility, it is highly unlikely that high density scatters of stone artefacts were missed. The exception would be in areas of poor to zero archaeological visibility of ground surfaces. Coverage of the archaeological survey is shown in Figure 6 and survey data are available on request as gpx or kmz files.

In general, archaeological visibility was good due to the current drought in the area and because crops were recently harvested on many of the farms. There were tracts of land, however, where archaeological visibility was limited by thick grass and natural vegetation cover. Nevertheless, sufficient observations were made for the purpose of this assessment and areas of poor visibility did not appear to have potential for housing significant archaeological resources. Examples of the receiving environment are shown in Plates 1 through 7.

Table 1 lists all archaeological occurrences identified during the September 2017 and March-April 2018 field seasons (Figures 6, 7, 8 & 9 and Plates 9 to 15). Only one observation is of the historic period (Plate 12 – cement water or feed trough for domestic stock) while the remainder of the finds consist of Stone Age materials.

Historic period disused feeding / watering trough

IW4 is a feed or water trough for domestic stock made of modern materials and is situated about 5m to the west of the internal wind farm road that leads to proposed turbine WTG1W of the Impofu West Wind Farm (Figure 6, Plate 12 and Table 1). This is a rectangular structure with the top of its walls about 30cm above ground level and with an extent of roughly 1m by 2m. One of the short side walls has a small round hole through it, with a diameter of about 2cm which was likely for a pipe (water) or hose fitting. Some of the cement cast bricks are broken away along one of the long side walls and the plastered

interior is cracked in places. The broken trough is no longer suitable for holding water, but may still be used to contain fodder.

Significance and Recommendation: This structure is considered to be of low heritage value and is not conservation worthy. No further studies, mitigation or management measures are required. If necessary, the broken structure may be damaged or destroyed without a permit from ECPHRA.

IW5 – Stone Age Quarry

This is a fairly small and low quartzite outcrop south of the hard stand for proposed turbine WTG28W, where numerous flake scars resulting from Stone Age quarrying of raw material for the manufacture of stone tools were recorded (Figures 6 & 8 and Plates 12 & 13). Some flake scars are weathered while others are covered with lichens, indicating that the flake scars are not of modern origin. While the age of the quarrying activities is indeterminate, it is certainly of LSA and probably of MSA origin. Due to dense grass covering the surrounding surface sediments it was impossible to search ground surfaces for flaking debris that may have resulted from quarrying or tool production activities. If present, associated stone tools may give a rough indication of the Stone Age time period when the quartzite outcrop was last visited or quarried. The red and orange polygon around the quarried outcrop allows for a 5m buffer around the outcrop with the edge of the **IW5** polygon lying about 20m south of the verge of the hard stand for WTG28W (Figure 8).

Significance and recommendation: This is a good example of Stone Age quarrying and is considered to be of low to medium significance and given a field rating of Generally Protected C. The preparation of the hard stand and construction of WTG28W will not directly impact **IW5**, but because the site is in close proximity to development, it is recommended that it be enclosed with a temporary fence for the construction phase of development. Fencing should be a temporary standard 4 strand 1.2 m cattle fence with large clear "NO-GO AREA" signs attached from the top strand every 15 m. These measures must be supervised by an archaeologist and must be in place prior to the construction phase of the wind farm development. The temporary fencing should be removed after construction. It is recommended that no signage or fencing is used after construction as this may attract unwanted attention and possible damage to the archaeological occurrence. It was noted that the hard stand area for proposed turbine WTG28W, including surface and near-surface sediments, is already significantly transformed by agricultural activities and therefore archaeological monitoring of construction at this locality is not warranted.

IW6 – Low density scatter of LSA and MSA stone artefacts in sand quarry

A small sand quarry is situated about 150 m ENE of the proposed turbine location WTG40W and immediately east of an intersection / turning point of the internal road east of WTG40W (Figure 9, Plate 13 and Table 1). The sand quarry is approximately 30 m by 40 m or 1200 m^2 in extent and has been excavated to a maximum depth of between 3 to 4 m below the surface, but one pile of very light coloured and gravelly sediment suggests that at least one deeper test pit was excavated. Several stretches of exposed profile were open to inspection. Scattered randomly in very low densities across the floor of the quarry are a mix of natural and modified stones of quartzite, quartz and quartzitic sandstone (Plate 13). The specimens in Plate 13 include two unmodified (non-archaeological) pieces on the left of the photo, while the remainder are a mix of LSA and MSA pieces including some tiny pieces of quartz reminiscent of flaking debris resulting from the manufacture of microlithic tools that are typical of LSA industries. Several broken blades and convergent flakes retain faceted or prepared platforms that are markers of the Levallois technique used in the production of blades and points in the MSA. Other pieces include flakes, flaked pieces, chips and chunks. No formal tools or retouched pieces were seen. No artefacts or anthropogenic layers were

seen in any of the exposed profiles and no other cultural or faunal remains are present. Considering this and the considerable extent of the excavation, then these finds most likely result from a low density background scatter of temporally mixed materials rather than from a specific archaeological site.

Significance and Recommendation: Already in a disturbed context, the finds at **IW6** are temporally mixed and lack any other archaeological remains and are therefore considered to be of low significance and given a field rating of Generally Protected C. It is recommended, therefore, that no further studies or mitigation of these finds is required, and because they were adequately recorded during this study, and are not classified as archaeological sites, it is recommended that a permit for their destruction is not required. Because this area is in close proximity to the archaeologically sensitive dunes of Brandewynkop and falls within the 5km wide pre-colonial cultural landscape, it cannot be ruled out that significant archaeological resources lie buried in sub-surface sediments. It is recommended, therefore, that archaeological monitoring should be undertaken in the area south of the dashed white line shown in Figures 6 & 9. Archaeological monitoring should be managed by a suitably qualified and accredited professional archaeologist during the construction phase of development.

IW7 – Quarry with in situ ESA and MSA Stone Artefacts

Originally identified by Dr Almond during the screening phase of this project, the quarry at **IW7** retains profiles of ancient aeolian sands with *in situ* Stone Age stone artefacts. Although the quarry is avoided by the latest Impofu West layout, it provides insight to sub-surface archaeological materials in the surrounding environment (Figure 6 and Plates 14 & 15). During his palaeontological field investigations for the Impofu Wind Farms project, Dr Almond identified *in situ* ESA artefacts in ancient aeolian deposits at a quarry with exposed geological stratigraphy (Almond 2017; see Figure 6 and Plate 8). The stone artefacts are bedded in Plio-Pleistocene aged Nanaga aeolianites (from about 5 million to 12 000 years old) that were exposed as a result of recent quarrying activities (Almond 2017). This author's visit to the quarry at **IW7** revealed that the stone artefacts are of both ESA and MSA age and that numerous non-archaeological stones are in the same context as the artefacts (Plate 15). In fact, unmodified stones occur far more commonly than stone artefacts, and may derive from underlying gravels that were likely moved up through the soft sediments by burrowing animals or other forms of bioturbation. No distinct anthropogenic layers of stone artefacts were seen in the exposed quarry profiles and certainly this very low density type of occurrence cannot be mitigated through excavation. Similar finds of *in situ* ESA artefacts were made during an archaeological assessment near Jeffreys Bay (Kaplan 2016).

Significance and recommendation: Even though *in situ* finds of this age are rarely identified outside of archaeological cave sites (but see Almond 2017 and Kaplan 2016), the finds at **IW7** are regarded to be of low significance due to their low numbers and total lack of any other associated cultural and faunal material. It is further expected that such finds are fairly common in sub-surface sediments, but likely in fairly low densities as seen here and at the locality identified near Jeffreys Bay (Kaplan 2016). If present in high densities, such *in situ* ESA materials are potentially of greater scientific value than the exposed, displaced and temporally mixed ESA & MSA accumulations at sites like Geelhoutboom (Binneman & Reichert 2017 and Deacon & Geleijnse 1988). Although the finds are given a rating of Generally Protected C, it is recommended that the surrounding area of the Impofu West Wind Farm site within the dashed white ellipse shown in Figure 6 should undergo archaeological monitoring by a suitably qualified and accredited professional archaeologist during the construction phase as higher densities of *in situ* artefacts may be exposed during construction.

Table 1. Description, location, sensitivity/significance and recommendations for identified archaeological resources (see Figure 4 and Plates 7 through 22).

Point Name	Age & Material	Location - WGS 84 Lat/Lon dec.degrees	Sensitivity / Significance	Mitigation or Management
IW1-160	ESA & other - quarried outcrop & low density scater of stone artefacts - 2017	S34.07385° E24.57117°	Low-Med	none - avoided in latest layout
IW2 - 161	MSA & other - quarried outcrop & low density scatter of stone artefacts - 2017	S34.07143° E24.57422°	Low-Med	none - avoided in latest layout
IW3 - 162	Stone Age quarrying of quartzite outcrop - 2017	S34.06974° E24.57273°	Low-Med	none - avoided in latest layout
IW4 - 193	Historic period - feed/water trough modern	S34.07068° E24.56243°	Low	None
IW5 - 212	Stone Age quarrying of quartzite outcrop	S34.11753° E24.52655°	Low-Med	avoided in latest layout - temp fence during construction
IW6 - 214	LSA-MSA artefacts in sand quarry	S34.12586° E24.51828°	Low	monitor surrounds during construction
IW7 - 215	MSA/ESA - in situ pieces in quarry	S34.10100° E24.54633°	Low	avoided - monitor surrounds during construction

As part of the studies for the purpose of engineering (geotechnical) assessments, localized vertical excavations up to 5 m deep were conducted at selected and specific localities (in this case selected wind turbine sites; Figure 9). Due to the required depth for the geotechnical trial pits (up to about 5 m to ensure that the intended turbine foundation base is reached), these excavations were performed with a mechanical excavator.

Geotechnical excavations were performed on 20 March 2018 in the footprints of proposed wind turbines WTG38, 39, 40 and 41W (Figure 9). Because no heritage resources were present on surface sediments, an excavation or testing permit was not required from the ECPHRA.

Although no surface archaeological materials were identified at any of these localities, it could not be ruled out entirely that sub-surface sediments may contain archaeological or palaeontological resources. In order to avoid or minimize any unforeseen damage to sub-surface heritage resources, this author was present to conduct archaeological monitoring of the geotechnical excavations. The completed excavations at WTG38, 39, 40 & 41W are shown in Plates 16 and 17.

While no anthropogenic horizons were detected in any of the test excavations, a single archaeological stone artefact was unearthed from the test excavation at the proposed turbine location WTG38W. The stone artefact shown in Plate 16 is a large water worn quartzite cobble with a maximum length of about 20cm. A chunk of cemented dune sand adheres to a portion of the artefact (Plate 16). The piece is broken or flaked at one end, which is typical of hammer stone damage. Pecking damage to one of the surfaces suggests that the piece was used as an anvil for the bipolar flaking technique and highly smoothed surfaces suggests that the piece was also used as a grind stone. While this specimen is part of the low density background scatter of stone artefacts seen elsewhere in the surrounding environment, it does not represent an archaeological site and is considered to be of low significance. Nevertheless, this find demonstrates that archaeological resources are buried in sub-surface sediments and that this area should be monitored as part of the archaeological monitoring within the pre-colonial cultural landscape as recommended for **IW6** and surrounds (see Figures 6 & 9).

Apart from the single archaeological specimen at proposed turbine location WTG38W, no other archaeological remains or anthropogenic strata were seen in any of the

geotechnical excavations. Nevertheless, due to the archaeological sensitivity of the 5 km wide coastal strip, it is recommended that archaeological monitoring be conducted in the area south of the dashed white line shown in Figures 6 & 9 during the construction phase by a suitably qualified and accredited professional archaeologist. This requirement is to be included in the EMPr for the Impofu West Wind Farm development.

6. Sources of Risk, Impact Identification and Assessment

Vegetation clearing and earthmoving activities associated with the construction phase of development have potential to impact archaeological resources and ultimately the cultural landscape, and therefore, only the construction phase is considered as a potential risk. Consequently, only known and predicted impacts associated with the construction phase of the wind farm development are assessed.

Existing and future wind farms in the area could have a significant negative cumulative impact on archaeological resources unless these were documented, mitigated or conserved according to their significance and to ensure that the impact on the archaeology of the area is minimised. Where appropriate, representative samples of the archaeological record are and should be conserved for interested and affected parties, future generations and scientists. Through the implementation of management and mitigation measures such as those presented below in section 7, the cumulative impact of wind farm developments on the archaeological record is greatly reduced. The positive cumulative impact on heritage resources is that the impact assessments required for these developments have greatly improved our record and understanding of archaeological material in the area and have provided an opportunity to conserve them for present and future generations. This is not possible if uncontrolled piecemeal developments as well as natural processes were to take place.

A further cumulative negative impact of wind turbines is on the aesthetic and visual value of the natural and cultural landscape. This and the potential impact to buried heritage resources within the pre-colonial cultural landscape are the main negative cumulative impacts associated with the proposed development. Although the proposed Impofu West Wind Farm will be situated in an existing and growing renewable energy landscape with numerous wind turbines in the immediate surroundings, the exclusion of the archaeological No-Go area shown in Figures 3 & 5 as well as the one kilometre long stretch immediately east of the Tsitsikamma River (all proposed development is more than 2.5 km from the Tsitsikamma River) has helped to reduce this negative impact. Furthermore, the below proposed archaeological monitoring in the pre-colonial cultural landscape during the construction phase will further assist in reducing potential negative impacts to heritage resources. There are positive and negative cumulative impacts as described above, but provided that management and mitigation measures are implemented, then the negative cumulative impacts are considered to be low.

The criteria and methodology for assessment, as well as the format and templates of the below tables were provided by Aurecon. The individual impact tables presented below are assessments of known and predicted impacts of the construction phase of development on archaeological resources that are currently located within the impact areas of the latest Impofu West Wind Farm layout. Comprehensive details of significance and recommendations are given in section 5.4 above and section 7 below.

Note that a negative impact rating without mitigation can become a positive impact rating with mitigation as the mitigation can have a positive influence on archaeological resources. For example, the mitigation measure of archaeological monitoring during the construction phase may result in the recording of previously undocumented heritage remains, which is a positive impact on our understanding of the archaeological record. If mitigation results in an archaeological resource being conserved or if something new is learned about a resource as a result of mitigation, then the impact can go from negative (without mitigation) to positive (with mitigation).

Table 2. Impact Table for Pre-colonial Cultural Landscape along 5km wide coastal strip – medium to high significance.

Project phase	**Construction**			
Impact	**pre-colonial cultural landscape along 5km wide coastal strip - medium to high significance**			
Description of impact	**excavation may damage sub-surface heritage resources in cultural landscape**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**it is recommended that archaeological monitoring be undertaken in the area south of the dashed white line shown in Figures 6 & 9. Archaeological monitoring should be managed by a suitably qualified and accredited professional archaeologist during the construction phase of development**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Positive	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Moderate - negative**		**Minor - positive**	
Comment on significance	in agreement with the calculated significance rating			
Cumulative impacts	without mitigation impacts could be high negative, with mitigation impacts likely to be low negative			

Table 3. Impact Table for *in situ* ESA & MSA in surroundings of quarry at IW7.

Project phase	**Construction**			
Impact	**In situ ESA & MSA in surrooundings of quarry at IW7**			
Description of impact	**excavation may damage sub-surface heritage resources**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	**it is recommended that the surrounding area of the Impofu West Wind Farm site within the dashed white ellipse shown in Figure 6 undergoes archaeological monitoring by a suitably qualified and accredited professional archaeologist during the construction phase**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Positive	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Regional	Impacts felt at a regional / provincial level	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Major - negative**		**Minor - positive**	
Comment on significance	agree with calculated significance			
Cumulative impacts	without mitigation impacts could be major negaive, but with mitigation could be positive			

A general overarching mitigation requirement is that before the 132kV overhead grid connection to the collector substation is constructed, a final archaeological micrositing walkthrough must be undertaken to ensure that any unforeseen impacts due to this line are mitigated by micrositing the power line route and pylon placements.

The No-Go option of the proposed project not being developed (i.e. the *status quo* remains) will involve continued low significance and/or unknown significance negative impacts due to natural processes and agricultural activities on archaeological resources, and because the proposed development impacts are considered to be low overall, can be controlled as well as monitored, then there is no preference of one over the other.

7. Conclusions and Recommendations

A comprehensive archaeological foot survey of the Impofu Wind Farms site was conducted over a 20 day period from 12 March to 5 April 2018, and 5 of these days were spent on the Impofu West Wind Farm site. Identified and recorded archaeological resources and observations for the Impofu West site include:

1) Historic period disused feeding / watering trough made of modern materials, low significance and not conservation worthy (**IW4**) – no further studies or mitigation of this find is required;

2) Stone Age quarrying / flaking of outcropping quartzite (**IW5**), avoided in latest development layout and no further investigations required (but see recommendations given below);
3) LSA & MSA stone artefacts in sand quarry, considered to be of low significance (**IW6**) - no further studies or mitigation of this find is required (but see recommendations given below); and
4) *In situ* MSA and ESA stone artefacts in quarry (**IW7**) – avoided in latest development layout (but see recommendations given below).

Results and inputs received through the iterative screening and preliminary design process, desktop studies, preliminary meetings, workshops and consultations have enabled Red Cap to proactively resolve several heritage-related concerns and to avoid several archaeological finds. The main ones for Impofu West being:

1) the exclusion of the previously undisturbed and archaeologically sensitive area west of Brandewynkop and stretching to the shoreline as indicated as a No-Go zone in Figures 3 and 5 has helped to reduce the visual and physical impact of the wind farm on this undisturbed portion of the pre-colonial cultural landscape (5 km wide coastal strip);
2) the exclusion of the area immediately east of the Tsitsikamma River (all proposed development is more than 2.5 km from the Tsitsikamma River) has resulted in a marked reduction in the potential direct impacts on archaeological resources and will also help to reduce the visual impact of wind turbines on the aesthetic value of the cultural landscape;
3) the avoidance of Stone Age quarry sites and associated low density Stone Age artefact scatters at **IW1**, **IW2** and **IW3** (Figure 7) has had the positive impact of preserving these heritage resources for Interested and Affected Parties (I&APs), future generations and scientists; and
4) the avoidance of *in situ* ESA and MSA materials in the quarry originally observed by Dr Almond at **IW7** (Figure 6) has had the positive impact of preserving these heritage resources for I&APs, future generations and scientists.

The No-Go option of the proposed project not being developed (i.e. the *status quo* remains) will involve continued low significance and/or unknown significance negative impacts due to natural processes and agricultural activities on archaeological resources, and because the proposed development impacts are considered to be low overall, can be controlled as well as monitored, then there is no preference of one over the other.

Existing and future wind farms in the area could have a significant negative cumulative impact on archaeological resources unless these were documented, mitigated or conserved according to their significance and to ensure that the impact on the archaeology of the area is minimised. Where appropriate, representative examples of the archaeological record must be conserved for I&APs, future generations, and scientists. Through the implementation of management and mitigation measures such as those presented below, the cumulative negative impact of wind farm developments on the archaeological record and cultural landscape is greatly reduced. The positive cumulative impact on heritage resources is that the impact assessments required for wind farm developments have greatly expanded our record and improved our understanding of archaeological material in the area and have provided an opportunity to conserve them for present and future generations. This is not possible if uncontrolled piecemeal developments as well as natural processes were to take place.

A further cumulative negative impact of wind turbines is on the aesthetic and visual value of the natural and cultural landscape. This and the potential impact on buried heritage

resources within the pre-colonial cultural landscape are the main negative cumulative impacts associated with the proposed development. Although the proposed Impofu West Wind Farm will be situated in an existing and growing renewable energy landscape with numerous wind turbines in the immediate surroundings, the elimination of turbines from the archaeological No-Go area shown in Figures 3 & 5, as well as the one kilometre long stretch immediately east of the Tsitsikamma River, has helped to reduce this negative impact. Furthermore, the below proposed archaeological monitoring in the pre-colonial cultural landscape during the construction phase will further assist in reducing potential negative impacts to heritage resources. There are positive and negative cumulative impacts as described above, but provided that management and mitigation measures are implemented, then the negative cumulative impacts are considered to be low.

Overall, from an archaeological standpoint, but provided that the recommended mitigation measures are implemented, there are no fatal flaws associated with the proposed latest Impofu West Wind Farm layout and the development will have a negligible impact on the archaeological value of the area. If the recommended mitigation measures are implemented, then negative impact to archaeological resources will be negligible and there is potential for positive impact. Without mitigation, negative impacts on archaeological resources will range from minor through moderate to major.

Therefore, provided that the below recommendations are implemented, there are no objections to the proposed Impofu West Wind Farm layout proceeding to the EIA phase of the application for Environmental Authorisation.

Recommendations made below should be included as conditions of authorisation and should form part of the Environmental Management Programme for the development.

Heritage Resources and Recommendations:

1. Historic period disused feeding or watering trough is of low significance and not conservation worthy (**IW4**). No further studies, mitigation or management measures are required. If necessary, the broken structure may be damaged or destroyed without a permit from ECPHRA.

2. Stone Age quarry at **IW5**: This is a good example of Stone Age quarrying and is considered to be of low to medium significance and given a field rating of Generally Protected C. The preparation of the hard stand and construction of proposed turbine WTG28W will not directly impact **IW5**, but because the site is in close proximity to development, it is recommended that it be enclosed with a temporary fence for the construction phase of development. Fencing should be a temporary standard 4 strand 1.2 m cattle fence with large clear “NO-GO AREA” signs attached from the top strand every 15 m. These measures must be supervised by an archaeologist and must be in place prior to the construction phase of the wind farm development. The temporary fencing should be removed after construction. It is recommended that no signage or fencing is used after construction as this may attract unwanted attention and possible damage to the archaeological occurrence. It was noted that the hard stand area for proposed turbine WTG28W, including surface and near-surface sediments, is already significantly transformed by agricultural activities and therefore archaeological monitoring of construction at this locality is not warranted.

3. LSA & MSA stone artefacts at the sand quarry (**IW6**) as well as the isolated combination hammer stone / grind stone / anvil found in the geotechnical test pit at the proposed turbine location WTG38W are considered to fall within the pre-colonial cultural

landscape along the 5km wide coastal strip: This part of the landscape in the southern part of the Impofu West Wind Farm is identified as an archaeologically sensitive area by, among others, Eastern Cape Heritage Consultants (Binneman & Reichert 2017), the Gamtkwa Khoisan Council (Gamtobakwa Khoisan Council 2017) and this author The proactive exclusion of wind farm development activities from the previously undisturbed No-Go area indicated in Figures 3 & 5, as well as the one kilometre long stretch immediately east of the Tsitsikamma River, has helped to reduce the visual impact on the pre-colonial cultural landscape. Because of the archaeological sensitivity of this area and to avoid or minimize negative impacts of construction on buried heritage resources, it is recommended that archaeological monitoring be undertaken in the area south of the dashed white line shown in Figures 6 & 9. Archaeological monitoring should be managed by a suitably qualified and accredited professional archaeologist during the construction phase of development.

4. Although the *in situ* ESA and MSA stone artefacts in the quarry at **IW7** are avoided by the latest Impofu West Wind Farm layout, it cannot be ruled out that higher densities of *in situ* ESA and MSA artefacts of medium to high significance lie buried in these ancient aeolian sediments. Therefore, it is recommended that the surrounding area of the Impofu West Wind Farm site within the dashed white ellipse shown in Figure 6 undergoes archaeological monitoring by a suitably qualified and accredited professional archaeologist during the construction phase.

5. The EMPr must include the requirement for archaeological monitoring in all areas identified as needing archaeological monitoring during construction. The contractor must supply the suitably accredited professional archaeologist that will oversee the monitoring with a construction programme at least 4 weeks before construction starts to ensure the monitoring can be properly planned.

6. A general overarching mitigation requirement is that before the 132kV overhead grid connection to the collector substation is constructed, a final micrositing walkthrough must be undertaken to ensure that any unforeseen impacts due to this line are mitigated by micrositing the power line route and pylon placements.

7. Archaeological induction should be performed, in tandem with environmental induction, by a professional and suitably experienced archaeologist prior to the construction phase of development to ensure that all persons working on the wind farm site are familiar with the types of heritage resources that may be exposed during construction and the necessary steps to follow in the event that archaeological resources are unearthed.

8. In the event that vegetation clearing and earthmoving activities expose archaeological or palaeontological resources, then such activities must stop immediately and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and/or the South African Heritage Resources Agency (SAHRA) must be notified immediately. These heritage resources are protected by Section 35(4) of the NHRA (Act 25 of 1999) and may not be damaged or disturbed in any way without a permit from the relevant heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned and completed before construction continues in the affected area and will be at the expense of the developer.

9. In the event of exposing human remains during construction, then the find should be protected from further disturbance and work in the immediate area should be halted. The find will fall into the domain of SAHRA and must be reported to them, and will require inspection by a professional archaeologist to undertake mitigation, if needed. Any disturbance to a human burial older than 60 years will require a permit in terms of Section 36 (3)(a). Graves and burial grounds are the property of the state and may require excavation

and curation in an approved institution. Any work associated with the find will also be at the cost of the developer.

8. References

ACO UCT. 2010. Environmental Impact Assessment for three proposed nuclear power station sites and associated infrastructure – Heritage Impact Assessment. Prepared for Arcus Gibb Engineering and Science, Johannesburg.

Almond, J. 2017. Palaeontological Heritage Screening Assessment. Impofu WEF near Humansdorp, Eastern Cape.

Almond, J.E. 2011a. Palaeontological Specialist Study: Desktop Assessment. Proposed Oyster Bay Wind Energy Facility near Humansdorp, Kouga Local Municipality, Eastern Cape.

Almond, J.E. 2011b. Palaeontological Specialist Study: Desktop Assessment. Proposed Tsitsikamma Community Wind Energy Facility near Humansdorp, Kouga Local Municipality, Eastern Cape.

Anderson, G. 2010. Heritage Survey of the Proposed Melkhout-Oyster Bay Transmission Line for Coastal Environmental Services.

Anderson, G. 2011. Heritage Survey of the Proposed 66 kV Line between St Francis and Red Cap Kouga Wind Farm, Eastern Cape for Coastal & Environmental Services.

Binneman, J.N.F. 1996. The symbolic construction of communities during the Holocene Later Stone Age in the south-eastern Cape. Unpublished D.Phil. thesis: University of the Witwatersrand.

Binneman, J. 2010a. Archaeological Desktop Study for the Proposed Oyster Bay Wind Energy Facility, Local Kouga Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2010b. A Phase 1 Archaeological Heritage Impact Assessment for the Proposed Deep River Wind Energy Project, Kouga Municipality, District of Humansdorp, Eastern Cape Province.

Binneman, J. 2011a. An Archaeological Desktop Study for the Construction of the Proposed Tsitsikamma Community Wind Energy Facility, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2011b. A Phase 1 Archaeological Impact Assessment for the Proposed Oyster Bay Wind Energy Facility, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2011c. A Phase 1 Archaeological Impact Assessment for the Proposed Tsitsikamma Community Wind Energy Facility, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2011d. A Phase 1 Archaeological Heritage Impact Assessment for the Proposed Happy Valley Wind Energy Facility near Humansdorp, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2012a. A Phase 1 Archaeological Impact Assessment for the Proposed 132kV Power Line Linking the Tsitsikamma Community Wind Energy Facility to the Proposed

Extension of the Dieprivier Substation, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Binneman, J. 2012b. Archaeological Impact Assessment for the proposed Banna Ba Pifhu Wind Energy Project near Humansdorp, Eastern Cape: Chapter 11 of the April 2012 CSIR Draft Environmental Impact Assessment Report.

Binneman, J. 2013a. A Letter of Recommendation (With Conditions) for the Exemption of a Full Phase 1 Archaeological Heritage Impact Assessment for the Proposed Mining of Gravel on Portion 2 of The Farm Klein River No. 713, Kouga Local Municipality, Humansdorp Division, Eastern Cape Province.

Binneman, J. 2013b. A Letter of Recommendation (With Conditions) for the Exemption of a Full Phase 1 Archaeological Heritage Impact Assessment for the Proposed Mining of Gravel on Portion 8 of The Farm Klein River No. 713, Kouga Local Municipality, Humansdorp Division, Eastern Cape Province.

Binneman, J. 2013c. A Letter of Recommendation (With Conditions) for the Exemption of a Full Phase 1 Archaeological Heritage Impact Assessment for the Proposed Mining of Shale on Portion 21 of The Farm Elandsjagt No. 687, Kouga Local Municipality, Humansdorp Division, Eastern Cape Province.

Binneman, J and Reichert, K. 2015. An Archaeological Walkthrough Survey of the Proposed 132kv Power Line Route from the Melkhout Substation to the Dieprivier Substation Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

Binneman, J and Reichert, K. 2017. An Archaeological Desktop Study For The Proposed Impofu Wind Energy Facility Near Oyster Bay In The Kouga Local Municipality And Potential Power Line Routes To The Grassridge Substation Northeast Of Port Elizabeth, Eastern Cape Province.

Brink, J.S. 2015. Field inspection of a palaeontological discovery on the Gibson Bay Wind Farm, Eastern Cape Province. National Museum, Bloemfontein.

Deacon, H.J and V. B. Geleijnse, 1988 The Stratigraphy and Sedimentology of the Main Site Sequence, Klasies River, South Africa. The South African Archaeological Bulletin, Vol. 43, No. 147, pp. 5-14.

DEA&DP, 2005. Guidelines for Involving Specialists in EIA Processes.

De Klerk, W.J. 2010. Palaeontological Heritage Impact Assessment of the proposed wind farms in the coastal region of the Kouga Local Municipality near the villages of Oyster Bay and St Francis Bay. Assessment conducted in terms of Section 38 (8) of the National Heritage Resources Act (Act 25 of 1999). Prepared for: Arcus GIBB, Engineering & Science

Du Plessis, L. 2011. Visual Impact Assessment for the Proposed Happy Valley Wind Energy Facility on a site near Humansdorp, Eastern Cape Province. Prepared for Renewable Energy Investments South Africa, by MetroGIS (Pty) Ltd.

EC PHRA, Mokhanya, S. 2013. The HIA Review Comment for the Proposed Mining of Gravel on Portions 2 and 8 of The Farm Klein River No. 713, Kouga Local Municipality, and Mining of Shale on Portion 21 of The Farm Elandsjagt No. 687, Kouga Local Municipality, Humansdorp Division, Eastern Cape Province.

Gamtobakwa Khoisan Council, 2017. Letter addressed to Eastern Cape Heritage Consultants cc, dated 21 July 2017 with the subject: Draft Archaeological Desktop Study: Proposed Impofu Wind Farms and Grid.

Heritage Western Cape (HWC), 2007 (draft). Minimum Standards for Phase 1 Archaeological Impact Assessment (AIA) Reports.

Heritage Western Cape (HWC), 2016a. Guide For Minimum Standards For Archaeology And Palaeontology Reports Submitted To Heritage Western Cape.

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

Kaplan, J. 2016. Archaeological Impact Assessment: Proposed 66 Kv Overhead Line Servitudes and Substations Jeffreys Bay, Eastern Cape.

Nilssen, P. 2003. Proposed St. Francis Golf Estate. Phase 1 Heritage Impact Assessment. Final Report.

Nilssen, P. 2010. St Francis Links - Golf Estate. Phase 2 Archaeological Mitigation. Preliminary report prepared for WBHO, and the South African Heritage Resources Agency (SAHRA permit No. 80/04/08/032/51)

Nilssen, P. 2013. Heritage / Archaeological Impact Assessment - Proposed Gibson Bay Wind Farm Grid Connection, Kou-Kamma and Kouga Local Municipalities, Humansdorp District, Eastern Cape Province

Nilssen, P. 2014. Final Revised Heritage / Archaeological Impact Assessment – Including Alternative 3. Proposed Gibson Bay Wind Farm Grid Connection, Kou - Kamma and Kouga Local Municipalities, Humansdorp District, Eastern Cape Province.

Nilssen, P. 2015. Archaeological Micro-Siting of Wind Turbine, Site Camp, Lay-down and Substation Localities. Oyster Bay Wind Farm, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Nilssen, P. 2016. Final Report - Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 22 April 2015 - 31 May 2016.

Nilssen, P. And Smith, P. 2015. Notification: Discovery and Rescue Collection of Fossil Bearing Deposit at Gibson Bay Wind Farm, Eastern Cape Province.

Patrick, M. 2012. Khoisan Heritage Resources Associated with the Thyspunt Transmission Lines Integration Project.

SAHRA APM, 2007. Guidelines: Minimum Standards for Archaeological & Palaeontological Components of Impact Assessment Reports.

SAHRA APM, 2010. Review comments on the Environmental Impact Assessment for three proposed nuclear power station sites and associated infrastructure: Heritage Impact Assessment: Archaeological Component.

SAHRA APM, 2012. Compliance to SAHRA Minimum Standards for Phase 1 Archaeological Impact Assessments.

SAHRA, 2017. Minutes of the Heritage Impact Assessment Workshop Held on the 23 October 2017 from 09h00 -17h00, at The Castle Of Good Hope Boardroom, Cape Town.

SAHRA APM, 2018. Compliance to SAHRA Minimum Standards, SAHRIS Requirements and Section 38 of the NHRA.

UNESCO, 2008. Operational guidelines for the implementation of the World Heritage Convention, 2008.

Van Ryneveld, K. 2010. Cultural Heritage Impact Assessment: Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa. Prepared for Arcus Gibb Engineering and Science and the South African Heritage Resources Agency – SAHRA, APM Unit.

Van Ryneveld, K. 2013. Phase 1b Archaeological Monitoring; The Melkhout – Oyster Bay Power Line: Phase 1b, Humansdorp District, Eastern Cape, South Africa.

Webley, L. 2003. Maitland River Mouth Strategic Environmental Assessment – Phase 1 Heritage Impact Assessment.

9. **Figures and Plates** (on following pages)

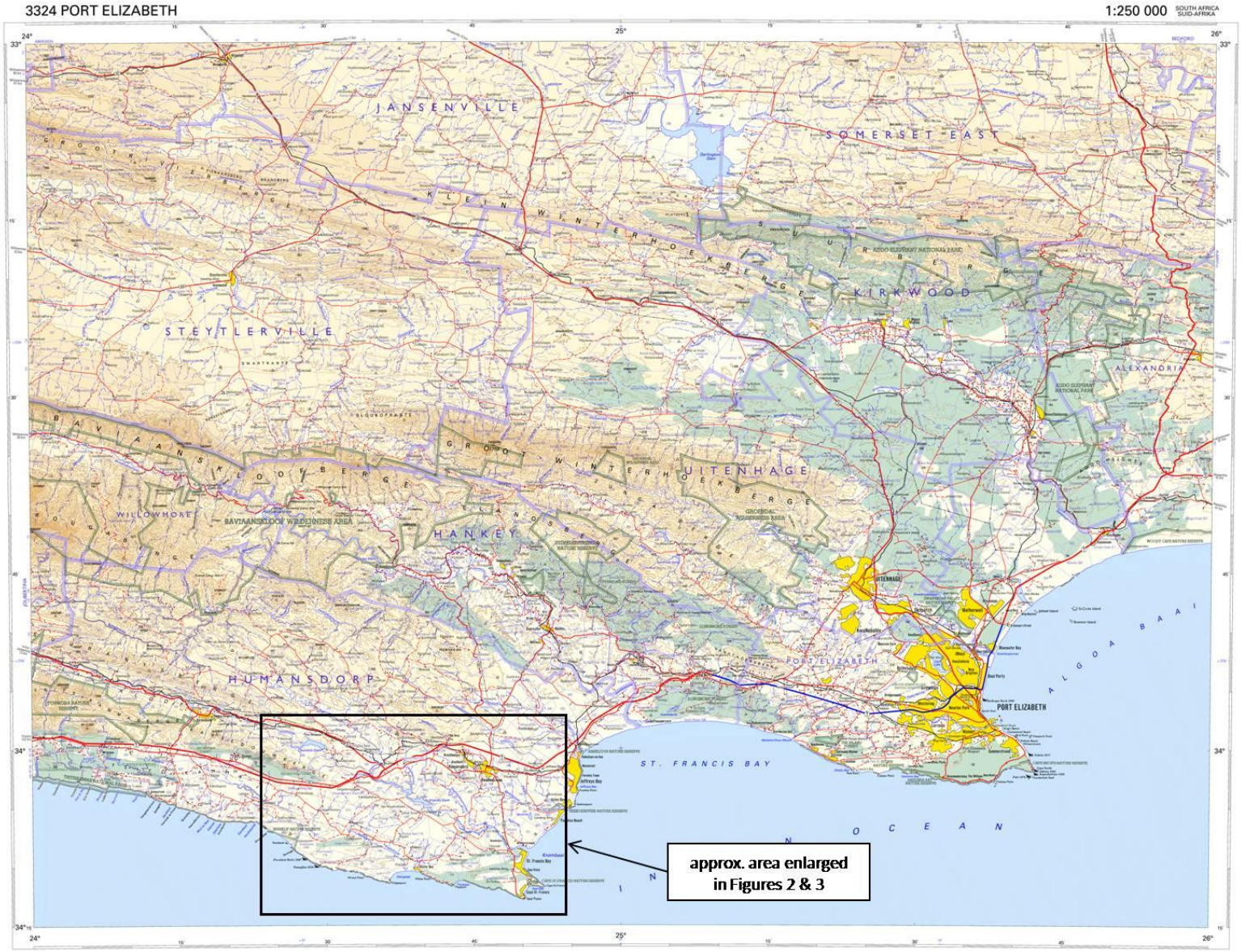

Figure 1. General location of the larger study area west of Port Elizabeth, Eastern Cape Province. Map – 3324 Port Elizabeth 1:250 000 - courtesy of The Chief Directorate, Surveys & Mapping, Mowbray.

Figure 2. Approximate area enlarged from Figure 1 showing the Impofu Wind Farms boundary (white) and archaeologically sensitive areas south of blue lines. Courtesy of Red Cap, Aurecon and Google Earth 2018.

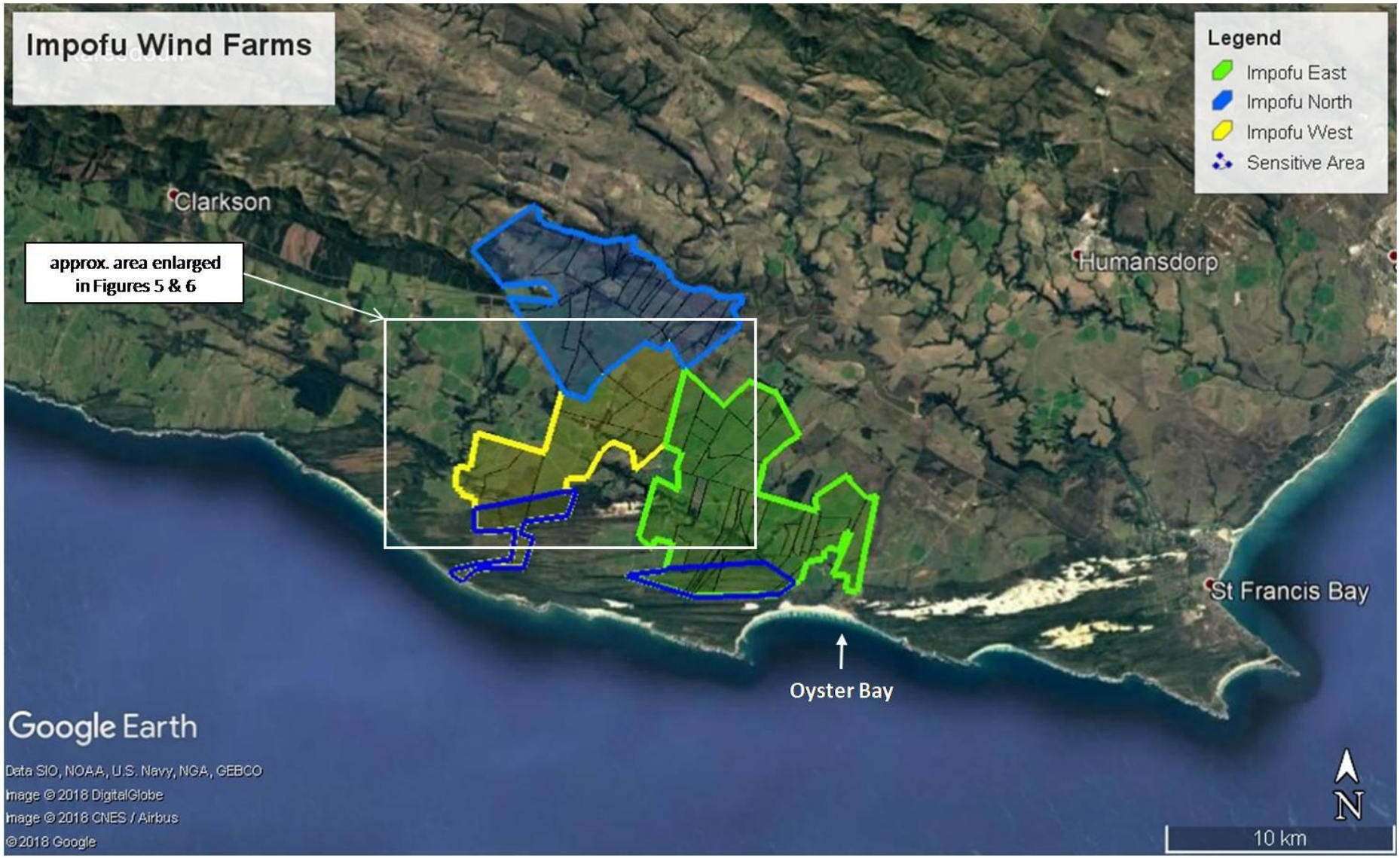

Figure 3. Approximate area enlarged from Figure 1 showing the latest preliminary boundaries for the three Impofu Wind Farms. Known archaeologically sensitive parts of Impofu West and Impofu East are indicated by blue polygons. Courtesy of Red Cap, Aurecon and Google Earth 2018.

Figure 4. The proposed Impofu Wind Farms site (white polygon) relative to the existing wind farms of Tsitsikamma Community, Gibson Bay, Kouga and Jeffreys Bay. Construction of the Oyster Bay Wind Farm will commence shortly, while Ubuntu and Banna Ba Pifhu have a valid EA. Courtesy of Red Cap, Aurecon and Google Earth 2018.

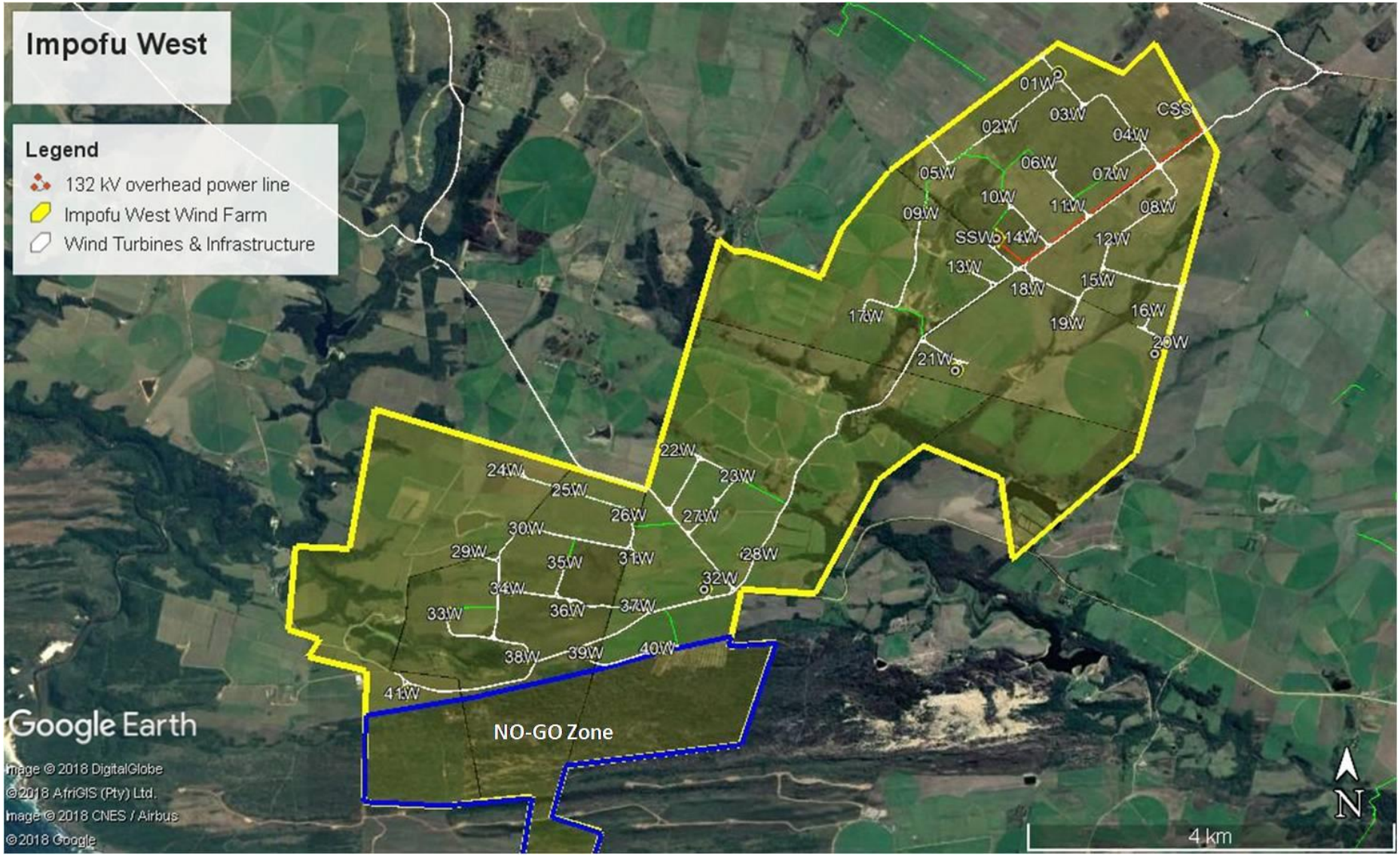

Figure 5. Area enlarged from Figure 3 showing the latest (March 2018) **Impofu West Wind Farm** layout showing wind turbine and sub-station sites (labelled markers), roads and cables (white lines) and off-road cables (green lines), and the archaeological No-Go Zone (blue polygon). Courtesy of Red Cap, Aurecon and Google Earth 2018.

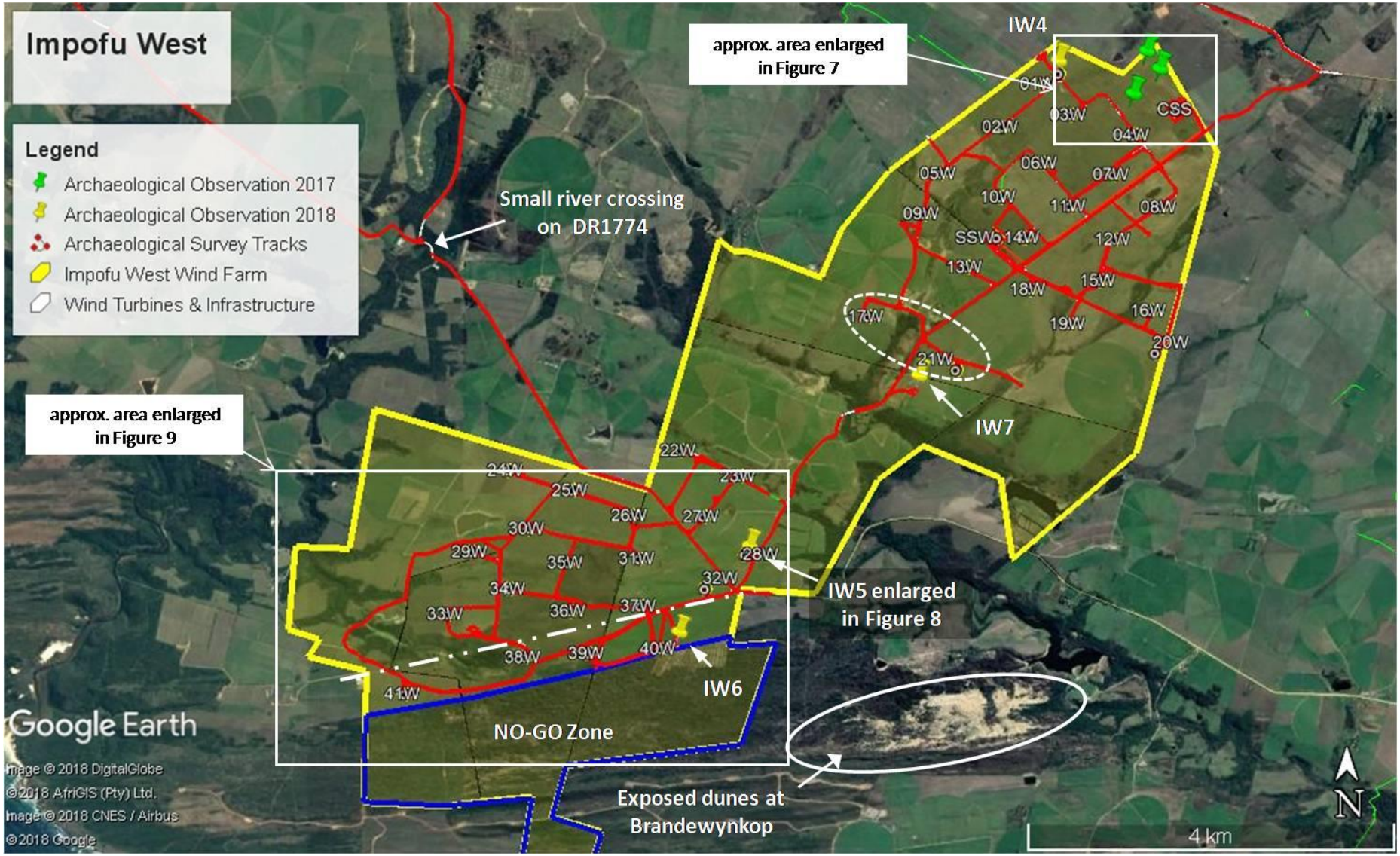

Figure 6. Area enlarged from Figure 3 showing the latest Impofu West Wind Farm layout with an overlay of the archaeological survey tracks and observations from the 2017 and 2018 fieldwork seasons. Archaeological monitoring during construction is recommended for the area south of the dashed white line and within the white ellipse (dashed line). Courtesy of Red Cap, Aurecon and Google Earth 2018.

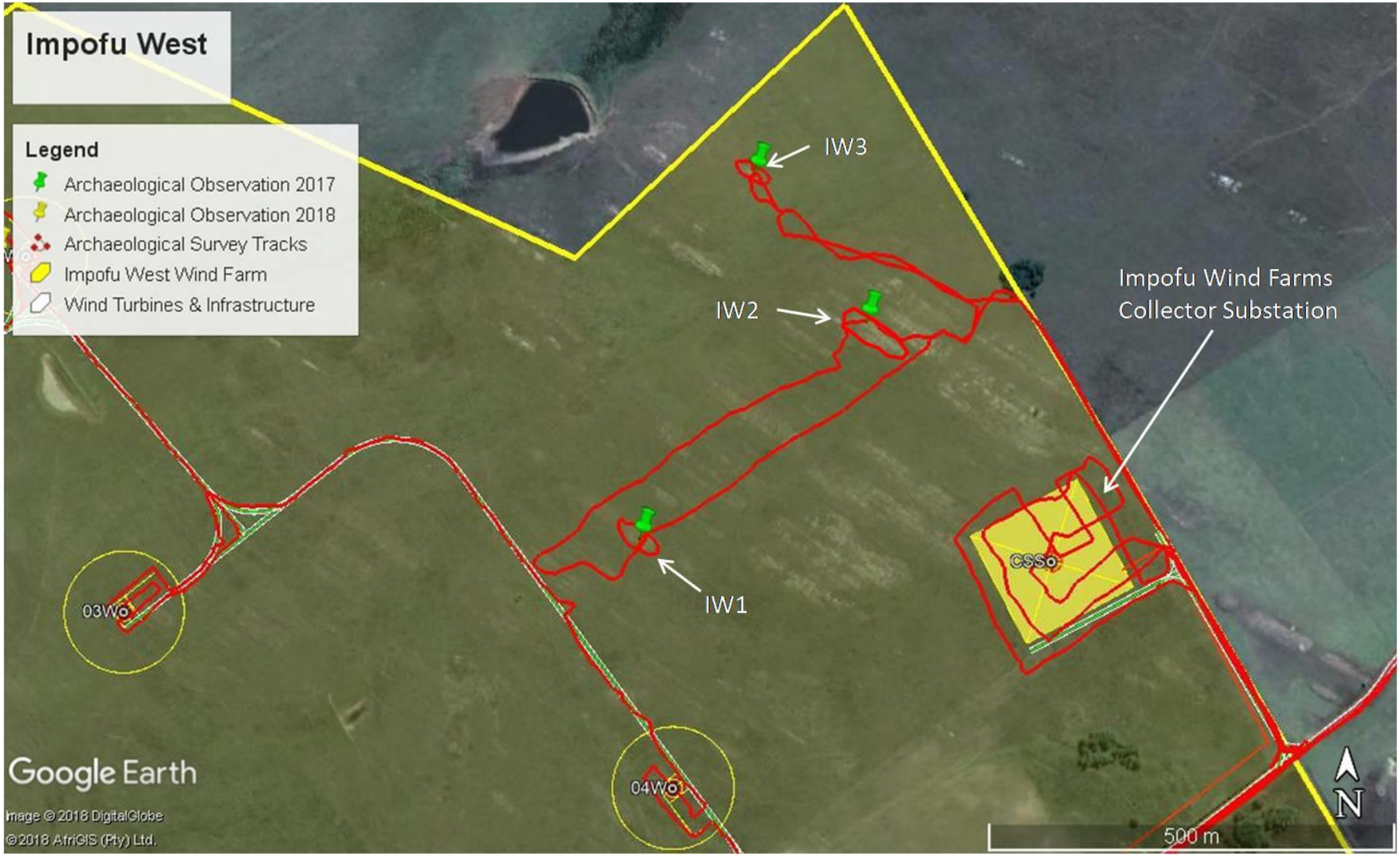

Figure 7. Area enlarged from Figure 6 showing the latest (March 2018) Impofu West Wind Farm layout with an overlay of archaeological survey tracks and archaeological finds. Note that **IW1, 2 & 3** are avoided in the latest development layout.

Figure 8. Area enlarged from Figure 6 showing Stone Age quarry site at **IW5** relative to proposed turbine location WTG28W. Dashed red and orange line indicates buffer around **IW5** and the proposed placement of the temporary fence during the construction phase of development. Courtesy of Red Cap and Google Earth 2018.

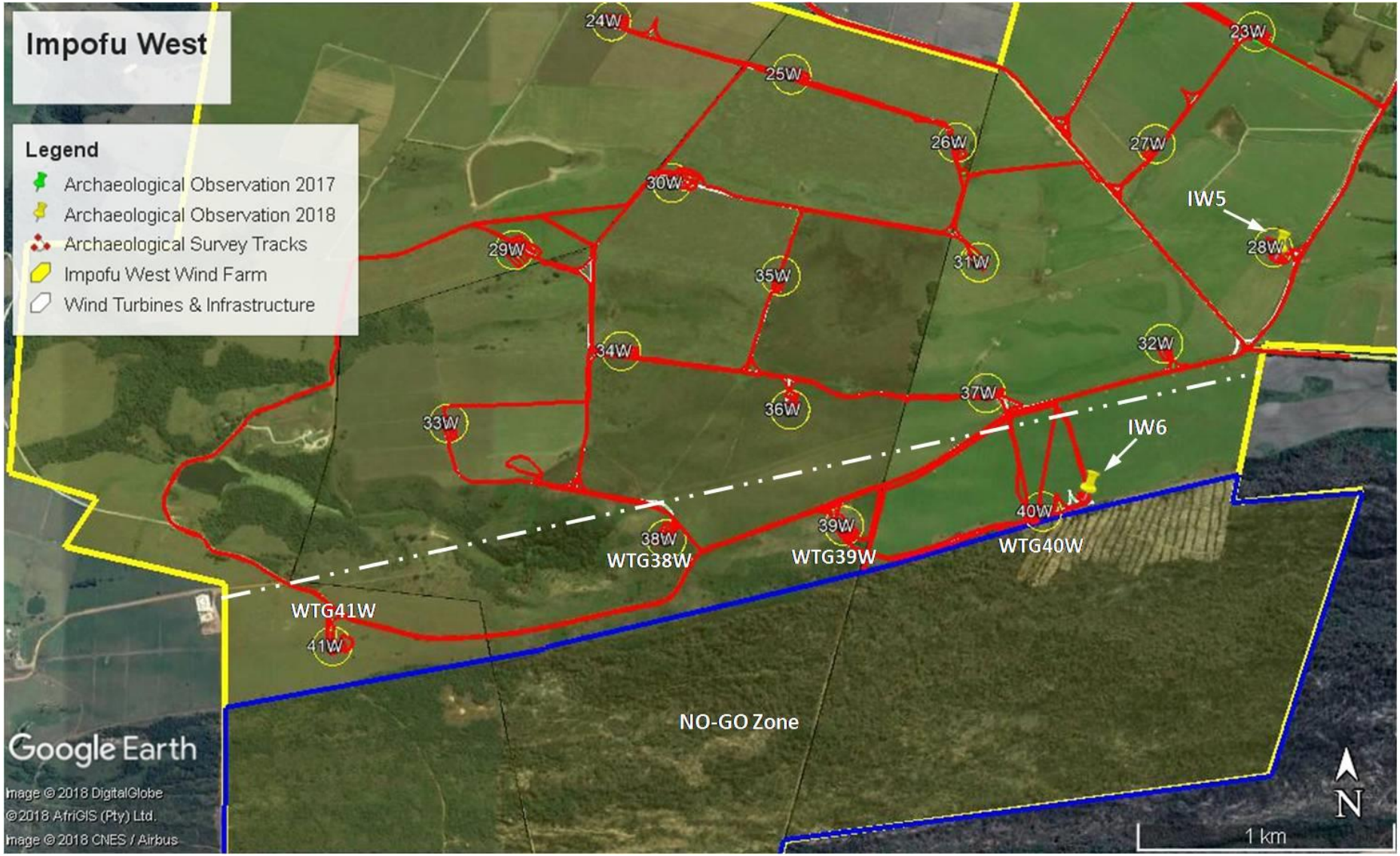

Figure 9. Area enlarged from Figure 6 showing the locality of wind turbine sites where geotechnical test pits were excavated (WTG38, 39, 40 & 41W; see Plates 16 & 17). Blue line denotes the northern portion of the archaeological No-Go zone. Courtesy of Red Cap and Google Earth 2018.

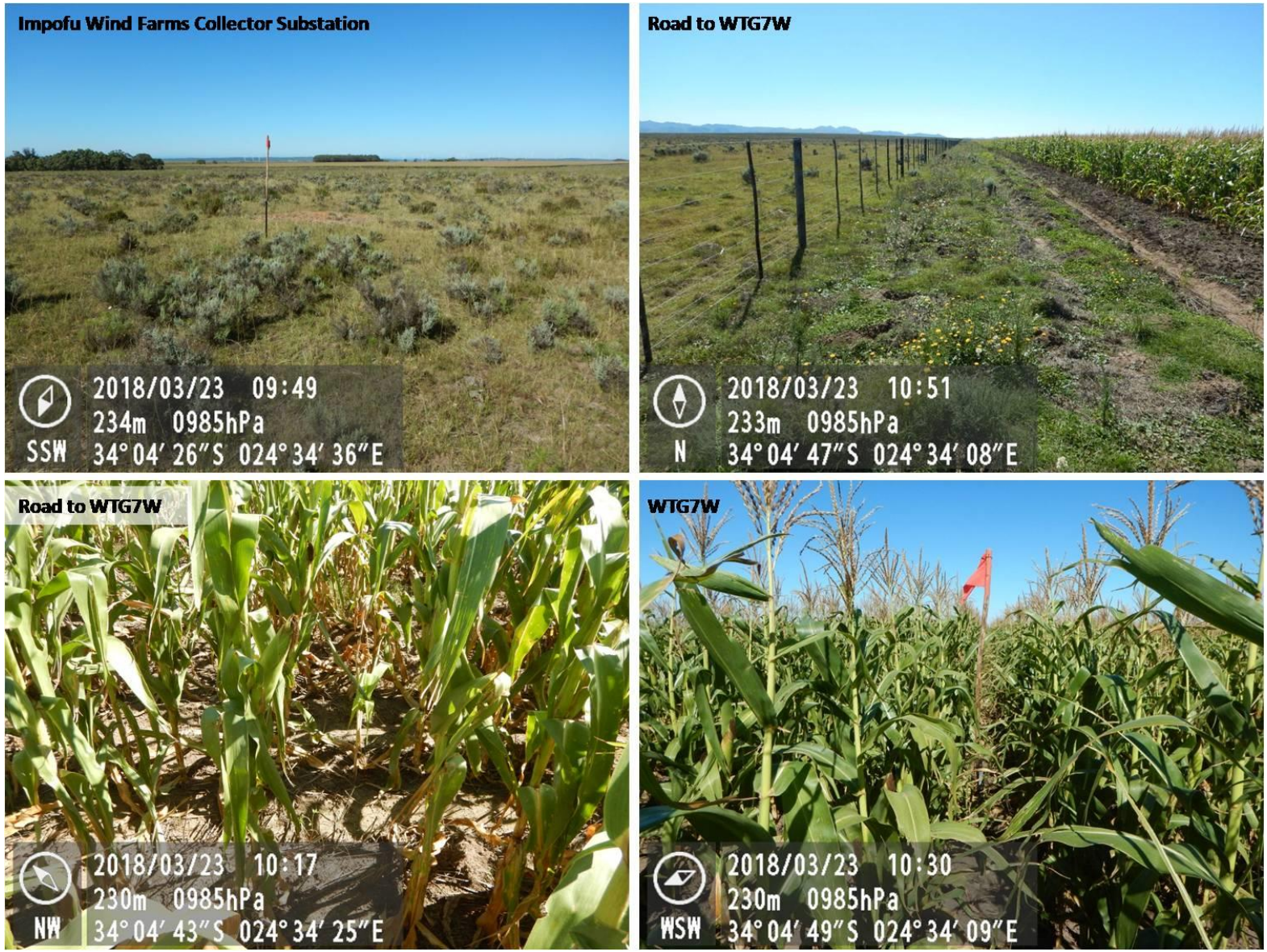

Plate 1. Examples of the receiving environment showing topography, vegetation cover, existing disturbances and agricultural lands. Pegged markers are the centre points of wind turbine sites.

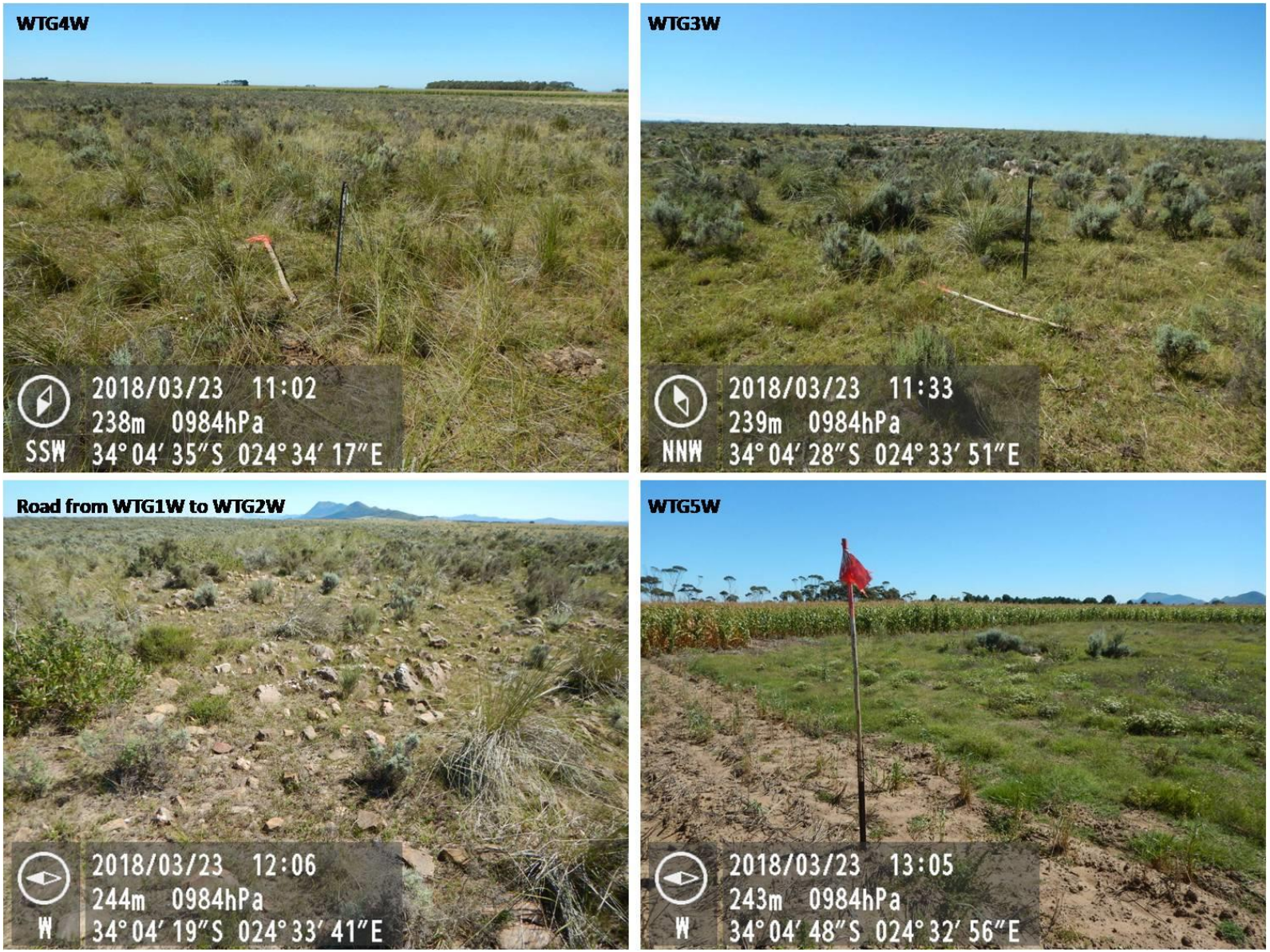

Plate 2. Examples of the affected environment showing flat to slightly undulating landscape, vegetation cover, exposed surfaces and agricultural lands. Pegged markers are the centre points of wind turbine sites.

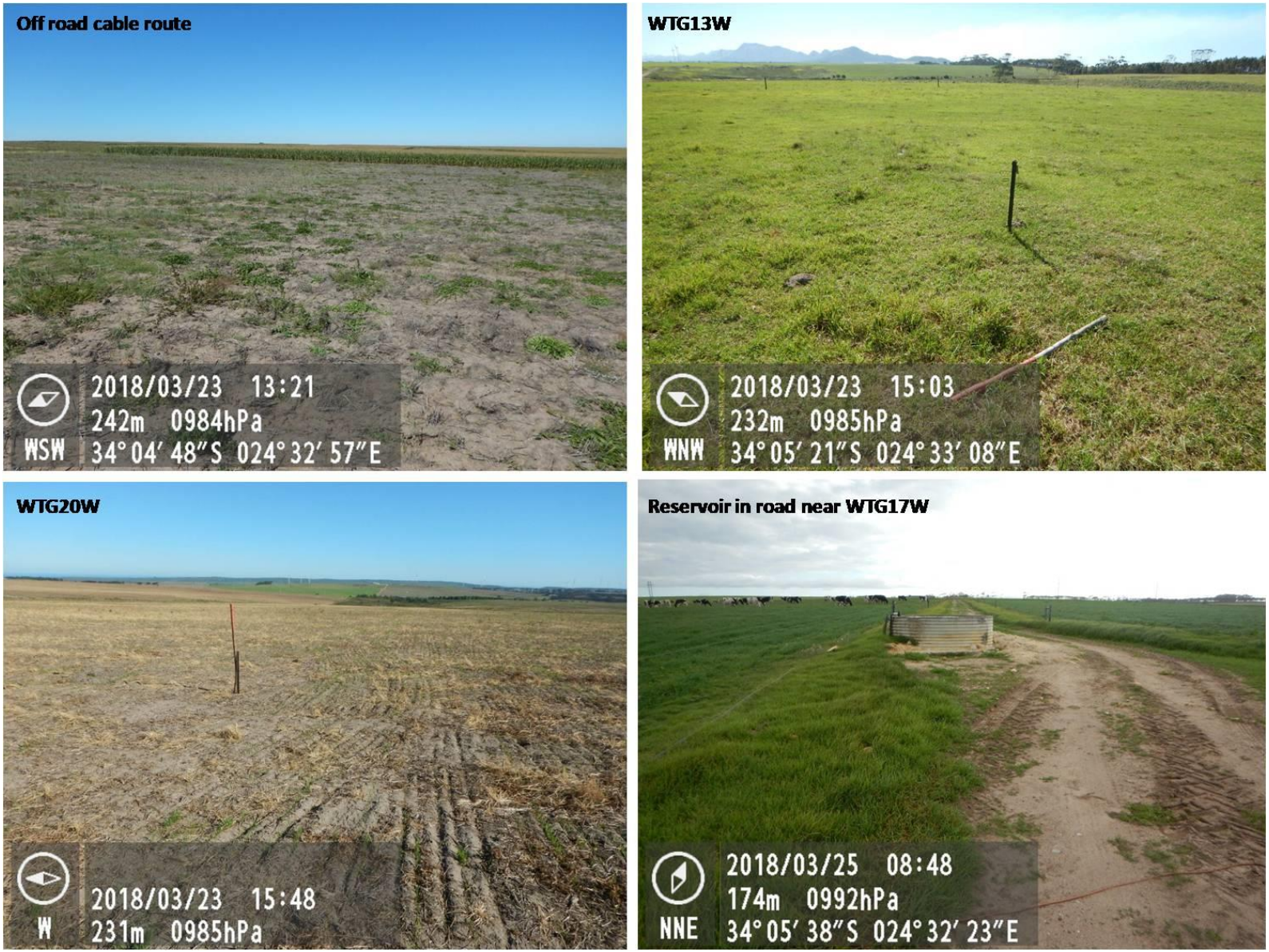

Plate 3. Examples of the affected environment showing topography, harvested and cleared fields, vegetation cover, exposed surfaces and existing disturbances. Pegged markers are the centre points of wind turbine sites.

Plate 4. Examples of the affected environment showing exposed ancient aeolian sands (top L), gently undulating landscape, vegetation cover and agricultural lands. Pegged markers are the centre points of wind turbine sites.

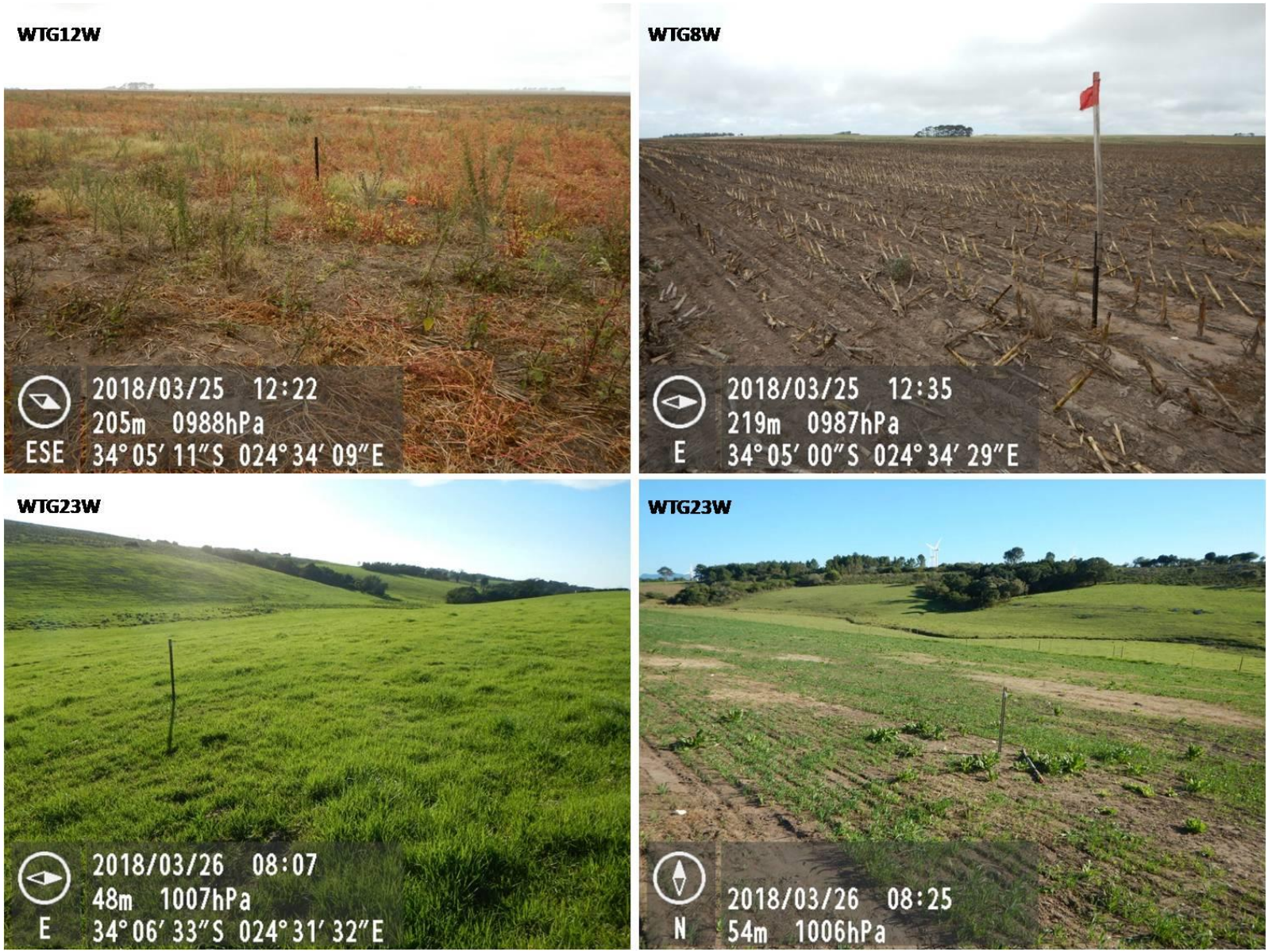

Plate 5. Examples of the affected environment showing topography, harvested and cleared agricultural lands, exposed surfaces and vegetation cover. Pegged markers are the centre points of wind turbine sites.

Plate 6. Examples of the affected environment showing existing disturbances, topography and vegetation cover. Pegged markers are the centre points of wind turbine sites.

Plate 7. Examples of the affected environment showing dense vegetation cover, exposed surfaces and topography. Pegged markers are the centre points of wind turbine sites.

Plate 8. Examples of the geological profiles and *in situ* Early and Middle Stone Age implements at the quarry sites identified by Dr Almond. Ellipses enclose *in situ* stone artefacts and non-archaeological rocks bedded in ferricritised aeolian sands. Typical, crude bifacial ESA hand axe in quartzite (top R). Scales: ruler = 15cm long and geological hammer = 30cm long. (images courtesy of Dr Almond and also see Almond 2017).

Plate 9. Context and finds at **IW1** showing quartzite outcrops, heavily weathered and patinated ESA bifacial core or crude hand axe (top R) and large hammer stone with heavily pecked and damaged end (bottom R).

Plate 10. Context and finds at **IW2** showing rocky outcrop, flaked quartzite (top R), flake (bottom L) and retouched and notched adze (bottom R).

Plate 11. Context of Stone Age quarry at **IW3** showing quartzite outcrop and flake scares as indicated by fingers and arrows. Note lichen growth on flake scars (top R). GPS is 10cm long.

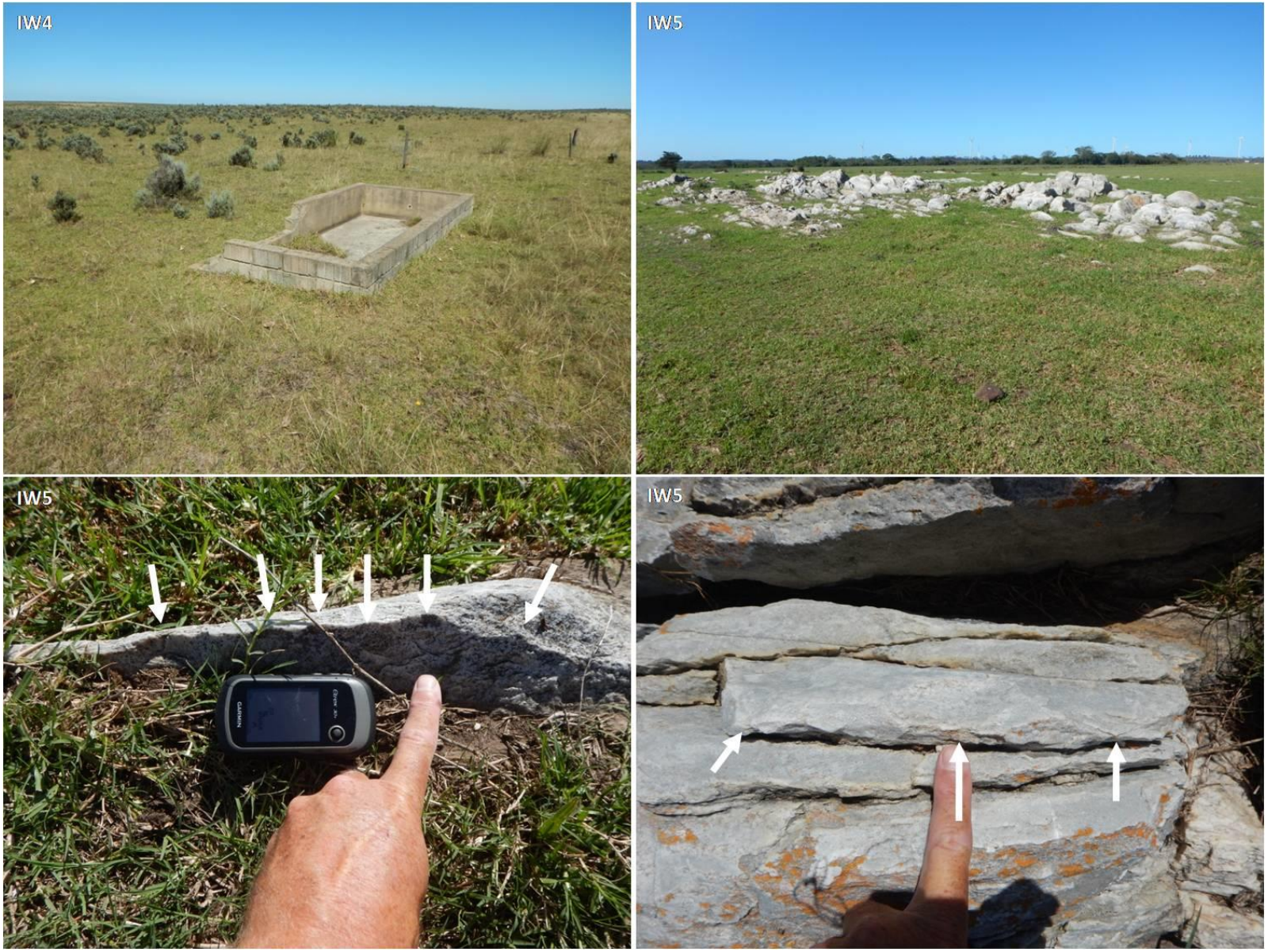

Plate 12. Historic period feed or water trough (top L) about 1m wide and 2m long. Stone Age quarry at **IW5** showing quartzite outcrop (top R) and flake scars indicated with fingers and arrows. GPS unit is 10cm long.

Plate 13. Top images show flake scars at **IW5** and bottom images show context of sand quarry at **IW6** (L) with a collection of unmodified stones and stone artefacts (R). Scale is in cm.

Plate 14. The quarry with *in situ* Stone Age material at **IW7**. Note quartzite flake of likely MSA origin (top inset) and quartzite flake of likely ESA origin (bottom inset).

Plate 15. *In situ* unmodified stone (to right of GPS unit) and *in situ* MSA flake (bottom R) in ancient aeolian sediments in the exposed profile of the quarry at **IW7**. Scale bar at left is one meter long and the GPS unit is 10cm long.

Plate 16. Geotechnical excavations in progress at the proposed location of WTG38W (pegged marker) (top L). Exposed profile to a depth of 4.2 m (Right). Combination hammer stone, anvil and grind stone with cemented sands and anvil-related pecking damage indicated by the ellipses (bottom L). Apart from this artefact, no other materials or anthropogenic strata were seen.

Plate 17. Geotechnical test pits at WTG39, 40 and 41W. Excavations are between 4 and 5 m deep. No archaeological traces or anthropogenic layers were seen.

Appendix A

Legislation regarding the general protection of heritage resources taken from the National Heritage Resources Act (Act 25 of 1999)

Provisional protection

29. (1) SAHRA, or a provincial heritage resources authority, may, subject to subsection (4), by notice in the Gazette or the Provincial Gazette, as the case may be—

(a) provisionally protect for a maximum period of two years any—

(i) protected area;

(ii) heritage resource, the conservation of which it considers to be threatened and which threat it believes can be alleviated by negotiation and consultation; or

(iii) heritage resource, the protection of which SAHRA or the provincial heritage resources authority wishes to investigate in terms of this Act; and

(b) withdraw any notice published under paragraph (a).

(2) A local authority may, subject to subsection (4), by notice in the Provincial Gazette—

(a) provisionally protect for a maximum period of three months any place which it considers to be conservation-worthy, the conservation of which the local authority considers to be threatened and which threat it believes can be alleviated by negotiation and consultation; and

(b) withdraw any notice published under paragraph (a): Provided that it notifies the provincial heritage resources authority within seven days of such provisional protection.

(3) A provincial heritage resources authority may, by notice in the Provincial Gazette, revoke a provisional protection by a local authority under subsection (2) or provisionally protect a place concerned in accordance with subsection (1).

(4) A heritage resources authority or a local authority may not provisionally protect any heritage resource unless it has notified the owner of the resource in writing of the proposed provisional protection.

(5) A heritage resource shall be deemed to be provisionally protected for 30 days from the date of service of a notice under subsection (4) or until the notice is withdrawn or the resource is provisionally protected by notice in the Gazette or the Provincial Gazette, whichever is the shorter period.

(6) A heritage authority or a local authority may at any time withdraw a notice which it has issued under subsection (4).

(7) SAHRA shall inform the relevant provincial heritage authority and local authority within 30 days of the publication or withdrawal of a notice under subsection (1).

(8) A provincial heritage resources authority shall inform the relevant local authority within 30 days of the publication or withdrawal of a notice under subsection (1).

(9) A local authority shall inform the provincial heritage authority of the withdrawal of a notice under subsection (2)(b).

(10) No person may damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of a provisionally protected place or object without a permit issued by a heritage resources authority or local authority responsible for the provisional protection.

Legislation relevant to Heritage Areas taken from the National Heritage Resources Act (Act 25 of 1999)

Heritage areas

31. (1) A planning authority must at the time of revision of a town or regional planning scheme, or the compilation or revision of a spatial plan, or at the initiative of the provincial heritage resources authority where in the opinion of the provincial heritage resources authority the need exists, investigate the need for the designation of heritage areas to protect any place of environmental or cultural interest.

(2) Where the provincial heritage resources authority is of the opinion that the need exists to protect a place of environmental or cultural interest as a heritage area, it may request a planning authority to investigate its designation in accordance with proposals submitted by the provincial heritage resources authority with its request. The planning authority must inform the provincial heritage resources authority within 60 days of receipt of such a request whether it is willing or able to comply with the request.

(3) Where the planning authority informs the provincial heritage resources authority that it is willing and able, the provincial heritage resources authority must assist the planning authority to investigate the designation of the place as a heritage area.

(4) Where the planning authority does not so inform the provincial heritage resources authority, or informs the provincial heritage resources authority that it is not so willing and able, the provincial heritage resources authority may investigate the designation of the place as a heritage area and, with the approval of the MEC, designate such place to be a heritage area by notice in the Provincial Gazette.

(5) A local authority may, by notice in the Provincial Gazette, designate any area or land to be a heritage area on the grounds of its environmental or cultural interest or the presence of heritage resources, provided that prior to such designation it shall consult—

(a) the provincial heritage resources authority; and

(b) owners of property in the area and any affected community, regarding inter alia the provisions to be established under subsection (7) for the protection of the area.

(6) The MEC may, after consultation with the MEC responsible for local government, publish regulations setting out the process of consultation referred to in subsection (5).

(7) A local authority must provide for the protection of a heritage area through the provisions of its planning scheme or by-laws under this Act, provided that any such protective provisions shall be jointly approved by the provincial heritage resources authority, the provincial planning authority and the local authority, and provided further that—

(a) the special consent of the local authority shall be required for any alteration or development affecting a heritage area;

(b) in assessing an application under paragraph (a) the local authority must consider the significance of the area and how this could be affected by the proposed alteration or development; and

(c) in the event of any alteration or development being undertaken in a heritage area without the consent of the local authority, it shall have the power to require the owner to stop such work instantly and restore the site to its previous condition within a specified period. If the owner fails to comply with the requirements of the local authority, the local authority shall have the right to carry out such restoration work itself and recover the cost thereof from the owner.

(8) A local authority may erect signage indicating its status at or near a heritage area.

(9) Particular places within a heritage area may, in addition to the general provisions governing the area, be afforded further protection in terms of this Act or other heritage legislation.

Legislation relevant to archaeology and palaeontology taken from the National Heritage Resources Act (Act 25 of 1999)

Archaeology, palaeontology and meteorites

35. (1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) 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.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

(c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and

(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

(6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or a meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

(7) (a) Within a period of two years from the commencement of this Act, any person in possession of any archaeological or palaeontological material or object or any meteorite which was acquired other than in terms of a permit issued in terms of this Act, equivalent provincial legislation or the National Monuments Act, 1969 (Act No. 28 of 1969), must lodge with the responsible heritage resources authority lists of such objects and other information prescribed by that authority. Any such object which is not listed within the prescribed period shall be deemed to have been recovered after the date on which this Act came into effect.

(b) Paragraph (a) does not apply to any public museum or university.

(c) The responsible authority may at its discretion, by notice in the Gazette or the Provincial Gazette, as the case may be, exempt any institution from the requirements of paragraph (a) subject to such conditions as may be specified in the notice, and may by similar notice withdraw or amend such exemption.

(8) An object or collection listed under subsection (7)—

(a) remains in the ownership of the possessor for the duration of his or her lifetime, and SAHRA must be notified who the successor is; and

(b) must be regularly monitored in accordance with regulations by the responsible heritage authority.

Legislation relevant to burial grounds and graves taken from the National Heritage Resources Act (Act 25 of 1999)

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

Legislation relevant to the proposed activity under consideration taken from the National Heritage Resources Act (Act 25 of 1999)

Heritage resources management

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 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(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.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

(a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

(b) notify the person concerned that this section does not apply.

(3) 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:

(a) The identification and mapping of all heritage resources in the area affected;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(c) an assessment of the impact of the development on such heritage resources;

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

(a) whether or not the development may proceed;

(b) any limitations or conditions to be applied to the development;

(c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

(d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

(e) whether the appointment of specialists is required as a condition of approval of the proposal.