A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS OF THE PROPOSED WESLEY – PEDDIE 132 KV POWER LINE FOR THE AUTHORISED UNCEDO LWETHU WIND ENERGY FACILITY, NGQUSHWA LOCAL MUNICIPALITY, AMATHOLE DISTRICT, EASTERN CAPE PROVINCE.

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BRIEF SUMMARY/OVERVIEW

Background

Savannah Environmental (Pty) Ltd on behalf of Just Energy South Africa appointed Eastern Cape Heritage Consultants to conduct a Phase 1 Archaeological Assessments for the proposed project. Just Energy South Africa is proposing the construction of the new Wesley-Peddie 132KV power line between the Eskom Wesley Substation and the Eskom Peddie Substation to connect the authorized Uncedo Lwethu Wind Energy Facility to the Eskom grid (Maps 1-2). Two comprehensive archaeological impact assessments and reports have been compiled for the River Bank Wind Energy Facility (Binneman, Booth (author) and Higgitt 2010) and the Canyon Springs Wind and Solar Facility (Booth 2011) at Wesley. All background information is included in these reports and will not be repeated here in any detail.

Purpose of the Study

The purpose of the study was to conduct an Phase 1 Archaeological Impact Assessment of the proposed 132KV power line route from the Uncedo Lwethu Wind Energy Facility to the Eskom Peddie Substation near Peddie, Ngqushwa Local Municipality, Amathole Municipal District, Eastern Cape Province, in order to establish;

- the range and importance of possible exposed and *in situ* heritage remains and features within the servitude of the proposed development,
- the potential impact of the development on these heritage resources,
- to make recommendations to minimize possible damage to these heritage sites/materials,

The location of the power line

The proposed power line route is located within the 1:50 000 topographic reference maps 3327AD Hamburg, 3327AB Cross roads and 3327AA Peddie (Maps 1-2). It is situated in the Ngqushwa Local Municipality of the Amathole District Municipality of the Eastern Cape Province. The power line starts on the farm Sandflat 149 in the north-western corner of the proposed Phase 1 Riverbank Wind Energy Facility north-east of the small settlement of Wesley (Maps 1-3). From there it follows the high ground past several small settlements in a north-westerly direction for approximately 30 kilometres to the Peddie Substation which is located about 3,6 kilometres north of Peddie (Map 1, 2 and 7).

The general landscape in the southern coastal area and near the Peddie Substation comprises a gentle undulating hill landscape with open valley drainage systems/lines. The hills are well covered by dense grass and patches of small, low shrubs and stands of *Acacia karroo* trees. The drainage lines are well covered by dense thicket vegetation. The remainder, and also the longest part of the power line route, runs though a hilly landscape deeply incised by the Bira and Gqutywa Rivers. The valleys have steep gradients and are well covered by dense thicket vegetation.

The majority of the power line route traverses through communal owned farm land used for the cultivation of subsistence crops and for grazing of livestock.

Type of development

Just Energy South Africa is proposing the construction of a new 132KV overhead power line of approximately 30 kilometres in length between the Eskom Wesley Substation and the Eskom Peddie Substation. The proposed power line will connect the authorized Uncedo Lwethu Wind Energy Facility to the Eskom grid. The Phase 1 of the wind energy facility (Riverbank Wind Energy Facility) plans to connect to Wesley Substation and an alternative connection point for Phase 2 (Uncedo Lwethu Wind Energy Facility) is required.

Investigation

The terrain was relatively easy to access but the archaeological visibility in general was poor due to the dense surface cover of grass and shrubs. Apart from a few occasional weathered Middle Stone Age stone tools observed along the power line route no other archaeological sites/materials of any significance were observed. Nevertheless, it is possible that sites/materials are covered by soil and vegetation and may be exposed during the construction of the substation and power lines. On the other hand, the proposed power line route traverses several historic farmer homestead sites, a graveyard and graves.

Cultural sensitivity

Apart from the few historic farmer homestead sites and graves observed, most of the study area investigated appears to be of low archaeological and historical (sites/materials) sensitivity and the impact of construction therefore will be of low negativity. However, the construction of the power line will have a cumulative visual impact where it joins other existing power lines and will be a new negative visual intrusion on the cultural landscape where it is introduced for the first time.

Recommendations (see page 17)

1. The power line traverses several historic farmer homesteads at KwaNdaba and it is recommended that the pylon positions are place at between 20-50 metres on either side of the sites. The sites must be fenced-off to prevent damage to the features.

2. The power line route near KwaHoyi must be re-routed and fenced-off to prevent damage to the graveyard and the historic farmer homestead site.

3. The power line must also be re-routed at Wooldridge because it traverses straight through the settlement and it will also impact on the 'sense of place' of the graves.

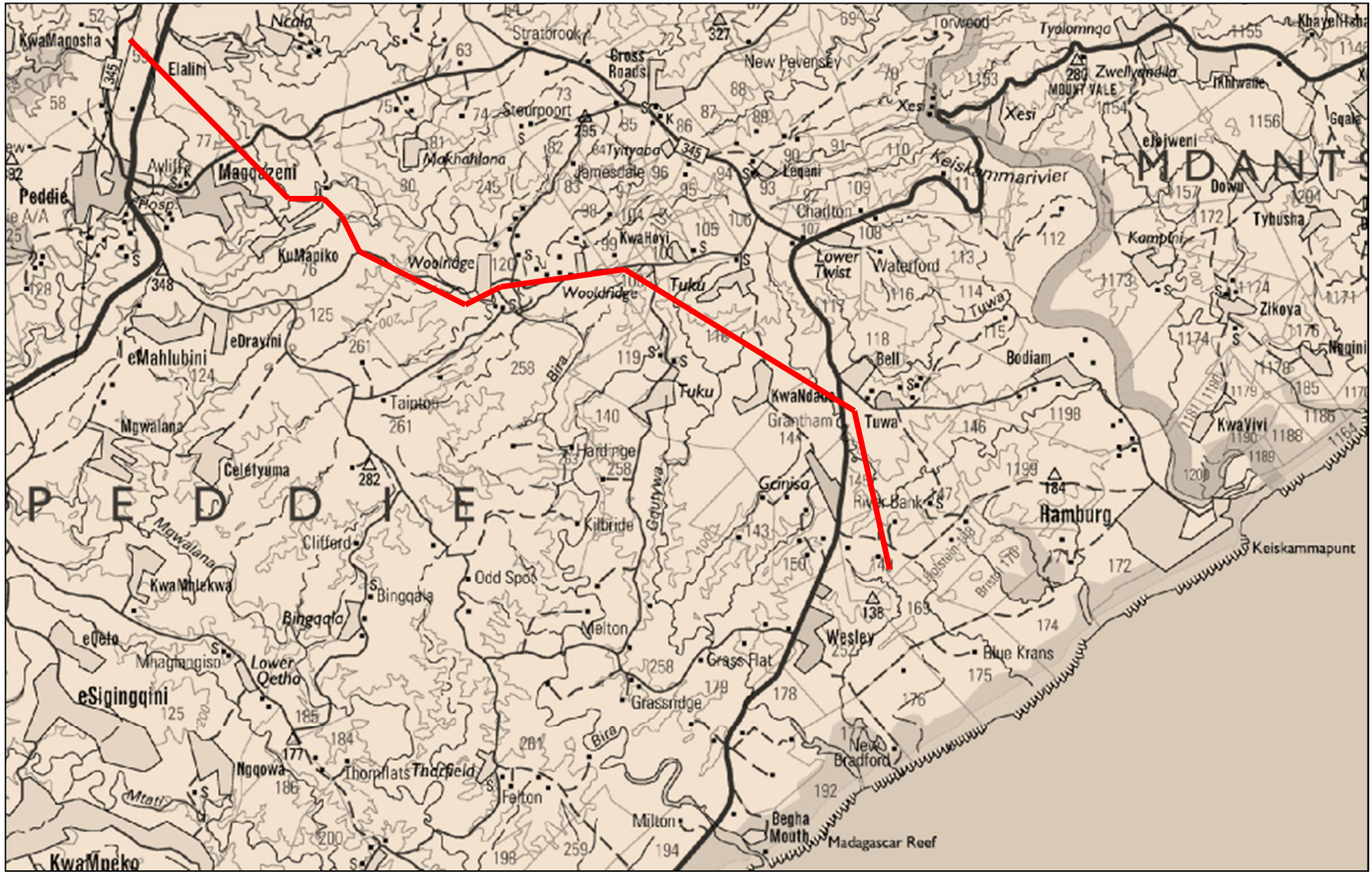
4. It is of great importance to identify all graves and graveyard locations during the public participation meetings.

5. Once the final layout for the power line has been established, an experienced archaeologist or heritage practitioner must conduct a comprehensive walkthrough of these areas. A report and recommendations will follow from the walkthrough.

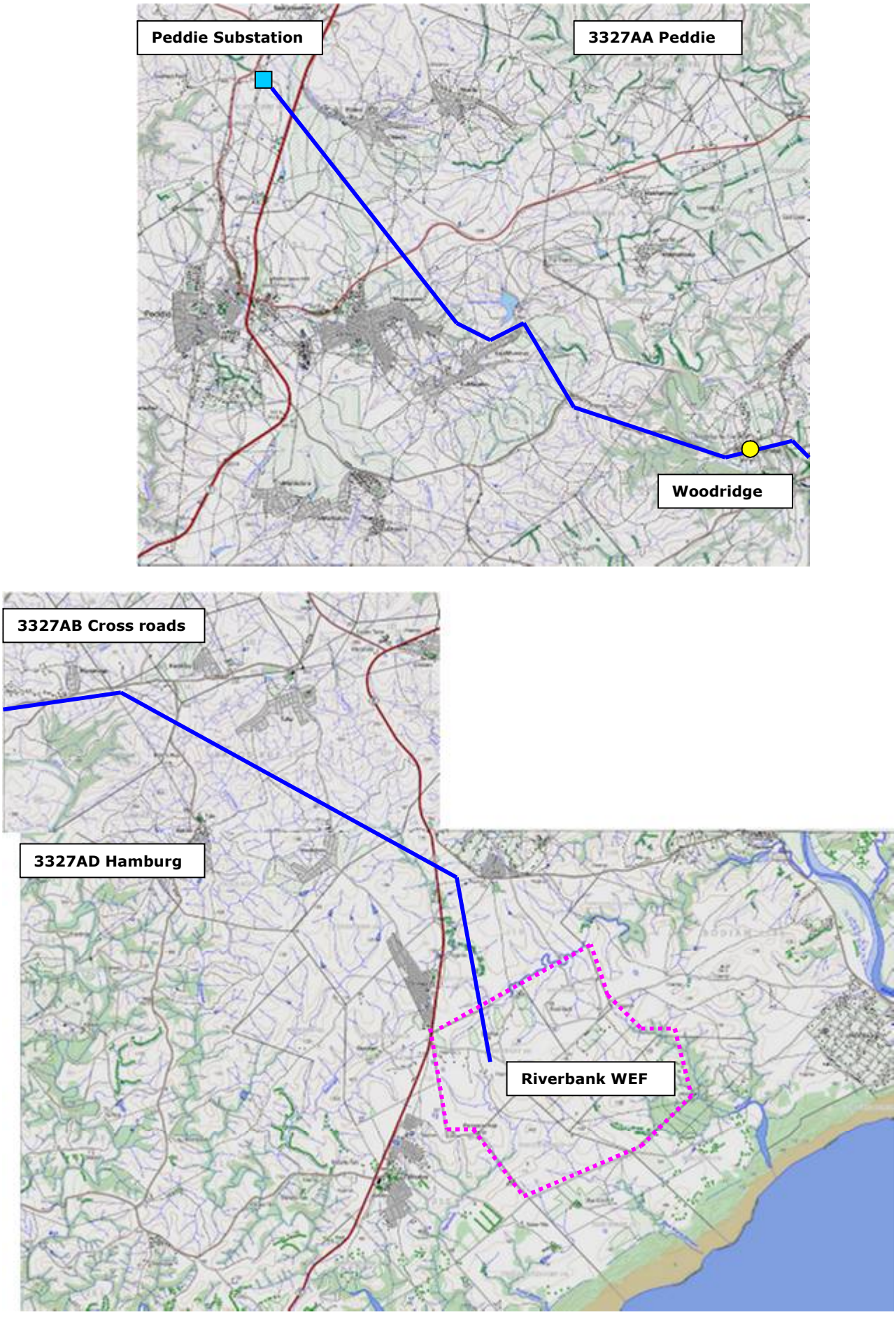
6. All construction activities must be monitored by an archaeologist/heritage practitioner or alternatively a person must be specially trained, for example the ECO, to conduct the monitoring. The archaeologist/heritage practitioner should regularly visit the construction site to inspect the construction routes and activities and to meet with the ECO.

7. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter or alternatively the ECO must be trained as a site monitor to report to the foreman when archaeological sites are exposed.

8. If any concentrations of archaeological materials are exposed, work must stop immediately and reported to the archaeologist at the Albany Museum (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811). Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.



Map 1. 1:250 000 Map indicating the location of the proposed new 132KV power line between the Eskom Wesley Substation and the Eskom Peddie Substation.



Map 2. 1:50 000 Maps indicating the location of the proposed new 132KV power line between the Eskom Wesley Substation and the Eskom Peddie Substation.

Brief archaeological literature review

The area has a rich documented historical past of conflict, change, adaptation and interaction between different groups and individuals (Mostert1992). The archaeological history of the area is less clear, mainly because little field research has been conducted here in the past. Notwithstanding, there are a large number of reports, references and accessioned material in museums of the region and nationally which provide us with a background. This information was compiled by R.M. Derricourt during the early1970s and published in his book, *Prehistoric man in the Ciskei and Transkei* in 1977. He also conducted fieldwork at the nearby Chalumna River Mouth, Middledrift and Ann Shaw.

From the archival information and limited field work, it is evident that the area has an interesting and complex archaeological past. Earlier Stone Age (ESA) hand axes, cleavers and other stone tools, dating to approximately 1,5 million years old, were found mainly in inland areas such as on the slopes of the Thyume River around the University of Fort Hare in Alice, Middledrift, Kentani, Butterworth, Idutywa and Lusisiki to name a few. During a rescue excavation on the campus in 1974 thousands of ESA stone tools were recovered (Opperman 1979). Large numbers of ESA stone tools were also found at Middledrift (Hewitt 1925; Burkitt 1928). These sites were regarded important at the time and were visited by A.J.H. Goodwin (Goodwin & Lowe 1929).

Both locations also yielded Middle Stone Age (MSA) stone artefacts dating between 250 000 and 30 000 years old. MSA artefacts can be found throughout the region, but carry little information because they are not associated with any other archaeological material. Later Stone Age open sites, dating to the past 20 000 years are also widely scattered throughout the area. Derricourt (1977) excavated several mounds at Middledrift and Ann Shaw where he found a stone tool tradition in the bottom layers which he called the Middledrift Tradition, dating to some 5 000 years old. The origins of the upper deposits of these mounds are not clear, but it would appear that they were associated with pastoralist groups. Thin, fine, mainly undecorated pot shards, a KhoiSan burial and complete cow burials found in these mounds, would strongly suggest Khoi occupation.

The most common archaeological sites are shell middens (large piles of marine shell) found usually concentrated opposite rocky coasts (people refer to these as 'strandloper middens'). These were campsites of San, KhoiSan and Bantu-speakers who lived along the immediate coast and collected marine foods. Mixed with the shell are other food remains, cultural material and often human remains are also found in the middens. These middens date from the past 8 000 years. Derricourt excavated a shell midden at Chalumna River Mouth which was associated with undecorated pottery and dated to 510 BP. and most probably of Khoi origin.

Although there are no records of Early Iron Age (first farming communities) sites or material from the area, it is possible that such settlements maybe present in the region (Maggs 1973). Evidence in the form of thick walled well-decorated pot shards is present along the coast (Rudner 1968) and the nearest settlement was excavated just west of East London (Nongwaza 1994). Research in the Great Kei River Valley indicates that the first mixed farmers were already settled in the Eastern Cape region between A.D. 600-700 (Binneman 1994). After A.D. 1300 the Late Iron Age populations (pre-colonial farming societies) left the river valleys and settled on the hilltops throughout the region.

At Middledrift and Ann Shaw Derricourt also excavated a Late/Historical Iron Age settlement with grain pits and ash heaps. The grain pits were of typical Nguni type; jar-shaped with a small opening. The floor was lined with stones and sealed with a layer of clay.

As said at the beginning, this area has a rich in historical past and Early European travellers such as Beutler (Theal 1896) also found the Gonaqua Khoi in 1752 living here and along the Keiskamma River (Khoi word) towards the nearby coast. Lord Somerset declared the Tyumie-Keiskamma Rivers as the colonial boundary with the Xhosa in 1819.

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Theal, G.M. 1896. Balangrike historische dokumenten: Ries van den Vaandrig Beutler in 1752. Kaapstad: N. de Sandt de Villiers & Co. Drukkers.

Relevant impact assessments

Binneman, J., Booth, C. (author) & Higgitt, N. 2010. A phase 1 archaeological impact assessment (AIA) for the proposed Riverbank Wind Energy Facility between Hamburg and Wesley, Amathole District Municipality, Eastern Cape Province. Prepared for Savannah Environmental Ltd. (Pty). Unpublished report. Albany Museum.

Booth, C. 2010. An archaeological desktop study for the proposed Riverbank Wind EnergyFacility between Hamburg and Wesley, Peddie, Amathole District Municipality, Eastern Cape Province.

Booth, C. 2011. A phase 1 archaeological impact assessment (AIA) for the proposed Canyon Springs Wind and Solar Facility located on portions 18, 19, 20 and 21 of farm 258, Peddie, Wesley, Amathole District Municipality,Eastern Cape Province. Prepared for: Usk Consulting Environmental & Waste Engineering Service. East London. Albany Museum.

ARCHAEOLOGICAL INVESTIGATION

Methodology

The archaeological survey for the proposed Wesley-Peddie 132KV power line followed the layout as supplied by the developer which mainly follows the hilltops and high ground (Maps 3-7). A Google Earth aerial image investigation was also conducted of the area and route prior to the investigation. The survey was conducted on foot by two people and spots checks and surveys were also conducted from a vehicle to investigate as much of the terrain as possible. GPS readings were taken and all important features were digitally recorded (for views of the power line route, the surrounding landscape and vegetation see Appendix D, Figures 1-10 and Maps 3-7).

Limitations and assumptions

Although most of the power line route was relatively easy to access the archaeological visibility in general was poor due to the dense surface cover of grass and thicket vegetation in places. Due to the dense surface vegetation and little sheet erosion on the high ground it was difficult to locate archaeological sites/materials. Large parts of the route also run over old fields, roads and areas disturbed by settlement developments. Regardless of the restrictions imposed by the dense vegetation and physical environment, the experiences and knowledge gained from other investigations in the wider surrounding region provided background information to make assumptions and predictions on the incidences and the significance of possible pre-colonial archaeological sites/material which may be located in the area, or which may be covered by soil and vegetation. Two phase 1 archaeological impact assessments conducted at Wesley also provided good background information and insight regarding the archaeological and historical heritage of the area.

Results and findings

The power line starts on the farm Sandflat 149 in the north-western corner of the proposed Riverbank Wind Energy Facility site approximately 1,75 kilometres north-east of the small settlement of Wesley and about 9 kilometres west of Hamburg, a small coastal resort near the Keiskamma River Mouth (Maps 1-3). From here it runs north for about 4,8 kilometres before it turns north-west near the small settlement of Tuwa and crosses the R72 towards KwaNdaba (Figure 2). Dense grass covered the area and made it difficult to observe heritage sites/materials along the power line route, but a number of heritage sites/materials were observed during the 2010 investigation and the 2014 survey in the wider area of the route (Map 3). These composed mainly of Middle Stone Age stone tools observed at the many sand mine area in the immediate vicinity of the proposed power line (Figure 1). The stone tools occur on a hard reddish land floor and were covered by grey sandy soils between 0,5 and 1,0 metres deep. It is expected that the development will expose some of these stone tools when the pylon foundations are constructed. However, the stone tools are in secondary context and of low significance. The historic farmer homestead site (probably dates from the early/middle 20th century) will not be directly

impacted by the power line, but must be fenced- off before construction starts to prevent possible damage to the site.

From the R72 to KwaNdaba the route crosses mostly over old contoured ploughed fields covered by dense short grass (Map 4a) (Figure 3). The area to the north of the settlement is dotted with traces of old farmer homestead sites which most probably dates from the early/middle 20th century. These were mainly identified from Google Earth aerial images because the dense grass made it difficult to observe the traces on the ground. The proposed power line crosses over at least two of these old homesteads to the north of KwaNdaba (Map 4b-c, hh and hh1 marked with blue squares). Although the exact age of these homesteads are not known, they are regarded as historical features and part of the cultural landscape and should not be damaged. As there is little space for the route to maneuver due to the large number of similar features on the landscape, it is suggested that the pylons are placed some distance from the features (Map 4c). The sites must be secured before construction starts to prevent any disturbances.

The route from KwaNdaba runs in a north-westerly direction towards Wooldridge over a series of high hills and the Gqutywa River valley (Map 5a). The hilltops, steep gradients and deep valleys are well covered by dense grass, bushes, small trees and thicket vegetation (Figure 4). Near KwaHoyi the route turns in a westerly direction and follows the gravel road along a ridge towards Wooldridge (Maps 5a and 6a). At the turn, the proposed power line route traverses over a historic farmer settlement and a graveyard (Map 5b) (Figures 4-5). The direction of the route must be changed to avoid impact on these features (see Map 5c).

En route to Wooldridge the route passes small settlements next to the gravel road and descends down a long, steep gradient into the Bira River valley (Map 6a) (Figure 5, right insert). The line crosses through the settlement and close to at least two graves sites (there may be more) (Map 6b) (Figure 6). It is inappropriate for the power line to traverse straight through the settlement and will impact on the ‘sense of place’ of the graves. It is recommended that the route follows the alternative blue route along the gravel road.

From Wooldridge and the Bira River valley the route continues in a north-westerly direction again, following the gravel road up the steep slope through dense thicket vegetation to the top of the plateau (Map 6a) (Figures 7). Here the route departs from the gravel road towards the northern end of Feni where it turns sharply to the south-west and continues between the settlement and the Nkwekazi Dam along the steep slope of the KwaFanana and Feni drainage lines (Map 7) (Figures 8-9). The hill slopes are disturbed by soil erosion, borrow pits and contoured ploughed fields. From Feni the route turns north-west again towards the Peddie Substation and crosses the R345 and N2 (Map 7) (Figures 9-10). This part of the route is covered by dense tall grass and large patches of bushes and small trees.

ASSESSMENT OF THE IMPACTS

The power line

The proposed 132KV power line will consist of overhead cables suspended from wooden/metal structures placed a few hundred metres apart. These structures must be firmly positioned several metres deep in the ground. Although the placing of the structures will only affect a few square metres, it will be the additional activities such as the service roads for the construction vehicles and clearing of vegetation along the servitude which will disturb the land surface on a large scale.

These activities may have a negative effect on the above and below ground archaeological remains. The disturbances to the landscape may be rehabilitated over time, but the power line, however, will have a long term visually impact on the general countryside.

Pre-colonial archaeology

Nature of the impacts

Apart from a few stone tool occurrences of mainly Middle Stone Age origin near the start of the power line route and a few occasional stone tools observed along the route, no other sites/remains of significance were observed. The main impact on the pre-colonial archaeological heritage sites/remains (if any) will be the physical disturbance of the material and its context. The construction of the tower foundations for the power line and service roads may expose, disturb and displace archaeological sites/material. It is assumed that the overhead transmission lines may have less impact on possible buried archaeological material then other developments due to their smaller foot print, but that depends on the construction methods and activities. Nevertheless, from the available information it would appear that the proposed 132KV power line route from the Wesley Substation to the Peddie Substation is of low archaeological sensitivity. However, due to the dense vegetation cover along the entire route the archaeological visibility was poor and sites/material may be covered by soil and vegetation.

Extent of the impacts

Construction of the power line tower foundations and service roads may impact on remains which are buried, but these impacts will be limited and restricted to the local area. The construction of the tower foundations will also only disturb small areas and the negative impact on possible pre-colonial archaeology heritage sites/materials may be relatively small. Other projects such as the construction of service roads and levelling activities will disturb larger areas and may expose sites/materials on a larger scale. In both cases further disturbances of sites/materials can be limited by mitigation.

Table 1. Impacts of the proposed 132KV power line from the Wesley Substation to the Peddie Substation on the pre-colonial archaeology.

Nature: The potential impact of the construction of the power line foundations and service roads on above and below ground pre-colonial archaeological heritage sites/materials.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Unlikely (2)	Unlikely (2)
Significance	Low (16)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	No, but in some cases, yes	No
Can impacts be mitigated?	Yes	
Mitigation No mitigation is proposed before construction starts because the archaeological remains (if any) are of low significance (excluding human remains). However, if concentrations of archaeological materials are exposed then all work must stop for an archaeologist to investigate (see below). If any human remains (or any other concentrations of archaeological heritage material) are exposed during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the Eastern Cape Provincial Heritage Resources Authority, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.		
Cumulative impacts: The number and size of the tower foundations will determine the impact on the buried materials (if any), but in general it will be negligible.		
Residual impacts: Long term to permanent		

Historic farmer heritage, graves and graveyards

The hilltops of the former Transkei and Ciskei regions are dotted with small modern settlements. In close vicinity of the modern brick houses are the remains of old homesteads/settlements almost similar in outlay to those which date from pre-colonial Iron Age times (pre-colonial farming societies). Little evidence is visible on the ground because these features have degraded over the years and are covered by dense grass. However, one can easily identify the layout of these features from aerial images. The proposed new power line from the Wesley Substation to the Peddie Substation traverses these features in several areas. Unfortunately we do not know how old these features are, but they most probably date from the early/middle 20th century. For the purpose of this report they are regarded as historic features, similar to historic buildings and structures elsewhere which are older than 60 years and protected by the National Heritage Recourses Act of 1999 (NHRA).

Several of the graves observed have modern headstones (one dates to 1932), but there are many without headstones which may be older and are over-grown. Graves are highly significant heritage features and are protected by NHRA, provincial and local municipal legislation. In many cases unmarked burials are associated with pre-colonial farming settlements and it is possible that graves may also be found at historic farmer homesteads as well.

Nature of the impacts

The main problem with the historic homestead features is that they are not always visible and easily identified on the ground because of dense vegetation cover. For this reason these heritage features are directly threatened by any development. Any surface activities such as vegetation clearing, levelling activities and construction of roads will seriously damage and/or destroy the features. Marked graves are easily identified and may escape damage during construction, but also make them easy targets for vandalism. Unmarked graves are often damaged or destroyed during levelling and excavation activities. Power line constructed in close proximity of graveyards could impact on their 'cultural space and sense of place'

Extent of the impacts

Although direct impacts on marked graves and graveyards are not expected, buffer zones must be implemented to prevent any possible damage to them during construction work. Graves and graveyards are emotionally loaded social features and any damage during construction will create serious negative impact in the community. Similarly, if unmarked graves and/or human remains are exposed during construction work it will also bring about emotional reactions. Any accidental exposure of human remains must be treated with dignity and mitigated immediately.

Table 2. Impacts of the proposed 132KV power line from the Wesley Substation to the Peddie Substation on the historical farmer heritage.

Nature: The potential impact of the construction of the power line tower foundations and service roads on above and below ground historic farmer heritage sites, excluding graves.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	moderate (5)	Minor (3)
Probability	Highly (4)	Unlikely (2)
Significance	Medium (44)	Low (18)
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	No, but in some cases, yes	No
Can impacts be mitigated?	Yes	
Mitigation Pylon positions must be place at between 20-50 metres on either side of the sites. The sites must be fenced-off to prevent construction vehicles from damaging the features. If any human remains (or any other concentrations of historic farmer heritage material) are exposed during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the Eastern Cape Provincial Heritage Resources Authority, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.		
Cumulative impacts: The number and size of the tower foundations will determine the impact on the buried materials.		
Residual impacts: Long term to permanent		

Table 3. Impacts of the proposed 132KV power line from the Wesley Substation to the Peddie Substation on the historical farmer heritage.

Nature: The potential impact of the construction of the power line tower foundations and service roads on graves and graveyards.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Minor (3)
Probability	Probable (3)	Unlikely (2)
Significance	Medium (44)	Low (18)
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	No, but in some cases, yes	No
Can impacts be mitigated?	Yes	
Mitigation Where necessary power line route must be re-routed to prevent damage to the graveyard, graves during construction. It will also impact on the 'sense of place' of the graves. Pylons must be placed so they do not damage historic farmer homestead sites because often unmarked graves are found in these sites. Preferably the graveyard should be fenced-off before construction starts. Damage to the graves will have serious negative reaction from the community. If any human remains are exposed during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the Eastern Cape Provincial Heritage Resources Authority, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.		
Cumulative impacts: The number and size of the tower foundations will determine the impact on the graves and graveyards and unmarked graves.		
Residual impacts: Permanent		

Cultural landscape and sense of place

Power lines and substations are an integral part of the South African landscape. This is especially the case for the wider Poseidon substation area, where huge pylons and power lines dominate the skyline in all directions. The proposed power line and substation, however, are relatively small in comparison to the existing network of power lines and will probably have little impact in the short term on the cultural landscape.

Nature of the impacts

It is difficult to assess what impact the substation and the power line will have on the cultural landscape in the sort term because they will eventually be dwarfed by the huge wind turbines. Notwithstanding, the power line from the substation to the Poseidon substation will contribute to the cumulative impact of 'visual pollution' and the change of sense of place. Furthermore, the developments will also contribute (on a small scale) to the transformation of a once rural agricultural environment to an 'industrial character' of the region. It will also add to a negative visual impact on the historical and natural landscape and character of the area.

Extent of the impacts

Due to the relatively small size of the proposed 132kv powerline and the substation the visual impact on the landscape may be not very prominent in the sort term. Nevertheless, as an addition to an existing power lines in the area it will add a cumulative visual impact to the landscape, especially on the high lying areas. The main impact on the cultural landscape will be the extensive construction of roads and other activities which will leave permanent scars.

Table 4. Impacts of the proposed 132KV power line from the Wesley Substation to the Peddie Substation on the cultural landscape.

Nature: The potential impact of the construction of the power line on the cultural landscape in terms of visual impacts and changes to 'sense of place'.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	yes	
Mitigation Mitigation cannot reduce the negative visual effect on the cultural landscape and 'significance of place'.		
Cumulative impacts: The construction of the power lines will slightly increases the visibility of these features on the high ground and where the new line joins existing power lines. It will also create new visual effects especially in areas where there were no lines before.		
Residual impacts: Disturbances to the landscape by the construction of the power lines and service roads will be long term.		

Table 5. Environmental management programme for heritage resources

Objective: Preserving the pre-colonial archaeological and historic farmer heritage sites/remains along the proposed 132KV power line from the Wesley Substation to the Peddie Substation.	
Project component/s	Construction of power lines and associated infrastructure.
Potential impact	The physical disturbance, damage and/or destruction of pre-colonial archaeology and historic farmer heritage sites/remains.
Activity/risk source	Large scale levelling, construction of power lines and access roads for construction vehicles
Mitigation: Target/Objective	All construction activities on the substation site must be monitored by an archaeologist/heritage practitioner (or alternatively a person specially trained to conduct the monitoring, i.e. the ECO). This must include the clearing of the vegetation (which constrained the visibility of heritage resources during the walkthrough investigation), and the leveling activities.

Mitigation: Action/control	Responsibility	Timeframe
Once the final layout of the power line and associated infrastructure has been established, an experienced archaeologist or heritage practitioner must conduct a comprehensive walkthrough of these areas. A report and recommendations will follow.	Proponent, consultant, contractor and the heritage practitioner.	Before and during construction starts.
All construction activities must be monitored by an archaeologist or heritage practitioner or alternatively a person must be specially trained, for example the ECO, to conduct the monitoring.	Proponent, consultant, contractor, heritage practitioner	From the start and duration of all phases of the construction phases, i.e., during the clearing of the vegetation for the above ground heritage.
If any human remains (or any other concentrations of heritage material) are exposed during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the Eastern Cape Provincial Heritage Resources Authority so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.	Proponent, consultant, contractor, heritage practitioner and heritage authority.	During the levelling phase for the buried heritage.

Performance indicator	All heritage sites/materials observed during any construction activity must be recorded. The success of the monitoring will be determined by the degree of damage/disturbance that can be avoided to heritage resources.
Monitoring	All construction activities must be monitored by a heritage practitioner or alternatively a person must be specially trained, for example the ECO. The heritage practitioner should apart from monitoring specific activities at specific time also regularly visit the construction site (for example, once a month) to inspect the construction routes and activities (or to meet with the ECO, A report and if required a list of recommendations, should be compiled and submitted to the Eastern Cape Provincial Heritage Resources Authority after the monitoring phase(s) for comment.

DISCUSSION AND MITIGATION

The terrain was relatively easy to access but the archaeological visibility in general was poor due to the dense surface cover of grass and shrubs. Apart from a few occasional

weathered Middle Stone Age stone tools observed along the power line route no other archaeological sites/materials of any significance were observed. However, it is possible that sites/materials are covered by soil and vegetation and may only be exposed during the construction of the power lines. In general the proposed 132KV power line from the Wesley Substation to the Peddie Substation appears to be of low archaeological significance. On the other hand the investigation establishes that the power line route traverses several historic farmer homestead sites, a graveyard and graves. These three sensitive areas that were identified must be considered in the planning of the final layout:

1. The power line traverses several historic farmer homesteads sites in an area north of KwaNdaba (Map 4). It is recommended that the pylon positions are place at between 20-50 metres on either side of the sites.

    - The sites must be fenced-off to prevent construction vehicles from damaging the features. Often there are unmarked graves in these historic homestead sites.

2. The power line route near KwaHoyi must be re-routed to prevent damage to the graveyard and the historic farmer homesteads site (Map 5).

    - Preferably the graveyard should be fenced-off before construction starts. Damage to the graves will have serious negative reaction from the community.

3. The power line must also be re-route at Wooldridge because it is inappropriate for the power line to traverse straight through the settlement and it will also impact on the 'sense of place' of the graves (Map 6).

    - It is recommended that the route follows the alternative blue route along the gravel road.

4. It is possible that there are more graves or even graveyards 'hiding' in the dense vegetation along the servitude of the power line, or may be include once/if the layout changes. It is of great importance that these features, if they exist, are identified during the public participation meetings.

Other Recommendations:

5. Once the final layout in terms of the route, pylon positions, access/construction roads and maintenance/workshop areas have been established, an experienced archaeologist or heritage practitioner must conduct a comprehensive walkthrough of these areas. A report and recommendations will follow from the walkthrough.

6. All construction activities must be monitored by an archaeologist/heritage practitioner or alternatively a person must be specially trained, for example the ECO, to conduct the monitoring. This must include the clearing of the dense grass (which constrained the visibility of heritage resources during the walkthrough), leveling, placing and excavations of the pylon foundations and construction of the access roads.

- The archaeologist/heritage practitioner should apart from monitoring specific activities at specific times also regularly visit the construction site (for example, once a month) to inspect the construction routes and activities (or to meet with the ECO, see below).

7. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

    - Alternatively the ECO must be trained as a site monitor to report to the foreman when archaeological sites are exposed. This person must monitor all activities during the construction phase.

8. Although it would seem unlikely that any significant archaeological remains will be exposed during the development, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development. Should such material be exposed during construction, all work must cease in the immediate area (depending on the type of find) and it must be reported to the archaeologist at the Albany Museum in Grahamstown (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (See appendix C for a list of possible archaeological sites that maybe found in the area).

GENERAL REMARKS AND CONDITIONS

Note: This report is for a Phase 1 archaeological heritage impact assessment only and do not include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35) (see Appendix B) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the unlikely event of such finds being uncovered, (during any phase of construction work), it must be reported to the archaeologist at the Albany Museum (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811) immediately. The developer must finance the costs should additional studies be required as outlined above. The *onus* is also on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999. The consultant is responsible to forward this report to the relevant Heritage Authority for assessment, unless alternative arrangements have been made with the specialist to submit the report.

It must also be clear that Phase1 Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: List of selected observations along the proposed power line from the Wesley Substation to the Peddie Substation.

Text description	Text reference	GPS Location	Type of site	Rating	Location/ status
msa1	Map 3	33.17.56,03S 27.22.29,16E	Middle Stone Age stone tools	Low	outside servitude
hh	Map 4	33.14.56,01S 27.16.36,87E	historic farmer homestead	medium -high	in servitude
hh1	Map 4	33.14.47,80S 27.19.27,47E	historic farmer homestead	medium -high	in servitude
hh2	Map 5	33.13.21,86S 27.16.36,87E	historic farmer homestead	medium -high	in servitude
graveyard	Map 5	33.13.20,82S 27.16.33,06E	Graveyard	High	in servitude
grave1	Map 6	33.13.41,71S 27.14.09,14E	Grave	High	close to servitude
grave2	Map 6	33.13.42,50S 27.14.10,81E	Grave	High	close to servitude

APPENDIX B: brief legislative requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (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;
(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.

Burial grounds and graves

36. (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.

Heritage resources management

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

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of the site –
(i) exceeding 5000m^2 in extent, or
(ii) involving three or more 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 resources authority;

(d) the re-zoning of a site exceeding 10 000m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as 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.

APPENDIX C: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

Identification of Iron Age archaeological features and material

- Upper and lower grindstones, broken or complete. Upper grindstone/rubber will be pitted.
- Circular hollows - sunken soil, would indicate storage pits and often associated with grindstones.
- Ash heaps, called middens with cultural remains and food waste such as bone.
- Khaki green soils would indicate kraal areas.
- Baked clay/soil blocks with or without pole impression marks indicate hut structures.
- Ceramic potsherds.
- Iron slag and/or blowpipes indicate iron working.
- Human remains may also be associated with khaki green soils.
- Metal objects and ornaments

Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general human remains are buried in a flexed position on their side, but are also found buried in a sitting position with a flat stone capping. Developers are requested to be on alert for the possibility of uncovering such remains.

Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m^2 in extent, should be reported to an archaeologist.

Large stone cairns

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane.* They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities**.**

APPENDIX D

DIGITAL IMAGES OF THE LANDSCAPE
AND
AERIAL VIEWS OF THE HERITAGE SITES

Map 3. An aerial image of the power line (red line) and heritage sites/materials observed during the 2010 survey for the Riverbank WEF (pink pins) and blue pin mark the sand mine in Figure 1 below.

Figure 1. A general view of the sand mines in the vicinity of the power line and a sample of Middle Stone Age stone tools observed at these disturbances. The power line starts to the right of the hill in the back ground, marked by the red arrow.

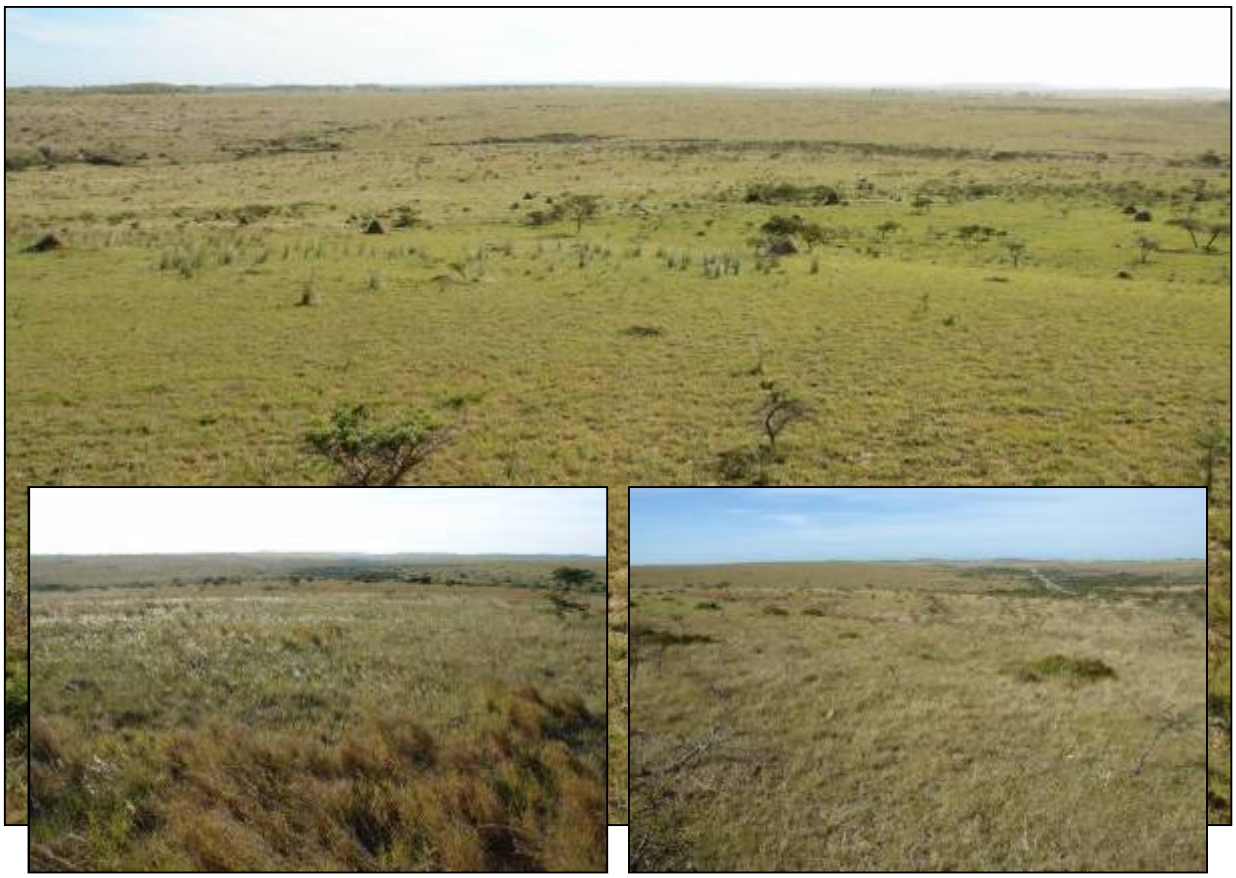


Figure 2. General views of the starting location of the power line (main image), the route northwards towards the R72 near Tuwa (left insert) and a reverse view from near Tuwa towards the starting location (right insert).

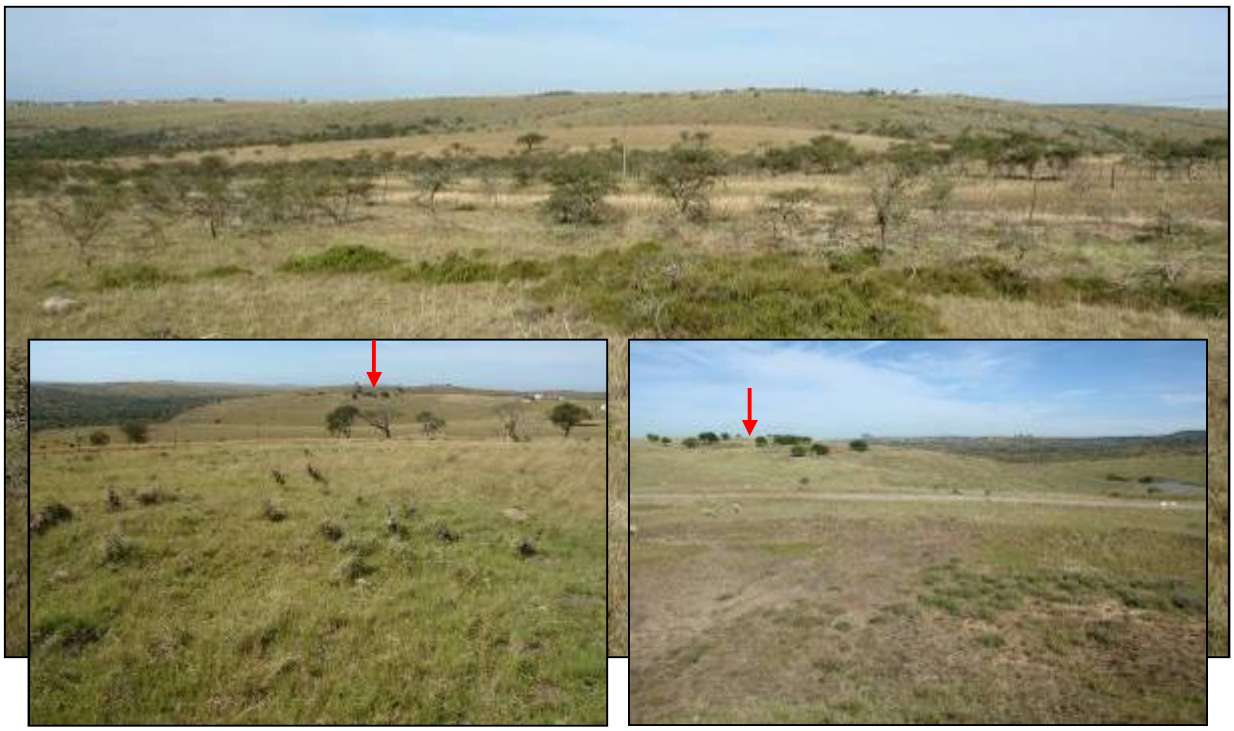
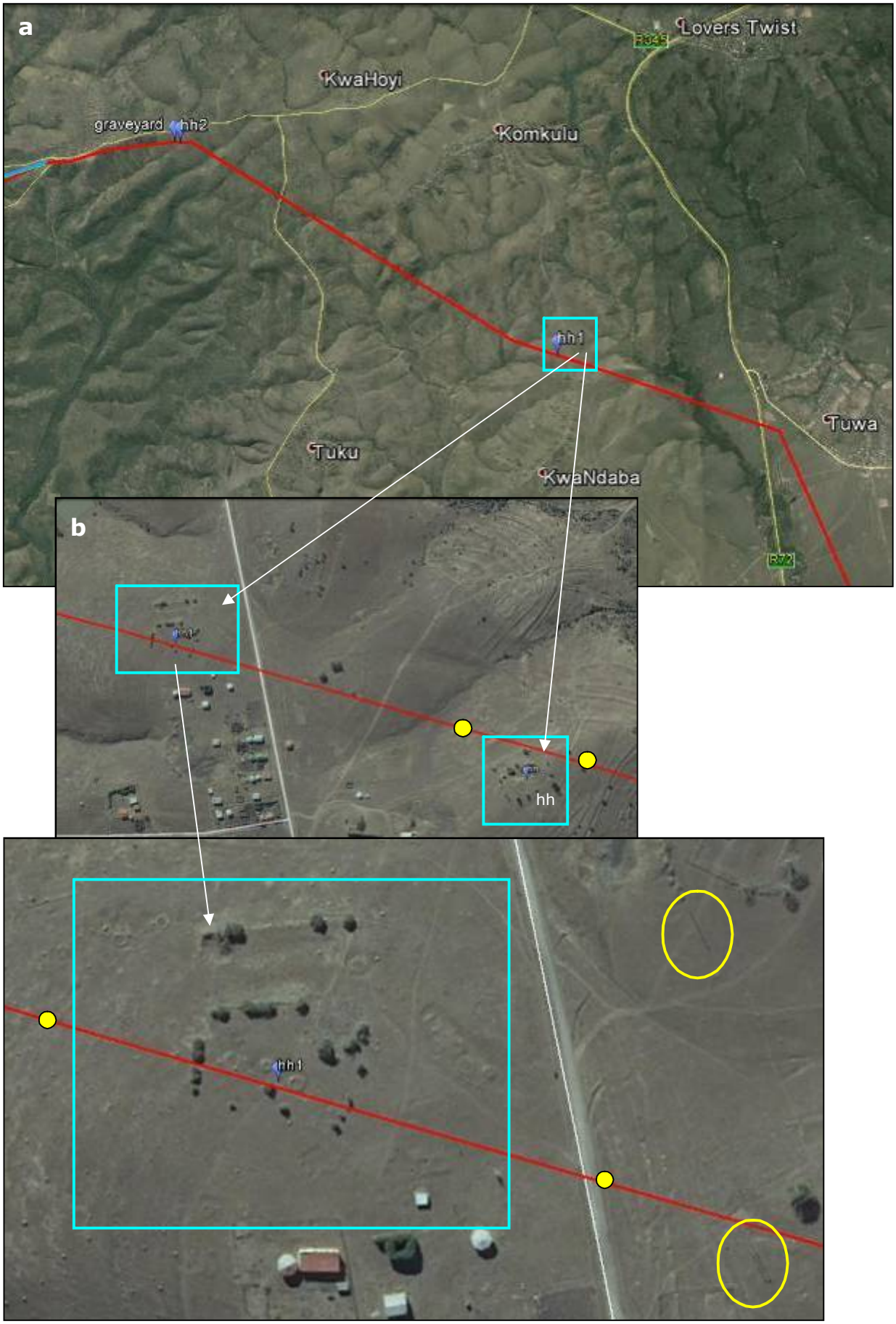
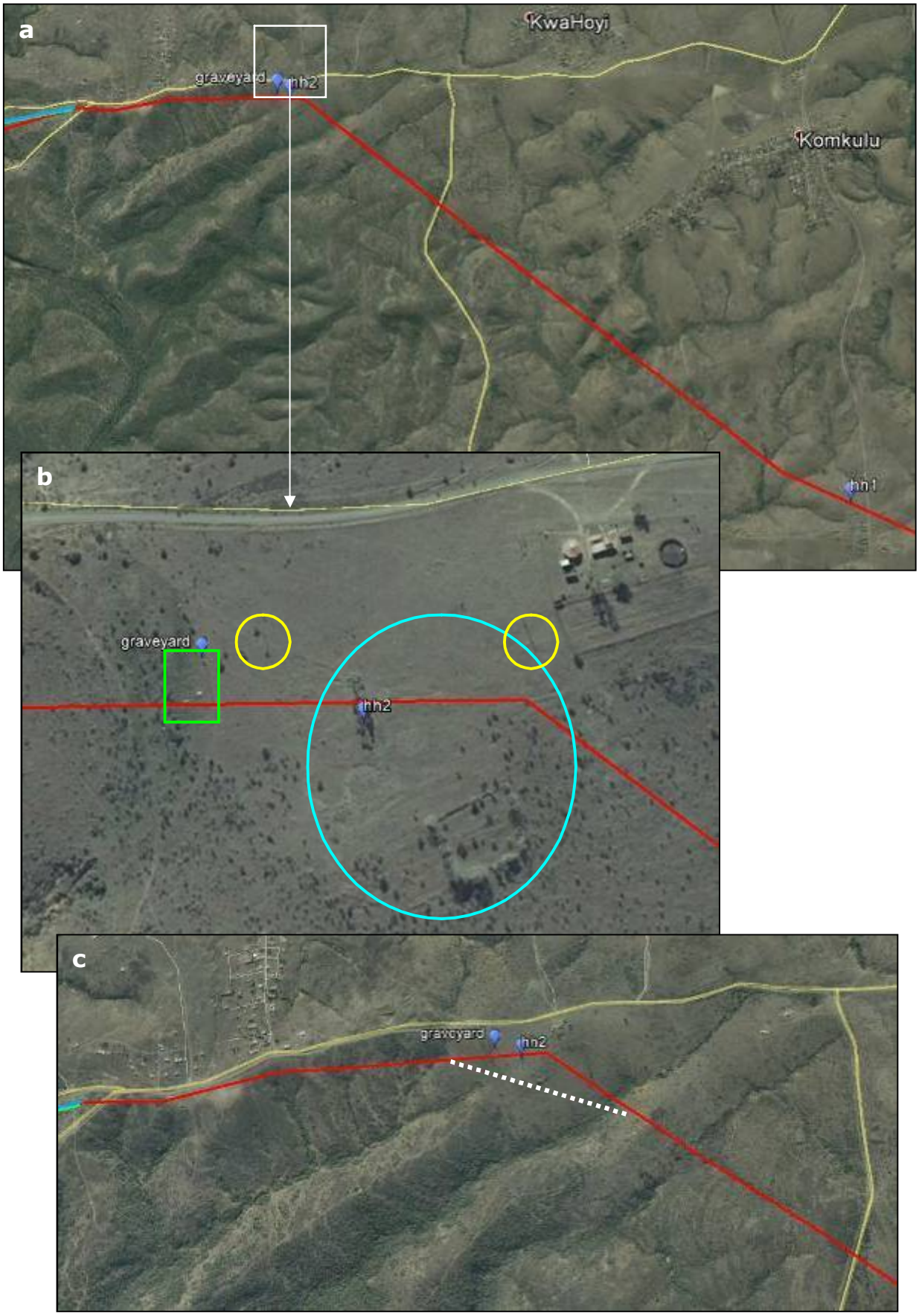


Figure 3. General views of the location where the route crosses the R72 in a north-westerly direction to KwaNdaba (main image), reverse view towards the R72 (left insert) and the route towards Wooldridge (right insert). The historic homesteads are at the patches of trees indicated by the red arrows (see map 4b-c below).



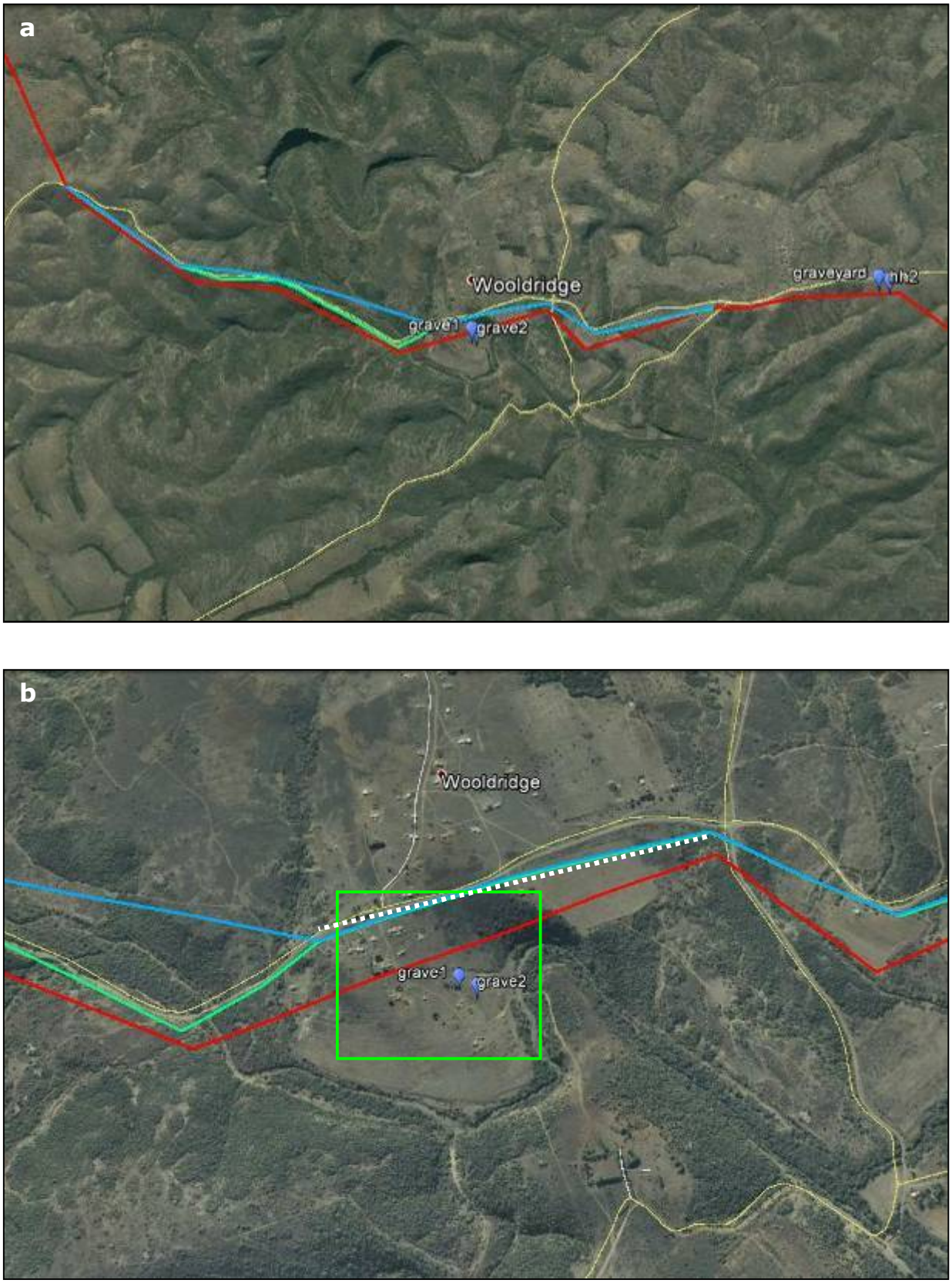
Map 4. Aerial images of the power line (red line) from Tuwa to Wooldridge (a). The blue squares mark sensitive areas of historic homesteads (b-c), the yellow circles existing power line pylons and the yellow dots suggest pylon positions for the red power line to avoid damage to the features inside the blue squares (hh and hh1).



Map 5. Aerial images of the power line (red line) from KwaNdaba to Wooldridge (a). The green square marks a graveyard, blue circle a sensitive area of historic homesteads (b), the yellow circles existing power line pylons and the white broken line (c) suggests an alternative route for the red power line to avoid damage to the graveyard.

Figure 4. General views of the power line route from KwaNdaba (main image and right insert) to Wooldridge (left insert).

Figure 5. General views of the route to Wooldridge (main image), the graveyard marked by the red arrow (left insert) and a view from Wooldridge towards the graveyard in the far distance.



Map 6. Aerial images of the power line (red line) from Woodridge to Feni (a). The green square marks a settlement with graves and the broken white line agrees with the blue route as an alternative route.

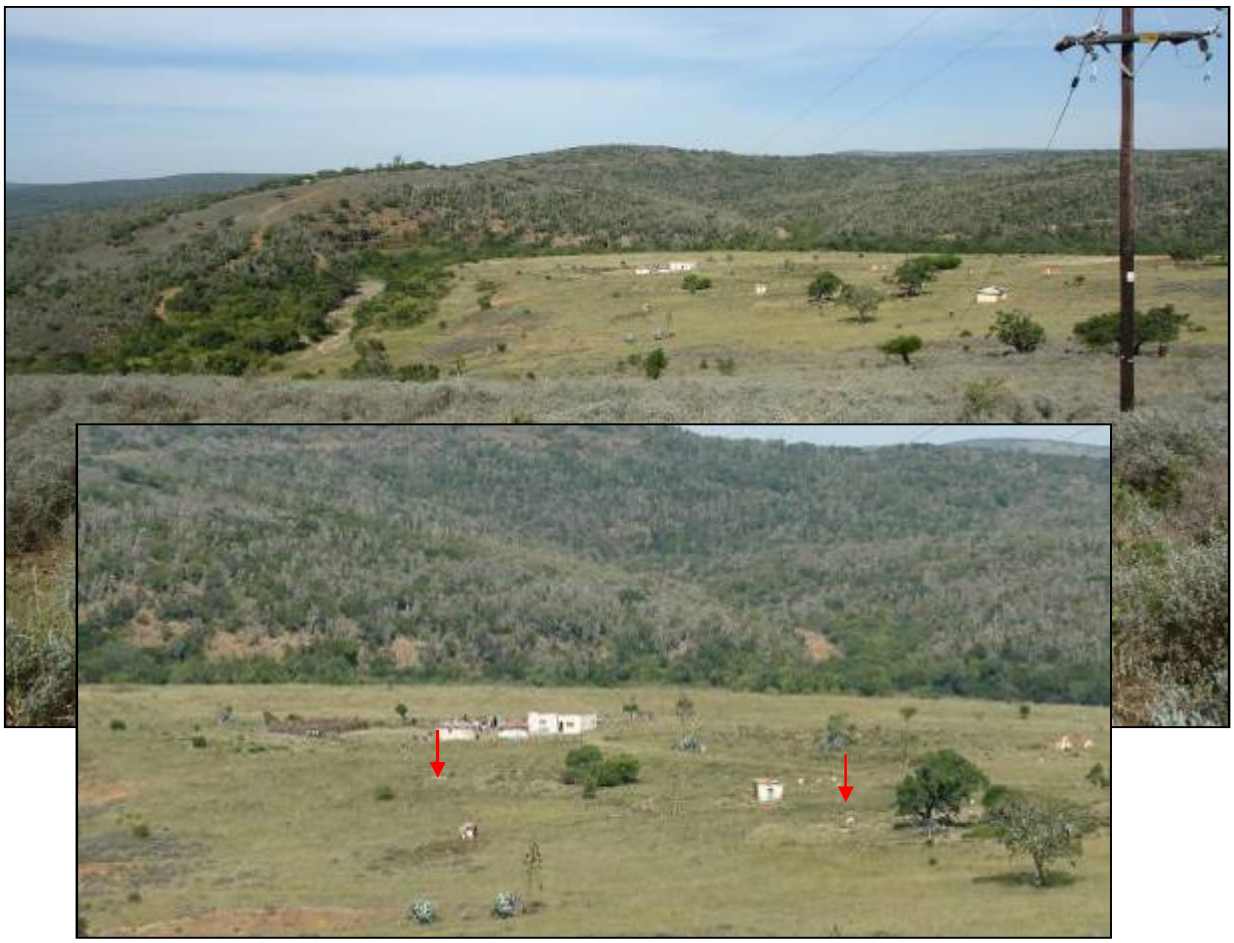


Figure 6. General views of the settlement at Wooldridge (main image) and the location of the graves marked by the red arrows (insert).

Figure 7. General views of the route from Wooldridge and the Bira River valley(main image) towards Feni.

Map 7. An aerial image of the power line (red line) from Feni towards the Peddie Substation.

Figure 8. General views of the route to Feni visible in the far distance (main image), towards Woodridge (left insert) and the route around Feni along hill slope south towards the Peddie Substation (right insert).

Figure 9. General views of the route from Feni along the valley towards the R345 and the Peddie Substation (main image), from the R345 towards Feni in the far distance (left insert) and a view from the R345 towards the Peddie Substation (right insert).

Figure 10. General views towards the Peddie Substation from the N2 (main image), towards the N2 from the substation (left image) and a view from the N2 towards Feni.