

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED NAMIES WIND ENERGY FACILITY NEAR AGGENEYS, NORTHERN CAPE

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

Prepared for

Aurecon South Africa (Pty) Ltd

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EXECUTIVE SUMMARY

ACO Associates cc was appointed by Aurecon South Africa (Pty) Ltd on behalf of juwi Renewable Energies (Pty) Ltd to assess the potential impacts to heritage resources that might occur through the proposed construction of a wind energy facility (WEF) on Farm 212/0 and Farm 88/1 to the southeast of Aggeneys and southwest of Pofadder in the Northern Cape. The facility would have up to 58 turbines and will include a 35 to 40 km long power line linking to the Aggeneis Substation to the west. Two turbine layouts and two power line corridors are assessed.

The site lies south of a range of low mountains and is composed of wide open, flat land covered with grass and small bushes. Occasional rocky outcrops occur and ephemeral water courses are frequent, mainly in the north.

A range of heritage resources was recorded in the project area. These include ephemeral scatters of stone artefacts, dense occupation sites, isolated bedrock grinding grooves, dense clusters of grinding grooves, rock art, graves, built structures, the ruined historical village of Namies, historical kraals and the very landscape in which the facility is planned.

Impacts to these resources will generally be of low significance although in a few areas impacts of medium to high significance will be likely before mitigation. Certain archaeological sites may need mitigation, if they cannot be avoided. It is seen as critical that large vehicles be prevented from accessing the proposed WEF site through the ruined Namies village, which was central to the early development of the region.

It is recommended that the proposed WEF and associated infrastructure be allowed to proceed with either WEF layout alternative and either power line alternative. However, Alternative 1 in both cases is favoured. This recommendation is subject to the following conditions:

- The main access road to the site may not pass through the village of Namies;
- All heritage resources that are not mitigated and are not affected by the proposed project must be protected from harm;
- In the WEF layout area the archaeological sites VSH2013/001 and VSH2013/002 must be avoided by the road or else mitigation will be required as appropriate;
- For power line Alternative 1 the archaeological site at BHK2013/002 will need to be avoided or mitigated;
- For power line Alternative 2 the line may be placed through the area with archaeological sites (KYK2013/001-004) but mitigation and/or avoidance of certain areas will be required. Rerouting the line some 150 m to the south of the outcrop would, however, be preferable. Any access road that follows the line may not run over the rocky outcrop – it will need to run to the south of the outcrop;
- Any changes to the WEF layout or power line routes should be approved by an archaeologist; and
- If any isolated human burials are discovered/ unearthed during construction, work in the immediate vicinity must stop and the find must be reported to SAHRA. An archaeologist would then conduct an inspection and conduct an exhumation under the necessary permit.

Contents

1. INTRODUCTION	4
1.1. Terms of reference	5
2. HERITAGE LEGISLATION	5
3. METHODS.....	6
3.1. Literature survey.....	6
3.2. Field survey	6
3.3. Impact assessment	6
3.4. Limitations	6
4. DESCRIPTION OF THE AFFECTED ENVIRONMENT	7
5. HERITAGE CONTEXT	9
5.1. Archaeology	9
5.2. History	10
6. FINDINGS.....	11
6.1. Archaeology	11
6.2. Built environment.....	20
6.3. Graves.....	21
6.4. Memorials.....	23
6.5. History of Namies.....	24
6.6. Scenic routes, landscape and sense of place	27
7. ASSESSMENT OF IMPACTS	28
7.1. Archaeological impacts (including graves)	28
7.2. Landscape and sense of place.....	30
8. MANAGEMENT MEASURES	32
9. CONCLUSIONS	32
10. RECOMMENDATIONS	32
11. REFERENCES	33
APPENDIX 1: Heritage site listing	36
APPENDIX 2: Mapping.....	42

1. INTRODUCTION

ACO Associates cc was appointed by Aurecon South Africa (Pty) Ltd on behalf of juwi Renewable Energies (Pty) Ltd to assess the potential impacts to heritage resources that might occur through the proposed construction of a wind energy facility (WEF) on two farm portions to the southeast of Aggeneys and southwest of Pofadder in the Northern Cape (Figure 1). These are the remainder of Farm 212 Namies South (5764 ha) and Portion 1 of Farm 88 Vogelstruis Hoek (7248 ha). The two power line options would cross Farm 88/0 (northern option) or Farm 627/0 (southern option) as well as all of Farm 87/0, Farm 87/1, Farm 87/2, Farm 61/0, Farm 56/0 and Farm 56/1. The study area for the actual WEF is 13 012 ha.

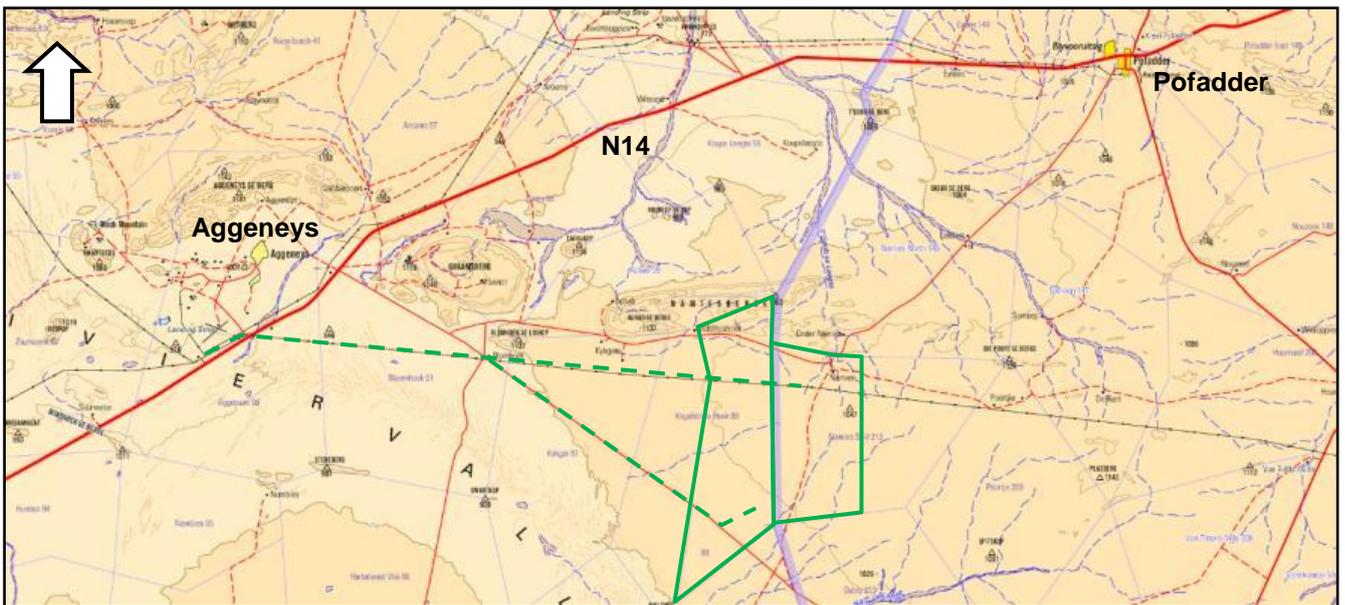


Figure 1: Map showing the location of the proposed development. The two polygons indicate the farm portions, while the dashed lines represent the two alternative power line routes.

The facility is planned to comprise of 45 to 58 turbines with individual capacities of 2.4 to 3.0 MW. The total capacity of the WEF would be 140 MW. The turbine towers would be 91 to 94 m high and the blades 54 to 58 m long. The towers would be mounted on concrete foundations and a hard standing area for the crane would be built alongside each. The total area impacted at each turbine would be 2304 m². Gravel access roads of approximately 7 m width would link the turbines. An on-site substation of 12 000 m² would be constructed. Cabling will be laid underground following the internal roads as much as possible, where after an overhead power line of 132 or 220 kV and some 35 to 40 km length would link the facility with the Aggeneys Substation some 32 km due west of Namies.

The alternatives being considered are as follows:

- Facility layout: two layouts using different turbine capacities but following similar row alignments;
- Technology: two different turbine capacities – Alternative 1 would consist of 45 turbines of 3.0 MW (referred to as Turbines a01-a45 in this report) and Alternative 2 would consist of 58 turbines of 2.4 MW (referred to as Turbines 01-58 in this report). These would result in the two different facility layout alternatives;

- Road access: three potential access roads are being evaluated;
- Power lines: two alternative routes are under consideration – Alternative 1 follows the existing Eskom 400 kV line, while Alternative 2 starts further south and runs along the Loop 10 road before joining the Eskom line further to the west; and
- Activity: generation of energy through wind turbines or the No-Go alternative.

1.1. Terms of reference

The terms of reference for the heritage study, as laid out in the Final Scoping report (Aurecon 2013), are as follows:

- Conducting a detailed desk-top level investigation to identify all archaeological, cultural and historic sites in the proposed development areas;
- Undertaking field work to verify results of desktop investigation;
- Document (GPS coordinates and map) all sites, objects and structures identified on the candidate sites;
- Submit the relevant application form, as required by South African Heritage Resources Agency and Northern Cape Provincial Heritage (Boswa ya Kapa Bokone);
- Compile a report which would include:
 - Identification of archaeological, cultural and historic sites within the proposed development areas;
 - Assess the sensitivity and significance of archaeological remains in the site;
- Evaluation of the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction (medium term), more than 10 years after construction (long term)); cumulative impacts that may occur as a result of the activities.
- Recommendation of mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance;
- The preparation of a heritage resources management plan which includes recommendations on the management of the objects, sites or features, and also guidelines on procedures to be implemented if previously unidentified cultural resources are uncovered during later developments in the area;
- Consideration of relevant guidelines; and
- Cognisance must be taken of the Department of Environmental Affairs and Development Planning guideline: “Guideline for involving heritage specialists in EIA processes”.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains older than 60 years and located outside of a formal cemetery administered by a local authority (Section 36), non-ruined structures older than 60 years (Section 34) and public monuments and memorials (Section 37). Landscapes with cultural significance are also protected under the definition of the National Estate (Section 3 (3.2d)). Section 38 (2a) states that if there is reason to believe that heritage

resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Since the project is subject to an Environmental Impact Assessment, The South African Heritage Resources Agency (SAHRA) and Heritage Northern Cape (Boswa ya Kapa Bokone) are required to provide comment on the proposed project in order to facilitate final decision making by the Department of Environmental Affairs (DEA).

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context into which each development was to be set. This literature included published material, unpublished commercial reports and online material. Historical information was gleaned from oral history, a locally produced book and surveyor general survey diagrams.

3.2. Field survey

The WEF site was examined through a combination of driving and walking on 23rd and 24th July 2013. The power line routes were examined mostly on the 25th July but one portion in the south was checked on the 23rd. During the surveys the positions of finds were recorded on hand-held GPS receivers set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development. It was found that heritage sites, in particular archaeological resources, were strongly clustered. As such, it was easier to name the clusters of occurrences rather than naming every specific one separately. The clusters were determined through constructing enclosing polygons around the relevant GPS points.

3.3. Impact assessment

For consistency, the impact assessment ratings were done using a scale supplied by Aurecon. In mapping the sites we have elected to outline clusters of spatially or temporally related occurrences to make for easier management. These outlines are provided in the appended maps. In general, heritage significance has been assigned for the most significant component within each site.

3.4. Limitations

In general the landscape was such that we could easily identify areas requiring detailed foot survey so the fact that we did not walk the entire layout is not considered to be a significant limitation. Visibility was excellent throughout the study area and archaeological resources are unlikely to have been missed. However, the westernmost portion of the power line corridor could not be accessed due to difficulty in contacting one landowner and the other being away. This limitation was offset by a recent report produced by another specialist which covers much of this area (Morris 2013).

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The area earmarked for the WEF layout is generally very flat and covered by small bushes but with numerous open, sandy areas (Figures 2 to 4). Some areas appeared severely overgrazed which made the surface highly visible (Figure 5). A large Eskom power line runs from east to west across the WEF site (Figure 6). (The proposed Alternative 1 power line route for the WEF runs to the south of this line.) The site has low mountains in the north and a few low hills to the southwest (Figures 2 and 3). Figures 7 and 8 show views of the western parts of the power line routes.



Figure 2: View towards the northeast showing a long distance perspective of the landscape in which the WEF would be situated. The dashed ellipse indicates the approximate position of the proposed facility.



Figure 3: View southwest from Turbine 45.



Figure 4: View north from Turbine 31.



Figure 5: View north from Turbine 07.



Figure 6: View west from the eastern end of the proposed Alternative 1 power line route.



Figure 7: View east from the N14 along the power line route immediately south of the existing ESKOM 400 kV lines. Both power line alternatives use this stretch.



Figure 8: View west along the southern power line route immediately south of the Loop 10 gravel road. Several borrow pits occur within the road reserve but the power line would be beyond the road reserve. Only Alternative 2 uses this section.

5. HERITAGE CONTEXT

5.1. Archaeology

Although little archaeological research has been conducted in the general area around Pofadder and Aggeneys, several impact assessment studies have been conducted in recent years. These form the basis of the present background review.

Early (ESA) and Middle Stone Age (MSA) material, including manufacturing sites, have been found on the northern slopes of the Gamsberg, probably positioned so as to gain easy access to a source of stone material on the mountain, the likes of which is not easily available on the plains (Morris 2010, 2013). On the south side of Gamsberg Morris (2013) located two late LSA sites with stone artefacts, ostrich eggshell, bone (on one site) and pottery. He also found several granite outcrops to have associated artefact scatters, 'waterbakke' and, in one case, a grinding groove. The proposed power line runs between some of these finds. Pelsler (2011) reported MSA and Later Stone Age (LSA) material in an area around the Paulputs substation near Pofadder, although his illustrations appear to be of LSA artefacts made on quartz. He also mentions the presence of ostrich eggshell. East of Aggeneys, Webley and Halkett (2012) found a background scatter predominantly of quartz, but including some quartzite artefacts. Although diagnostic MSA features were absent, the size of the artefacts suggests that they pertain to the Middle Stone Age.

According to Morris (2011a) LSA sites are the predominant archaeological trace noted in surveys in the Aggeneys-Pofadder region. Although Morris (2010) found little LSA material on the northern slopes of the Gamsberg, he did find three LSA settlements on the plains below the mountain. To the northwest of the Gamsberg, he located two stone cairns which could represent graves, as well as a ceramic LSA site. These sites probably represent transient settlement by transhumant hunter-gatherers or herders that moved through the area. Beaumont *et al.* (1995:263) noted that most LSA sites then known in Bushmanland appeared to be ephemeral occupations by small groups of people in the hinterland both north and south of the Orange River. This was in sharp contrast to the substantial herder encampments along the Orange River floodplain itself. Away from the river, LSA material, mainly quartz flakes, appears to often be focused around the base of granite hills (Morris 2011a, 2011b & 2011c; Pelsler 2011; Webley & Halkett 2011) or around pans (Orton & Webley 2012b). Beaumont *et al.* (1995) agree and add that red dunes and the margins of seasonal pans also served as foci for LSA occupation.

Despite the above observations, archaeological remains are likely to be patchy since, in a 15 km linear survey between Pofadder and Pella, Halkett (2010) failed to record any archaeological material. In general, Morris (2011c) notes that archaeological finds around Aggeneys and Pofadder are sparse. His survey of the farm Blomhoek supports this, indicating too that the dune areas there have virtually no archaeological material in them (Morris 2013).

Rock art is known from the region but is uncommon. Rudner and Rudner (1968) note the scarcity of suitable rock canvases and that art is sparsely distributed through the region. Engravings occur along the Orange River (Morris 1998) where suitable rock exists, while in the rocky areas away from the river there are rare rock paintings. Rudner and Rudner (1968) described the paintings on the farm Kangnas 60 km to the southwest of Aggeneys but their descriptions were somewhat inaccurate. The sites were re-recorded by Orton and Webley

(2012a; Orton 2013). The art is geometric tradition art, a style thought to have been painted by herders. Three sites contain rock art, two in a small ravine and one alongside a large pan.

Historical accounts of travels through southern Africa frequently provide clues to the pre-colonial occupation of the land. In this case, two travellers, John Barrow and George Thompson, passed through this area leaving observations on the local population.

Barrow (1801:387) wrote of the plains between the Kamiesberg Mountains and the Orange River that:

"These plains are now desolate and uninhabited. All those numerous tribes of Namaaquas, possessed of vast herds of cattle, are, in the course of less than half a century, dwindled away to four hordes, which are not very numerous, and in a great measure subservient to the Dutch peasantry, who dwell among them."

Thompson (1824:288) noted the following:

"The extensive plains, lying between the Gariiep and the Kamiesberg, are represented, by old writers, as occupied by a numerous race of people, possessed of large flocks and herds, and living in ease and abundance. Of these, the tribe now resident at Pella and its vicinity, is the only one remaining."

Both texts show that the area was well inhabited in the past but that colonial expansion was taking its toll on the indigenous inhabitants. Nevertheless, these observations suggest that archaeological remains, at least pertaining to the more recent prehistoric period, should be abundant on the landscape if one looks in the right places.

5.2. History

Three towns lie in an arc to the north of the site. While Aggeneys is modern and centred around the mining activities there, Pofadder was founded as a mission station in 1875 by Reverend Christian Schröder. Colonists began settling around the perennial spring from 1889 but only in 1917 were the first residential plots surveyed (Northern Cape Tourism Board 2007). Although not many significant historical buildings remain in Pofadder, the Dutch Reformed Church from the early 1920s is a declared Provincial Heritage Site (SAHRIS n.d.).

Pella, to the north and closer to the Orange River, is also a mission station but it was founded far earlier. It was founded by the London Missionary Society in 1814 as a sanctuary for the indigenous people who were driven from Namibia. The mission was abandoned in 1872 because of drought but reopened by the Roman Catholic Church in 1878 (Northern Cape Tourism Board 2007).

The farms in this area were generally surveyed very late. Vogelstruis Hoek 88 and Namies South 212 both date to 1895. Buildings are generally of 20th century age, although some older ones may be present in rare instances.

Morris (2010, 2013) also describes the scene of a possible massacre of Bushmen in a kloof on the south side of Gamsberg which appears to exist only in local legend. There is little or no evidence for this, but if true the site would be a very important intangible heritage site associated with memory.

6. FINDINGS

All heritage occurrences are listed in Appendix 1 and grouped into 'sites' as appropriate.

6.1. Archaeology

Pre-colonial archaeological resources were found to be very sparsely located in the study area and, in common with other surveys in the region, strongly linked to landscape features. Although background scatter artefacts were noted, these were very rare, even more so than expected. This may be due to the lack of suitable flaking rock in the landscape. However, within the turbine layout area stone artefact scatters were located in association with outcrops of ferricrete. Two particularly large such sites were located in the south-western part of the WEF study area close to Turbines 36 and a29. Both had extensive scatters of quartz artefacts with occasional artefacts in other materials (silcrete, quartzite and crypto-crystalline silica). In one place a quartz artefact was found embedded within the ferricrete surface suggesting great age. Four additional smaller sites were found: one just northeast of T22 and Ta17 and three just north of T12. These sites likely date to the Middle Stone Age. Only the first two – the largest ones – should be protected or mitigated. Figures 9 to 11 illustrate these sites, showing their context and surface appearance.



Figure 9: View of VSH2013/001 with white quartz artefacts visible on the surface.



Figure 10: View of VSH2013/002.



Figure 11: View of the ground surface of VSH2013/001 with white quartz artefacts.

In the northern part of the WEF site there were three granite bedrock exposures with grinding grooves and patches on them (Figure 12). None of them had associated artefact scatters.



Figure 12: Location of VSH2013/005 with one of the grinding grooves shown close up (scale in cm).

Along the power line routes pre-colonial archaeological resources were focussed on two main areas. The first was an exposed granite outcrop of about 1.6 km long and up to about 100 m wide along the southern margin of the Loop 10 road, on the farm Kykgat 87/1. Only 1.2 km of its length was examined since the rest curved away from the power line route and the rocks became markedly lower. A variety of resources was found here. Most frequently encountered were grinding grooves and hollows similar to those described above. In total, this stretch which includes sites KYK2013/001 to KYK2013/004 contained at least 125 hollows and patches. At the far western end of this area there were a few ‘waterbakke’ (named “!Gorras” by Morris (2013) – the Nama name for these features), but otherwise water must have been obtained from further away, presumably towards the south. No obvious pan exists there on aerial photography but our experience in the area suggests that these grinding features are generally located close to water sources.

Also along this stretch were a number of artefact scatters. Quartz was the predominant stone material used, but other materials were occasionally noted. Pottery was present in places, while fragments of ostrich eggshell occurred throughout. Occasional historical items, such as glass and ceramics, were found on sites at the south-eastern end of this granite outcrop. Figures 13 and 14 show examples of the kinds of artefacts found at these sites. A large quartz outcrop also occurred between the granite exposure and the road. This outcrop had been used as a quarry site to obtain stone material and numerous scars could be seen showing where people had struck flakes directly off the outcrop (Figures 15 & 16).



Figure 13: Stone artefacts, pottery, bone and ostrich eggshell from KYK2013/001 (point 212). Scale in cm.



Figure 14: Stone artefacts and a bottle fragment from KYK2013/004 (point 237). Scale in cm.



Figure 155: The quartz outcrop at KYK2013/004 (point 233).



Figure 16: Flaked quartz outcrop at KYK2013/004. Scale in cm.

The most interesting aspect of the archaeological remains found in this area were another eight sites bearing markings similar to those recently documented at Kangnas, some 79 km to the west (Orton & Webley 2012a). The markings in this area seemed to generally be at far earlier stages of manufacture with varying degrees of working evident. Some were simply impact scars where another rock had been used to strike the vertical surface of the boulder (Figure 17), others were ground to varying degrees and differentially weathered (Figures 18 & 19) while just one cupule was deeply ground into the rock (Figure 20). This one and one other at the same site showed evidence of renewed grinding long after the initial formation of the cupules. This is evident by the fresher, lighter orange scarring around the lower part of the right hand cupule in Figure 20. As was the case at Kangnas, the affected rock faces are oriented towards the southeast and south, although one appeared to face southwest. Aside from these markings and those from Kangnas, the only other report of a similar nature comes from Nieuwoudtville, far to the south (D. Morris, pers. comm. 2013). The meaning, function and significance of these sites remain unknown and they require further academic research.

A cluster of pre-colonial archaeological resources was also found to the north of the WEF area, but only a very brief visit to this area was conducted just to assess whether, given the right combination of natural resources, Stone Age people would have occupied the area.

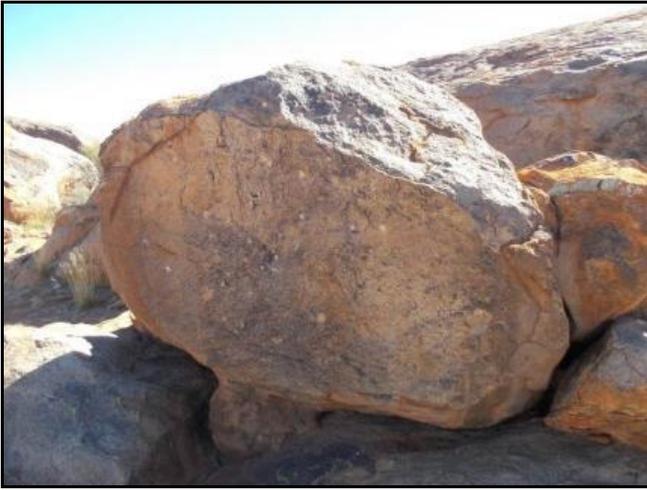


Figure 17: A boulder with many impact marks on it. It is at KYK2013/004 (point 239).

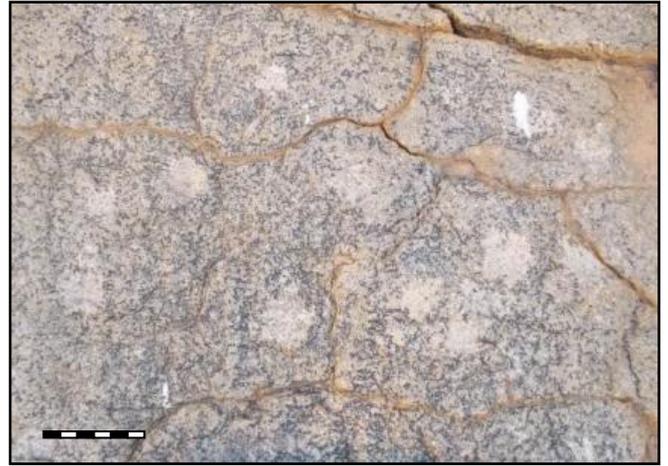


Figure 18: A series of shallow, variably ground and unweathered cupules at KYK2013/004 (point 244). Scale in cm.



Figure 19: Some shallow but well ground and somewhat weathered cupules at KYK2013/004 (point 244). Scale in cm.



Figure 20: Two more deeply ground cupules with that on the right being the deepest seen at KYK2013/004 (point 236). Scale in cm.

Historical archaeological resources were also present, but mostly associated with the ruined village of Namies just north of the WEF site. Elsewhere, historical items were sometimes found associated with LSA material (although perhaps only by chance) and sometimes on their own. These included fragments of historical bottle glass and ceramics. Among the latter were some of stoneware and one sponge-printed refined earthenware sherd. These items are typically found in historical contexts dating to the later part of the 19th century or the early 20th century. This is consistent with the age of the farms in the area. Historical kraals were also present. One was a small stone kraal with two enclosures at KYK2013/001. They were built between the granite boulders with two skins containing a rubble fill – the typical historical construction method (Figure 21). A far larger and much more formal kraal was found further west at BHK2013/004 (Figure 22). It measured about 73 m by 27 m and had three enclosures. Such kraals are strongly characteristic of the earlier stock farmers and some kraals may even still be in use today.



Figure 21: View towards the west showing the main kraal enclosure in the middle with the smaller one being in shadow to the right of the prominent boulder. The rest of the granite outcrop can be seen stretching towards the upper left hand corner of the photograph.



Figure 22: View of the large historical kraal at BHK2013/004. The second enclosure is visible in the distance while the third and smaller one is further back.

The most important historical archaeological resources relate to the ruined Namies village and its associated features. Although located just outside the footprint area of the proposed WEF, the context of the village would be altered through construction of the WEF (Figure 23). The village area contained a large number of ruined structures including a church, some kraals and a variety of buildings presumed to be houses and outbuildings. Three graveyards were also found, but these will be discussed under the relevant section below. This section does not provide extensive detail on the village since it will not receive direct impacts but a general description is given. In a later section we provide a brief historical analysis from the sources we were able to track down.



Figure 23: View towards the south over the area occupied by the ruined Namies village. The school boarding house is just visible (left arrow), as is the date palm that stands alongside what was said to be the main water supply for the village (right arrow). The WEF would be constructed in the area behind the village (effectively the skyline) as seen in this view.

The ruined structures in Namies were mostly built from mud bricks placed over stone foundations, although in one instance a building had stone to half height. Due to their relatively recent age (20th century), many had modern cement on their outer walls. However, the use of mud-bricks and mud mortar indicate a traditional construction style widely used across western South Africa. Cement was very scarce in South Africa before 1920 when local production started. In the case of structures built after this time the cement may have been applied to the outside only because it was costly to acquire. Earlier structures probably had mud mortar on their exterior surfaces and once cement became available it may have been applied to replace the mud mortar which could have been degrading with age and exposure to the elements. Not knowing the age of the structures makes it difficult to ascertain this, but the latter scenario seems more likely. Today the majority of ruins have nothing besides stone and bricks visible and other materials (joinery, roofing, etc.) may well have been stripped and reused elsewhere. Why the school boarding house has survived intact is unknown. Several kraals and other small stone structures were also noted. Figures 24 to 32 show a selection of the ruined structures in Namies. As a standing, functional structure, the boarding house is discussed further under built environment below.



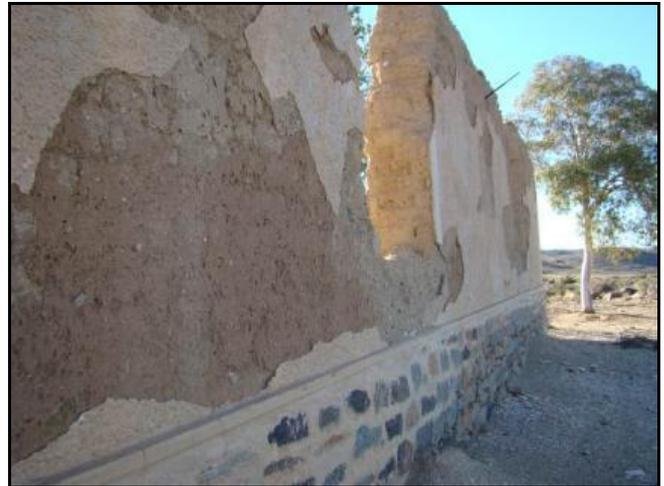
Figure 24: Buildings close to the date palm at NMS2013/002 (point 166).



Figure 25: Small circular piled stone structure at NMS2013/012 (point 170).



Figure 26: A large stone kraal at NMS2013/012 (point 171). The inside is covered in a thick layer of old dung.



Figures 27 & 28: The ruin of the church building at NMS2013/018 (point 1940) which apparently also served as the school.



Figure 29: The remains of a ruin at NMS2013/019 (point 195) with part of the stone foundation visible. The mud bricks have completely dissolved.



Figure 30: The remains of a ruin at NMS2013/019 (point 196) with just the cement plaster visible. Again, the mud bricks have dissolved.



Figure 31: A more recent structure made of home breeze blocks at point 202. It is not old enough to be considered an archaeological heritage resource.



Figure 32: Two parallel lines of stone walling of made unknown function at NMS2013/012 (point N007).

Several historical sources allow us to ascertain that the structures were likely all built after about 1895. Over a period of forty years a certain Dik Schalk Hattingh, who was assistant to W.C. Scully (magistrate in Springbokfontein [now Springbok] and Namaqualand) camped at the spring in Namies. He was very protective of his camping spot (Eksteen 2012) and given that Scully worked in the area from 1890 to 1892 (Scully 1913 in Schaeffer 2008), it seems possible that the ruins presently occurring around what is said to be the original spring (W. Visser, pers. comm. 2013) may only have been built after that time. When travelling to Namies from the west, Conradie (1909 in Schaeffer 2008), who preached at Namies between 1886 and 1895, noted with glee the sighting of the tents there. He also commented that, for his comfort, Jan Visser junior used to lend him his tent while he was visiting. These are all indications that the built structures post-date 1895.

The Cape Town archives carries school inspection reports dating between 1926 and 1957 (NASA, n.d.), but Anonymous (1962) suggests that the school closed in 1951. This is consistent with the testimony of the present land owner, Mr Visser, who told us that his brother attended the school until Standard 2 which, for him, would have been about 1951. He also informed us that his brother had attended school in the church thus suggesting that no actual school building was ever erected.

Also relevant in this section are the many ash/rubbish dumps that were located within the village area. These would relate to specific houses and are places where ash and general refuse was discarded. The majority of the material on these dumps might well be less than 100 years of age and thus not protected by the NHRA, but, given that the area seems to have been used in a less formal manner prior to the construction of houses, it is possible that some older and thus legally protected archaeological resources might be present. Amongst the ash, such dumps typically contained broken glass, broken ceramic items (plates, cups, etc), tin cans, lined school slates and school pencils (mostly black but one white one was noted). One dateable item was a saucer with the words "MADE IN OCCUPIED JAPAN" on the underside. This inscription guarantees that the piece was made between 1945 and 1952 (Reference.com 2013) and that it was left at Namies at some later date. A fragment of a Great Trek commemorative bowl indicates manufacture around 1938 providing a further date for occupation of the village. Figures 33 to 39 show a selection of photographs of material relating to these dumps.



Figure 33: Artefacts from NMS2013/002 (point 180). Note lined school slates at top left.



Figure 34: A tin dump at NMS2013/002 (point 182).



Figure 35: Artefacts from NMS2013/002 (point N014). Some of these items may be late 19th century.



Figure 36: An ash and rubbish dump at NMS2013/002 (point N006).



Figure 37: A teacup base from NMS2013/002 (point 184).



Figure 38: A saucer from NMS2013/019 (point 197). Note the inscription: "made in occupied Japan".



Figure 39: A white pencil from NMS2013/002 (point 184).

6.2. Built environment

Aside from some stone-built farm dams, there is only one standing structure within close proximity of the WEF site. A further small structure occurs north of the power line route close to BHK2013/004 but this was not visited. The dams are likely to date to the mid-20th century and are built of stone with pointed cement in between. One is still in use (Figure 40), while the other is falling apart with all loose stones apparently removed from the site, perhaps for reuse elsewhere. Both lie within the WEF footprint area.



Figure 40: Farm dam at point 016. The inset shows the pointing and a tensioned cable to hold the dam together.

The school boarding house is the most well preserved structure in the study area, although it is currently in a state of disuse. It is a U-shaped structure under a corrugated iron roof with two gables in front (Figure 41) and wings extending to the rear, the eastern one of which is longer and houses a garage (Figure 42). The western wing contains the kitchen. An extra wing was added to the western side at a later date and is built in a slightly different style. The earliest aerial photograph for the region dates to 1962 and shows this new wing already in place. Further history related to the school is discussed below.



Figure 41: The front of the Namies school boarding house at NMS2013/022. The new wing extends to the right.



Figure 42: The rear of the Namies school boarding house at NMS2013/022. The new wing extends to the left.

6.3. Graves

One isolated grave was found along the power line route at KYK2013/004 (point 233). The location is very strange given that it is placed on top of an outcropping quartz vein. But it might have been chosen for convenience because of where the death occurred and/or because there was a ready supply of rock here to cover the body (Figure 43).

At Namies there were three graveyards. One is located in close proximity to the school boarding house (130 m to its west; Figures 44 - 46), while the other two occur alongside one another 600 m to the west of the boarding house. The first, at NMS2013/004, is located precariously between a dam, a road and a river. It consists of 15 graves oriented east-west in two primary rows approximately 18 m apart from one another. All are stone packed and have no formal headstones.



Figure 43: The grave located at KYK2013/004 (point 233).



Figure 44: Graves at NMS2013/004 with the dam and school boarding house in the middle and background respectively.



Figure 45: Graves at NMS2013/004 with the nearby gravel roads visible in the background.

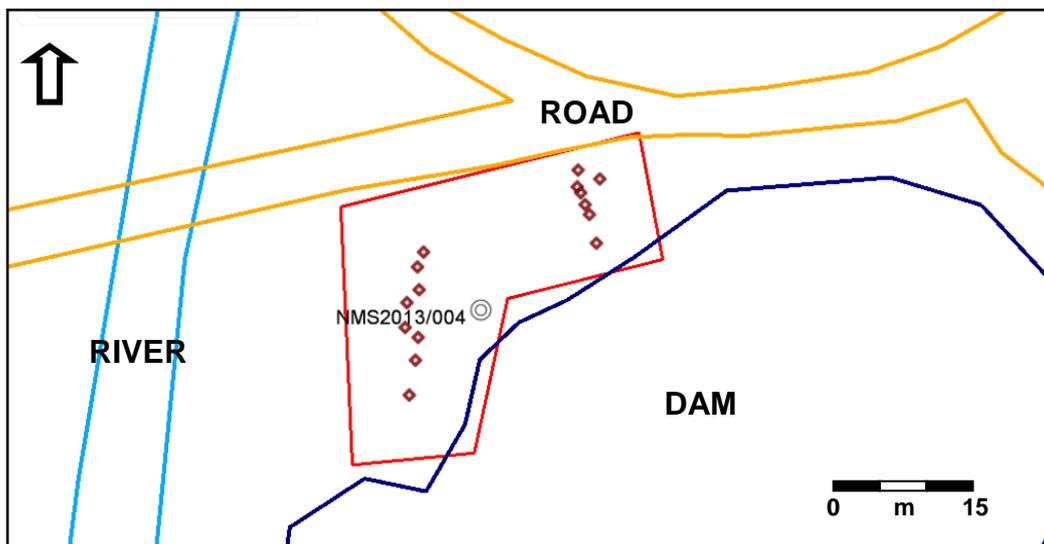


Figure 46: Schematic plan of the NMS2013/004 graveyard showing its relationship to the roads, river and excavated dam. The red diamonds represent individual graves and the red polygon an approximate designation of the site.

One of the graveyards to the west is fenced and is presumed to be the ‘white’ graveyard (Figure 47). It contains both formal graves with headstones as well as less formal stone-packed graves. The graves with dated headstones indicate births/deaths in 1923/1923 (van der Westhuizen), 1936/1936 (Maass), 1914/1979 and 1913/1987 (Maass), the last two in a double grave. Fourteen people were buried here. The second graveyard is unfenced and lies just north of the fenced one. All its graves are in the less formal style with some being stone-packed and others merely marked with head and foot stones (Figures 48 & 49). Sadly, this latter graveyard has been badly damaged by burrowing animals. This graveyard has approximately 25 graves. In all the three graveyards represent 54 deaths. Only two appear to be recent so the rest presumably date to the period of occupation of the village.



Figure 47: The fenced graveyard at NMS2013/021. One grave inside the graveyard is individually fenced.



Figure 48: The unfenced graveyard at NMS2013/021. Again, one grave inside the graveyard is individually fenced.



Figure 49: Graves in the unfenced graveyard at NMS2013/021. All the rocks visible in the background represent head and foot stones.

Isolated, unmarked pre-colonial graves can occur anywhere on the landscape where the substrate is appropriate for digging or they could be buried underneath a stone cairn such as that illustrated in Figure 43. The locations of such graves cannot be predicted, but we are confident that no stone cairn graves are located along the turbine rows.

6.4. Memorials

One public memorial relating to the Great Trek occurs at NMS2013/005. Its inscription indicates that a stone beacon was erected there in 1949, while the present permanent structure was unveiled in 1984 (Figures 50 & 51).



Figures 50 & 51: The Great Trek memorial and its plaque at NMS2013/005.

6.5. History of Namies

Finding information on the history of this little village was not easy. However, a number of sources have helped put together some information. Mr Barry Eksteen, a local resident and son of a former dominee in the area, is particularly acknowledged for his research (Eksteen 2012), some of which is included in the summary below.

Namies was important as a water supply point for people trekking across Bushmanland as it was the last water before Gamoep, 100 km to the southwest across the open plains. After good rains trekboers used to come and camp at Namies (Eksteen 2012). Although the land owner, Mr Visser, commented that the hole at the palm tree was the original spring, we know from the writings of W.J. Conradie (1909 in Schaeffer 2008), the minister from Garies, that there was more than one water hole in Namies. Our survey revealed three wells. When Namies became established is unknown, however, that Moffat did not go there and does not even mark it on his map (Figure 52) suggests that it may have either been relatively unknown in 1858 or perhaps that the wells had yet to be dug.

The minister from Garies would travel through Bushmanland each Autumn to lead 'Nagmaal' (communion). Scully noted that after good rains trekboers from across northern Bushmanland would congregate at Namies and the minister at times preached to several hundred people (Eksteen 2012). Conradie himself, however, notes that "his small flock at Namies had grown to over a hundred souls" and that his sermons were held in a large tent provided by Mr Visser that could accommodate 95 people (Conradie 1909 in Schaeffer 2008).

The farms here, including Namies South 212 on which the village was located, were first surveyed in 1895. However, a memo exists that shows that in 1889 already Jan Visser, who was hiring the land at Namies South from the government, had asked to be given first rights to buy the property when it was surveyed. He made this request as he was concerned that the farm would be auctioned and that he would lose the rights to this popular place. Although

his request was rejected for legal reasons, he did manage to obtain a five year lease once the farm was surveyed (Eksteen 2012). Prior to this, Visser had “been living on this farm for many years, grazing his flocks far and wide” (Conradie 1909 in Schaeffer 2008:202).

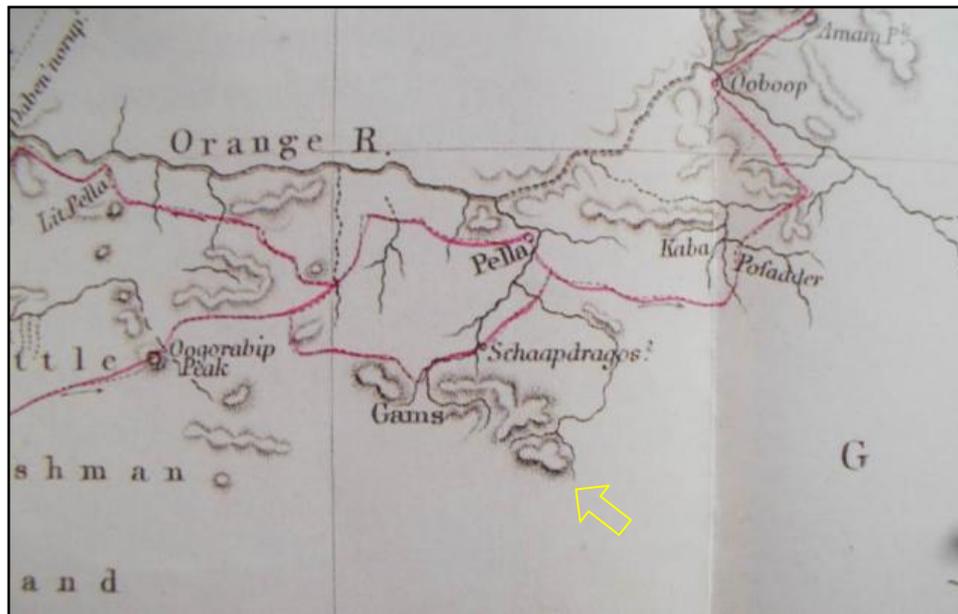


Figure 52: Extract from Moffat’s map of his travels (Source: Schaeffer 2008: facing page 38). Although the map is somewhat inaccurate and stylised, we might expect Namies to appear in the area indicated by the yellow arrow.

In 1897 A.J. Dippenaar, who, with the blessing of Visser, lived at Namies in a tented waggon, wrote to the civil commissioner requesting that land be donated by the government for a church and school. If this was agreed to, the church would undertake to meet the costs of the building work. The basis of his request was that there were 29 NG Kerk members in Namies and 37 children being schooled there. Upon investigation, the commissioner found that just nine people had signed a petition for a church and school and four of these were in fact Roman Catholics from Pella, some 56 km away! Furthermore, Visser claimed that there were no more than ten school children and that the idea of building a church and school was ridiculous. At that time, the nearest school was located at Bowesdorp (the precursor to today’s Kamieskroon) some one and a half days trek to the south (Eksteen 2012). We do not know from the information available who was telling the truth and Visser may well have simply been trying to protect his rights to the land. Interestingly, as noted by Conradie (1909 in Schaeffer 2008), Dippenaar was Visser’s brother-in-law.

With the subsequent souring of relations between Visser and Dippenaar, Visser wrote to the commissioner requesting that Namies be auctioned publically so that he could buy it. This was agreed to, but only after the area could be inspected by the commissioner (Eksteen 2012).

Soon afterwards much correspondence regarding the establishment of a town at Pofadder is on record. The need for a church and school was great and a school inspector was dispatched to the region – although land would need to be acquired, his 1905 report was favourable. In July 1906 the surveyor-general sent a surveyor to Namies South to select approximately 500 morgen of land for the church and school. Because the land around the fountain was rocky and bad for grazing, a minimum of 200 morgen was going to be required (Eksteen 2012). The resulting “school erf” was indicated on a 1908 survey diagram which,

unfortunately, was not available online. However, because it was reconsolidated with the parent farm in 1958 we do have its location on a later survey diagram (Figure 53; Chief Surveyor General n.d.). Around the same time, permission was also granted for a school to be built at Pofadder (Eksteen 2012). Although a school building had yet to be erected, a teacher (E.H. van Biljon and his/her sister) was already appointed to start at Namies in January 1910. Acting on information reported to them, the teacher asked whether the school board might obtain exclusive rights to the well located 30 yards from the boarding house (Eksteen 2012). We did not locate any well this close by (the nearest probable well that we found was located at NMS2013/020, some 250 m away), but, nevertheless, we can tell from this that a boarding house did in fact already exist in 1909. However, a letter written in 1910 indicates that no plans had yet been drawn up for a school in Namies (Eksteen 2012).

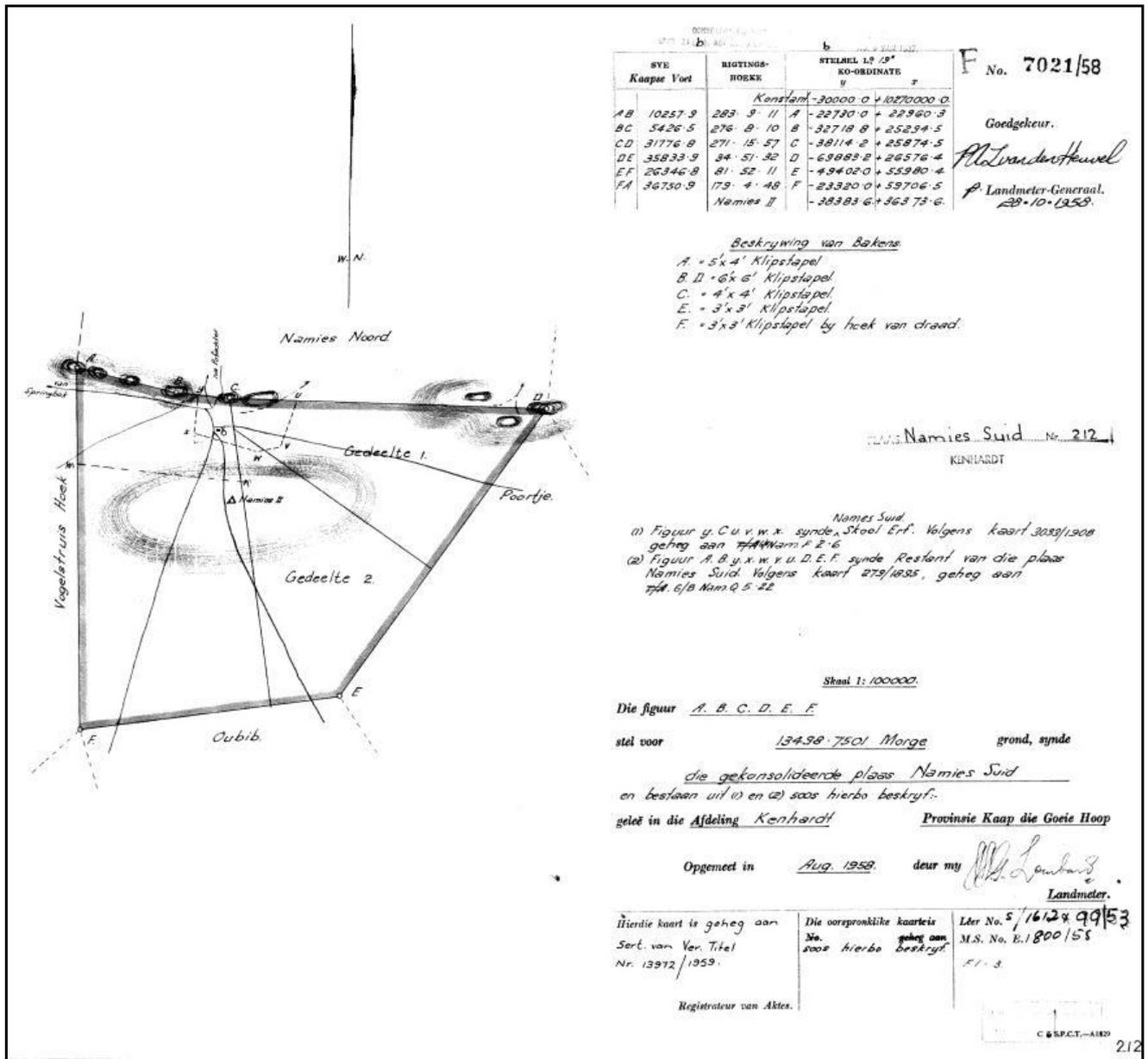


Figure 53: 1958 survey diagram indicating the “school erf” (dotted outline in the north) that was consolidated with the remainder of Farm 212 and the two new portions and remainder that were created at that time. Although the farm boundary, internal portions and trigonometric beacon (central triangle labelled Namies II) exactly match the modern 1:50 000 topographic map, it appears that the locations of roads and the roads and single building (possibly the present school boarding house) were just roughly sketched on. Source: Chief Surveyor General (n.d.).

Although school was being held on the NG church property for some years, from 1912 this was no longer allowed by the church as indicated in a letter from the Reverend Chierhout to the department of education. Provision for a proper school was thus important (Eksteen 2012). When the present ruined church building was constructed is hard to determine. We know from the 50th anniversary booklet of the Pofadder Dutch Reformed congregation (Anonymous 1962) that the congregation was first formally established at Namies on 23rd March 1912. However, a statement that an existing school building was enlarged and subsequently used for church purposes is very enigmatic given Eksteen's (2012) note that no school building was present in January 1910. Although it is possible that some smaller structure was present on the church property and used for school purposes, Eksteen's archival research is more likely correct. The congregation was moved to Pofadder where a new church was built and consecrated in 1922 to 1923, although, interestingly, the congregation retained the name of Namies until 1927 when the name Pofadder was adopted. The church booklet provides a photograph of the Namies Church (Figure 54) which we must then assume to have been in existence before the decision was taken to move the congregation to Pofadder. The photograph shows a view of the church from the north with a small stone-lined path leading towards it from the north-west – despite its informal nature, part of this path remains present today (Figure 55).

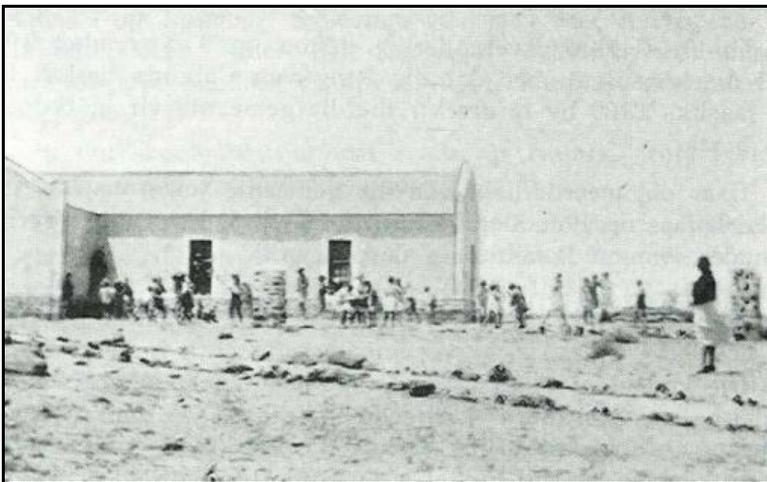


Figure 53: “Namies Skool en Kerksaal” (Source: Anonymous 1962:9).



Figure 54: Portion of the stone-lined path still present.

It is quite apparent from the above history that the village of Namies, although being relatively short-lived, played a key role in the development of the region. It was for many years a central gathering point for trekboers from Namaqualand and Bushmanland and eventually the first Dutch Reformed Church congregation for the local region was established here. Only in the mid-20th century did the area fall from favour with the still relatively new town of Pofadder taking over the primary role.

6.6. Scenic routes, landscape and sense of place

The N14 lies some 15 km to the north of the WEF site and is the only route that can be regarded as a significant scenic route through the area. To the north the site is completely screened from the N14 by the intervening low mountains and from the west it is too distant from the N14 to result in an impact. The power line would run over and close to the N14 but would follow the alignment of an existing 400 kV line thus resulting in only a minimal increase in impact.

The general environment of the proposed WEF site and associated infrastructure is very open, undeveloped and natural. The only anthropogenic modifications are fences, roads and the occasional farm houses and windmills that dot the area. As such, the introduction of wind turbines would constitute a major change to this very rural, but at the same time natural, landscape. Figures 2 and 22, among others, provide good illustrations of the landscape character in the area.

One very specific impact that will be experienced relates to the sense of place surrounding the ruined Namies village. It is noted that the nearest proposed turbines for Alternative 1 are just over 2.0 km from the edge of the village area, while for Alternative 2 the turbines would encroach to within 1.6 km of the village. The introduction of such large industrial structures to the landscape context of Namies would impact on its sense of place, however, because the village is ruined and no longer occupied, this would not be a major impact.

7. ASSESSMENT OF IMPACTS

Impacts to heritage resources will be focussed on two main areas, archaeology and landscape context/sense of place. These are assessed separately for the WEF layout alternatives, the project area access road and the power line and in the tables that follow. Note that for archaeological resources all impacts occur at the construction phase and, because of their permanent nature, are sustained through the project lifespan. For the landscape the impacts would be similar during all phases but would revert to the No-Go status after decommissioning. A final table assesses the No-Go alternative for the project as a whole.

7.1. Archaeological impacts (including graves)

The WEF site itself has very little archaeology on it (Figure A2.1). There are a few locations with bedrock grinding areas and a number of ferricrete outcrops with stone artefact scatters on them. Only two adjoining areas of the latter are deemed archaeologically significant (because of their large size and the density of artefacts) and would require avoidance or mitigation. This area is shown in Figure A2.2 and the WEF layout alternatives, including the on-site roads and underground cables, are assessed in Table 1. Mitigation of the affected archaeological resources would entail either avoidance of the relevant area or excavation, collection and analysis of stone artefacts from the area to be impacted. Alternative 1, because it has fewer turbines (and hence a smaller spatial impact) and aligns better with the space in between the two significant archaeological sites, is slightly preferred.

Table 1: Assessment of archaeological impacts for the WEF alternatives including the on-site roads and power lines.

Nature of impact	Disturbance or destruction of archaeological resources during WEF construction.			
	Alternative 1		Alternative 2	
	Before mitigation	After mitigation	Before mitigation	After mitigation
Extent	Site specific	Site specific	Site specific	Site specific
Magnitude	Low	Very low	Medium	Very low
Duration	Long term	Long term	Long term	Long term
Significance	Low	Very low	Medium	Very low
Probability	Probable	Unlikely	Definite	Unlikely
Confidence	Sure	Sure	Sure	Sure
Reversibility	Irreversible		Irreversible	
Cumulative impacts	Archaeological resources are sporadic but widespread and thus cumulative impacts are difficult to assess accurately. However, because many resources of generally greater significance are likely to occur in areas not suited to renewable energy projects, the cumulative impacts are considered to be of low significance. At the only other renewable energy facility planned, immediately to the east, far fewer archaeological resources were encountered.			

To the north of the WEF layout area is the ruined Namies village. This area is of concern because there are components of the village (buildings and graves) that are located very close to the roads and could be impacted by any road widening (See Figure A2.3). Table 2 assesses the impacts of potential access roads onto the WEF site assuming, as a worst case scenario, that the site would be accessed through Namies before mitigation. Note that no access road layout was provided so it is assumed that existing local roads would be used for this purpose. Mitigation would involve avoiding using the roads through Namies and accessing the site via another route, either southwards from the Aggeney's-Namies road or northwards from the Loop 10 road. The proponent has indicated that the latter is the most likely route that would be used for WEF construction access, although roads through the village might still be used to transport workers.

Table 2: Assessment of archaeological impacts for access roads onto the WEF site (this excludes the internal access roads).

Nature of impact	Disturbance or destruction of archaeological resources during access road construction.	
	Before mitigation	After mitigation
Extent	Site specific	Site specific
Magnitude	High	Very low
Duration	Long term	Long term
Significance	High	Very low
Probability	Probable	Unlikely
Confidence	Sure	Certain
Reversibility	Irreversible	
Cumulative impacts	The nature of the archaeological resources suggests that they are rare in that they represent the remains of an abandoned village. Cumulative impacts would thus not apply as similar impacts cannot occur elsewhere and other similar ruined villages are not known from the area.	

The power line routes are separate in the east and then follow the same alignment in the west. The only significant impacts that would occur are in the central area close to where the two routes join. The impact assessment (Table 3) assumes that some sort of track or road would be required along the route for periodic servicing of the power lines. Mitigation of the affected archaeological resources would entail either avoidance of the relevant area or recording, excavation, collection and analysis of archaeological material from the area to be

impacted. Note that impacts to the rock art would be indirect (contextual) impacts because it is unlikely that any boulders would be moved for the installation of the power line. Because power line Alternative 1 would result in fewer impacts, it is preferred.

Table 3: Assessment of archaeological impacts for the power line alternatives (including any potential access road following the route).

Nature of impact	Disturbance or destruction of archaeological resources during power line and associated access road construction.			
	Alternative 1		Alternative 2	
	Before mitigation	After mitigation	Before mitigation	After mitigation
Extent	Site specific	Site specific	Site specific	Site specific
Magnitude	Low	Very low	High	Low
Duration	Long term	Long term	Long term	Long term
Significance	Low	Very low	Medium	Low
Probability	Definite	Probable	Definite	Probable
Confidence	Sure	Sure	Sure	Sure
Reversibility	Irreversible		Irreversible	
Cumulative impacts	The archaeological material present along one portion of the Alternative 2 route is of high significance and is very unusual. Only three areas with the sort of art encountered there are known from South Africa. The archaeological artefacts are less significant but, given the typical archaeology in the landscape, loss of these sites would have a regional effect and thus a larger cumulative impact.			

7.2. Landscape and sense of place

The wide, open rural and natural landscape of the study area would be altered through the imposition of large, industrial structures. These would reduce the quality of the landscape, both from the point of view of people using or traversing it and also from the point of view of the context of the now ruined Namies village. Because the village is no longer occupied and in a ruinous state the significance of these impacts is somewhat reduced, but nevertheless, they do need to be considered. The only mitigation that could be considered would be to move the turbines further away from the Namies village but it is believed that the presently planned buffers of 2.0 km for Alternative 1 and 1.6 km for Alternative 2 are sufficient. One cannot mitigate impacts to the general landscape. As such, the ratings before and after mitigation are identical (Table 4). However, because there would be less turbines in Alternative 1, this alternative is seen as slightly preferable. In general, though, because of the remote location of the site and its lack of visibility from the N14, the significance ratings are low.

Table 4: Assessment of landscape/sense of place impacts for the WEF alternatives including the on-site roads and power lines.

Nature of impact	Alteration of the qualities of the landscape through the introduction of industrial structures to it.			
	Alternative 1		Alternative 2	
	Before mitigation	After mitigation	Before mitigation	After mitigation
Extent	Local	Local	Local	Local
Magnitude	Low	Low	Low	Low
Duration	Long term	Long term	Long term	Long term
Significance	Low	Low	Low	Low
Probability	Definite	Definite	Definite	Definite
Confidence	Certain	Certain	Certain	Certain
Reversibility	Reversible		Reversible	
Cumulative impacts	Only one other similar facility is planned within a range of 60 km and this is immediately to the east. The two facilities would appear as one from a distance which reduces the scale of the cumulative impact to one of limited significance.			

The proposed power lines would either follow the existing Eskom line from the east side of the proposed WEF (Alternative 1), or run from the southern edge of the development to join the Eskom line further west (Alternative 2). The latter would thus result in new impacts to the landscape along the Loop 10 road alignment. Alternative 1, by virtue of following an existing power line corridor, would result in impacts of less magnitude and is thus preferred. These impacts are assessed in Table 5. No mitigation is suggested for this component so the ratings before and after mitigation are identical.

Table 5: Assessment of landscape/sense of place impacts for the power line alternatives (including any potential access road following the route).

Nature of impact				
	Alternative 1		Alternative 2	
	Before mitigation	After mitigation	Before mitigation	After mitigation
Extent	Local	Local	Local	Local
Magnitude	Very low	Very low	Low	Low
Duration	Long term	Long term	Long term	Long term
Significance	Very low	Very low	Low	Low
Probability	Definite	Definite	Definite	Definite
Confidence	Certain	Certain	Certain	Certain
Reversibility	Reversible			
Cumulative impacts	One other similar facility is planned just to the east and this too would require a power line. However, given the existence of a far larger (400 kV) power line in the landscape there is little difference between the addition of one or two smaller lines to it.			

The No-Go Alternative would see the land remaining as it is without any transformation to industrial uses. The impacts that would occur would relate to trampling of archaeological artefacts by grazing livestock and perhaps isolated acts of vandalism that might occur to built and ruined structures. These impacts are assessed in Table 6. No mitigation is required if the development does not proceed so the ratings are identical before and after mitigation.

Table 6: Assessment of the No-Go Alternative.

Nature of impact	Natural processes of erosion and trampling by grazing livestock will continue for archaeology and the site will remain undeveloped.	
	Alternative 1	
	Before mitigation	After mitigation
Extent	Site specific	Site specific
Magnitude	Very low	Very low
Duration	Long term	Long term
Significance	Very low	Very low
Probability	Probable	Probable
Confidence	Sure	Sure
Reversibility	Irreversible	
Cumulative impacts	The cumulative impacts to archaeology are very minor for the site while landscape impacts will not occur at all for this option.	

8. MANAGEMENT MEASURES

Management measures include the following:

- Mitigation should be carried out as suggested above. This will need to take place before construction;
- Any heritage sites, particularly the Namies village (NMS2013/004, 012 and 018-022) and the vicinity of the rock art (KYK2013/001-004) should be strictly off limits during construction. The possibility of vandalism and theft of artefacts does exist when large numbers of people are working around the sites; and
- The general principle of reducing landscape scarring as far as possible should be adhered to so as to reduce the impacts to the landscape.

9. CONCLUSIONS

This study finds that construction of the proposed WEF is feasible and that the present turbine layout will adequately protect the heritage resources on site. Alternative 1, which has fewer turbines and is better aligned in terms of the one area with significant archaeological resources, is preferred. The power line corridors will both have impacts to archaeological resources, although those from Alternative 1 are less and this alternative is thus preferred. Because road widening through the ruined village of Namies is not possible, the site will need to be accessed by large vehicles from elsewhere.

10. RECOMMENDATIONS

It is recommended that the proposed WEF and associated infrastructure be allowed to proceed with either WEF layout alternative and either power line alternative. However, Alternative 1 in both cases is favoured. This recommendation is subject to the following conditions:

- The main access road to the site may not pass through the village of Namies;
- All heritage resources that are not mitigated and are not affected by the proposed project must be protected from harm;

- In the WEF layout area the archaeological sites VSH2013/001 and VSH2013/002 must be avoided by the road or else mitigation will be required as appropriate;
- For power line Alternative 1 the archaeological site at BHK2013/002 will need to be avoided or mitigated;
- For power line Alternative 2 the line may be placed through the area with archaeological sites (KYK2013/001-004) but mitigation and/or avoidance of certain areas will be required. Rerouting the line some 150 m to the south of the outcrop would be preferable, however. Any access road that follows the line may not run over the rocky outcrop – it will need to run to the south of the outcrop;
- Any changes to the WEF layout or power line routes should be approved by the archaeologist; and
- If any isolated human burials are located during excavation, work in the immediate vicinity must stop and the find be reported to SAHRA and an archaeologist for inspection and exhumation under the necessary permit.

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APPENDIX 1: Heritage site listing

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
N001	S29 20 17.5 E19 10 24.3		Slight hollow on the slopes of a quartz koppie. There are some rough boulders arranged around the edge of the hollow. Purpose unknown.	Low
015	S29 19 28.4 E19 12 32.5		Background scatter of quartz artefacts. Very ephemeral and hardly worth recording.	Low
016	S29 21 43.7 E19 12 09.2		Stone and cement dam, c. 9m diameter, walls 0.8m thick. Cement pointed in places	Low
017-056	S29 20 51.8 E19 08 47.5	VSH2013/001	Big quartz scatter on an outcrop of ferricrete. Most dense in the northeast part.	Medium 8 hours
057-115	S29 21 00.5 E19 08 32.3	VSH2013/002	As above but less dense.	Low-medium 4 hours
116-122	S29 19 56.2 E19 08 01.2	VSH2013/003	As above but far smaller.	Low
123	S29 19 34.9 E19 08 56.4		Early to mid-20 th century farm dam	Low
124	S29 19 26.1 E19 09 03.3	VSH2013/004	Small, low density scatter of quartz on a ferricrete outcrop.	Low
150	S29 18 25.1 E19 09 57.0	VSH2013/005	Bedrock exposure with two grinding grooves alongside a small water course though there is no obvious standing water spot.	Low
151	S29 18 12.8 E19 09 44.0	VSH2013/006	Bedrock exposure with two grinding grooves and six grinding patches alongside a small water course	Low
152	S29 18 11.6 E19 09 44.9		Bedrock exposure with one grinding patch.	
125-127	S29 18 33.7 E19 11 17.2	NMS2013/001	Small, low density scatter of quartz on a ferricrete outcrop.	Low
128-130	S29 18 32.6 E19 11 20.7	NMS2013/002	Small, low density scatter of quartz on a ferricrete outcrop.	Low
131-133	S29 18 29.5 E19 11 21.0	NMS2013/003	Small, low density scatter of quartz on a ferricrete outcrop.	Low
134-148	S29 18 13.1 E19 12 31.6	NMS2013/004	Informal graveyard on an "island" between river, road and dam.	High AVOID
149	S29 17 55.8 E19 11 43.4	NMS2013/005	Great Trek monument erected in 1988 to replace an earlier stone cairn from 1949 which commemorated the Great Trek.	Medium AVOID
153	S29 17 39.8 E19 12 39.8	NMN2013/001	Upright elongated stone in river bed, presumably a marker of some sort.	Low
154	S29 17 46.9 E19 12 47.7	NMS2013/006	Bedrock exposure with one grinding patch alongside the river.	Low
155	S29 17 47.9 E19 12 46.3	NMS2013/007	Artefact scatter on high ground between boulders and in front of a small south-facing shelter. Quartz, fine-grained black rock, ?hornfels, silcrete, pottery, ostrich eggshell, bone, tin can, glass, refined earthenware.	High 8 hours
156	S29 17 47.6 E19 12 43.8	NMS2013/008	Bedrock exposure with two grinding patches.	Low
157	S29 17 50.3 E19 12 43.9	NMS2013/009	Bedrock exposure with three ephemeral grinding patches.	Low
158	S29 17 50.0 E19 12 45.5	NMS2013/010	Historical granite quarry.	Low
159	S29 17 46.6 E19 12 43.4	NMS2013/011	Artefact scatter on raised open area. Hard to define the edges of the scatter. Quartz, hornfels, tin can, refined earthenware. Widespread scatter over this area but 159 is a concentrated spot.	High 16 hrs
160	S29 17 46.5 E19 12 42.4		Another concentration in this large site. Quartz, clear quartz backed point fragment, fibre-tempered pottery (4.5 mm thick, plain rim), ostrich eggshell.	
161	S29 17 48.2 E19 12 09.5	NMS2013/012	Stone walling at 90 degrees to the river.	High AVOID
162	S29 17 48.6 E19 12 06.5		Namies well point. Appears as a stone-lined pit now filled up with river sand. Immediately alongside the river.	
163	S29 17 49.9		Stone and mud-brick ruin with lime-wash on the inside walls.	

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
	E19 12 07.0		Cement plaster outside. Bamboo lying in and around the ruin.	
164	S29 17 50.4 E19 12 07.2		Mud-brick ruin with cement plaster outside. c. 3x4 m	
165	S29 17 50.6 E19 12 07.1		Stone foundation. c. 3x4m	
166	S29 17 49.8 E19 12 06.6		Small stone pillar.	
167	S29 17 50.5 E19 12 06.5		Low density dump of glass and ceramic. Mostly 20 th century but also some late 19 th century items.	
168	S29 17 50.9 E19 12 06.6		Small stone structure.	
169	S29 17 51.2 E19 12 07.3		Scatter of glass, ceramic and iron.	
170	S29 17 52.7 E19 12 07.4		Small stone enclosure made from single stones piled atop one another. c. 2x3m. Some glass and ceramics lying about as well.	
171-174	S29 17 54.7 E19 12 09.0		Stone kraal made from two skins with rubble fill. Thick dung layer inside. Opening is just west of centre in the northern (downslope) wall. Occasional glass and ceramics, several tins and other metal near entrance of kraal.	
175	S29 17 51.3 E19 12 05.5		Stone enclosure made from single stones piled atop one another. c. 4x4m. Some ceramics lying about as well.	
N004	S29 17 48.3 E19 12 09.6		Short section of very roughly packed stone walling with one boundary stone marking the end	
N005	S29 17 51.0 E19 12 16.8		A small (4m x5 m) ruined mud brick dwelling with stone foundation. Possible stone stoep to the south.	
N006	S29 17 51.0 E19 12 21.0		Raised ash heap with iron, blue glass and "flow blue" ceramic fragment	
N007	S29 17 50.9 E19 12 21.3		Two parallel rows of stone walling (each 3 m long), roughly packed. Possibly the foundations of a house? No mud brick nearby. Probably associated with N006	
N008	S29 17 50.7 E19 12 21.9		A corner of stone walling, associated with N009 & N010, appears to be a kraal? Running along a small stream.	
N009	S29 17 52.0 E19 12 22.0		See N008. More low, roughly constructed, stone walling. About 30 cm high and about 30 cm in width	
N010	S29 17 52.0 E19 12 21.6		See N009. More short sections of stone walling. It's possible the walling was to protect people living along the river from flooding and not a kraal at all.	
N011	S29 17 53.2 E19 12 21.6		A roughly packed section of stone walling, forming a small kraal about 2 m x 2 m against a very small koppie.	
N012	S29 17 53.2 E19 12 21.6		A smoothed grinding hollow (not a proper groove) in the granite bedrock of the small koppie, near the kraal	
N013	S29 17 51.7 E19 12 18.1		A large, conical ash heap, with a large collection of ceramics, glass, iron, a single cartridge, slate pencils and a fragment of slate with engraved lines. One of the ceramics has designs of the "Great Trek" memorial bowl dating to 1938. Probably associated with building N005.	
N014	S29 17 52.1 E19 12 17.3		Another large, flattened rubbish dump with glass, ceramics and a metal button. Nearby a square quartz artifact with crushing along edge – possible gun flint?	
N015	S29 17 54.6 E19 12 15.3		Ruins of a mud brick dwelling consisting of at least 2 "rooms". The north is about 8 m x 4 m in size, with 2 interior wall cupboards, on either side of 2 interior doorways that were "bricked" in with mud bricks. The second room to the south is only accessed from the outside and is the same size as the first. It may also have been divided into 2 in the past. The ruin has stone foundations. There is a metal oven door outside the ruins to the south.	
N016	S29 17 55.8 E19 12 14.9		A single row of stone forming a rough rectangle next to a fence. It may represent the base of a ruined house, or even a kraal.	
N017	S29 17 56.2 E19 12 15.1		Ruins of a large mud brick dwelling with stone foundations. Sections of the walling are at least 1.5 m high and there are bits of plaster still adhering to the outside. There is evidence of at least 5 rooms, a small room (6 m x 4 m) to the north and	

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
			at least 4 rooms forming a square of around 8 m x 10m in total.	
N018	S29 17 56.3 E19 12 14.4		Roughly packed stone walling, incorporating some bedrock boulders, forming a half circle next to N017 and the road. It seems to represent a stone kraal. Lots of metal cans nearby	
N020	S29 17 56.3 E19 12 20.8		A triangular stone kraal (each wall 10 m in length, at least 50 cm thick and at least 1 m high) with a floor made of stone and cement. However, at the apex of one of the corners to the north, there is a narrow passage, at least 1 m deep, which runs into a roughly packed square kraal. The walling is made of 2 outer skins with rubble inside. The square kraal is 10 m x 15 m with an entrance to the east. Clearly designed for dipping small stock	
176	S29 17 47.1 E19 12 03.5	MNS2013/013	Bedrock exposure with one shallow grinding groove alongside the river.	Low
177	S29 17 48.4 E19 12 11.5	MNS2013/014	Bedrock exposure with three shallow grinding patches alongside the river.	Low
178	S29 17 48.4 E19 12 12.1	MNS2013/015	Bedrock exposure with one shallow grinding groove alongside the river.	Low
179	S29 17 51.2 E19 12 15.1	MNS2013/016	Bedrock exposure with one shallow grinding patch 100 m from the river.	Low
180	S29 17 54.3 E19 12 14.3	MNS2013/012	Ashe heap with 20 th century glass and ceramics. Also some school slates with lines on both sides but opposite sides are drawn at 90 degrees to one another.	
181	S29 17 52.0 E19 12 17.1	MNS2013/017	Bedrock exposure with one shallow grinding groove 150 m from the river.	Low
182	S29 17 55.2 E19 12 13.2		Tin dump with long, low packed stone mound to its south.	
183	S29 17 55.7 E19 12 13.7		Ash dump with lots of glass.	
184	S29 17 55.3 E19 12 14.1	MNS2013/012	Ash heap with several packed stone features around it. A lid of "Nugget Dark Brown Boot Polish", base of a tea cup with "Made in Japan". Also a two-room kraal made from walls with two skins and a rubble fill. Metal basin inside kraal.	
185-188	S29 17 57.3 E19 12 19.7		Stone kraal made from walls with two skins and a rubble fill as well as some large slabs standing on end.	
189	S29 17 56.5 E19 12 19.9		Hole in the ground alongside the river that must have served as a well. There is a stone-packed berm along the river and extending from the kraal (185-188), presumably to prevent sand washing into the hole.	
190	S29 17 59.4 E19 12 21.1		Some graffiti on a rock. Also some glass, ceramics and tin lying about.	
191	S29 18 00.1 E19 12 20.2		Small cement foundation.	
192	S29 18 00.5 E19 12 20.7		Small stone foundation with several other stone piles to the north. Many fragments of school slate around here.	
193	S29 18 00.9 E19 12 19.8	MNS2013/018	Two parallel stone alignments, possibly a pathway leading to the church.	High AVOID
194	S29 18 01.9 E19 12 20.6		T-shaped church. Stone foundation with mud bricks above. Cement plaster and limewash outside. Outside walls are stippled (university plaster) with smooth detail around doors, windows and corners. Brown-coated cement plaster inside. Square of gum trees planted around the church but some are missing. To the southeast are several piles of stone with stone-working flakes.	
195	S29 18 12.2 E19 12 24.4		Ruin/foundation with cement plaster, but the structure has caved in with dissolved mud bricks forming a mound over everything.	
196	S29 18 12.8 E19 12 23.6	MNS2013/019	Ruin/foundation with cement plaster.	Low-Medium AVOID
197	S29 18 12.4 E19 12 21.5		Ash heap with glass, ceramics, metal, window and bottle glass, school slate, plate with "Made in occupied Japan".	
N021	S29 18 09.1 E19 12 21.5		A large rectangular stone structure, around 20 m x 10 m, with a muddy interior wall. A kraal?	
N022	S29 18 12.0		A possible outside stone oven?	

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
	E19 12 23.1			
N023	S29 18 12.4 E19 12 22.5		A small (2 m x 1.5 m) stone structure, function unknown	
N024	S29 18 11.7 E19 12 24.3		A large ash heap/rubbish dump undermined by aardvark activity. Ceramics and a copper wick from a paraffin lamp.	
211	S29 18 13.2 E19 12 25.3		Stone foundation of c. 4x4m.	
198	S29 18 07.7 E19 12 29.8		Collapsed structure. One small section of stone foundation and a line of cement plaster are visible. The rest is just a big mound of dissolved mud-brick. There is an old pepper tree alongside the ruin.	
199	S29 18 07.6 E19 12 28.4		Ash heap with lots of glass and some ceramics. Metal is rare. Also a small stone feature to the east. A large "Hugo's Wellington Jam Purity Guaranteed" tin of 220x220x330mm.	
200	S29 18 08.7 E19 12 30.9		Collapsed structure with a stone foundation on one side, the rest is just a mound of dissolved mud-bricks.	
201	S29 18 06.5 E19 12 27.8	NMS2013/020	Tiny stone structure with two other stone features nearby. Also a shallow grinding patch on a boulder next to the structure.	Low-Medium AVOID
N025 N026	S29 18 06.9 E19 12 32.2		Two boundary stones, possibly representing the corners of a stone kraal, but the vegetation is dense and no evidence of walling	
N027	S29 18 07.1 E19 12 31.6		A large hole dug into the ground near the river, presumably a well? The soil dump nearby.	
N028	S29 18 08.9 E19 12 33.5		A large, roughly packed stone kraal (8m x 9m) built between, and incorporating, a number of large boulders. No evidence of 2 skins.	
202	S29 18 12.0 E19 12 33.6		Small ruin made of home-made breeze blocks. c. 3x3m. Relatively recent.	Low
203-206	S29 18 15.2 E19 12 13.5	NMS2013/021	Fenced graveyard with two formal gravestones indicating deaths in 1923 and 1936 and another pair indicating 1979 and 1987. Fourteen burials in total.	High AVOID
207-210	S29 18 13.5 E19 12 13.8		Unfenced graveyard with at least 24 graves but disturbance makes this number uncertain. None of the graves have formal headstones.	
N029	S29 18 11.8 E19 12 39.6		A well- built stone kraal , about 10 m x 10 m, about 1.5 m high and with wooden entrance poles. A nearby brick building (shed?). Probably dating to the nearby Boarding school.	
N030	S29 18 15.2 E19 12 37.9	NMS2013/022	Boarding school of brick (currently painted cream) and under corrugated iron (painted green), in good condition with wooden window frames and doors (painted brown). The original, older core is a U-shape with 2 gables facing northward. Evidence of a garden under irrigation (little furrows) to the north. To the west of the original building is an addition, also under corrugated iron. It consists of two large rooms (dormitories?) with wooden floors.	High AVOID
276			There is evidence of agriculture in the front (northern) grounds of the Koshuis by way of lines in the ground, alignments of weeds and the leiwater furrow leading northwards along the east side of the Koshuis to the gardens.	
212	S29 19 06.7 E19 01 16.8		Scatter of quartz artefacts, plenty of ostrich eggshell and some bone behind granite boulders.	Low-medium 4-8 hrs
213	S29 19 07.1 E19 01 17.0		Stone kraal with two enclosures built between the boulders. Walls composed of two skins with a rubble fill. Historical.	Low
214	S29 19 07.9 E19 01 17.9		Quartz and ostrich eggshell scatter below the koppie. The rock face has light pecking on it but this may be recent. A bottle fragment and stoneware fragment were found on a ledge to the west.	Medium 4 hrs
215	S29 19 08.5 E19 01 17.8	KYK2013/001	Bedrock exposure with 3 grinding grooves and 1 grinding patch.	
216	S29 19 09.1 E19 01 18.0		Bedrock exposure with 1 grinding groove and 3 grinding patches. Many quartz artefacts surround the outcrop.	Medium 8 hours
217	S29 19 08.7 E19 01 19.4		Bedrock exposure with 1 grinding groove and 1 grinding patch. Some quartz artefacts surround the outcrop but mostly to the southeast.	Low

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
218	S29 19 11.1 E19 01 20.8		Six fragments of stoneware, probably all from one vessel.	Low
219	S29 19 09.6 E19 01 17.3		Widespread quartz scatter but concentrations at these points.	Medium 8 hours
220	S29 19 08.5 E19 01 16.3			
221	S29 19 05.6 E19 01 12.8	KYK2013/002	Bedrock exposure with 4 grinding patches.	Low
222	S29 19 05.3 E19 01 12.0		Quartz and ostrich eggshell scatter alongside a bedrock outcrop.	Low-medium 4 hours
223	S29 19 04.7 E19 01 10.1		Widespread, low density quartz and ostrich eggshell scatter.	Low
224	S29 19 04.0 E19 01 11.4		Two small bedrock exposures with 4 grinding patches.	Low
225	S29 19 04.4 E19 01 11.8		Bedrock exposure with multiple grinding patches all over it. At least 20 patches.	Low
226	S29 19 03.8 E19 01 10.8		Bedrock exposure with 1 grinding patch.	Low
227	S29 19 02.7 E19 01 10.1		Quartz, crypto-crystalline silica and ostrich eggshell scatter including a very dense and half buried cluster of eggshell among low bedrock outcrops.	Medium 8 hrs
228	S29 19 03.2 E19 01 08.5		Two bedrock exposures each with at least 10 grinding patches on each.	Low
229	S29 19 01.9 E19 01 08.3		Widespread, low density quartz and ostrich eggshell scatters.	Low
230	S29 19 00.6 E19 01 06.5		KYK2013/003	Bedrock exposure with about 10 grinding grooves and patches.
231	S29 18 59.7 E19 01 05.1	Bedrock exposure with 2 ground patches.		Low
232	S29 18 58.6 E19 01 01.5	KYK2013/004	Bedrock exposure with 1 ground patch.	Low
233	S29 18 56.7 E19 00 59.4		Very likely a grave. Quartz and granite block pile with a possible headstone on top of a quartz vein.	High AVOID
234	S29 18 56.6 E19 00 59.0		Quarried quartz outcrop.	Low
235	S29 18 58.8 E19 00 57.8		North edge of the koppie with 2 ground patches.	Low
236	S29 18 59.3 E19 00 57.7		Boulder on koppie with six cupules. Five seem old with four of these showing reworking. One seems new. They are on a vertical wall with two facing ESE and four facing east.	Medium AVOID
237	S29 18 59.8 E19 00 57.4		Ledge on the koppie with 3 ground patches. Also a scatter of quartz, crypto-crystalline silica, glass and an upper grindstone.	
238	S29 18 58.0 E19 00 57.1		Quartz, ostrich eggshell and pottery scatter on the low neck behind the koppie.	Medium 4 hours
239	S29 18 57.8 E19 00 55.9		Boulder facing SSE with about 20 impact marks (very early stage cupules) on vertical rock. The marks manifest as circular scars indicating a percussion cone. There is also a bedrock exposure with 1 ground patch in front of the boulder.	Medium AVOID
240	S29 18 57.3 E19 00 55.5		Boulder facing SE with ten cupules on it on vertical rock. One is very early with the other nine small but well ground. Some extend into a cleft between the boulders. One possible cupule on a flat ledge in front of the boulder.	Medium AVOID
241	S29 18 57.3 E19 00 56.0		Bedrock exposure with 3 ground patches on it.	Low
242	S29 18 57.2 E19 00 55.4		Bedrock exposure with 3 or 4 ground patches on it. Also a quartz scatter around the outcrop.	Low
243	S29 18 57.3 E19 00 54.6		Bedrock exposure with 4 ground patches on it.	Low
244	S29 18 57.2 E19 00 54.1		South facing boulder with thirty three cupules in varying stages on it on vertical rock. None are deep, but some are well ground and old. Many are unweathered and appear newer. There is also a scatter of quartz and crypto-crystalline silica below and a bedrock exposure with about 6 ground patches.	Medium AVOID

GPS ID	GPS co-ordinates	Site name	Description	Significance Mitigation
245	S29 18 56.4 E19 00 55.0		Southeast facing boulder with one shallow cupule on it on vertical rock. There is also a scatter of quartz, ostrich eggshell and grit-tempered pottery in front of the boulder.	Medium AVOID
246	S29 18 56.4 E19 00 55.5		Southeast facing boulder with several impact marks but no ground cupules on vertical rock. The rock is spalling around the impacts so hard to tell the number.	Medium AVOID
247	S29 18 56.4 E19 00 56.4		Bedrock exposure with 8 ground patches on it.	Low
248	S29 18 56.0 E19 00 55.2		Bedrock exposure with 4 ground patches on it as well as 1 other large ground area. An artefact scatter with quartz, 'other' stone material, pottery, ostrich eggshell, an upper grindstone fragment occurs nearby.	Medium 4 hours
249	S29 18 56.1 E19 00 53.8		Bedrock exposure with 1 ground groove.	Low
250	S29 18 55.5 E19 00 53.7		Southeast facing boulder with four early stage cupules on it on vertical rock.	Medium AVOID
251	S29 18 55.2 E19 00 53.9		Bedrock exposure with 1 ground patch behind the 250 boulder.	Low
252	S29 18 55.4 E19 00 53.0		Bedrock exposure with 2 ground patches.	Low
253	S29 18 53.8 E19 00 49.8		Southwest facing boulder with eight cupules on it in varying stages on vertical rock. Also historical/recent graffiti (J. VAN)	Medium AVOID
254	S29 18 53.7 E19 00 48.2		Huge bedrock exposure with several shallow natural basins in which rain water would collect (waterbakke). There are several shallow ground patches including 2 large patches occurring side by side.	Low
255	S29 18 54.0 E19 00 47.6		Bedrock exposure with 7 ground patches.	Low
256	S29 18 51.2 E19 00 45.3		Bedrock exposure with 1 ground patch.	Low
257	S29 18 52.9 E19 00 45.5		Bedrock exposure with some waterbakke and about 7 ground patches on the highest point of the exposure.	Low
258	S29 18 53.1 E19 00 43.7		Bedrock exposure with some waterbakke and about 7 ground patches.	Low
259	S29 18 03.8 E19 00 27.2		KYK2013/005	Quartz scatter on the south side of a tiny koppie. Also a low curved stone wall extending from the east side of the koppie.
260	S29 17 54.0 E18 59 49.4	BHK2013/001	Quartz scatter around a granite outcrop beneath the existing ESKOM lines.	Low
261	S29 17 55.7 E18 59 44.0	BHK2013/002	Quartz scatter in front of a bedrock outcrop. Also a small cairn of granite rocks, possibly a grave?	Low or ?High AVOID cairn
262	S29 17 55.2 E18 59 41.7		Light scatter of quartz and ostrich eggshell. Also one sponge-printed refined earthenware fragment.	Low
263	S29 17 54.6 E18 59 41.3		Quartz scatter in front of a bedrock outcrop.	Medium 8 hours
264	S29 17 54.0 E18 59 39.1		Quartz scatter in front of a bedrock outcrop.	Medium 4 hours
265	S29 17 53.1 E18 59 38.3		Quartz, ostrich eggshell and crypto-crystalline silica scatter beneath the existing ESKOM lines.	Low
266	S29 17 52.3 E18 59 32.0	BHK2013/003	Quartz and ostrich eggshell scatter under the ESKOM line in a sandy area.	Low
267	S29 17 52.1 E18 59 29.6		Quartz, ostrich eggshell and crypto-crystalline silica scatter near base of koppie. Includes a clear quartz backed flake.	
268-274	S29 17 49.8 E18 59 21.8	BHK2013/004	Large stone kraal with three compartments. Built from two skins with a rubble fill. A few tins and a bottle are lying about on the north side of the kraal. Further north are more historical resources (Structure and kraals) but these were not visited.	Medium AVOID
N031	S29 17 50.0 E18 59 21.4	BHK2013/005	Along the transmission line, on the edge of a small koppie is a large kraal complex. There is a scatter of quartz implements (including a quartz scraper) as well as 2 small fragments of grit-tempered pottery, in front of the kraal.	Low - Medium

APPENDIX 2: Mapping

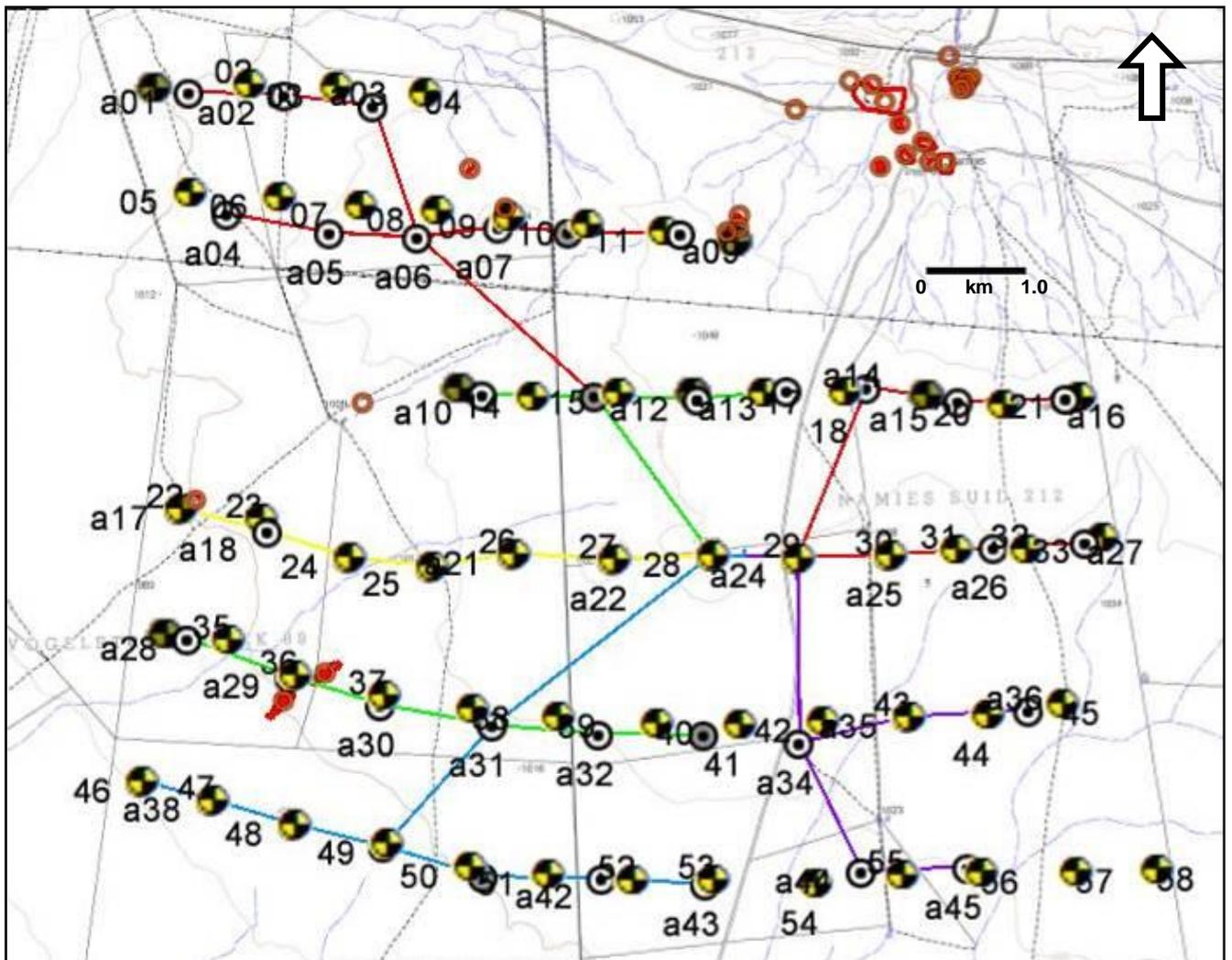


Figure A2.1: Map showing the locations of all recorded heritage resources (orange symbols and red polygons) with the two WEF alternatives (Alt. 1 = white circle with dot; Alt. 2 yellow/black symbols). The cluster of heritage sites in the northeast is the ruined Namies village. See A2.2 and A2.3 for enlargements.

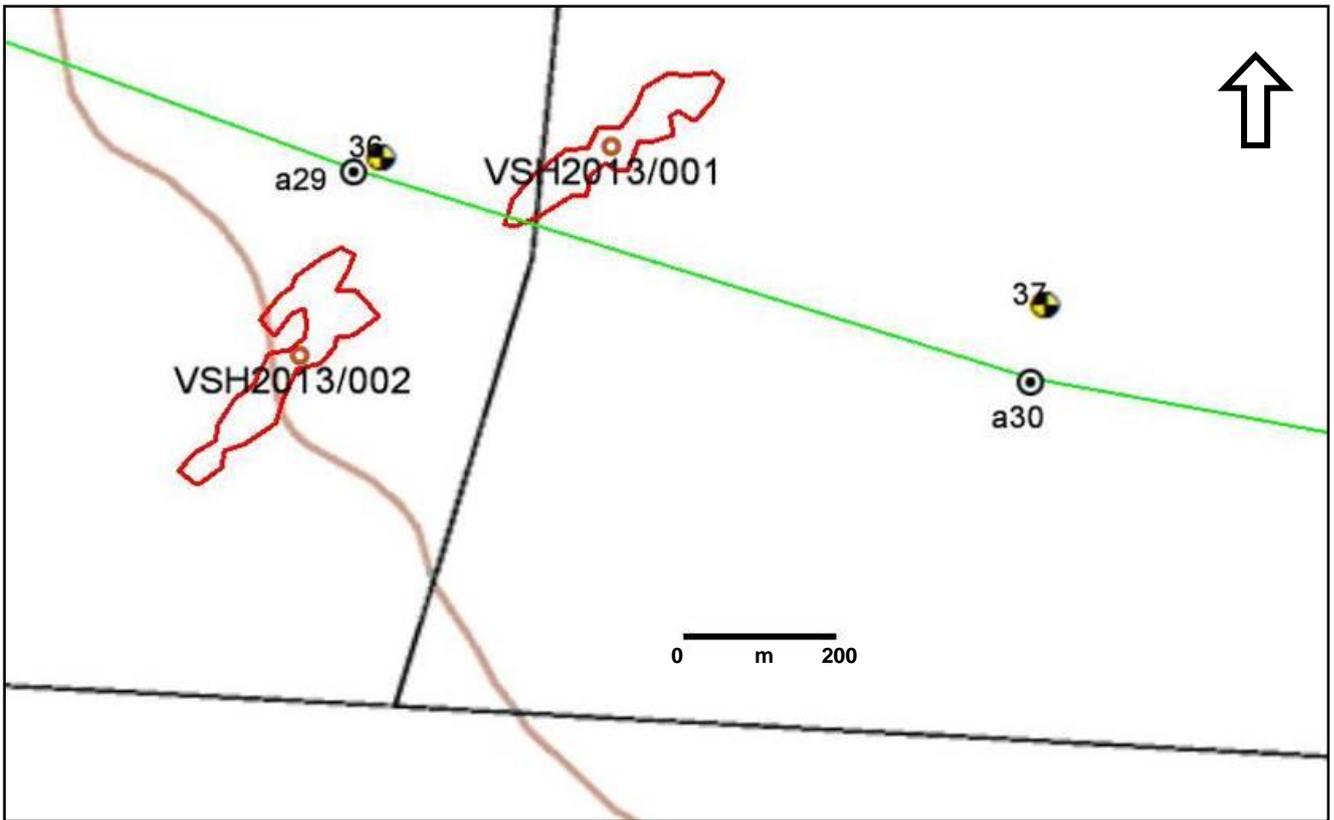


Figure A2.2: Map showing the location of the significant archaeological resources in relation to Turbines a29 and a30 of Alternative 1 and Turbines 36 and 37 of Alternative 2.

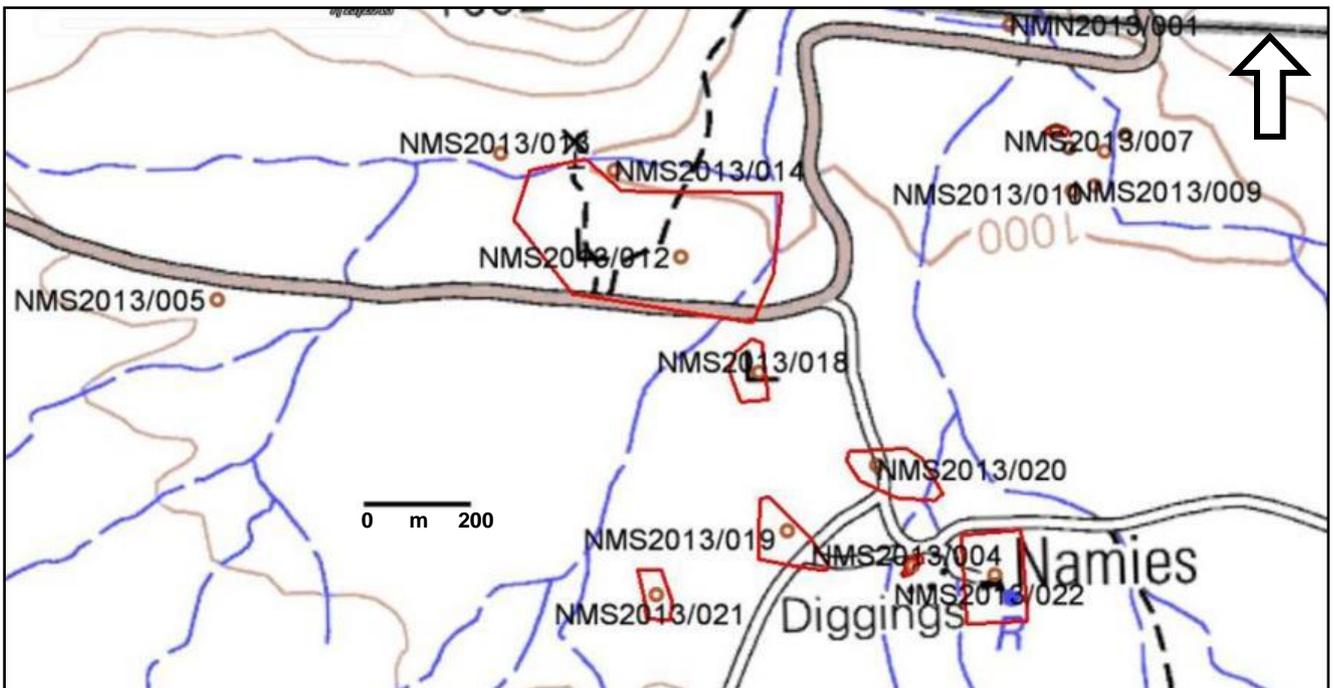


Figure A2.3: Map showing the locations of the various heritage sites located around and associated with the ruined Namies village.

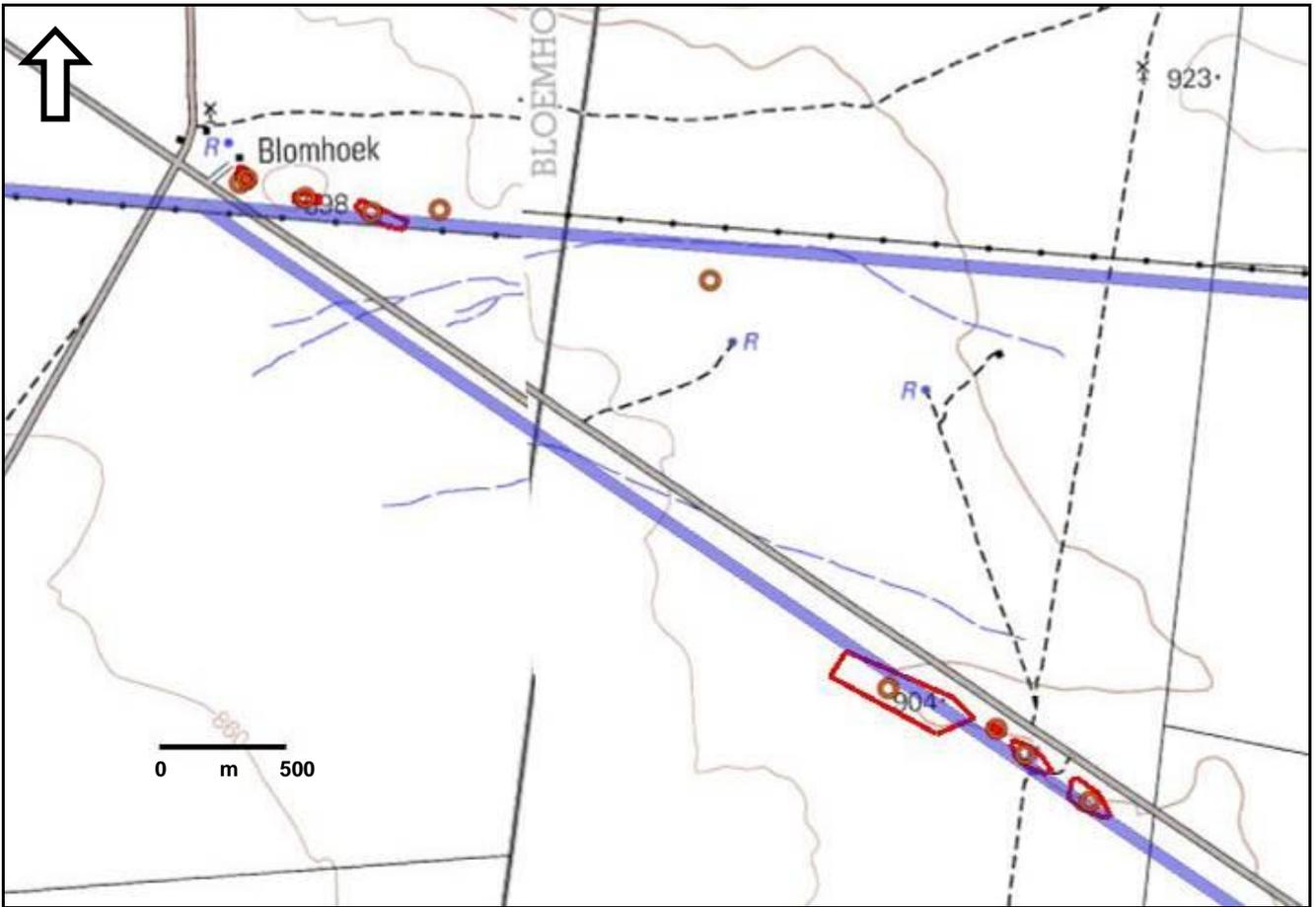


Figure A2.4: Map showing the locations of all recorded heritage resources (orange symbols and red polygons) located along the power line routes. See A2.5 and A2.6 for enlargements.

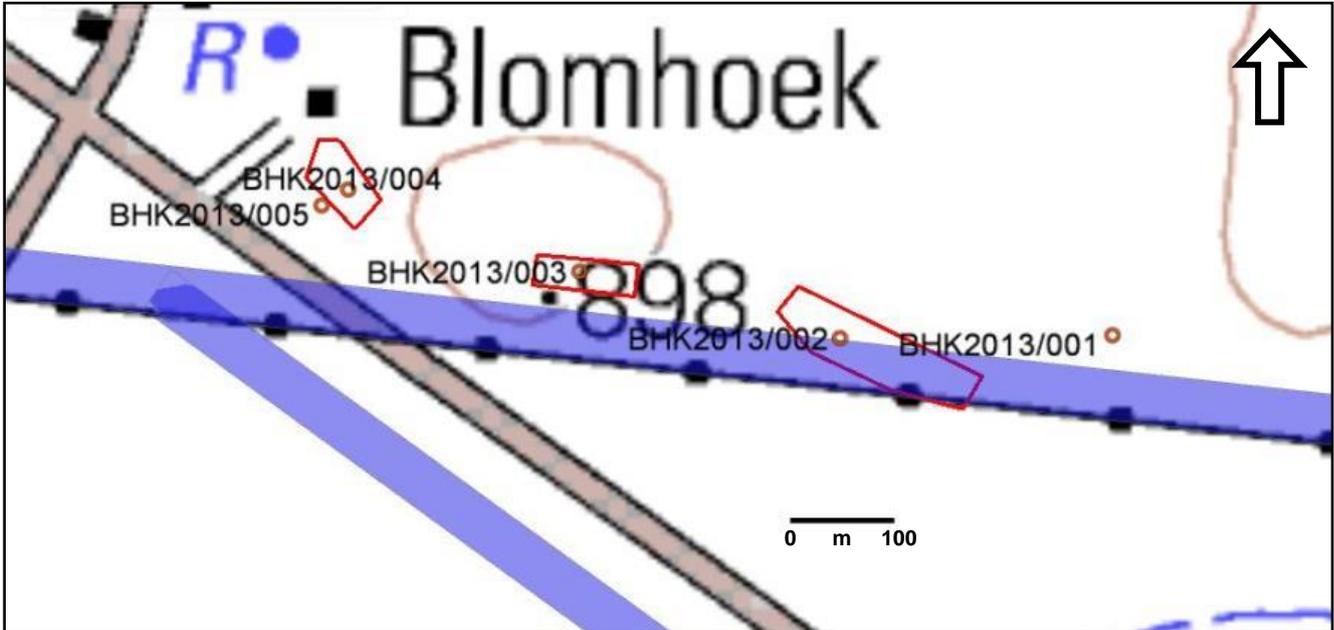


Figure A2.5: Map showing the location of the significant archaeological resources in relation to power line Alternative 1.

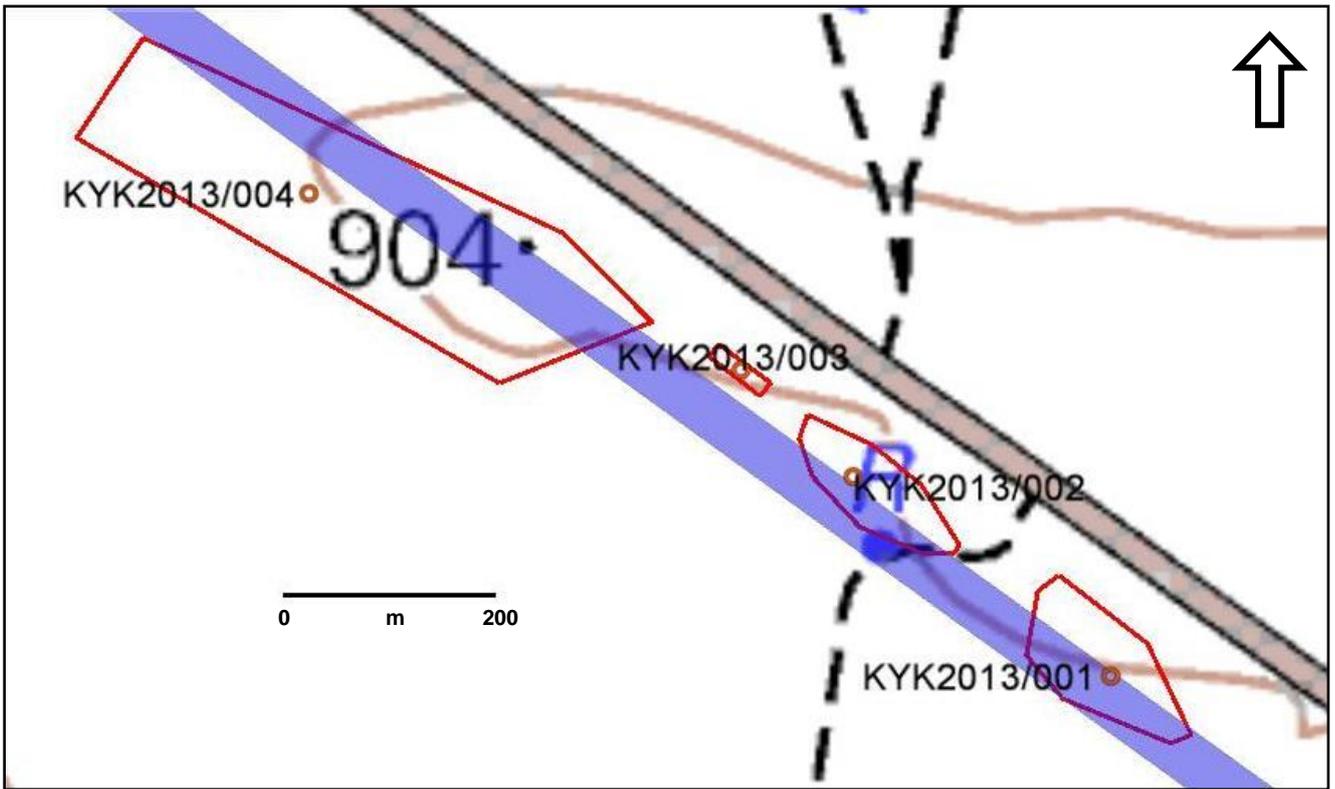


Figure A2.6: Map showing the location of the significant archaeological resources in relation to power line Alternative 2.