
PHASE 1 ARCHAEOLOGICAL ASSESSMENT
MICRO-SITING
& PHASE 2 ARCHAEOLOGICAL TEST PITTING
TURBINE LINE 33-36,
RED CAP KOUGA WIND FARM, CENTRAL CLUSTER,
OYSTER BAY, EASTERN CAPE, SOUTH AFRICA

DATE: 2012-05-31



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CONTENTS

1) TERMS OF REFERENCE	2
2) PHASE 1 ARCHAEOLOGICAL ASSESSMENT: MICRO-SITING.....	3
❖ BACKGROUND	3
o Turbine Locality 48.....	7
o Turbine Locality 50.....	9
o Turbine Locality 53.....	11
o Turbine Locality 61.....	13
3) PHASE 2 ARCHAEOLOGICAL TEST PITTING: TURBINE LINE 33-36	15
❖ BACKGROUND	15
❖ PHASE 2 ARCHAEOLOGICAL TEST PITTING: TURBINE LINE 33-36	17
o Turbine Locality 33.....	19
o Turbine Locality 36.....	22
4) SUMMARIZED RECOMMENDATIONS	26

LIST OF FIGURES

Figure 1: Development layout – Red Cap Kouga Wind Farm, Central Cluster (courtesy Red Cap)	4
Figure 2: Turbine footprint layout.....	5
Figure 3: Micro-siting assessment findings.....	5
Figure 4: Summary of micro-siting assessment	6
Figure 5: Turbine Locality 48	7
Figure 6: Image gallery – Turbine Locality 48	8
Figure 7: Turbine Locality 50	9
Figure 8: Image gallery – Turbine Locality 50	10
Figure 9: Turbine Locality 53	11
Figure 10: Image gallery – Turbine Locality 53.....	12
Figure 11: Turbine Locality 61	13
Figure 12: Image gallery – Turbine Locality 61.....	14
Figure 13: Copy of SAHRA permit nr 80/12/02/027/51.....	16
Figure 14: General locality of Turbine Line 33-36, Red Cap Kouga Wind Farm, Central Cluster.....	17
Figure 15: Turbine Line 33-36 in relation to turbines 28, 41 and 40	18
Figure 16: Test pit localities in relation to Turbine Locality 33 and Turbine Locality 36	18
Figure 17: Turbine Locality 33 – Test pit particulars.....	19
Figure 18: Turbine Locality 33 – Test pits 33.1, 33.2, 33.3, 33.4 and 33.5	19
Figure 19: Image gallery – Test pits at Turbine Locality 33.....	21
Figure 20: Turbine Locality 36 – Test pit particulars.....	22
Figure 21: Turbine Locality 36 – Test pits 36.1, 36.2, 36.3, 36.4 and 36.5	22
Figure 22: Turbine Locality 33 and Turbine Locality 36 in relation to Site 2.3.....	23
Figure 23: Image gallery – Test pits at Turbine Locality 36.....	25

1) TERMS OF REFERENCE

This report is compiled for Red Cap Investments (Red Cap) for purposes of SAHRA compliance with respect to requirements of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999) as identified in the Phase 1 Archaeological Impact Assessment (AIA) for the project, in accordance with the relevant SAHRA HIA Comment and SAHRA permit. Relevant documentation can be referenced as:

- Van Ryneveld, K. (ArchaeoMaps). 2010. *Cultural Heritage Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa* (CRM report);
- SAHRA HRC Comment (SAHRA File No 9/2/044/0001). 2011. *Review Comment on Heritage Impact Assessment* (including archaeological and palaeontological assessment);
- Van Ryneveld, K. (ArchaeoMaps). 2011. *Request for Amendment to the SAHRA HRC – Kouga Wind Energy Facility: Archaeology Section* (CRM letter of Recommendation);
- Van Ryneveld, K. (ArchaeoMaps). 2012. *Red Cap Kouga Wind Farm – Central Cluster: Cancellation of 2011 Permit Applications and Submission of Revised Permit Applications* (SAHRA permit application); and
- SAHRA Permit No 80/12/02/027/51.

The report is presented in 2 parts, including:

- Phase 1 archaeological assessment – Micro-siting; and
- Phase 2 archaeological test pitting – Turbine Line 33-36 (done under SAHRA Permit No 80/12/02/027/51)

[Monitoring along Turbine Line 40-41-48 will be done at the time of construction, under SAHRA Permit No 80/12/02/027/51].

2) PHASE 1 ARCHAEOLOGICAL ASSESSMENT: MICRO-SITING

❖ BACKGROUND

Micro-siting of the Red Cap Kouga Wind Farm was done without a SAHRA permit as per the revised SAHRA permit application (ArchaeoMaps, 2012-02-10):

'Micro-siting –

Preliminary micro-siting continued over 2 site visits, including December 2011 (2 days – preceding geotechnical testing) and again in January / February 2012 (3 days – during geotechnical testing). Micro-siting was limited to basic Phase 1 surface surveys of the final turbine footprints and the exact linear development alignments. No collections of artefacts were made, as proposed in the initial micro-siting permit application. The 1st field visit aimed to identify additional sites or archaeological occurrences that will directly be affected by the proposed final development layout (turbine positions)... Micro-siting during the 2nd field visit included monitoring of all turbine localities assessed during the 1st field visit as well as associated linear development alignments. Ongoing geotechnical testing allowed for sub-surface inspection of selected turbine localities. No archaeological remains were identified in any of the geotechnical test pits (churned backfilled pits) and no significant surface assemblages that would require systematic surface sampling were identified.'

Micro-siting covered all 41 proposed turbine localities included in the final development layout as well as applicable access roads. Assessment was restricted to relevant farm portions and farm camps and limited to exact turbine localities (100x120m lease areas that contain the 100x30m area to be impacted on by construction), access road areas (assessed with an approximate 20m development corridor) and the immediate surrounds.

All 41 turbine locations investigated were found to be suitable locations from an archaeological perspective. Of the 41 micro-sited turbine localities (and associated access roads) 37 proved to be anthropogenically sterile, applicable turbine localities include: Turbine Localities 28, 29, 30, 31, 32, 33 (see Turbine Line 33-36), 35, 36 (see Site 2.3 and Turbine Line 33-36), 37, 38, 40 (monitoring under SAHRA permit), 41 (monitoring under SAHRA permit), 42, 43, 44, 45, 47, 51, 54, 55, 56, 57, 58, 59, 60, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74 and 76. It is recommended that development at these turbines and applicable road portions proceed as applied for without the developer having to comply with additional cultural heritage compliance requirements.

Low densities of Stone Age artefacts were found in the general vicinity of 4 of the turbine localities, including: Turbine Localities 48, 50, 53 and 61. In addition to Stone Age resources a small stone built Colonial Period stock enclosure is present in the general Turbine Locality 50 area. Low densities of Stone Age artefacts are associated with quartzite outcrops, with the quality of quartzite / sandstone present at the outcrops inferred to be the determining factor relating to the presence of Stone Age lithics at the outcrops and directly associated with the quality and quantity of artefacts comprising the assemblage. At Turbine Locality 50 Stone Age artefacts are inferred to be the result of water deposition from areas further upstream.

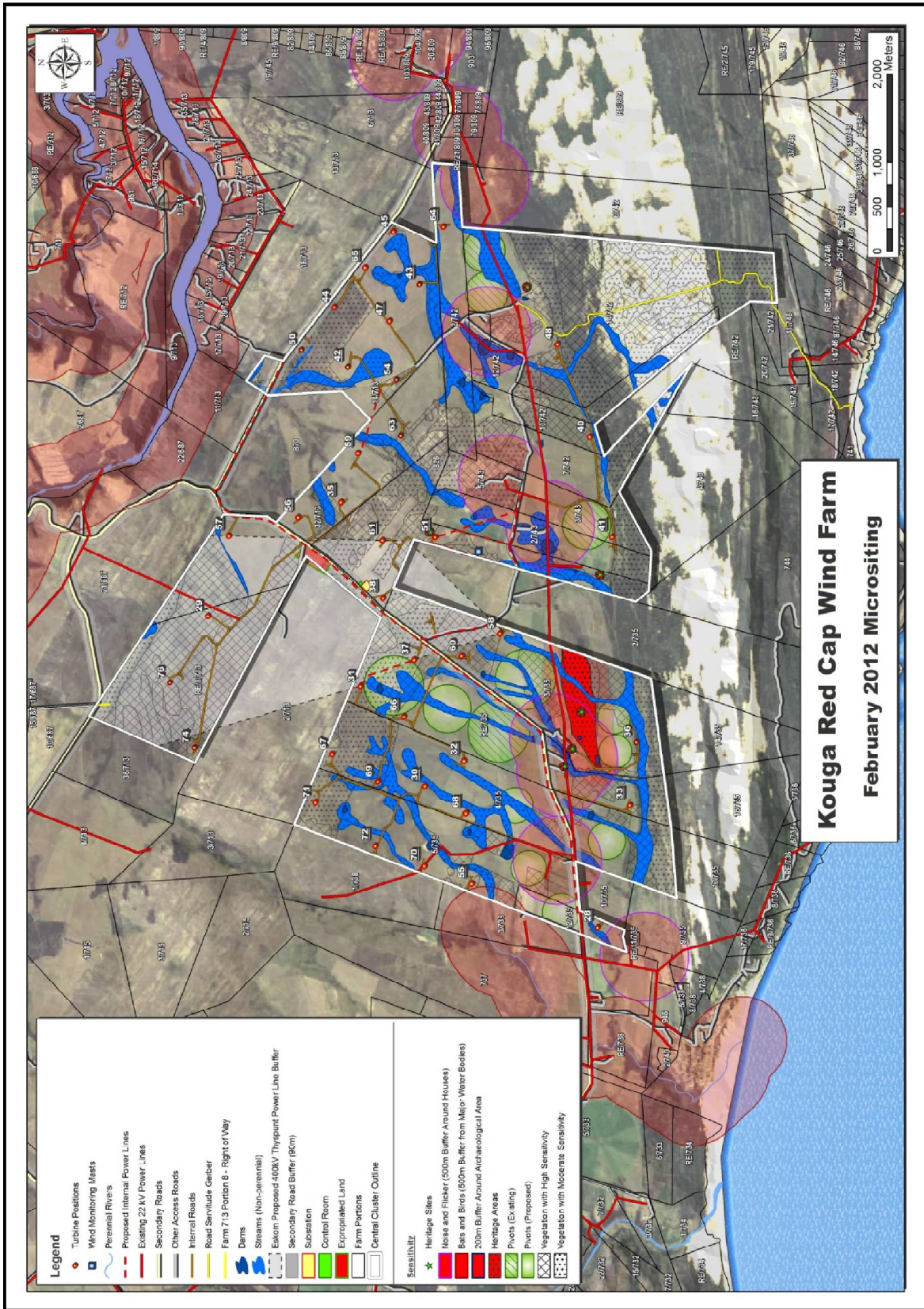


Figure 1: Development layout – Red Cap Kougou Wind Farm, Central Cluster (courtesy Red Cap)

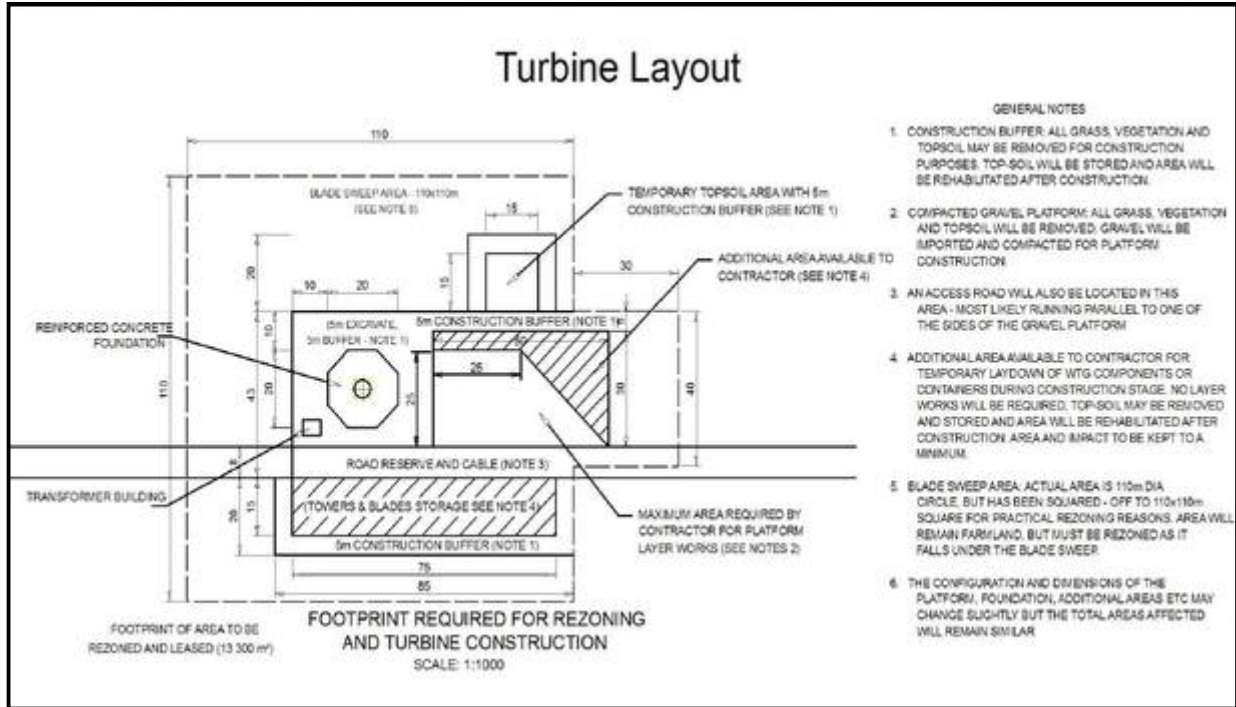


Figure 2: Turbine footprint layout



Figure 3: Micro-siting assessment findings

No	Turbine	Co-ordinate	Recommendations
1	28	S34°09'34.1"; E24°40'05.1"	N/A
2	29	S34°07'11.6"; E24°42'22.7"	N/A
3	30	S34°08'31.0"; E24°41'07.6"	N/A
4	31	S34°08'07.4"; E24°41'51.7"	N/A
5	32	S34°08'45.4"; E24°41'18.8"	N/A
6	33	S34°09'46.1"; E24°40'59.0"	Phase 2 Archaeological test pits / geotechnical monitoring (see report section)
7	35	S34°08'00.5"; E24°43'12.6"	N/A
8	36	S34°09'48.6"; E24°41'26.7"	Phase 2 archaeological test pits / geotechnical monitoring (see report section)
9	37	S34°08'27.2"; E24°42'03.3"	N/A
10	38	S34°08'15.8"; E24°42'30.4"	N/A
11	40	S34°09'31.8"; E24°43'41.3"	Archaeological monitoring at time of construction (SAHRA permit issued)
12	41	S34°09'39.8"; E24°42'57.1"	Archaeological monitoring at time of construction (SAHRA permit issued)
13	42	S34°08'03.1"; E24°44'12.3"	N/A
14	43	S34°08'29.5"; E24°44'48.5"	N/A
15	44	S34°07'58.3"; E24°44'38.7"	N/A
16	45	S34°08'20.0"; E24°45'11.8"	N/A
17	47	S34°08'18.5"; E24°44'32.5"	N/A
18	48	S34°09'20.0"; E24°44'22.1"	Placement of tower and blade storage area and temporary top soil area to the south of access road Temporary demarcation and signage at time of construction Archaeological monitoring at time of construction (SAHRA permit issued)
19	50	S34°07'46.1"; E24°44'19.9"	Temporary demarcation and signage at time of construction
20	51	S34°08'35.0"; E24°42'57.3"	N/A
21	53	S34°08'33.6"; E24°42'25.4"	Temporary demarcation and signage at time of construction
22	54	S34°08'21.0"; E24°44'06.7"	N/A
23	55	S34°08'48.0"; E24°40'24.5"	N/A
24	56	S34°07'44.8"; E24°43'06.1"	N/A
25	57	S34°07'19.4"; E24°42'58.1"	N/A
26	58	S34°08'58.7"; E24°42'14.7"	N/A
27	59	S34°08'06.8"; E24°43'34.3"	N/A
28	60	S34°08'44.6"; E24°42'04.8"	N/A
29	61	S34°08'15.7"; E24°42'55.9"	Temporary demarcation and signage at time of construction
30	63	S34°08'22.5"; E24°43'42.0"	N/A
31	64	S34°08'38.3"; E24°45'13.9"	N/A
32	65	S34°08'09.6"; E24°44'55.9"	N/A
33	66	S34°08'23.3"; E24°41'38.2"	N/A
34	67	S34°07'56.9"; E24°41'21.9"	N/A
35	68	S34°08'46.0"; E24°40'55.6"	N/A
36	69	S34°08'13.8"; E24°41'09.8"	N/A
37	70	S34°08'30.7"; E24°40'32.4"	N/A
38	71	S34°07'50.8"; E24°41'00.7"	N/A
39	72	S34°08'12.7"; E24°40'41.3"	N/A
40	74	S34°07'06.6"; E24°41'24.9"	N/A
41	76	S34°06'57.6"; E24°41'53.5"	N/A

Figure 4: Summary of micro-siting assessment

- *Turbine Locality 48*



Figure 5: Turbine Locality 48

Clusters of Stone Age artefacts were identified along the central-eastern portion of the quartzite outcrops situated just north of Turbine Locality 48. The Site 48.1 (S34°09'17.8"; E24°44'18.0") low density Stone Age occurrence is characterized by collections of a mixture of Middle (MSA) and Later Stone Age (LSA) artefacts typically collected in deflation hollows, signifying a disturbed secondary context to the artefacts. MSA type artefacts are primarily identified by broken flake and blade types while LSA types are typically represented by scrapers. Typologically artefacts seem to be of a fair quality but heavily rolled in appearance; the result of extensive post depositional water disturbance. Fairly high quantities of artefacts were present, with an average artefact ratio (artefacts: m²) of 5:1 recorded at deflations hollows containing artefactual material. However, the limited number of artefactual occurrences results in an average artefact ratio of $\leq 1:1$ for the indicated area. In comparison more deflation hollows containing artefacts than at Turbine Localities 50, 53 and 61 were present but concentrated across only a small part of the outcrops. Associated sub-surface deposits are not expected: The outcrops itself forms both the geological and anthropogenic basal member whilst geotechnical test pits indicated continuation of surface rock in sub-surface members.

RECOMMENDATIONS: The low density Site 48.1 Stone Age occurrence is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. The identified surface extent of the occurrence will not be impacted on by development. In order to ensure conservation of the low density Site 48.1 surface area it is recommended that the tower and blade storage area and the temporary topsoil area for turbine construction be situated to the south of the proposed access road. In addition temporary conservation measures should be in place at the time of construction, including clear visual demarcation by means of danger tape or construction netting around the southern perimeter of the outcrops. The area should be temporarily sign posted as a '*No-entry – Heritage /*

Archaeological sensitive area. Archaeological monitoring along Turbine Line 41-40-48 will be done at the time of construction. All temporary conservation measures should be removed after construction.



Figure 6: Image gallery – Turbine Locality 48

○ *Turbine Locality 50*



Figure 7: Turbine Locality 50

A few Stone Age artefacts were discovered across the southern part of the quartzite outcrops at Turbine Locality 50. Artefacts at the Site 50.1 outcrops (S34°07'47.2"; E24°44'20.5") were found scattered across the surface of the indicated area, often found lodged in small crevices (with some in a typical deflation hollow context), signifying their secondary disturbed context. The evident ex-situ context of artefacts, produced from a variety of quartzite types and including sandstone artefacts, associated with the lack of evidence for raw material quarrying at the outcrops itself and the stream just to the south of the outcrops, is inferred to be the result of stream deposition. Artefact quantities were too low to attempt an artefact ratio (artefacts: m²) description. Types included an admixture of Middle (MSA) and Later Stone Age (LSA) types, comprising in general of basic flakes, some with scraper edges. Artefacts are technologically of a fairly poor standard. Based on the evident ex-situ context of artefacts the Site 50.1 low density Stone Age occurrence holds no potential for future research, but the occurrence will be conserved by the development layout. In addition to extremely low quantities of Stone Age deposits a small rectangular stone built structure, Site 50.2 (S34°07'46.7"; E24°44'20.2"), a Colonial Period stock enclosure, is situated on the outcrops, approximately 25m south-east of Turbine 50. The structure measures approximately 1.5x1.5m in size and is clearly visible with walls in places still standing to an approximate 70-80cm height; the stock enclosure will not be impacted on.

RECOMMENDATIONS: The Site 50.1 low density Stone Age occurrence and the Site 50.2 Colonial period stock enclosure are both ascribed SAHRA *Low Significances* and *Generally Protected C Field Ratings*. Development will not impact on either of the localities. Based on proximity it is recommended that the developer ensures that the archaeologically sensitive areas be visually clearly demarcated, with danger tape or construction netting and

marked as a 'No-entry – Heritage / Archaeological sensitive area' sign. Temporary conservation measures should be removed after construction.



Figure 8: Image gallery – Turbine Locality 50

- *Turbine Locality 53*



Figure 9: Turbine Locality 53

A low density of Stone Age artefacts (Site 53.1 – S34°08'30.2"; E24°42'27.2") were identified, scattered across a portion of the quartzite outcrops north-east of Turbine Locality 53. Across the assessed portion of the outcrops, indicated as Site 53.1, low densities of artefacts occurred at intervals, collected in deflation hollows. At relevant deflation hollows clusters of artefacts mixed with smaller non-anthropogenic material were found with a rough estimated artefact ratio (artefacts: m²) of 2-3:1. However, the low density of identified deflation hollows containing anthropogenic material would provide for a general artefact ratio estimation of <1:25 across the indicated area. Identified artefacts were fairly small, signifying a Later Stone Age (LSA) assignment, although the possibility of a later Middle Stone Age (MSA) admixture cannot be excluded. Typologically and technologically the lithics can be ascribed as of a fair standard, but with an evident rolled appearance as a result of extensive secondary post depositional disturbance. Low density Stone Age occurrences are, based on their identified heavily disturbed contexts not associated with any organic material. Deposits may well have some stratigraphic depth, but reasonably inferred to represent a continuation of the surface identified disturbed context with the quartzite outcrops itself, being both the geological and anthropic basal member already primarily surfacing. Identification of disturbed Stone Age lithics at the outcrops does however indicate that further Stone Age occurrences can be expected across the extent of the greater outcrops (as indicated by the low density Stone Age occurrence on the outcrops to the east of the access road to Turbine Locality 61).

RECOMMENDATIONS: The Site 53.1 low density Stone Age occurrence is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. Development of, and associated development impact at Turbine 53 will be restricted to the south-west of the identified low density Stone Age occurrence; the occurrence will by implication be conserved. Based on close proximity to the occurrence it is recommended that additional temporary

conservation measures be taken at the time of construction: The developer should ensure that the outcrops be visually clearly demarcated, with danger tape or construction netting and marked as a 'No-entry – Heritage / Archaeological sensitive area' sign. Temporary conservation measures should be removed after construction.

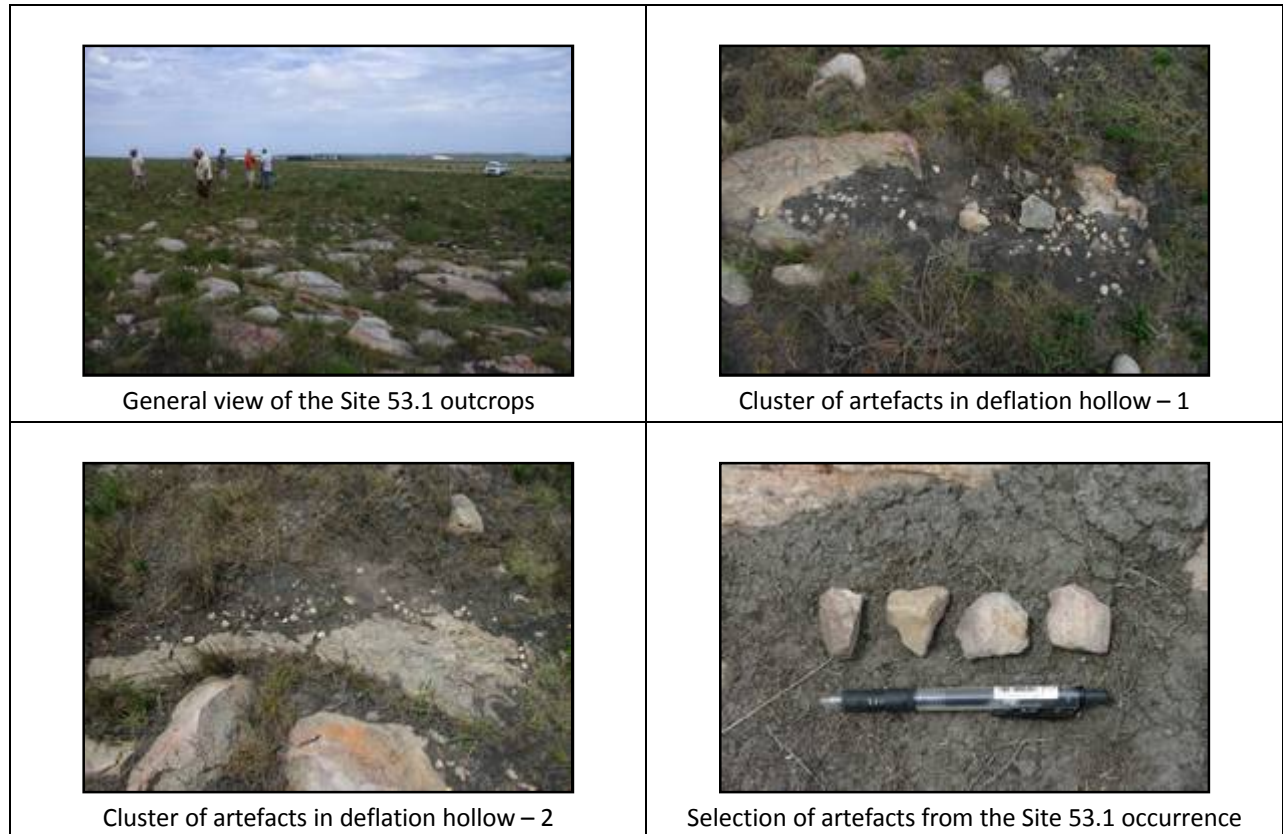


Figure 10: Image gallery – Turbine Locality 53

- *Turbine Locality 61*



Figure 11: Turbine Locality 61

A few artefacts were discovered in the hill east of the access road to Turbine Locality 61. Artefacts at the Site 61.1 locality (S34°08'21.4"; E24°42'57.1") were found scattered across the surface of the hill, often found lodged in small crevices. Artefact quantities were too low to attempt an artefact ratio (artefacts: m²) description. Types included typical Middle Stone Age (MSA) flake and blade types, with a number of artefacts being Later Stone Age (LSA) scraper and flake types. The Site 61.1 locality holds little potential for future research, but does serve as indicator that more prominent Stone Age deposits may be present in surrounding quartzite outcrops outside the scope of the micro-siting study site.

RECOMMENDATIONS: The Site 61.1 low density Stone Age occurrence is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. Development will not impact on the quartzite outcrops. It is recommended that the developer ensures that temporary conservation measures are in place at the time of development impact including that the locale be visually clearly demarcated, with danger tape or construction netting and marked as a '*No-entry – Heritage / Archaeological sensitive area*'. Temporary conservation measures should be removed after construction.

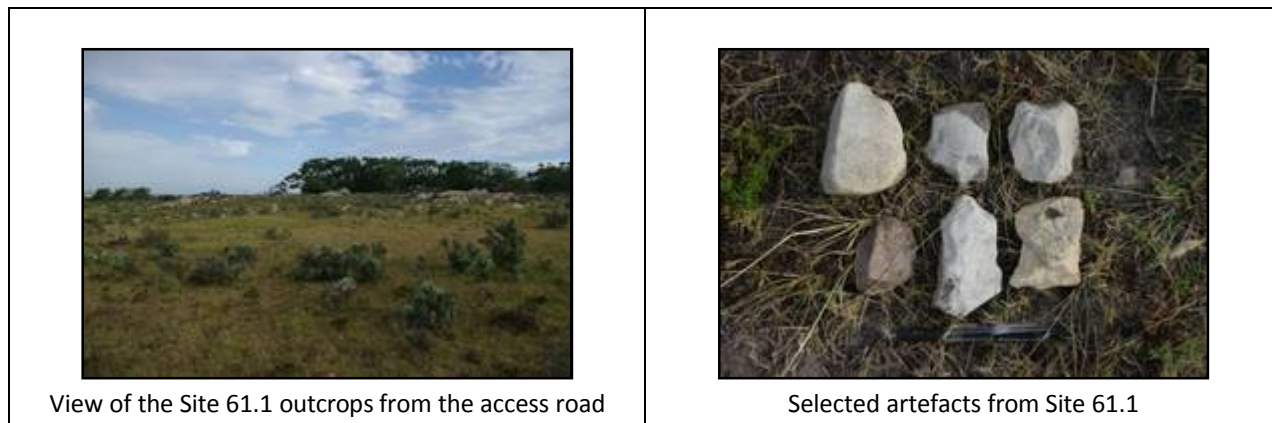


Figure 12: Image gallery – Turbine Locality 61

3) PHASE 2 ARCHAEOLOGICAL TEST PITTING: TURBINE LINE 33-36

❖ BACKGROUND

Phase 2 archaeological monitoring in the vicinity of Turbine Line 33-36 was applied for under a revised SAHRA permit application (ArchaeoMaps, 2012-02-10):

'Permit Application – Turbine Line 33-36

It is proposed that test-pitting be done in the vicinity of Turbine Line 33-36. In the event that archaeological remains are uncovered during excavations, work will be stopped and a way forward will be discussed by the project team, the Gamtkwa KhoiSan Council and SAHRA. This may entail full Phase 2 mitigation or the conservation of archaeological material and the latter may involve a no development option.

At present it is proposed that at least 8 test pits be excavated: 3 in the immediate vicinity of Turbine Locality 33, 3 in the immediate vicinity of Turbine Locality 36 and 2 in the general area between the 2 turbine localities. It is proposed that test pitting be conducted with a mechanical excavator under strict direction from the archaeologist. Should any anthropogenic material be encountered, excavations will be stopped. The proposal for the use of a mechanical excavator is twofold in nature:

- 1) Based on geotechnical testing at turbine localities 28, 41 and 40 (to the west and east of Turbine Line 33-36) sub-surface deposits in the general vicinity seems to be archaeologically sterile – no archaeological indicators were identified in geotechnical backfilled material at turbine localities 28 and 40, while exposed geotechnical sections were open for archaeological inspection at Turbine Locality 41. Here anthropogenic sterile exposed sections indicated that soft geological sediments are up to 3m thick and in one case up to 5m, making excavations with spades and trowels not a viable option for testing purposes; and*
- 2) It will allow sub-surface inspection of a greater amount of sections.*

It is proposed that archaeological test pitting coincides with geotechnical testing in the vicinity of Turbine Line 33-36...'


The above permit application to SAHRA was supported by Dr. Peter Nilssen (CHARM), appointed Association of Southern African Professional Archaeologists (ASAPA) Cultural Resources Management (CRM) accredited Coastal & Shell Midden Principle Investigator (Nilssen Archaeological Resources Management, 2012-02-10).

The applicable SAHRA permit was issued on 2012-03-01 (including test excavations for Turbine Line 33-36 and monitoring of Turbine Line 41-40-48). Relevant SAHRA permit details include:

SAHRA permit nr : 80/12/02/027/51

Issued to : Karen van Ryneveld, in association with Dr. Peter Nilssen

For : The excavation of at least 8 test pits along the line of 3(?) turbines (33-36) of the Central Cluster of the Red Cap Kouga Wind farm, to determine whether any archaeological site or sub-surface deposits are located in the area...



**SOUTH AFRICAN HERITAGE
RESOURCES AGENCY**

111 HARRINGTON STREET, CAPE TOWN, 8001
PO BOX 4622, CAPE TOWN, 8000
TEL: (021) 462 4962 FAX: (021) 462 4990

9/2/044/0001

PERMIT
No. 80/12/02/027/51

Issued under Section 35(4) of the National Heritage Resources Act, Act No. 25 of 1999.
Permission is hereby given:

to: Ms Karen van Ryneveld (ID: 7111100183082), in association with Dr Peter Nilssen acting as Principal Investigator for the project,


of: ArchaeoMaps, Postnet Suite 239, Private Bag X3, Beacon Bay, 5205, and CHARM, P.O. Box 176, Great Brak River, 6525,

for: the excavation of at least eight test pits along the line of three turbines (33-36) of the Central Cluster of the Red Cap Kouga Wind farm, to determine whether any archaeological site or sub-surface deposits are located in the area; and for the monitoring of the line of turbines 41-40-48 located 1km west of the line 33-36,

in: the Kouga Municipality District, near the town of Cape St Francis, Eastern Cape Province.

The following conditions apply:

1. Activities must be monitored by the applicant and overseen by Dr Nilssen. If any archaeological material is identified during test excavation and monitoring, excavation will be stopped and a way forward discussed by the project team, the Gamkwa KhoiSan Council and SAHRA.
2. If the permit holder is not to be present on the site at all times then SAHRA must be provided with the names and qualifications of the authorised representatives.
3. Adequate recording methods as specified in the Regulations and Guidelines pertaining to the National Heritage Resources Act must be used. Note that the position of all excavations must be marked on a plan of each site.
4. A report must be submitted to SAHRA on or before 01 April 2013. SAHRA reserves the right to withhold further permits if progress is not deemed satisfactory.
5. Reprints of all published papers, or copies of theses or reports resulting from this work must be lodged with SAHRA.
6. If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
7. It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed.
8. It is the responsibility of the permit holder to fill in excavations and protect sites during and after excavation to the satisfaction of SAHRA and the landowner.
9. SAHRA shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit.
10. SAHRA reserves the right to cancel this permit by notice to the permit holder.

This permit is valid until 01 April 2013
for CHIEF EXECUTIVE OFFICER ... 
Date: 01 March 2012

Place: Cape Town




Figure 13: Copy of SAHRA permit nr 80/12/02/027/51

❖ **PHASE 2 ARCHAEOLOGICAL TEST PITTING: TURBINE LINE 33-36**

Phase 2 archaeological test pitting along Turbine Line 33-36 was done on 2012-04-02. Test pitting, monitored by Karen van Ryneveld and Dr. Peter Nilssen, coincided with geotechnical testing, done under the supervision of geologists Tyrell Hayes and Lyzander Parfitt (TerraTest). Test pits were dug with mechanical excavator.

Ten test pits were dug, including 4 in the vicinity of Turbine Locality 33 (S34°09'46.1"; E24°40'59") and 4 in the vicinity of Turbine Locality 36 (S34°09'48.6"; E24°41'26.7") with an additional 2 test pits along Turbine Line 33-36. At each Turbine Locality 3 test pits were dug within the applicable turbine base area, an additional test pit was dug within the turbine laydown area, in the general area where the crane will be positioned during construction. Two additional test pits, 1 in the vicinity of Turbine Locality 33 and 1 in the vicinity of Turbine Locality 36, serve to further describe the general archaeological sensitivity of the area between the 2 turbines; no development will take place in this area.

RECOMMENDATIONS: No archaeological sites, lenses, occurrences or artefacts were identified in any of the test pit sections: Development of Turbine 33 and Turbine 36 pose no threat to the (surface or sub-surface) archaeological record. It is recommended that development of Turbine 33 and Turbine 36 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.



Figure 14: General locality of Turbine Line 33-36, Red Cap Kouga Wind Farm, Central Cluster



Figure 15: Turbine Line 33-36 in relation to turbines 28, 41 and 40



Figure 16: Test pit localities in relation to Turbine Locality 33 and Turbine Locality 36

○ *Turbine Locality 33*

Turbine Locality 33 – S34°09'46.1"; E24°40'59.0"					
Test pit	Co-ordinate	Position	Ave. Size	Ave. Depth	Archaeological status
T33.1	S34°09'45.4"; E24°40'56.3"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T33.2	S34°09'46.0"; E24°40'56.0"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T33.3	S34°09'45.8"; E24°40'57.3"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T33.4	S34°09'46.5"; E24°40'59.3"	Laydown area	6.0x2.0m	6.0m	Anthropogenic sterile section
T33.5	S34°09'46.5"; E24°41'02.1"	General line route	2.0x0.5m	2.0m	Anthropogenic sterile section

Figure 17: Turbine Locality 33 – Test pit particulars



Figure 18: Turbine Locality 33 – Test pits 33.1, 33.2, 33.3, 33.4 and 33.5

Three test pits (trenches), namely T33.1, T33.2 and T33.3, were dug at the Turbine Locality 33 base area. Test pits measured roughly 2.5x0.5m in size with an average depth of 3.0m. One test pit, T33.4, was dug within the laydown area, measuring roughly 6.0x2.0m in size with an average depth of 6.0m and a further test pit, T33.5, was dug to monitor deposits along the general Turbine Line 33-36. Test pit T33.5 measured approximately 2.0x0.5m in size with an average depth of 2.0m. No archaeological or cultural material was found in any of the test pits; sub-surface stratigraphic sections proved to be unanimously anthropogenically sterile. A general stratigraphy for the area can be described as:

- | | | |
|-----------------|-------------------------------|--|
| 1) Layer 1: | 0-0.4m | - Organic rich black sand |
| 2) Layer 2: | 0.4-0.7m (variation 0.4-2.5m) | - Dark / light grey Aeolian sand lenses (Holocene) |
| 3) Layer 3: | 0.7-2.2m (variation 2.5-5.5m) | - Pale yellow / yellow Aeolian sand (Quaternary) |
| 4) Layer 4: | 2.2-3.0m (variation 5.5-6.0m) | - Yellow sand / clayish member with red coloration (lenses) indicative of an iron rich mineral component |
| 5) Basal layer: | 6.0m | - Groundwater table (surfacing) |



View of T33.1 with T33.3 in the background



View of T33.2 towards T33.3



Excavations at T33.1



T33.1 – Section



Excavations at T33.2



T33.2 – Section



T33.3 – Section



Close-up of soil samples – T33.3



Figure 19: Image gallery – Test pits at Turbine Locality 33

○ *Turbine Locality 36*

Turbine Locality 36 – S34°09'48.6"; E24°41'26.7"					
Test pit	Co-ordinate	Position	Ave. Size	Ave. Depth	Archaeological status
T36.1	S34°09'47.9"; E24°41'24.0"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T36.2	S34°09'48.7"; E24°41'24.1"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T36.3	S34°09'48.3"; E24°41'25.3"	Turbine base	2.5x0.5m	3.0m	Anthropogenic sterile section
T36.4	S34°09'48.5"; E24°41'26.4"	Laydown area	6.0x2.0m	6.0m	Anthropogenic sterile section
T36.5	S34°09'48.6"; E24°41'18.5"	General line route	2.0x0.5m	2.0m	Anthropogenic sterile section

Figure 20: Turbine Locality 36 – Test pit particulars



Figure 21: Turbine Locality 36 – Test pits 36.1, 36.2, 36.3, 36.4 and 36.5

Again 3 test pits (trenches), namely T36.1, T36.2 and T36.3, were dug at the general Turbine Locality 36 base area. Test pits measured roughly 2.5x0.5m in size with an average depth of 3.0m. One test pit, T36.4, was dug within the laydown area, measuring roughly 6.0x2.0m in size with an average depth of 6.0m and a further test pit, T36.5, was dug to monitor deposits along the general Turbine Line 33-36. Test pit T36.5 measured approximately 2.0x0.5m in size with an average depth of 2.0m. No archaeological or cultural material was found in any of the test pits; sub-surface stratigraphic sections proved to be unanimously anthropogenically sterile. A general stratigraphy for the area can be described as:

- | | | |
|-----------------|-------------------------------|--|
| 1) Layer 1: | 0-0.4m | - Organic rich black sand |
| 2) Layer 2: | 0.4-0.7m (variation 0.4-2.5m) | - Dark / light grey Aeolian sand lenses (Holocene) |
| 3) Layer 3: | 0.7-2.2m (variation 2.5-5.5m) | - Pale yellow / yellow Aeolian sand (Quaternary) |
| 4) Layer 4: | 2.2-3.0m (variation 5.5-6.0m) | - Yellow sand / clayish member with red coloration (lenses) indicative of an iron rich mineral component |
| 5) Basal layer: | 6.0m | - Groundwater table (surfacing) |

Despite the fact that the general stratigraphy of test pits at Turbine Locality 36 proved to be very similar to that of test pits at Turbine Locality 33 a noticeably higher amount of clay was present in the Layer 4 member, signifying an intricate drainage system in the area during Quaternary times. According to geologist Tyrell Hayes (Pers. Comm., 2012-04-02), evidence of this drainage system has surfaced in geotech test trenches across the Central Cluster study site. Test pit evidence of an intricate Quaternary drainage system in the vicinity of Turbine Locality 36 is further supported by interpretation of the depositional history of the nearby Earlier and Middle Stone Age (ESA & MSA) site, labeled Site 2.3. According to Richard Fyvie (geologist, TerraTest), the site is situated along a palaeo-channel or drainage line of at least Quaternary age, but still periodically active. The palaeo-drainage line would have entered the sea further to the west-, south-west, before the formation of the Holocene, shifting dune system that today borders the greater Central Cluster study site to the south. Should this interpretation / hypothesis hold true it may explain archaeological sterility in the geotech pits in the area (Turbine Line 28-33-36-41-40) immediately south of the palaeo-drainage line. This implies a very localized palaeo-archaeological use of resources (including fresh water and raw materials exposed during water action) of the drainage line environs. In addition this minimizes the possibility of finding sub-surface Holocene related shell midden sites on a Quaternary landscape (excluding the possibility of buried human remains and later use of exposed raw materials, i.e. at Turbine Locality 48). To the east of the greater Central Cluster study site (in the general vicinity of the St. Francis Links Golf Estate, where extensive Phase 2 mitigation work has been done by Dr. Peter Nilssen) the intricate intersection of the Quaternary and Holocene landscapes may well explain the complex mosaic of specifically Middle and Later Stone Age (MSA & LSA) deposits on the landscape.

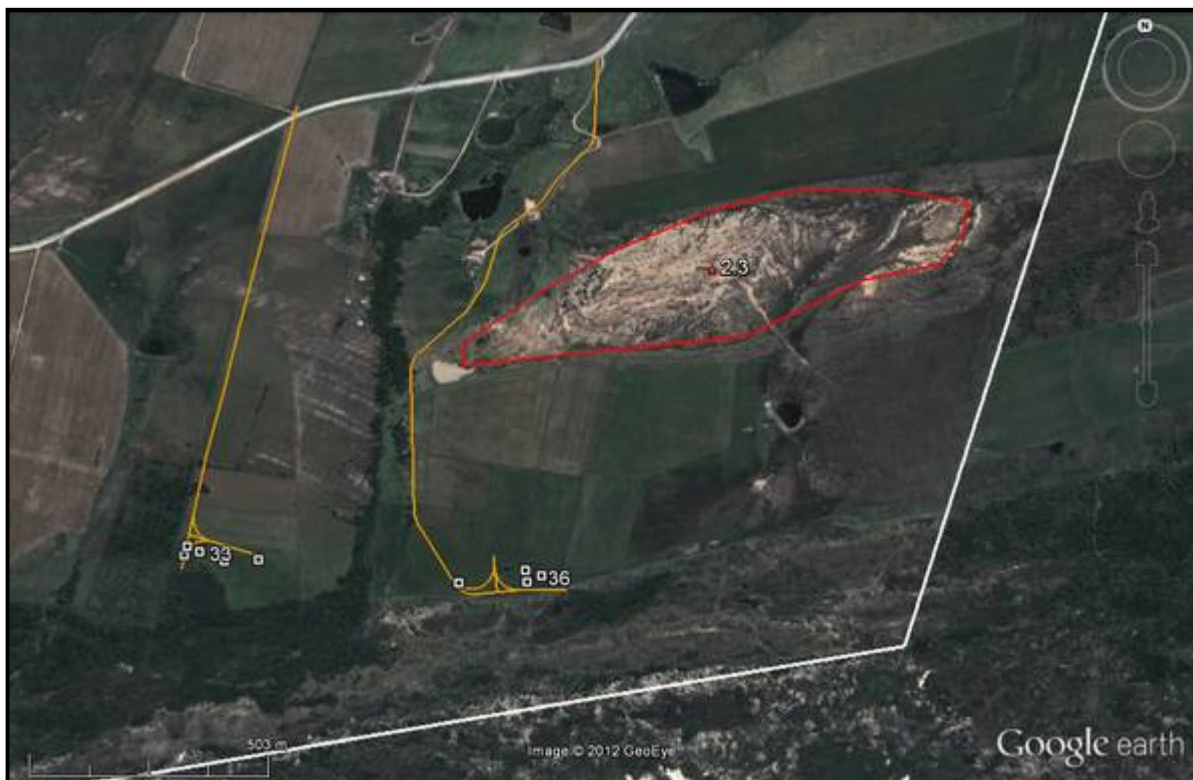


Figure 22: Turbine Locality 33 and Turbine Locality 36 in relation to Site 2.3



View of T36.3 and T36.1



View of T36.1



Anthropogenic sterile sub-surface deposits from T36.1



View of T36.2



T36.2 – Section



View of T36.3 – 1



View of T36.3 – 2



T36.3 – Section



Figure 23: Image gallery – Test pits at Turbine Locality 36

4) SUMMARIZED RECOMMENDATIONS

○ *Micro-siting*

NO ARCHAEOLOGICAL CONCERNS:

Turbine Localities 28, 29, 30, 31, 32, 33 (see Turbine Line 33-36), 35, 36 (see Site 2.3 and Turbine Line 33-36), 37, 38, 40 (monitoring under SAHRA permit), 41 (monitoring under SAHRA permit), 42, 43, 44, 45, 47, 51, 54, 55, 56, 57, 58, 59, 60, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 74 and 76.

ARCHAEOLOGICAL RECOMMENDATIONS:

➤ **Turbine Locality 48**

1. Placement of tower and blade storage area and temporary top soil area to the south of access road;
2. Temporary demarcation and signage at time of construction; and
3. Archaeological monitoring at time of construction (see Turbine Line 41-40-48).

➤ **Turbine Locality 50**

1. Temporary demarcation and signage at time of construction.

➤ **Turbine Locality 53**

1. Temporary demarcation and signage at time of construction.

➤ **Turbine Locality 61**

1. Temporary demarcation and signage at time of construction.

○ *Turbine Line 33-36*

No archaeological or cultural heritage resources were identified during Phase 2 archaeological test pitting in the vicinity of Turbine Line 33-36. **It is recommended that development of Turbine 33, Turbine 36 and associated road portions proceed as applied for without the developer having to comply with additional cultural heritage compliance requirements.**

○ *Turbine Line 41-40-48*

Archaeological monitoring should be done at the time of construction in the vicinity of Turbine Line 41-40-48. (Archaeological monitoring will be done under SAHRA Permit No 80/12/02/027/51 issued on 2012-03-01 and valid until 2013-04-01).