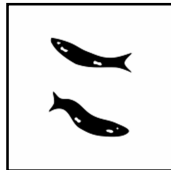


**ARCHAEOLOGICAL IMPACT ASSESSMENT
PROPOSED CONSTRUCTION YARDS AND SUB
STATION, LONGYUAN MULILO DE AAR WIND
ENERGY FACILITY
NORTHERN CAPE**

Prepared for:

Longyuan Mulilo De Aar Wind Power (Pty) Ltd
PO Box 50, Cape Town International Airport
South Africa, 7525
Contact: Karen@mulilo.com

By



Jonathan Kaplan
Agency for Cultural Resource Management
5 Stuart Road, Rondebosch, 7700
P/F: 021 685 7589
M: 082 321 0172
Email: acrm@wcacces.co.za

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Executive summary

ACRM was appointed to conduct an Archaeological Impact Assessment of the location sites for the proposed construction yards/laydown areas and substation/control building, for the Longyuan Mulilo De Aar Wind Energy Facility near De Aar in the Northern Cape Province.

Lay-down areas or construction yards are designated areas where project components will be temporarily held pending installation.

A detailed survey of the proposed location sites took place in February 2014, in which the following observations were made:

Construction Yard 1

A low density scatter of weathered indurated shale Middle Stone Age (MSA) implements were encountered on exposed gravels on the Farm Zwartkoppies. A few dispersed MSA flake tools were encountered over the remainder of the site.

An indeterminate rock engraving was recorded on a dolerite slab on the upper slopes of the proposed site, outside the footprint area.

The remains of an old stone kraal, and several graves were documented on the upper rocky slopes of the proposed site. In consultation with the applicant, the construction yard has now been moved to avoid the historic feature and protected graves.

Construction Yard 2

Dispersed, mostly single, isolated, weathered indurated shale MSA tools were recorded on soft red sands on the Farm Smouspoort. A thin scatter of MSA tools were encountered on partially eroded sands alongside the access road leading to the Maanhaarberg/De Aar 1 WEF, while a thin scatter of tools was documented on a large patch of eroded sand on the north eastern boundary of the footprint area.

Construction Yard 3

A diffuse scatter of weathered indurated shale MSA tools were documented on the proposed site on the Maanhaarberg plateau, on the Farm Smouspoort. Most of the tools were found on exposed patches of gravel, while a few tools were encountered on the red surface sands.

Substation/control building

A handful of weathered indurated shale MSA tools and a banded ironstone Later Stone Age (LSA) flake were recorded on an extensive sheet of eroded gravels alongside the Zwartkoppies Farm road, outside the proposed development site. No tools were found in the footprint area of the substation/control building.

Significance of the archaeological remains

The relatively small number of tools on each of the proposed sites, and the mostly isolated and disturbed context in which they were found, means that the archaeological remains documented during the study have been rated as having low significance.

The stone kraal and graves are rated as having high archaeological significance.

The following recommendations are made:

Construction Yard 1

1. No archaeological mitigation is required
2. In consultation with the applicant, the construction yard has been moved to avoid the historic kraal and sensitive graves. A buffer of 15m between the graves and the edge of the yard has been established. No further mitigation is therefore required.

Construction Yard 2

1. No archaeological mitigation is required.

Construction Yard 3

1. No archaeological mitigation is required.

Substation/control building

1. No archaeological mitigation is required.

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1. INTRODUCTION

ACRM was appointed by Longyuan Mulilo De Aar Wind Power (Pty) Ltd to conduct an Archaeological Impact Assessment of the location sites for the proposed construction yards/laydown areas and substation/control building, for the Longyuan Mulilo De Aar Wind Energy Facility (WEF) located about 25kms south west of De Aar in the Northern Cape Province (Figure 1).

Lay-down areas or construction yards are designated areas where components will be temporarily held pending installation.

An Archaeological Impact Assessment for the De Aar 1 Maanhaarberg WEF was undertaken in April 2010 (Kaplan 2010a). Relatively large numbers of weathered Middle Stone Age (MSA) tools were recorded during the study, but the survey encountered no significant archaeological heritage. In October 2010 a study focusing on the proposed access roads, powerline, construction camp site, and laydown areas was also undertaken (Kaplan 2010b). MSA implements were again documented, and several rock engravings were recorded. A site of high importance (zkw95), comprising scatters of stone tools, ostrich eggshell, portable art and several graves were recorded alongside the proposed access road to the wind energy facility on the Maanhaarberg plateau. The final layout incorporates the recommended buffer as per the archaeologists report (Kaplan 2010b).



Figure 1. Locality Map

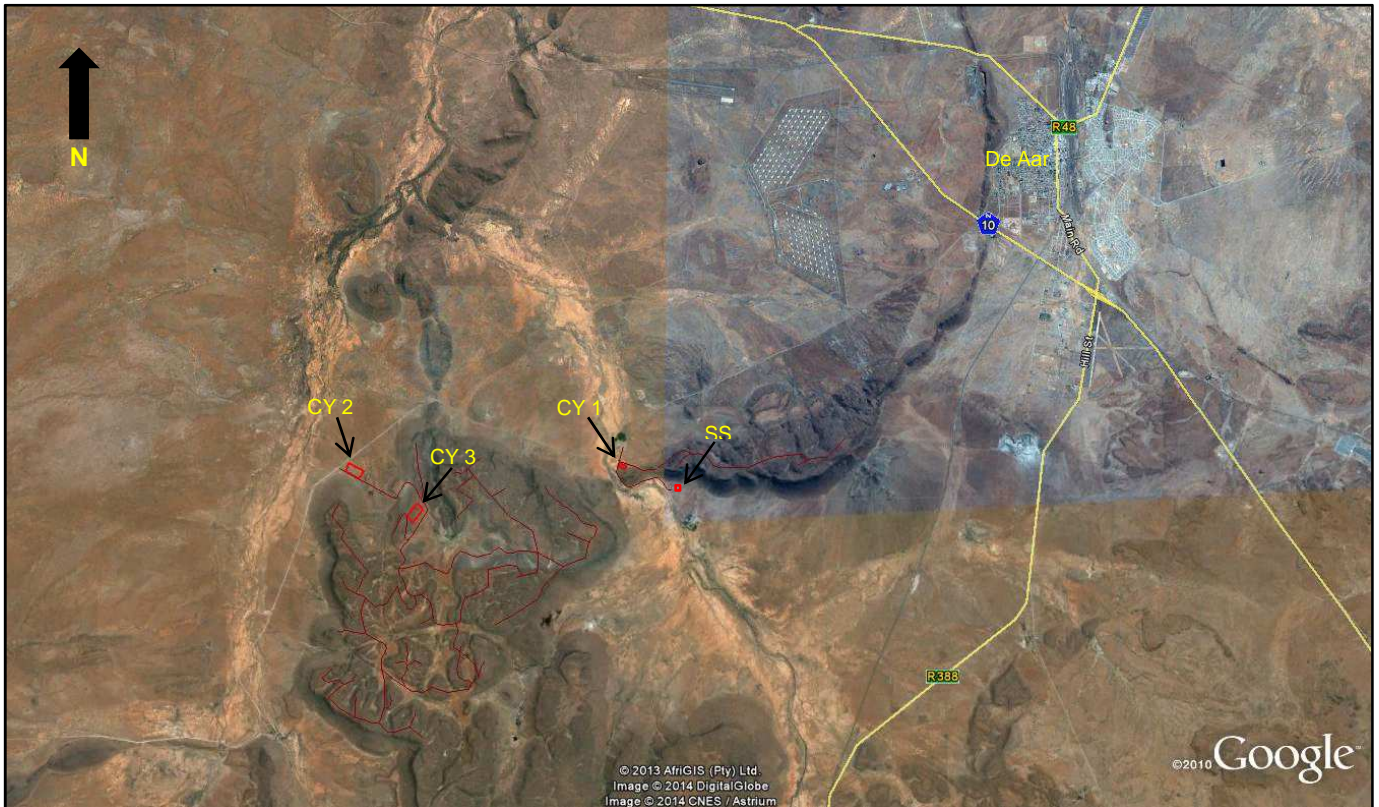


Figure 2. Google map illustrating the proposed Construction Yard (CY) sites, and Substation (SS)

2. TERMS OF REFERENCE

The terms of reference for the specialist archeological study are to:

- Determine whether there are likely to be any important archaeological remains that may potentially be impacted by the proposed construction yards and substation/control building.
- Recommend measures to minimise impacts associated with the proposed activities.

3. APPROACH TO THE STUDY

3.1 Method of survey

A detailed foot survey of the proposed location sites was undertaken on the 19th February 2014.

Archaeological remains located during the study were plotted in-situ using a Garmin Oregon 300 hand held GPS device set on the map datum WGS 84 (refer to Table I in Appendix I).

A track path of the survey was also created (refer to Figures 27-30 in Appendix II).

3.2 Constraints and limitations

There were no constraints or limitations associated with the study. Archaeological visibility was very good, and access to the proposed location sites was not a problem.

3.3 Identification of potential risks

The remains of a historic kraal and several graves were recorded in the footprint area of Construction Yard 1, but in consultation with the applicant, the laydown area has been moved to accommodate these important heritage finds. No further mitigation is recommended.

4. FINDINGS

4.1 Construction Yard 1

The proposed site is located on the Farm Zwartkoppies, and lies adjacent to the gravel road leading to the Zwartkoppies farmstead. The proposed site is about 150 x 100m in extent. The upper slopes of the site against the kopje are quite rocky, while the lower slopes are flatter and covered in vegetation and red sands (Figures 3 & 4). There are a few small outcroppings of dolerite on the site. Gravels alongside the fence/road have been exposed as a result of hill wash, exacerbated by heavy cattle trampling.

A diffuse scatter of weathered indurated shale MSA flakes (095) was encountered on a patch of exposed gravels alongside the road (Figure 7), while isolated MSA tools were found on the red surface sands alongside the powerline servitude. Site 095 is located outside the footprint area of the proposed (new) construction yard (refer to Figure 27 in Appendix II). The tools comprise a range of triangular shaped flakes, large blunted flakes, blades, chunks, flaked chunks, retouched, and partially retouched pieces (Figures 5 & 6). Similar types of tools were documented by the archaeologist just to the north of the powerline servitude during the 2010 scoping study (Kaplan 2010a).

The remains of a historic stone kraal were encountered on the upper, north eastern slopes of the proposed site (Figure 8), while four graves were also found near the western entrance to the kraal (Figures 9-11). The kraal measures about 30 x 10m, and is barely visible on the ground, but is visible on Google Earth (refer to Figure 27 in Appendix II).

The graves comprise fairly obvious mounds of packed stone, which are obscured by thick vegetation. At least one of the graves has a head and footstone indicating that it is a Christian burial. Fragments of white porcelain and some glass (possibly grave goods) were noted scattered about.

A scratched, indeterminate rock engraving (099) was found on a flat dolerite slab on the upper slopes of the kopje, just outside the footprint area of the proposed site (Figure 12). Some fine line engravings also occur, but these appear to be modern and may be the work of farm children. Rock engravings have been recorded on the Swartkoppies ridge just to the north of the proposed site (Kaplan 2010b).



Figure 3. Construction Yard 1 view facing south west



Figure 4. Construction Yard 1 view facing north east



Figure 5. Weathered MSA tools. Scale is in cm



Figure 6. Weathered MSA tools. Scale is in cm



Figure 7. Context in which most of the tools were found



Figure 8. Remains of the stone kraal. View facing west



Figure 9. Graves.



Figure 10. Grave



Figure 11. Graves



Figure 12. Arrow indicates the rock engraving

4.2 Construction Yard 2

The proposed site is located alongside a gravel road on the Farm Smouspoort and is about 400 x 200m in extent. The site is fairly level and is covered in natural vegetation with a substrate of red sands. There is very little surface stone on the proposed site (Figures 13 & 14).

A diffuse scatter of mainly single, isolated, weathered indurated shale MSA tools, including triangular shaped flakes, thick, chunky blunted flakes, chunks and blades, was documented during the assessment. A thin scatter of implements, including partially retouched and unmodified flakes, a core (124), blades and a (broken) lower grindstone fragment/anvil (106), were found on some sheet washed sands alongside the southern access road that leads to the WEF on the Maanhaarberg (Figures 15-17). A dispersed scatter of tools was also found on a large patch of exposed sand (118) in the north eastern portion of the proposed site. Weathered MSA flakes were also found in the access road during the 2010 scoping study (Kaplan 2010b).



Figure 13. Construction Yard 2 view facing north



Figure 14. Construction Yard 2 view facing south west



Figure 15. Broken grindstone/anvil (106). Scale is in cm



Figure 17. MSA tools. Scale is in cm



Figure 16. MSA tools. Scale is in cm

4.3 Construction Yard 3

The proposed site is located alongside a small 2-track road on the Maanhaarberg plateau, on the Farm Smouspoort, where the majority of the wind turbines are proposed. The site is fairly level and covered in vegetation with a substrate of red sands. There is very little surface stone on the site, but the mid/upper slopes are covered in small dolerite boulders (Figures 17 & 18). Note that the representation of the construction yard in Figure 29 (refer to Appendix II) is incorrect, and the proposed laydown area has now been moved alongside the road where the receiving environment is level.

A diffuse scatter of weathered indurated shale MSA tools, including thick, pointed and blunted flakes, a relatively larger number of retouched blades and chunks, and two tip retouched points (133 & 146) were documented on the proposed site (Figures 19-22). Most of the tools were found on the flat terrain on eroded patches of red sands (134, 142, 149, 157 & 165), while a few tools were found on the upper rocky slopes. The proposed site alongside the road was searched during the 2010 scoping study, where similar types of tools were encountered (Kaplan 2010a).



Figure 17. Construction Yard 3 view facing south



Figure 18. Construction Yard 3 view facing north



Figure 19. Context in which some of the tools were found



Figure 20. MSA tools. Scale is in cm



Figure 21. MSA tools. Scale is in cm



Figure 22. MSA tools. Scale is in cm

4.4 Substation/control building

The proposed site is located on the south western side of the Swartkoppies ridge next to the power line servitude, alongside the gravel farm road to Swartkoppies farm. The development site is about 200 x 100m in extent. Situated on the flat plains between the mountain and the gravel road, the proposed site is covered in natural vegetation on a substrate of softer orange coloured sands (Figures 23 & 24). There is hardly any surface sand on the proposed site. Extensive sheets of eroded gravels occur alongside the road.

Weathered indurated shale MSA tools, including triangular shaped flakes, retouched/notched and unmodified tools, chunks and blades, were found on the washed gravels alongside the Swartkoppies road. A single LSA banded ironstone flake was also found (Figures 25 & 26).

No archaeological remains were found on the proposed development site.



Figure 23. Substation/control building view facing north west



Figure 24. Substation/control building view facing north east



Figure 25. MSA tools. Scale is in cm



Figure 26. MSA tools. Scale is in cm

4.5 Significance of the archaeological finds

The relatively small numbers on each proposed site, and the mostly isolated and disturbed context in which they were found, means that the archaeological remains documented during the study have been rated as having low significance.

The majority of the tools documented during the study are assigned to MSA, and are comparable to most of the tools that were recorded during the 2010 studies undertaken by the archaeologist. Similar tools were also encountered during an assessment of the proposed 132kV overhead powerlines for the Maanhaarberg De Aar 1 Wind Energy Facility (Fourie 2102).

The historic stone kraal and graves (original Construction Yard 1) are rated as having high archaeological significance.

5. RECOMMENDATIONS

5.1 Construction Yard 1

1. No archaeological mitigation is required.
2. In consultation with the applicant, the construction yard has been moved to avoid the historic kraal and sensitive graves. A buffer of 15m between the graves and the edge of the yard has been established. No further mitigation is therefore required.

5.2 Construction Yard 2

1. No archaeological mitigation is required.

5.3 Construction Yard 3

1. No archaeological mitigation is required.

5.4 Substation/control building

1. No archaeological mitigation is required.

6. REFERENCES

Fourie, W. 2012. Proposed construction of two 132kV transmission lines from the Maanhaarberg and Damfontein Wind Energy Facilities (De Aar 1) near De Aar, Northern Cape. Report prepared for Aurecon South Africa (Pty) Ltd. PGS – Heritage & Grave Relocation Consultants.

Kaplan, J. 2010a. Archaeological Scoping Study for a proposed wind energy facility on the Maanhaarberge and Kombuisfonteinberge De Aar, Northern Cape. Report prepared for DJ Environmental Consultants. Agency for Cultural Resource Management. Cape Town.

Kaplan, J. 2010b. Archaeological Impact Assessment of a proposed wind energy facility near De Aar, Northern Cape Province. Report prepared for DJ Environmental Consultants. Agency for Cultural Resource Management. Cape Town

Appendix I

Spreadsheet of waypoints and description of archaeological finds

Site	Name of Farm	Lat/Long	Description of finds
Original Construction Yard 1	Zwartkoppies		
095		S30 43.016 E23 54.228	Low density scatter of weathered, indurated shale MSA flake tools on heavily eroded and trampled gravel near fence. Diffuse scatter of tools occur over the remainder of the site, between the powerline servitude and the boundary fence (below the kopje) about 50m to the north.
096		S30 43.088 E23 54.319	Kraal
097		S30 43.085 E23 54.296	A dispersed indurated shale MSA flakes
098		S30 43.090 E23 54.300 S30 43.088 E23 54.300	Graves
099		S30 43.091 E23 54.243	Indeterminate engraving and modern fine line engraving
Construction Yard 2	Smouspoort		
100		S30 43.132 E23 50.196	Weathered indurated shale MSA snapped blade
101		S30 43.039 E23 50.251	Weathered chunky indurated shale MSA partially retouched flake
102		S30 43.032 E23 50.262	Weathered indurated shale flake
103		S30 43.047 E23 50.271	Weathered indurated shale pointed MSA flake
104		S30 43.132 E23 50.205	X 3 weathered indurated shale flakes,
105		S30 43.143 E23 50.210	Weathered flake and blade
106		S30 43.142 E23 50.211	Broken lower grindstone/anvil
107		S30 43.124 E23 50.227	Weathered indurated shale flake
108		S30 43.115 E23 50.239	Broken retouched indurated shale flake
109		S30 43.066 E23 50.313	Weathered indurated shale blade
110		S30 43.156 E23 50.230	'Fresh' indurated shale flake
111		S30 43.038 E23 50.414	Broken, weathered indurated shale utilized flake
112		S30 43.047 E23 50.414	Broken weathered blade and flake/blade
113		S30 43.186 E23 50.308	Weathered flake
114		S30 43.201 E23 50.325	Weathered blade
115		S30 43.048 E23 50.523	Weathered chunk
116		S30 43.051 E23 50.508	Broken weathered indurated shale flake
117		S30 43.119 E23 50.418	X 2 thin, weathered indurated shale blades, 1 snapped, other partially retouched/utilized
118		S30 43.124 E23 50.414	Diffuse scatter of weathered indurated shale flakes, blades, chunk on large open patch of grave/red sand
119		S30 43.203 E23 50.347	Weathered chunk
120		S30 43.202 E23 50.332	Small weathered indurated shale flake
121		S30 43.164 E23 50.336	Large weathered chunk
122		S30 43.142 E23 50.232	Small, flat weathered indurated shale flake
123		S30 43.147 E23 50.222	Weathered indurated shale flake
124		S30 43.147 E23 50.219	Round core
125		S30 43.144 E23 50.205	Weathered indurated shale flake
126		S30 43.124 E23 50.191	Small weathered indurated shale flake
Construction Yard 3	Maanhaarberg on Smouspoort		
129		S30 43.708 E23 51.405	Triangular shaped weathered indurated shale MSA flake
130		S30 43.706 E23 51.406	X 2 weathered MSA flakes
131		S30 43.704 E23 51.402	Weathered flake and chunk
132		S30 43.702 E23 51.399	Snapped indurated shale blade MSA
133		S30 43.697 E23 51.390	Pointed MSA weathered flake with retouched tip.
134		S30 43.695 E23 51.378	About 10 weathered indurated shale MSA flake tools on patch of red sands, including a few blades, snapped blade, and blunted chunky flakes
135		S30 43.670 E23 51.367	Broken indurated shale retouched MSA blade
136		S30 43.642 E23 51.371	Broken flake and unmodified MSA flake

137		S30 43.647 E23 51.365	Indurated shale chunk
138		S30 43.649 E23 51.363	Flat retouched MSA indurated shale flake
139		S30 43.641 E23 51.357	MSA flake
140		S30 43.640 E23 51.356	Reworked indurated shale MSA flake
141		S30 43.638 E23 51.353	Indurated shale chunk
142		S30 43.627 E23 51.352	4-5 indurated shale MSA flakes, chunk, triangular shaped flake, retouched flake and blade on open patch of trampled red sands
143		S30 43.615 E23 51.353	X 2 small broken flakes and chunk
144		S30 43.614 E23 51.354	Broken MSA blade and chunk indurated shale
145		S30 43.609 E23 51.357	MSA flake
146		S30 43.602 E23 51.350	Triangular shaped pointed (retouched) flake, and chunk
147		S30 43.596 E23 51.354	Chunk
148		S30 43.587 E23 51.359	MSA indurated shale flake
149		S30 43.588 E23 51.347	X 3 indurated shale MSA flakes, 1 blade, small chunk on patch of red sands
150		S30 43.588 E23 51.344	Core reduced indurated shale flake
151		S30 43.550 E23 51.338	X 3 MSA flakes
152		S30 43.569 E23 51.335	MSA flake
153		S30 43.573 E23 51.345	Nicked & snapped, indurated shale MSA flake
154		S30 43.585 E23 51.348	X 2 broken indurated shale MSA blades
155		S30 43.587 E23 51.350	Chunk
156		S30 43.592 E23 51.355	Indurated shale MSA flake
157		S30 43.609 E23 51.363	Long indurated shale MSA blade, and several MSA flakes, chunk on patch of brown sands.
159		S30 43.615 E23 51.363	Long, chunky utilized/partially retouched indurated shale blade – MSA
160		S30 43.671 E23 51.339	Small indurated shale chunk
161		S30 43.672 E23 51.332	Large chunk
162		S30 43.685 E23 51.295	Broken, utilized indurated shale MSA flake
163		S30 43.690 E23 51.321	Chunk
164		S30 43.673 E23 51.380	Weathered indurated shale chunk, blade & small chunk
165		S30 43.670 E23 51.382	X 2, large, chunky indurated shale flakes, several smaller flakes, and chunk on patch of brown sand
166		S30 43.682 E23 51.390	Weathered chunk and flake
167		S30 43.715 E23 51.407	Weathered indurated shale flake
168		S30 43.745 E23 51.374	Broken flake and small broken blade
169		S30 43.776 E23 51.321	Chunk
170		S30 43.785 E23 51.314	Flake
171		S30 43.797 E23 51.293	chunk
Substation/control yard	Swartkoppies		Low density scatter of tools on extensive sheet of exposed gravels alongside the gravel road to Swartkoppies Farm, including MSA indurated shale flakes, retouched/nicked pieces, blades and banded ironstone LSA flake. No tools were found in the proposed footprint area.

Table 1. Spreadsheet of waypoints and description of archaeological finds

Appendix II
Track paths & waypoints

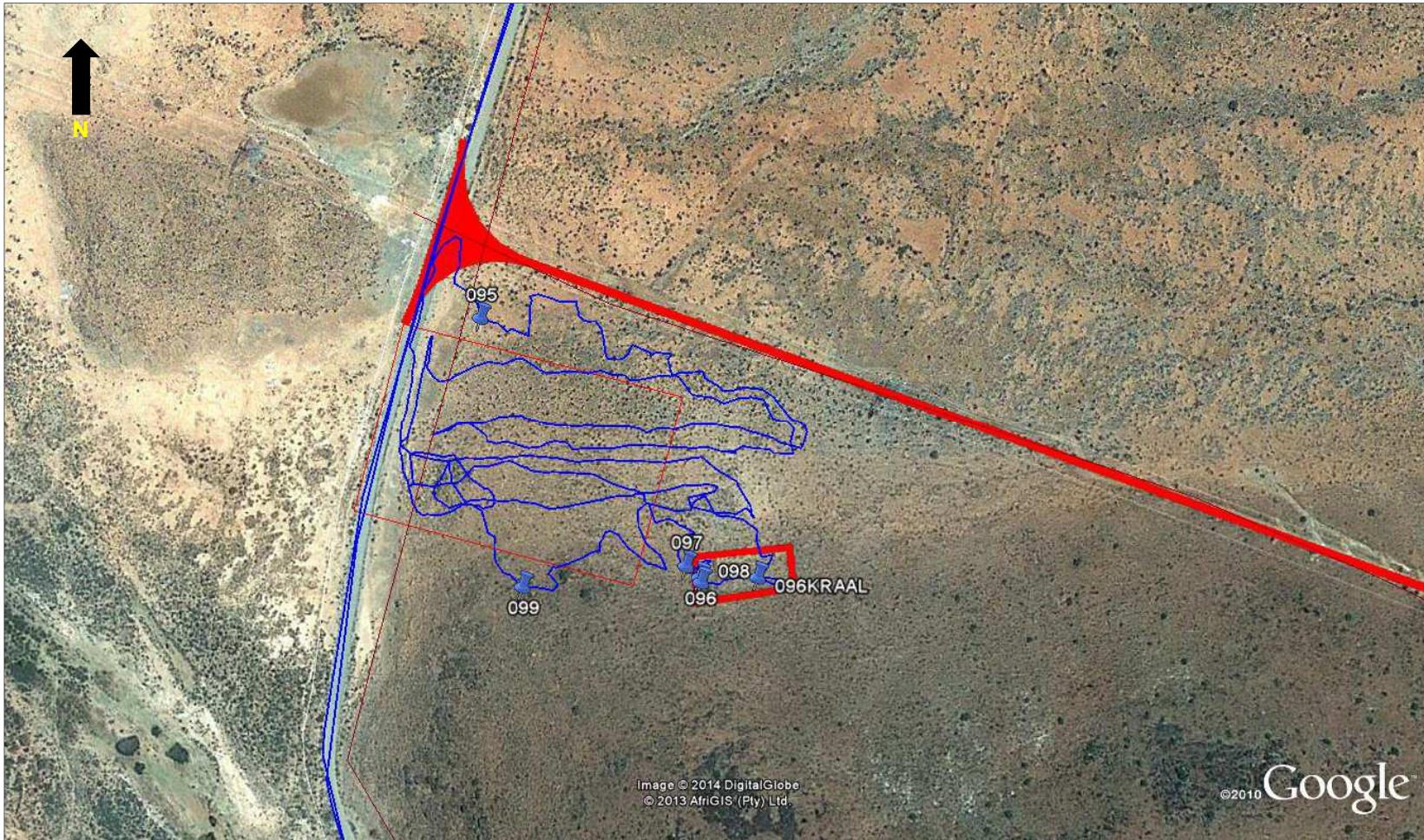


Figure 27. Track path. Construction Yard 1.

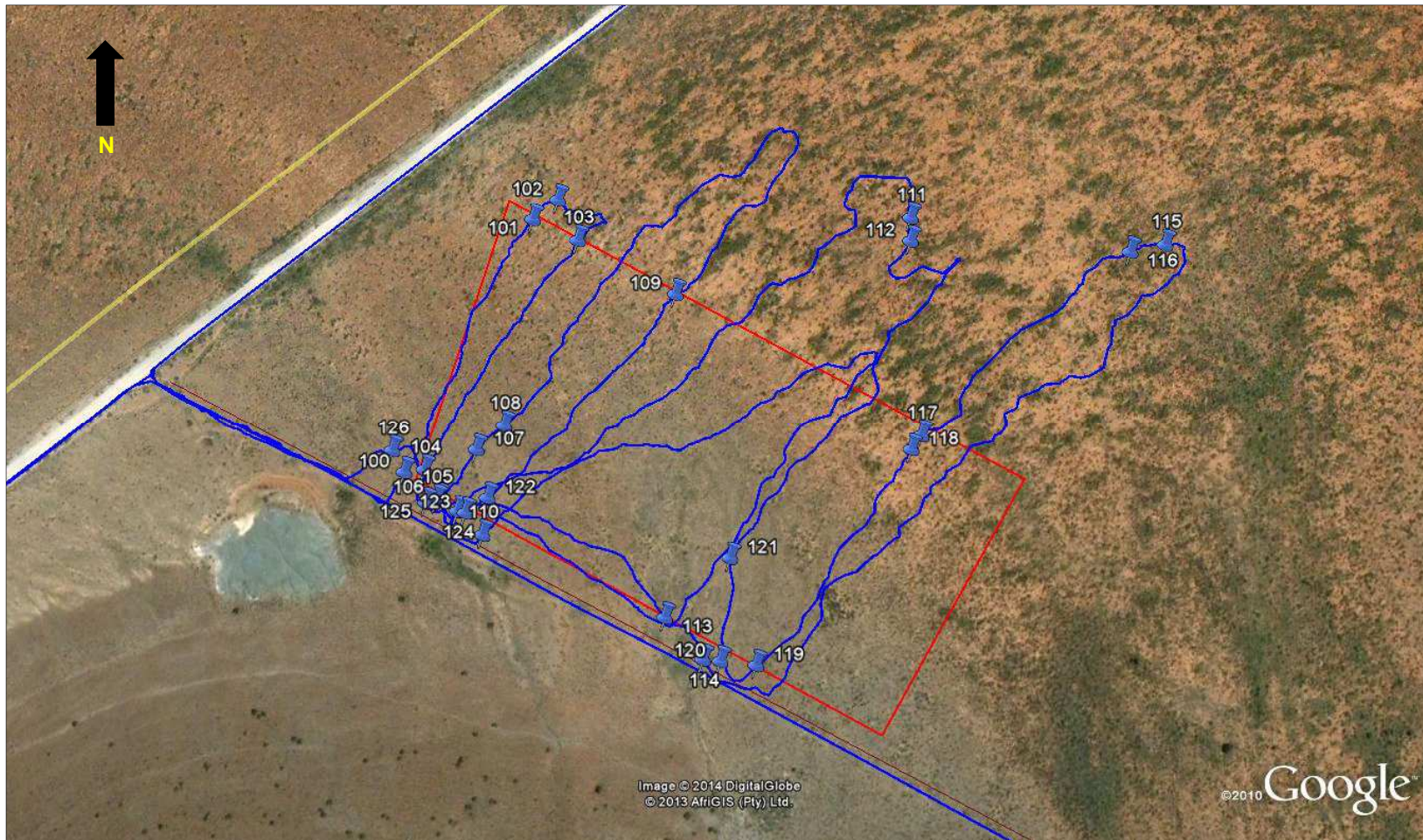


Figure 28. Track path. Proposed Construction Yard 2

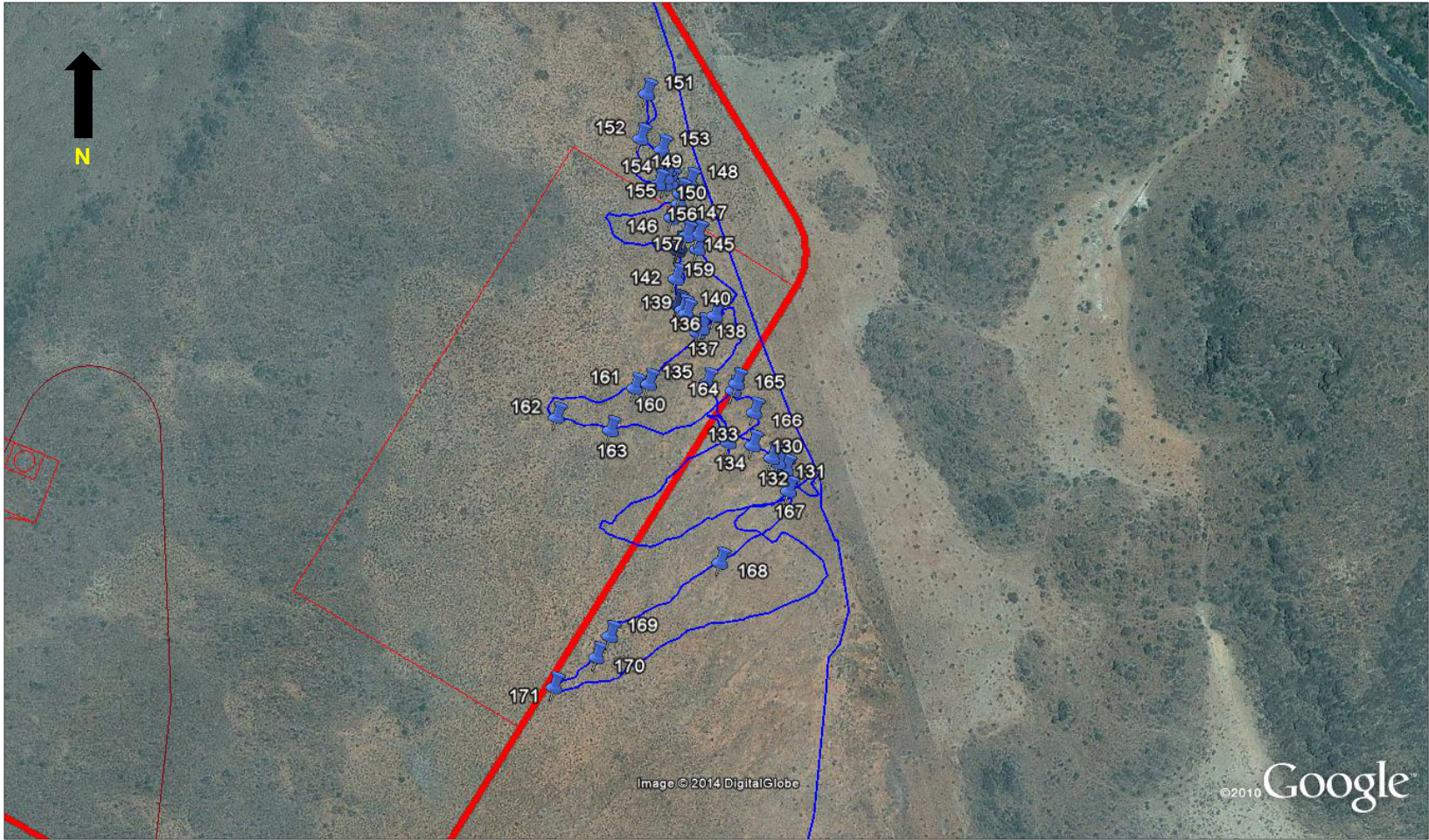


Figure 29. Track path. Proposed Construction Yard 3

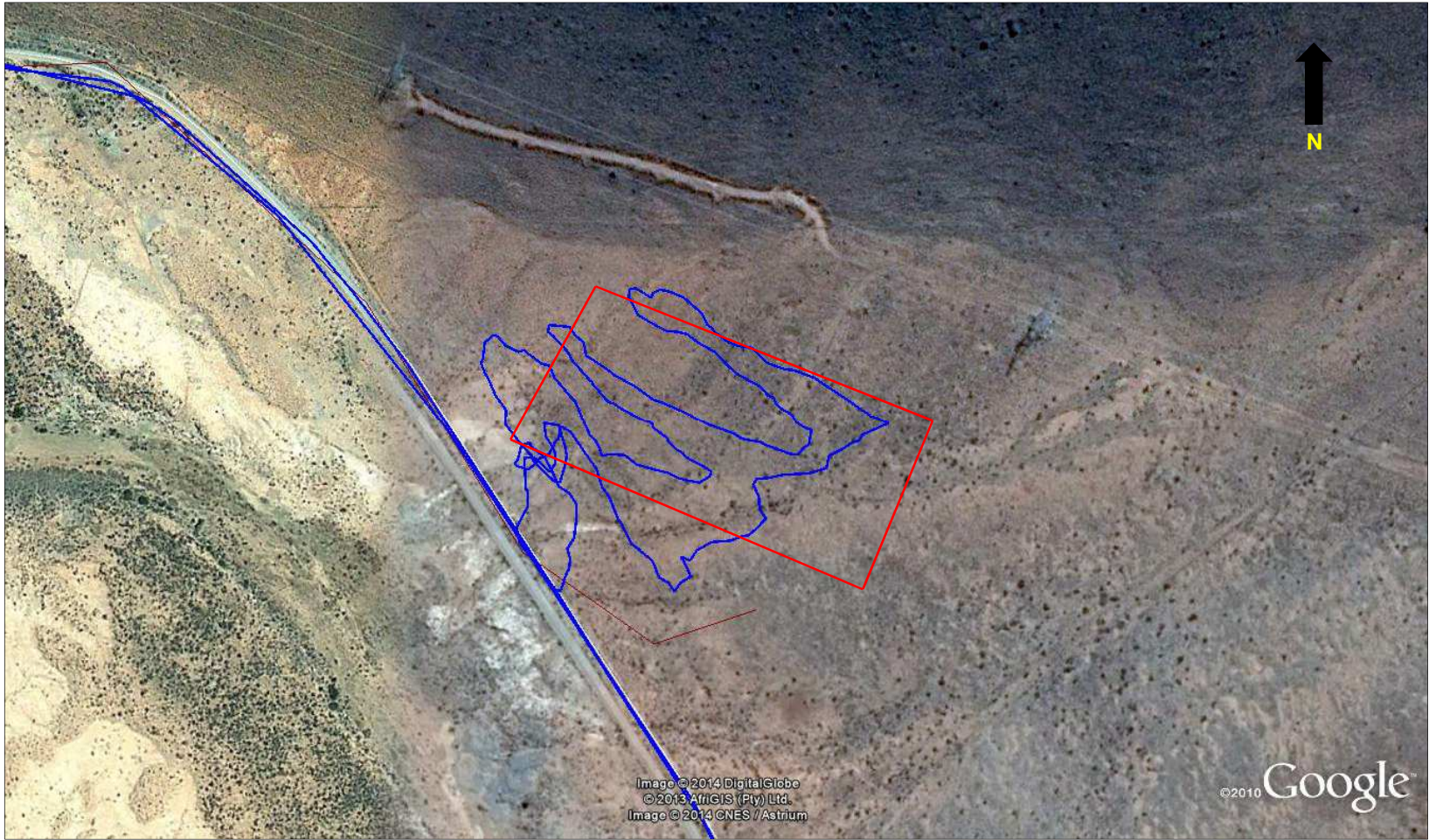


Figure 30: Track path: Proposed substation