

**Bayview Wind Farm,  
near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape**

---

- 30 July 2018 -

**Report to:**

**Sello Mokhanya** (Eastern Cape Provincial Heritage Resources Agency – EC PHRA, APM Unit)  
E-mail: smokhanya@ecphra.org.za; Tel: 043 745 0888; Postal Address: N/A

**Kim Brent** (EOH-Coastal and Environmental Services)  
E-mail: k.brent@cesnet.co.za; Tel: 041 585 1715; Postal Address: 67 African Street, Grahamstown, 6139



**Prepared by:**

**Karen van Ryneveld** (ArchaeoMaps)  
E-mail: karen@archaeomaps.co.za; Tel: 084 871 1064; Postal Address: Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

### **Specialist Declaration of Interest**

I, Karen van Ryneveld (Company – ArchaeoMaps; Qualification – MSc Archaeology), declare that:

- I act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its' proponent or subsidiaries, aside from fair remuneration for specialist services rendered;
- I am suitably qualified, accredited and experienced to act as independent specialist in this application;
- That work conducted have been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently;
- That all material information collected for purposes of this application, that may reasonably influence the decision of the competent authority, are transparently disclosed in the report; and
- That work conducted have been done in accordance with relevant heritage legislation, regulations and policy guidelines, and with cognisance to environmental legislation, regulations and policies, including the principle of Integrated Environmental Management (IEM).



**Signature –**

**- 30 July 2018 -**

**Bayview Wind Farm,  
near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape**

### Executive Summary

#### Project Name –

*Bayview Wind Farm*, near Port Elizabeth, Nelson Mandela Bay Municipality (NMBM), Eastern Cape [1:50,000 Map Ref – 3325DA].

#### Project Description –

The proposed development will comprise a maximum of forty-three (43) wind turbines, with an output capacity of 2-4.5MW per turbine, and a total output generating capacity of up to 140MW. Additional infrastructure that will be developed include operational and maintenance buildings, internal roads, underground electrical cabling lining turbines, an on-site substation / switching station and an overhead powerline (132kV) to an Eskom substation.

#### The Phase 1 Archaeological and Cultural Heritage Impact Assessment –

Field assessment of the *Bayview Wind Farm* study site yielded four (4) archaeological and cultural heritage resources, inclusive of type sites / occurrences, namely Sites BWF-S1 to BWF-S4. Two (2) of the identified resources are formally protected by the NHRA 1999, including Sites BWF-S1 and BWF-S2. The field assessment indicated a basic three-tiered Stone Age – Colonial Period – Contemporary Period cultural overlay.

- The proposed development poses no ‘fatal flaws’ with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a ‘No-Go’ option is irrelevant.
- The development will have an overall moderate positive cumulative impact on archaeological or cultural heritage resources and associated cultural landscapes.
- [In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, being identified during the course of development the process described in ‘Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase’ should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

<b>Heritage Compliance Summary – Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape</b>				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
<b>Bayview Wind Farm (General development co-ordinate – S33°39’56.2”; E25°39’35.9”) (Remaining Extent of Oliphants Kop 201, Portion 4 of Steyns Valley 202, Remaining Extent of Portion 8 of Ebb and Vloed 230)</b>				
BWF-S1	MSA (and LSA) – Low density lithic occurrences	N/A	Low Significance Generally Protected IV-C	Destruction without the developer having to comply with additional heritage compliance requirements
BWF-S2	Colonial Period – Ebb and Vloed Farmstead Remains	S33°39’16.6”; E25°38’57.6”	Automatic High Provincial Grade II Significance	Conservation (Formal conservation measures in place) Temporary heritage signage during the construction phase
BWF-S3	Contemporary Period – Oliphants Kop Farmstead	S33°39’59.1”; E25°39’07.1”	-	N/A (Resource not protected by the NHRA 1999)
BWF-S4	Contemporary Period – Oliphants Kop Workers Village	S33°40’05.7”; E25°39’08.4”	-	N/A (Resource not protected by the NHRA 1999)
In the event of a positive EA being issued, the final development layout, including all WTG localities and line routes, should be subjected to an archaeological and cultural heritage micro-siting (ground-truthing) study				

#### Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Bayview Wind Farm*, near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape, proceed provided the developer comply with the stipulated heritage compliance recommendations.

**The EC PHRA-APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.**

## CONTENTS

1 – Project Introduction and Terms of Reference .....	1
1.1) Project Name .....	1
1.2) Affected Properties and Location .....	1
1.3) Project Description.....	1
1.4) Terms of Reference .....	2
2 – The Phase 1 Archaeological and Cultural Heritage Impact Assessment .....	7
2.1) Archaeological and Cultural Heritage Legislative Compliance .....	7
2.2) Methodology and Gap Analysis.....	7
2.1 – Pre-feasibility Assessment .....	9
2.1.1) Pre-feasibility Summary .....	9
2.1.2) The SAHRA 2009 MPD and SAHRIS.....	9
2.1.3) SAHRA Provincial Heritage Site Database – Eastern Cape .....	10
2.1.4) General Discussion – The Receiving Environment.....	10
2.1.5) Chief Surveyor General Records .....	11
2.2 – Field Assessment .....	13
2.2.1) Site BWF-S1 – MSA (and LSA): Low Density Lithic Occurrences .....	13
2.2.2) Site BWF-S2 – Colonial Period: Ebb and Voed Farmstead Remains – S33°39’16.6”; E25°38’57.6” .....	13
2.2.3) Site BWF-S3 – Contemporary Period: Oliphants Kop Farmstead – S33°39’59.1”; E25°39’07.1” .....	14
2.2.4) Site BWF-S4 – Contemporary Period: Oliphants Kop Workers Village – S33°40’05.7”; E25°39’08.4”.....	14
3 – Environmental Impact Assessment Rating .....	27
4 – Cultural Landscapes and Viewscapes and Cumulative Assessment.....	30
4.1) Cultural Landscapes and Viewscapes .....	30
4.2) Cumulative Assessment.....	31
5 – Recommendations .....	33
6 – Acronyms and Abbreviations.....	35
7 – References .....	36

### Appendix A:

Schematic Outline of the Pre-colonial and Colonial Periods in South Africa

### Appendix B:

Heritage Protocol for Incidental Finds during the Construction Phase

### Appendix C:

Resumé: Karen van Ryneveld

### List of Figures

<b>Figure 1:</b> Colonial Period registration of the farm Oliphants Kop 201, Uitenhage District, in 1837 (CSG Record – B956/1837).....	12
<b>Figure 2:</b> Colonial Period registration of the farm Ebb and Voed 230, Uitenhage District, in 1832 (CSG Record – B516/1832) .....	12
<b>Figure 3:</b> The sixteen (16) basic aspects of culture subject to processes of cultural change (after Els 1992).....	30

### List of Maps

<b>Map 1:</b> General locality of the <i>Bayview Wind Farm</i> , near Port Elizabeth, NMBM, Eastern Cape (Base Map – MapStudio, 2008) .....	5
<b>Map 2:</b> General Locality of the <i>Bayview Wind Farm</i> , near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape [1:50,000 Map Ref: 3325DA] .....	5
<b>Map 3:</b> Proposed layout of the <i>Bayview Wind Farm</i> , near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape (EOH-CES 2017b, 2017c) .....	6
<b>Map 4:</b> Spatial distribution of geo-referenced PHSs in the SAHRA – Eastern Cape database in relation to the <i>Bayview Wind Farm</i> , near Port Elizabeth, NMBM, Eastern Cape, study site ( <a href="https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape">https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape</a> ) .....	10
<b>Map 5:</b> Proposed layout of the <i>Bayview Wind Farm</i> , including turbine localities and powerline routes (courtesy EOH-CES).....	16
<b>Map 6:</b> Results of the Phase 1 AIA field assessment (heritage sites – blue) .....	17

### List of Plates

<b>Plate 1:</b> Panorama of the western portion of the <i>Bayview Wind Farm</i> study site .....	15
<b>Plate 2:</b> Panorama of the central portion of the <i>Bayview Wind Farm</i> study site .....	15
<b>Plate 3:</b> General view of the Turbine 11 locality .....	18
<b>Plate 4:</b> General view of the Turbine 12 locality .....	18

<b>Plate 5:</b> General view of the turbine 3 locality .....	18
<b>Plate 6:</b> General view of the Turbine 8 locality.....	18
<b>Plate 7:</b> General view of the Turbine 6 locality .....	19
<b>Plate 8:</b> General view of the Turbine 4 locality.....	19
<b>Plate 9:</b> General view of the Turbine 9 locality.....	19
<b>Plate 10:</b> General view of the Turbine 15 locality .....	19
<b>Plate 11:</b> General view of the Turbine 39 locality .....	20
<b>Plate 12:</b> General view of the Turbine 17 locality .....	20
<b>Plate 13:</b> General view of the Turbine 22 locality .....	20
<b>Plate 14:</b> General view of the Turbine 43 locality .....	20
<b>Plate 15:</b> General view of the Turbine 19 locality .....	21
<b>Plate 16:</b> General view of the Turbine 23 locality.....	21
<b>Plate 17:</b> General view of the Turbine 29 locality.....	21
<b>Plate 18:</b> General view of the Turbine 33 locality.....	21
<b>Plate 19:</b> General view of the Substation 1 area.....	22
<b>Plate 20:</b> General view of the Substation 2 area .....	22
<b>Plate 21:</b> General view of access roads [1].....	22
<b>Plate 22:</b> General view of access roads [2].....	22
<b>Plate 23:</b> General view of access roads [3].....	23
<b>Plate 24:</b> General view of access roads [4].....	23
<b>Plate 25:</b> General view of access roads [5].....	23
<b>Plate 26:</b> General view of access roads [6] .....	23
<b>Plate 27:</b> Site BWF-S2 – View of the contemporary Ebb and Vloed farmstead .....	24
<b>Plate 28:</b> Site BWF-S2 – Close-up of the contemporary Ebb and Vloed main residence .....	24
<b>Plate 29:</b> Site BWF-S3 – View of the contemporary Oliphants Kop farmstead .....	24
<b>Plate 30:</b> Site BWF-S4 – View of the contemporary Oliphants Kop workers village.....	24
<b>Plate 31:</b> Contemporary farming infrastructure [1] .....	25
<b>Plate 32:</b> Contemporary farming infrastructure [2] .....	25
<b>Plate 33:</b> Natural dam / waterhole.....	25
<b>Plate 34:</b> Anthropogenically sterile exposed streambed sections.....	25
<b>Plate 35:</b> Site BWF-S1 – A lithic artefact [amorphous core] .....	26
<b>Plate 36:</b> Site BWF-S1 – Surface gravel lens within which lithic artefacts are found [1] .....	26
<b>Plate 37:</b> Site BWF-S1 – Surface gravel lens within which lithic artefacts are found [2] .....	26
<b>Plate 38:</b> Site BWF-S1 – Selected lithic artefacts.....	26

## List of Tables

<b>Table 1:</b> Summarized development co-ordinates of the Bayview Wind Farm .....	<b>Error! Bookmark not defined.</b>
<b>Table 2:</b> Extract from the NHRA 1999, Section 38 .....	7
<b>Table 3:</b> SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations .....	8
<b>Table 4:</b> Archaeological and basic cultural heritage probability assessment.....	9
<b>Table 5:</b> Significance Rating Table.....	27
<b>Table 6:</b> Impact Severity Table .....	27
<b>Table 7:</b> Overall Significance Rating .....	28
<b>Table 8:</b> Environmental Impact Assessment Rating .....	29
<b>Table 9:</b> Heritage compliance summary .....	33
<b>Table 10:</b> List of Acronyms and Abbreviations.....	35

## 1 – Project Introduction and Terms of Reference

---

### 1.1) Project Name

*Bayview Wind Farm*, near Port Elizabeth, Nelson Mandela Bay Municipality (NMBM), Eastern Cape.

### 1.2) Affected Properties and Location

The *Bayview Wind Farm* will be situated on three (3) properties described as Remaining Extent of Oliphants Kop 201, Portion 4 of Steins Valley 202 and Remaining Extent of Portion 8 of Ebb and Vloed 230, with the study site comprising an approximate 2,813ha area. The *Bayview Wind Farm* study site is situated more or less 30km north of Port Elizabeth in the Nelson Mandela Bay Municipal area of the Eastern Cape [1:50,000 Map Ref: 3325DA] (EOH-CES 2017a).

### 1.3) Project Description

EOH-Coastal and Environmental Services have been appointed by the applicant, Bayview Wind Power (Pty) Ltd, a special purpose vehicle (SPV) establishment for the sole purpose of developing, owning and operating the *Bayview Wind Farm*, to prepare the Scoping and Environmental Impact Assessment (EIA) studies for purposes of an Environmental Authorization (EA) for the proposed development (EOH-CES 2017a).

The proposed development will comprise a maximum of forty-three (43) wind turbines, with an output capacity of 2-4.5MW per turbine, and a total output generating capacity of up to 140MW. Additional infrastructure that will be developed include operational and maintenance buildings, internal roads, underground electrical cabling lining turbines, an on-site substation / switching station and an overhead powerline (132kV) to an Eskom substation (EOH-CES 2017a).

Construction of the *Bayview Wind Farm* is estimated at 24-30 months, following the basic steps listed below (EOH-CES 2017a):

- Vegetation clearance and gate erection;
- Establishment of access roads;
- Establishment of buildings such as site office area, control building, warehousing and workshops, gatehouse and concrete batching plant;
- Establishment of temporary construction hardstand area (assembly area, storage area of approximately 15 ha) and pegging of structures;
- Temporary construction laydown area establishment (approximately 6 ha);
- Construction of turbine hardstands and platforms;
- Undertake detailed geotechnical studies and foundation works for the turbines;
- Establishment of foundations;
- Assembly and erection of structures;
- Undertake civil works for the substation and construct the substation;
- Stringing of conductors to the substation;
- Connection of the substation to the main grid; and
- Rehabilitation of disturbed areas (where applicable).

Ancillary infrastructure required for development include (EOH-CES 2017a):

- *Control Buildings and Hardstand Areas* –

Including an initial approximate 15ha hardstand area, a 6ha laydown area, a 0.36ha gate house with security, an approximate 1ha area comprising the control centre, office warehouse, workshop, canteen, visitor's centre and staff locker and a 0.5ha concrete batching plant.

- *Access Roads* –

The use of existing access roads will be prioritized during the construction and operational phases of development. Additional roads that may need to be created / upgraded include a main access road, approximately 25-30m of internal access roads and jeep tracks for routine maintenance purposes.

- *Servitude, Powerline and Substation –*

Underground cabling will connect the turbines to an on-site substation at medium voltage (MV) level, where it will be stepped up to high voltage (HV) level (132kV) via the main power transformer and then distributed via overhead line (OHL) to the designated Eskom Point of Connection (POC). Four (4) grid connection options are investigated:

1. A loop-in loop-out (LILO) on the Grassridge / Nootgedacht 132kV OHL;
2. A new 132kV OHL direct to Dedisa MTS;
3. A new 132kV OHL direct to Grassridge Main Transmission Substation (MTS); and
4. A 132 kV OHL within the CDC IDZ Existing Corridor to Dedisa MTS.

The powerline servitude will be 31-36m in width and an approximate 8m in width strip will be cleared of vegetation for stringing purposes. An on-site substation will be constructed (+/- 1ha), where turbines will connect to via underground MV cabling.

Powerline routes to be investigated for the development will affect the properties Remaining Extent of Oliphantskop 201, Portion 4 of Steins Valley 202, Remaining Extent of Portion 8 of Ebb and Vloed 230, Portion 1 of Oliphantskop 201, Remaining Extent of Grassridge 225, Remaining Extent of Coega Erf 246, Remaining Extent of Coega Erf 248, Coega Erf 329, Uitenhage Farms 612, Farm 717, Remaining Extent of the Farm Grassridge 227, Farm Grassridge 228, Remaining Extent of the Farm Geluksdal 590 (EOH-CES 2017b).

- *Turbines and Turbine Hardstands –*

A maximum of 43 turbines will be constructed. Turbine foundations will measure approximately 400m<sup>2</sup> in surface size, and 3m deep, with each turbine position associated with a crane hardstand area of approximately 1,800m<sup>2</sup> in surface size. Dimensions of turbines will be based on the technology used: Turbine height will not exceed 150m, with a maximum rotor diameter of 150m and maximum blade length of 75m.

The proposed development will address relevant water, waste management requirements (EOH-CES 2017a).

The *Bayview Wind Farm* will have an anticipated lifespan of 20-25 years. Should the development not be upgraded the wind farm will be decommissioned: Turbines and foundations will be dismantled. As much of the components parts as possible will be recycled and the study site rehabilitated (EOH-CES 2017a).

#### **1.4) Terms of Reference**

ArchaeoMaps have been appointed by EOH-CES to compile the Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the development, as specialist component to the application's Heritage Impact Assessment (HIA), and with findings and recommendations thereof to be included in the Scoping and EIA report. Terms of Reference (ToR) for the Phase 1 AIA are summarized as:

- Describe the existing area to be directly affected by the proposal in terms of its archaeological and cultural heritage characteristics as formally protected by the National Heritage Resources Act, No 25 of 1999 (NHRA 1999) and the general sensitivity of these components to change;
- Describe the likely scope, scale and significance of impacts (positive and negative) on the archaeological and cultural heritage resources of the area associated with the 1) construction and 2) operation or use phases of the proposal;
- Make recommendations on the scope of any mitigation measures that may be applied during the:
  - 1) construction; and
  - 2) operation or use phases
 to reduce / avoid the significance of identified related impacts. Mitigation measures could be design recommendations as well as operational controls, monitoring programmes, Phase 2 mitigation, management procedures and the like;
- Broadly describe the implication of a 'No-Go' option;
- Broadly comment on the cumulative impact (positive or negative) on archaeological or cultural heritage resources associated with the 1) construction and 2) operation or use phases of the proposal; and
- Confirm if there are any outright 'fatal flaws' to the proposal at its current location from an archaeological and cultural heritage perspective.

Summarized Development Co-ordinates (Wind Turbine Generator [WTG] Localities) Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape						
No.	WTG No.	X_Latitude	Y_Longitude	NGL	Hub-Height	Blade Tip Height
		deg / min / sec	deg / min / sec	(masl)	(masl)	(masl)
<b>EBB AND VLOED - FARM RE8/230</b>						
1	WTG1	33°39'20.38"S	25°38'11.38"E	186	314.9	384.2
2	WTG3	33°38'23.33"S	25°38'43.46"E	134	262.9	332.2
3	WTG5	33°38'39.63"S	25°38'46.32"E	140	268.9	338.2
4	WTG7	33°37'52.79"S	25°38'59.16"E	116	244.9	314.2
5	WTG8	33°38'54.91"S	25°39'05.19"E	139	267.9	337.2
6	WTG10	33°38'31.36"S	25°39'12.73"E	119	247.9	317.2
7	WTG11	33°37'32.00"S	25°39'17.46"E	100	228.9	298.2
8	WTG12	33°37'49.50"S	25°39'23.51"E	105	233.9	303.2
9	WTG14	33°39'25.04"S	25°39'25.92"E	131	259.9	329.2
10	WTG17	33°39'15.92"S	25°39'55.16"E	114	242.9	312.2
11	WTG18	33°38'55.99"S	25°39'58.14"E	112	240.9	310.2
12	WTG36	33°39'19.30"S	25°38'43.09"E	128	256.9	326.2
13	WTG37	33°39'01.55"S	25°38'35.27"E	141	269.9	339.2
<b>OLIPHANTSKOP - FARM RE/201</b>						
1	WTG2	33°39'52.69"S	25°38'12.19"E	174	302.9	372.2
2	WTG4	33°40'06.15"S	25°38'38.39"E	182	310.9	380.2
3	WTG6	33°39'48.34"S	25°38'41.54"E	164	292.9	362.2
4	WTG9	33°40'22.98"S	25°39'02.16"E	145	273.9	343.2
5	WTG13	33°39'44.11"S	25°39'23.39"E	144	272.9	342.2
6	WTG15	33°40'03.87"S	25°39'30.55"E	150	278.9	348.2
7	WTG16	33°40'36.23"S	25°39'30.48"E	121	249.9	319.2
8	WTG19	33°40'50.01"S	25°39'54.36"E	117	245.9	315.2
9	WTG20	33°40'05.26"S	25°40'04.59"E	127	255.9	325.2
10	WTG22	33°39'37.02"S	25°40'26.26"E	110	238.9	308.2
11	WTG23	33°40'18.89"S	25°40'36.58"E	115	243.9	313.2
12	WTG38	33°39'39.40"S	25°38'59.49"E	140	268.9	338.2
13	WTG40	33°39'20.37"S	25°40'14.49"E	107	235.9	305.2
14	WTG41	33°39'51.80"S	25°39'48.61"E	130	258.9	328.2
15	WTG42	33°39'54.11"S	25°40'46.58"E	104	232.9	302.2
16	WTG43	33°40'21.32"S	25°40'00.66"E	117	245.9	315.2
<b>STEINS VALLEY - FARM 4/202</b>						
1	WTG21	33°41'08.56"S	25°40'22.78"E	113	242	311
2	WTG24	33°41'22.28"S	25°40'43.11"E	99	228	297
3	WTG25	33°41'04.04"S	25°40'46.40"E	110	239	308
4	WTG26	33°40'29.66"S	25°41'07.24"E	112	241	310
5	WTG27	33°40'09.89"S	25°41'08.11"E	110	239	308
6	WTG28	33°40'56.96"S	25°41'08.54"E	109	238	307
7	WTG29	33°39'35.93"S	25°41'21.42"E	78	207	276
8	WTG30	33°40'44.08"S	25°41'24.55"E	110	239	308
9	WTG31	33°39'19.91"S	25°41'36.73"E	72	201	270
10	WTG32	33°40'23.10"S	25°41'44.26"E	80	209	278
11	WTG33	33°39'54.41"S	25°41'54.42"E	69	198	267

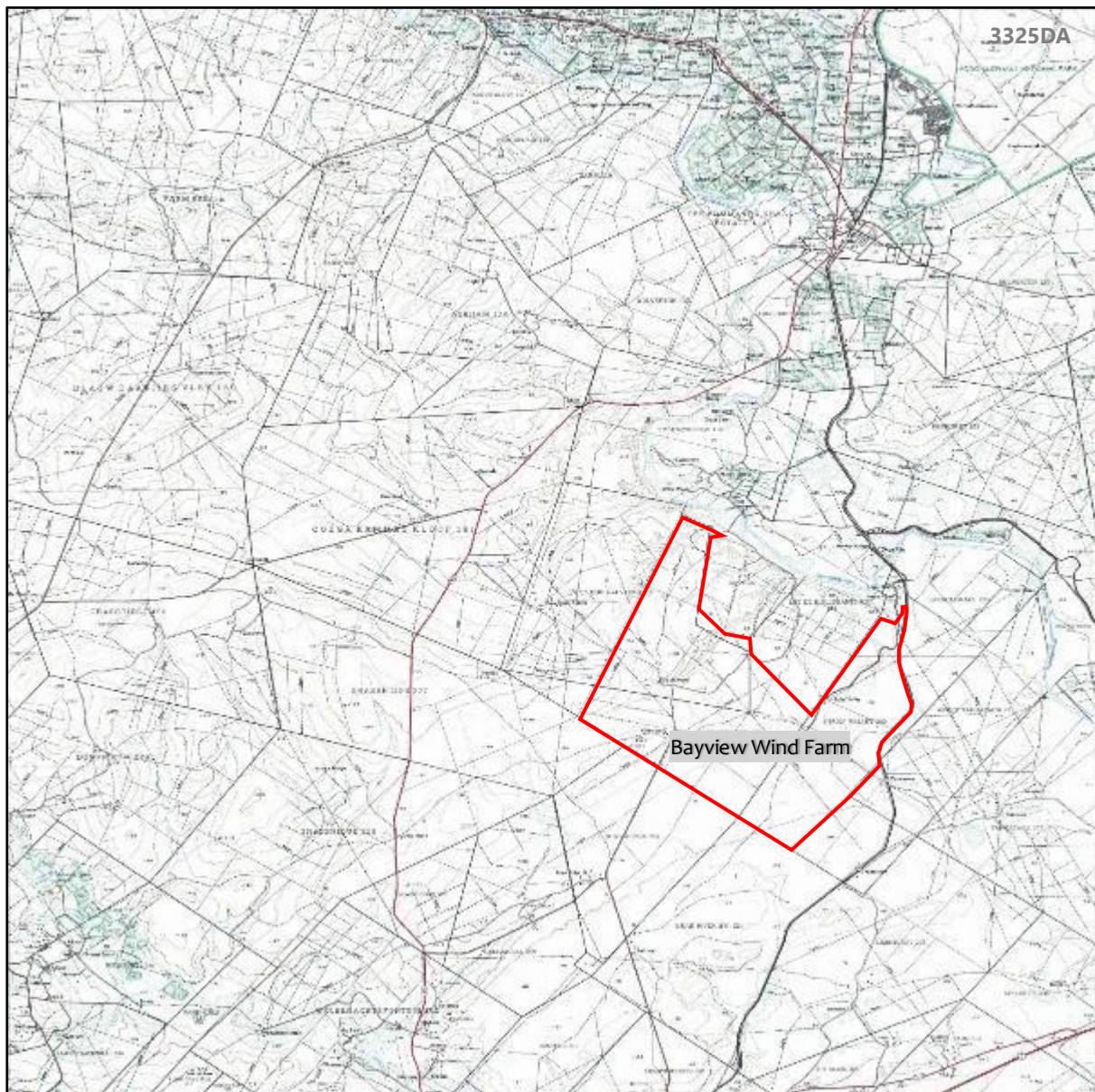


12	WTG34	33°39'33.79"S	25°41'56.85"E	67	196	265
13	WTG44	33°39'53.90"S	25°41'31.87"E	78	207	276
14	WTG45	33°39'53.52"S	25°41'10.68"E	84	213	282

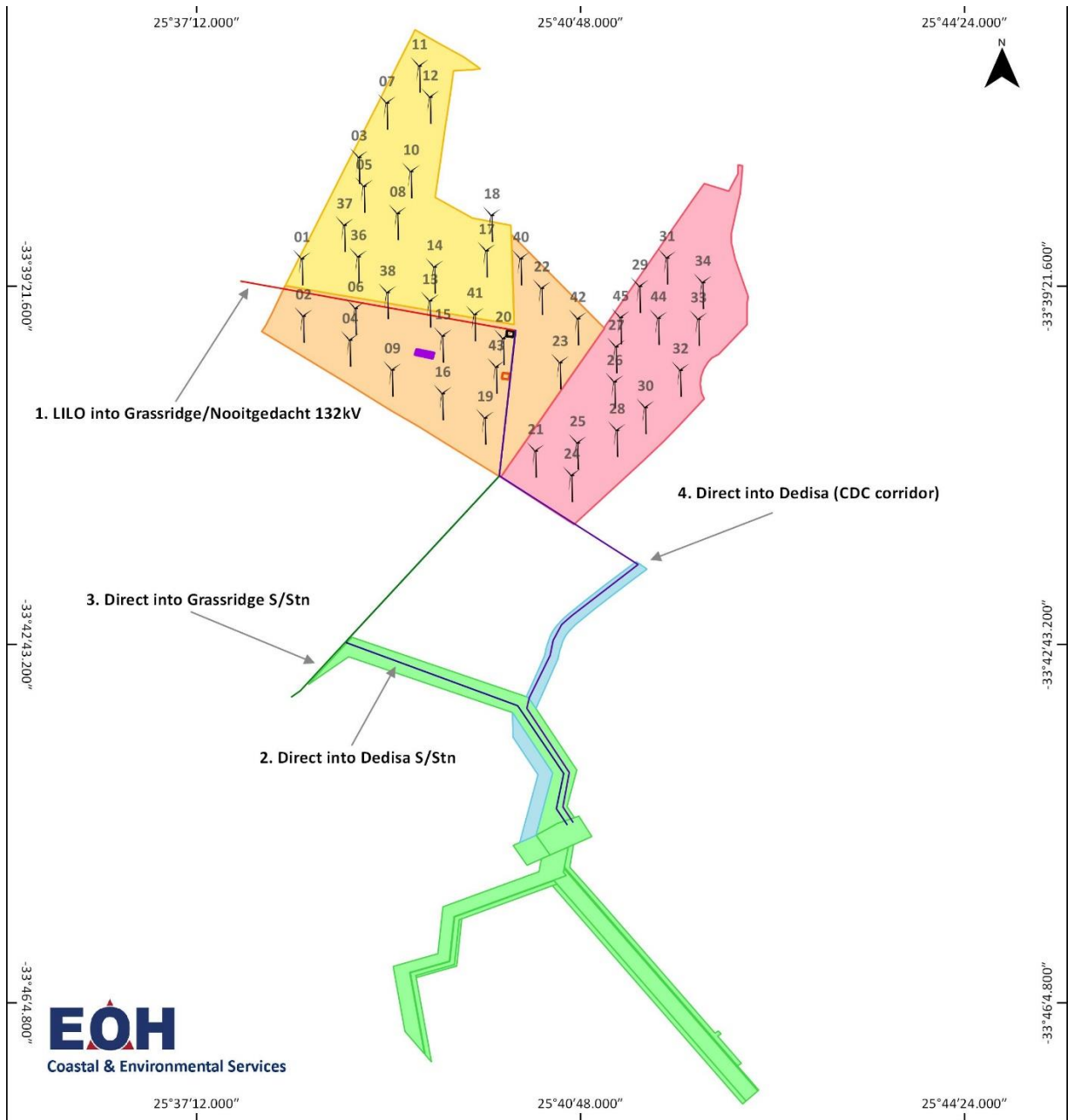
**Table 1:** Summarized development co-ordinates of the Bayview Wind Farm



**Map 1:** General locality of the Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape (Base Map – MapStudio, 2008)




**Map 2:** General Locality of the Bayview Wind Farm, near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape [1:50,000 Map Ref: 3325DA]



**EOH**  
Coastal & Environmental Services

TITLE

LAYOUT MAP	
<b>PROJECT</b>	 Proposed WTG Layout <b>Proposed Overhead Line Alternatives</b> 1. LILO into Grassridge/Nooitgedacht 132kV 2. Direct into Dedisa S/Stn 3. Direct into Grassridge S/Stn 4. Direct into Dedisa (CDC corridor) <b>Proposed Substation Alternatives</b> Proposed Elec S/S (Alt A)
<b>BAYVIEW WIND FARM</b>	
<b>MAP DETAILS</b>	
Drawn by: Rosalie Evans Date: July 2018 EOH Project Code: P208	
<b>SCALE</b>	
1:55,000	Proposed Elec S/S (Alt B) Proposed Control Office 200 m Electricity Corridor Option 4 Primary Utilities Corridor <b>Affected Properties</b> Oliphants Kop, RE of Farm 201 Ebb & Vloed, RE Portion 8 Farm 230 Steins Valley, Portion 4 of Farm 202
<b>DATUM</b>	
WGS84	

Map 3: Proposed layout of the Bayview Wind Farm, near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape (EOH-CES 2017b, 2017c)

## 2 – The Phase 1 Archaeological and Cultural Heritage Impact Assessment

### 2.1) Archaeological and Cultural Heritage Legislative Compliance

The Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the *Bayview Wind Farm*, near Port Elizabeth, NMBM, Eastern Cape, was requested to meet the Eastern Cape Provincial Heritage Resources Authority's (EC PHRA) requirements with reference to archaeological and basic cultural heritage resources in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38(1)(a), 38(1)(c)(i), 38(1)(c)(ii) and 38(1)(d). This report is submitted in (partial) fulfilment of the NHRA 1999, Section 38(3) requirements, for purposes of a NHRA 1999, Section 38(4) / Section 38(8) Heritage Impact Assessment (HIA) Comment by the EC PHRA.

<b>NHRA 1999, Section 38</b>	
1)	Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorized as –
a)	<b>The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;</b>
b)	The construction of a bridge or similar structure exceeding 50m in length;
c)	<b>Any development or other activity which will change the character of a site –</b>
i.	<b>Exceeding 5,000m<sup>2</sup> in extent;</b> or
ii.	<b>Involving three or more existing erven or subdivisions thereof;</b> or
iii.	Involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
iv.	The costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
d)	<b>The rezoning of a site exceeding 10,000m<sup>2</sup> in extent;</b>
e)	Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,
	Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

**Table 2:** Extract from the NHRA 1999, Section 38

The Phase 1 AIA aimed to locate, identify and assess the significance of archaeological and cultural heritage resources, inclusive of archaeological deposits / sites (Stone Age, Iron Age and Colonial Period), rock art and shipwreck sites, built structures older than 60 years, sites of military history older than 75 years, certain categories of burial grounds and graves, graves of victims of conflict, basic living heritage and cultural landscapes and viewsapes as defined and protected by the NHRA 1999, Section 2, 34, 35 and 36, that may be affected by the development.

This report comprises a Phase 1 AIA, including a basic pre-feasibility study and field assessment only. The report was prepared in accordance with the 'Minimum Standards' specifications for Phase 1 AIA reports, as stipulated by SAHRA (2007).

Additional relevant legislation pertaining to the Phase 1 AIA is listed as:

- National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2017).

### 2.2) Methodology and Gap Analysis

The Phase 1 AIA includes a basic pre-feasibility study and field assessment:

- The pre-feasibility assessment is based on the Appendix A schematic outline of South Africa's Pre-colonial and Colonial past, associated with introductory archaeological as well as general and scientific literature available and relevant to the study site. Databases consulted include the SAHRA 2009 Mapping Project Database (MPD), the South African Heritage Resources Information System (SAHRIS) and SAHRA database(s) on declared Provincial Heritage Sites (PHS) pertaining to the study site. The study excludes consultation of museum and university databases.
- The field assessment was done over a 2 day period with fieldwork conducted by the author. The assessment was done by vehicle and foot and limited to a Phase 1 surface survey. GPS co-ordinates were taken with Garmin Montana 680 (Datum: WGS84) Photographic documentation was done with a Canon EOS 1300D camera. A combination of Garmap (Base Camp) and Google Earth software was used in the display of spatial information.

The Phase 1 AIA was done according to the system and ‘Minimum Standards’ prescribed for the 3-tiered Phase 1-3 Heritage Impact Assessment (HIA) process (SAHRA 2007):

- Phase 1 HIA – A Phase 1 HIA is compulsory for development types as stipulated in the NHRA 1999, Section 38(1) and Section 38(8), including any other development type or study site as required by the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Authority (PHRA). A Phase 1 HIA comprises at minimum of an archaeological (AIA) and palaeontological (PIA) study, but aims to address all heritage types protected by the NHRA 1999 and to alert developers to additional heritage specialist study requirements, if and where relevant to a development. Phase 1 HIA studies focusses on pre-feasibility and desktop studies, routinely coined with field assessments in order to locate, describe and assign heritage site significance ratings to identified resources that may be impacted by development. The aim of a Phase 1 AIA is to make site specific and general development recommendations regarding identified heritage resources for development planning and implementation purposes and may include recommendations for conservation, heritage site declaration, monitoring, Phase 2 mitigation (excavation), or destruction.
- Phase 2 HIA – Phase 2 HIAs are as a norm required where heritage resources of such significance have been identified during the Phase 1 HIA that mitigation (excavation) thereof is necessary for development purposes. Aside from large scale Phase 2 mitigation (routinely to precede development impact), lower keyed Phase 2 requirements may well include sampling, testing and monitoring during the construction or implementation phase of a development. Phase 2 HIA work is as a norm done under a compulsory heritage permit.
- Phase 3 HIA – As an extension to Phase 2 HIA work or cases where recommendations for heritage declaration formed part of a development’s heritage compliance requirements, heritage resources of such scientific or heritage tourism significance, that their long-term conservation and continued research would be necessary within a development framework is proposed as a Phase 3 HIA.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations are done according to the combined NHRA 1999, Section 7(1) and SAHRA (2007) system.

<b>SAHRA Archaeological &amp; Cultural Heritage Site Significance System</b>			
<b>Site Significance</b>	<b>Field Rating</b>	<b>Grade</b>	<b>Recommended Mitigation</b>
High Significance	National Significance	Grade I	Heritage site conservation / Heritage site development
High Significance	Provincial Significance	Grade II	Heritage site conservation / Heritage site development
High Significance	Local Significance	Grade III-A	Heritage site conservation or extensive mitigation prior to development / destruction
High Significance	Local Significance	Grade III-B	Heritage site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Heritage site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	Grade IV-B	Heritage site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	Grade IV-C	On-site sampling, monitoring or no heritage mitigation required prior to or during development / destruction

**Table 3:** SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

### 2.1.1) Pre-feasibility Summary

Based on the Appendix A schematic outline of the Pre-colonial and Colonial Periods in South Africa and background literature and database information, the probability of archaeological and cultural heritage resources affected by, or situated in proximity to the Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape, can briefly be described as:

Archaeological and Basic Cultural Heritage Probability Assessment – Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape			
Primary Type / Period	Sub-period	Sub-period type site	Probability
EARLY HOMININ / HOMINID	-	-	None
	Graves / human remains: High scientific significance		
STONE AGE	Earlier Stone Age (ESA)		Low
	Middle Stone Age (MSA)		Medium
	Later Stone Age (LSA)		Low-Medium
		Rock Art	None
		Shel Middens	None
	Graves / human remains: ESA & MSA - High scientific significance; LSA - High scientific & social significance		
IRON AGE	Early Iron Age (EIA)		None
	Middle Iron Age (MIA)		None
	Later Iron Age (LIA)		Low-Medium
	Graves / human remains: EIA – High scientific significance; MIA & LIA – High scientific & social significance		
COLONIAL PERIOD	Colonial Period		Medium
		LSA – Colonial Period Contact	None
		LIA – Colonial Period Contact	Low-Medium
		Industrial Revolution	Low
		Apartheid & Struggle	Low
	Graves / human remains: Medium-high scientific & high social significance		

Table 4: Archaeological and basic cultural heritage probability assessment

### 2.1.2) The SAHRA 2009 MPD and SAHRIS

Eleven (11) archaeological Cultural Resources Management (CRM) reports are recorded in the SAHRA 2009 Mapping Project Database (MPD) and situated within an approximate 10km radius from the proposed Bayview Wind Farm study site, referenced as:

- Binneman, J. 2000. (Albany Museum). *Eskom-Poseidon (Cookhouse) – Grassridge (Port Elizabeth) Proposed Powerline: First Phase Desktop Data Survey of Cultural Heritage Resources.*
- Binneman, J. 2008. (Albany Museum). *A Phase 1 Archaeological Heritage Impact Assessment of the Proposed Amanzi Country Estate, Uitenhage District, Nelson Mandela Bay Municipality, Eastern Cape.*
- Kaplan, J.M. 2007. (ACRM). *Draft Feasibility Report for the Proposed Regional General and Hazardous Waste Disposal Facility (Addo, Eastern Cape): Heritage Assessment.*
- Kaplan, J.M. 2008. (ACRM). *Proposed Exxaro Alloystream Manganese Project in the Coega Industrial Development Zone: Heritage Impact Assessment.*
- Van Schalkwyk, L.O. & Wahl, B. 2007. (eThembeni). *Heritage Impact Assessment of Gamma-Grassridge Powerline Corridors and Substation, Eastern, Western and Northern Cape Provinces, South Africa.*
- Webley, L.E. 2003. (Albany Museum). *Addo Elephant National Park: Upgrading of Existing Tourist Road Network and Construction of Southern Access Road near Colchester – Phase 1 Archaeological Impact Assessment.*
- Webley, L.E. 2006. (Albany Museum). *Phase 1 Heritage Impact Assessment of the Proposed Biomass Plant in Zone 3, Coega, Port Elizabeth.*
- Webley, L.E. 2007. (Albany Museum). *Phase 1 Heritage Impact Assessment: Proposed Rezoning of the Farm 655 Portion 196, 197, 199 and 275 of 113 (Stellenhof), Addo, Eastern Cape.*
- Webley, L.E. 2007. (Albany Museum). *Phase 1 Heritage Impact Assessment of the Proposed Asia Steel Recycling Facility at the Coega Industrial Development Area.*
- Webley, L.E. 2007. (Albany Museum). *Phase 1 Archaeological Impact Assessment on the Construction of 50km of Loop Roads on the Farms Addo Heights [209], Lismore [208], Zoute Fontein [210], Nieu Jaars Kop [300] and Oliphants Plaat [214] within the Southern Section of the Addo Elephant National Park.*
- Webley, L.E. 2008. (ACO). *Heritage Impact Assessment for the Farm 924 Amanzi Estate, Portion 4 of the Farm 296 Amanzi Mooi Water, Erf 296 Portion 3 of Rietheuveld and Erf 296 Rietheuveld, in the Nelson Mandela Bay Municipality, Eastern Cape.*

Post compilation of the SAHRA 2009 MPD, and with the implementation of SAHRIS, only three (3) formally submitted SAHRIS cases, with study sites situated within the 10km radius from the *Bayview Wind Farm*, are associated with archaeological CRM reports, with this reasonably inferred to be a biased reflection of the number of development proposals associated with HIA studies conducted in the vicinity of the said study site. Archaeological CRM reports referred to are referenced as:

- Binneman, J. & Booth, C. 2010. (Albany Museum). *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Upgrading of the N2 Highway between Coega and Colchester as well as the Construction of the New Sundays River Bridge and Four Borrow Pits, Nelson Mandela Metropolitan Municipality, Eastern Cape Province.* [SAHRIS CaseID 2481].
- Nel, J. 2008. (Archaic HPM). *Final Report – Heritage Resources Scoping Survey and Preliminary Assessment Transnet Freight Line EIA, Eastern Cape and Northern Cape.* [SAHRIS CaseID 299, 749 and 1355].
- Van Ryneveld, K. 2014. (ArchaeoMaps). *Phase 1 Archaeological and Cultural Heritage Impact Assessment – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, South Africa.* [SAHRIS CaseID 9252].

### 2.1.3) SAHRA Provincial Heritage Site Database – Eastern Cape

No geo-referenced declared Provincial Heritage Sites (PHS) are recorded in the SAHRA – Eastern Cape database ([https://en.wikipedia.org/wiki/List\\_of\\_heritage\\_sites\\_in\\_Eastern\\_Cape](https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape)) and situated within an approximate 5km radius from the proposed *Bayview Wind Farm* study site.



**Map 4:** Spatial distribution of geo-referenced PHSs in the SAHRA – Eastern Cape database in relation to the *Bayview Wind Farm*, near Port Elizabeth, NMBM, Eastern Cape, study site ([https://en.wikipedia.org/wiki/List\\_of\\_heritage\\_sites\\_in\\_Eastern\\_Cape](https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape))

### 2.1.4) General Discussion – The Receiving Environment

The greater archaeological and cultural heritage receiving environment of the *Bayview Wind Farm* is described at the hand of relevant scientific literature and a number of archaeological Cultural Resources Management (CRM) studies conducted, with study sites situated within the general terrain, and according to the primary archaeological periods, namely the Stone Age, Iron Age and Colonial Period.

- *Stone Age* –

Archaeological CRM reports consulted indicate the presence of all Stone Age primary industries, namely the Earlier (ESA), Middle (MSA) and Later Stone Ages (LSA), and indicate that widespread low density lithic occurrences are common across the general landscape of the *Bayview Wind Farm*. The majority of identified surface deposits are ascribed to the MSA; found in varying low densities, often in poor contexts and produced from a range of local raw material sources (Anderson 2009; Binneman 2010; 2011a, 2011b; Booth 2011a, 2011b, 2011c; 2012a, 2012b; Van Ryneveld 2010; 2014). Documentation relating to the ESA is notably scarcer. Webley (2003) reported on a possible ESA handaxe, associated mainly with an MSA assemblage from the Addo Elephant National Park, while ESA, MSA and LSA lithic artefacts from a

secondary context were reported on from Zone 8 of the Coega IDZ (Almond *et. al.* 2003), the Jachtlakte Precinct study site, near Uitenhage (Booth 2012) and the Kouga Commercial Wind Farm (Van Ryneveld 2010). The primary ESA and MSA site from the region thus remains the Amanzi Springs site, excavated in the 1960s and associated with well-preserved organic material (Webley 2008). Following in the footsteps of the 1960s research at Amanzi Springs, the WITS archaeology department further pursued ESA and MSA research at the Penhill Farms, with research having had started in 2012 and still ongoing. Reported on LSA material is often directly associated with the MSA, again more than often from ex-situ contexts. Closer to the coastline LSA shell midden sites are fairly common, and including freshwater shell middens sites along the banks of the Sundays and Coega (Koegea) rivers (Almond *et.al.* 2013; Binneman 2010; Binneman & Booth 2010; Nilssen & Van Ryneveld 2012; Rossouw 2013a), but these are as a norm found only within the 5km coastal sensitive zone, and even then clustered within the 800m-1km zone from the shoreline. Archaeological evidence from the Zuurberg Mountains towards the north of Addo populates the record, including excavated and dated (circa 1,500AD) LSA hunter-gatherer (San) cave deposits, a wealth of rock paintings as well as pastoralist (Khoen) influx: The Iqua, Damasqua and Gonaqua are known to have been active in the area (Rossouw 2013b).

- *Iron Age –*

The Bayview Wind Farm study site is situated well south of the southern-most known extent of the Early Iron Age (EIA), in the general vicinity of East London (Nogwaza 1994), while the Eastern Cape is exempt from Middle Iron Age (MIA) distribution. To date there is only one record of a Later Iron Age (LIA) site, associated with an informal cemetery, from the general Uitenhage area (Van Ryneveld 2011).

- *Colonial Period –*

The Colonial Period history of the greater Nelson Mandela Bay area date back to the years prior to 1799, and when, in 1799 a stone fort, Fort Frederick, today overlooking Port Elizabeth, was built by the British to protect the Cape Colony against possible French attack during the Napoleonic Wars ([https://en.wikipedia.org/wiki/Port\\_Elizabeth](https://en.wikipedia.org/wiki/Port_Elizabeth)). Colonial Period resources, identified during archaeological CRM studies conducted in the general Bayview Wind Farm area include a complex of Colonial Period buildings reported on by Binneman (2010) from the Coega IDZ, as well as structures recorded by Van Ryneveld (2010; 2014). Webley (2008) recorded a range of Colonial Period structures as well as Colonial Period cemeteries, and three (3) additional Colonial Period cemeteries were reported on by Bennie (2010).

A basic pre-feasibility assessment of the greater archaeological and cultural heritage receiving environment of the Bayview Wind Farm thus indicates a general two-tiered cultural overlay across the general area, including the Stone Age and Colonial Period. This two-tiered cultural landscape was confirmed by archaeological field assessment at the Grassridge / Dassiesridge (Booth 2012a; Van Ryneveld 2014) Wind Farm Complex to the east of the Bayview Wind Farm as well as at the Spitskop / Middleton / Amakhala / Golden Valley / Cookhouse (Booth 2011a, 2011b, Halkett *et. al.* 2010) Wind Farm Complex, further to the north, where in both cases development impact on the cultural landscapes were defined as of a low cumulative nature. Close proximity of the Bayview Wind Farm to specifically the Grassridge / Dassiesridge Wind Farm Complex may be indicative of a similar low heritage impact development proposal.

### **2.1.5) Chief Surveyor General Records**

Chief Surveyor General (CSG) records of the Colonial Period registration of the affected properties were only available for Oliphants Kop and Ebb and Vloed, indicating that the farms were first registered in 1837 and 1832 respectively (<http://csg.dla.gov.za>).



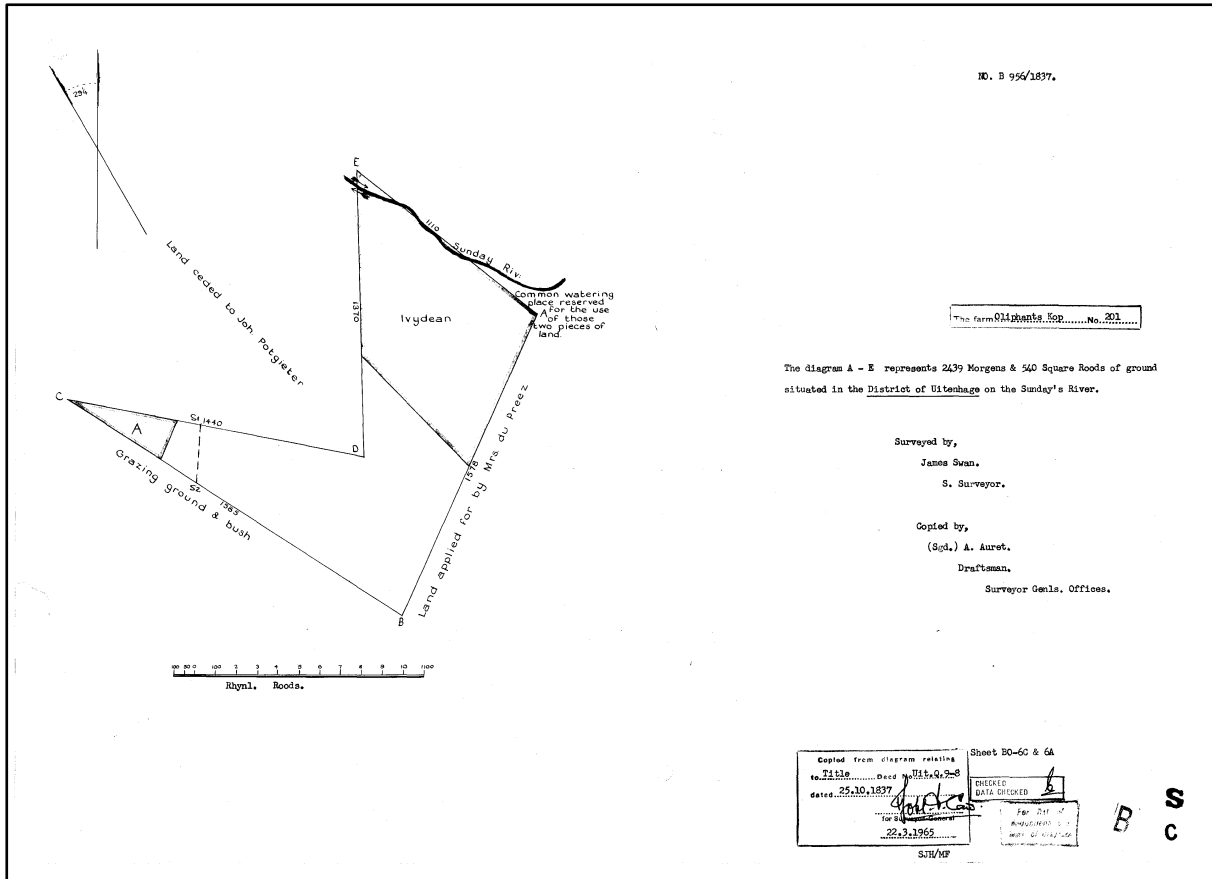


Figure 1: Colonial Period registration of the farm Oliphants Kop 201, Uitenhage District, in 1837 (CSG Record – B956/1837)

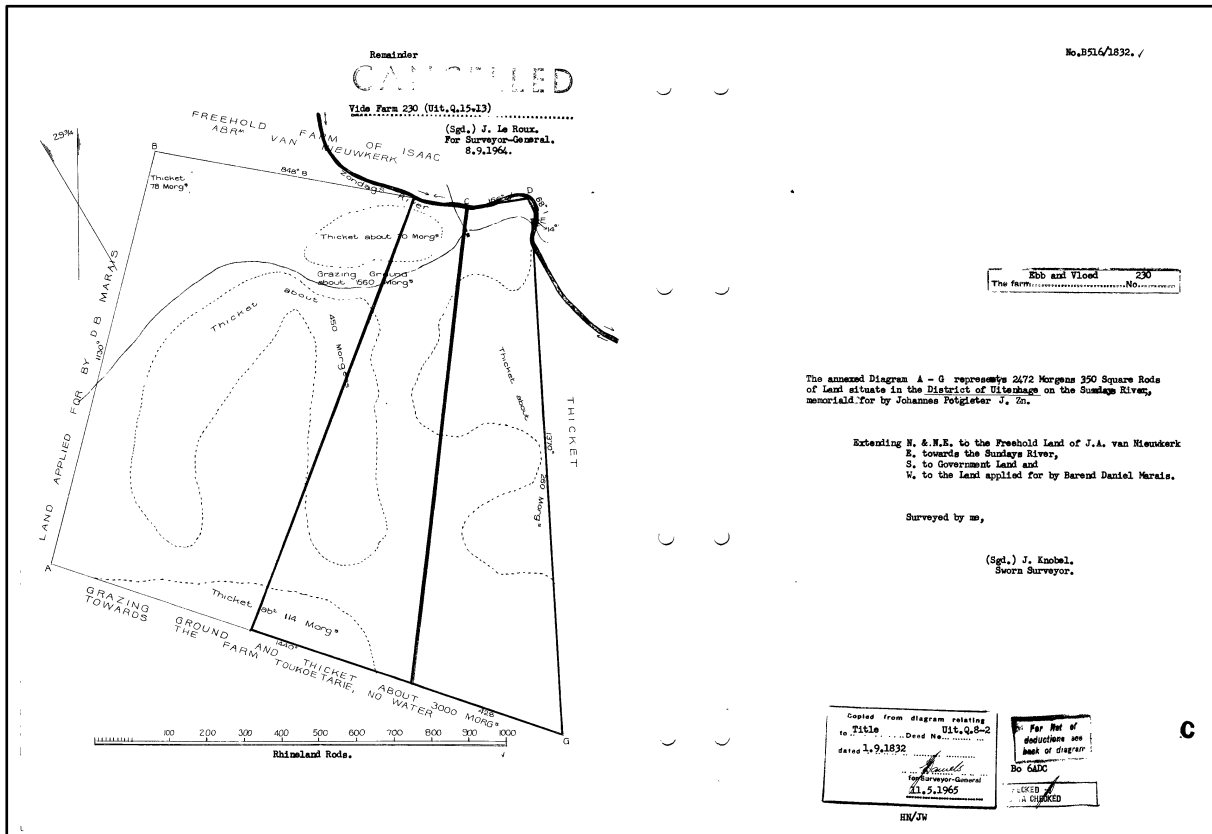


Figure 2: Colonial Period registration of the farm Ebb and Voed 230, Uitenhage District, in 1832 (CSG Record – B516/1832)

Visibility across the *Bayview Wind Farm* study site can be described as fair, but with visibility varying greatly, from areas with notably good surface visibility to areas with no visibility due to impenetrable thicket vegetation.

Field assessment of the forty-three (43) proposed turbine localities, two (2) substation localities, existing access roads and the Grassridge / Nooitgedacht and direct Grassridge powerlines, with these powerlines traversing the study site, yielded four (4) archaeological and cultural heritage resources, inclusive of type sites / occurrences, namely Sites BWF-S1 to BWF-S4. Two (2) of the identified resources are formally protected by the NHRA 1999, including Sites BWF-S1 and BWF-S2. Field assessment of the *Bayview Wind Farm* study site indicated a basic three-tiered Stone Age – Colonial Period – Contemporary Period cultural overlay.

(Due to access constraints the Dedisa powerline route was not assessed.)

### 2.2.1) Site BWF-S1 – MSA (and LSA): Low Density Lithic Occurrences

Low densities of Stone Age lithics, primarily Middle Stone Age (MSA), but including macrolithic Later Stone Age (LSA) artefacts, are present in surface gravel lenses scattered across the study site. Artefacts were produced from quartzitic raw material sources. Artefact ratios (artefacts: m<sup>2</sup>) are however extremely low, with the highest ratios recorded being 2-3:1, and an average of  $\leq 1:1$ . Assemblages are informal in character, comprising mainly amorphous cores, flakes and debitage, indicative of a substandard or poor technology. Gravel lenses seem to be surface restricted, but subsurface contexts cannot be excluded, implying a primarily ex-situ surface context of artefacts. Rich gravel lenses, associated with higher artefact densities, observed in access roads on Ebb and Vloed are inferred to be imported material, probably for road rehabilitation purposes. Gravel lens densities are not reflected in immediately adjoining virgin areas, and large, in excess of 1-2m in depth exposed dam and streambed sections (S33°38'52.2"; E25°38'40.0" and S33°39'32.2"; E25°38'16.3") in fairly close proximity to access road gravel lenses yielded only anthropogenically sterile sections. Subsurface section anthropogenic sterility on Ebb and Vloed is reflected by anthropogenic sterile sections at a sand mine on the eastern portion (Steyns Valley – S33°40'09.8"; E25°40'56.3") of the study site, near Turbine locality 27.

- **Site Significance and Recommendations:** Based on low artefact densities, substandard technology and ex-situ, surface restricted contexts, infrequent MSA and LSA lithic occurrences present in surface gravel lenses scattered across the study site are ascribed SAHRA / EC PHRA *Low Significances* and *Generally Protected IV-C Field Ratings*. Conservation or mitigation of these occurrences will not serve to further the current understanding of the Stone Age past. It is recommended that development proceed across these areas without the developer having to comply with additional heritage compliance requirements.

### 2.2.2) Site BWF-S2 – Colonial Period: Ebb and Voed Farmstead Remains – S33°39'16.6"; E25°38'57.6"

Site BWF-S2 comprise the Colonial Period Ebb and Vloed farmstead remains, including the main residence and an outbuilding. The site is no longer in use and in a poor state of conservation, overgrown with vegetation. Structures are older than 60 years of age, and with reference to the registration of Ebb and Vloed in 1832, most probably older than 100 years. Formal conservation measures, including a permanent fence with access gate, are in place, with these conservation measures complying with SAHRA / EC PHRA minimum standards for heritage site conservation. Within the current proposed layout no turbine will be constructed within approximately 400m from the site (see Turbine locality 36). Upgrading of the existing access roads, passing by the site, will not have a negative impact on the site.

- **Site Significance and Recommendations:** The Site BWF-S2 Colonial Period farmstead, comprising of structures older than 60 years of age, is formally protected by the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Formal conservation measures, including a permanent fence with access gate, are in place. In addition to permanent conservation measures it is recommended that the site be temporarily sign posted during the construction phase, indicating the site as a 'No Entry – Heritage Site' area.

**2.2.3) Site BWF-S3 – Contemporary Period: Oliphants Kop Farmstead – S33°39’59.1”; E25°39’07.1”**

Site BWF-S3 comprise the Contemporary Oliphants Kop farmstead. The site will not be impacted on by the proposed development. The site, associated with its current operations, is complimented by general farming infrastructure including work and storage facilities, livestock enclosures, water troughs, dams, wind pumps and game viewing structures scattered across the study site. Contemporary Period cultural resources (with structures younger than 60 years) are not formally protected by the NHRA 1999.

- **Site Significance and Recommendations:** Site BWF-S3 is not formally protected by the NHRA 1999.

**2.2.4) Site BWF-S4 – Contemporary Period: Oliphants Kop Workers Village – S33°40’05.7”; E25°39’08.4”**

Site BWF-S4 comprises the Contemporary Oliphants Kop workers village. The village will not be impacted by the proposed development.

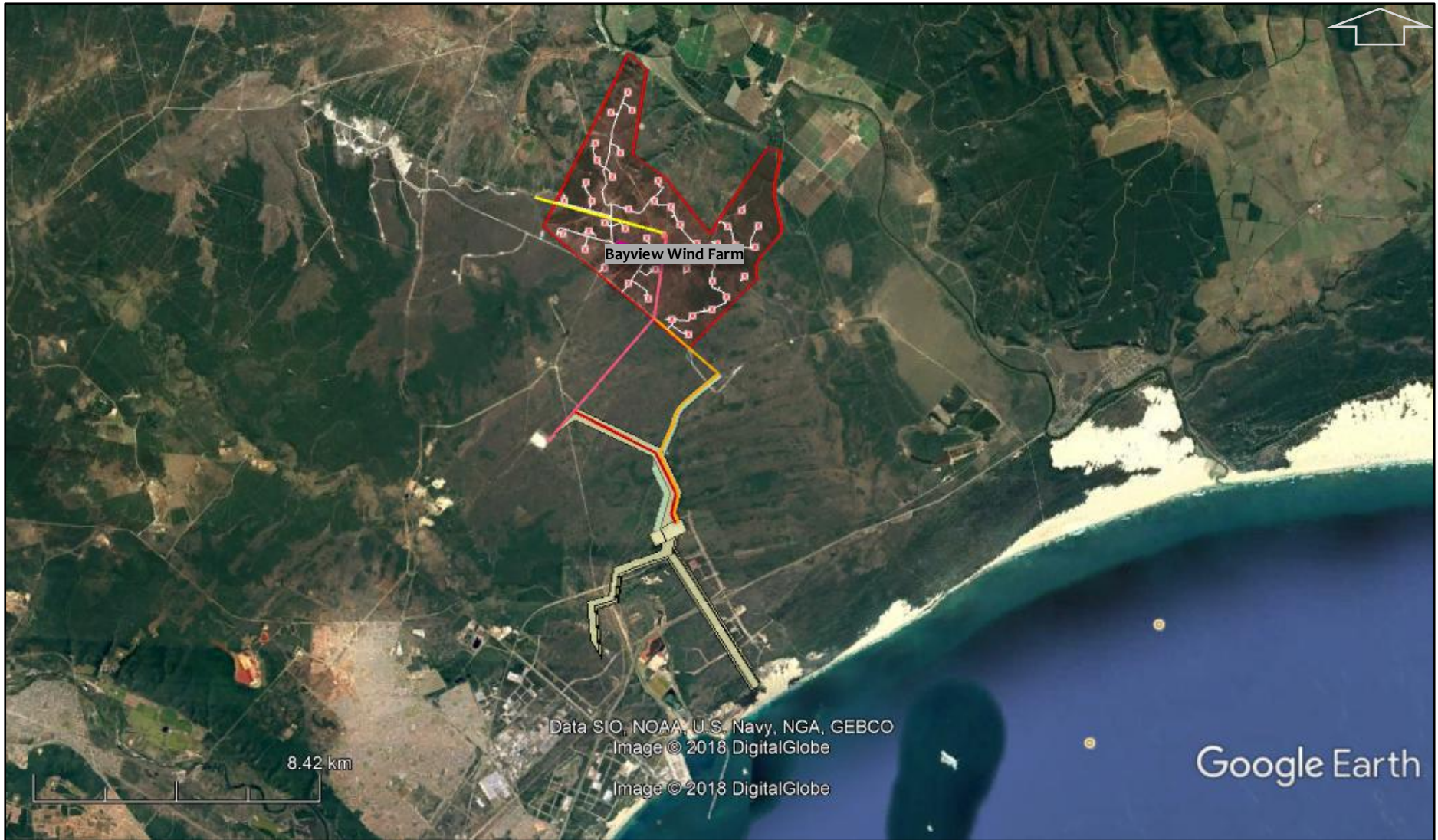
- **Site Significance and Recommendations:** Site BWF-S4 is not formally protected by the NHRA 1999.



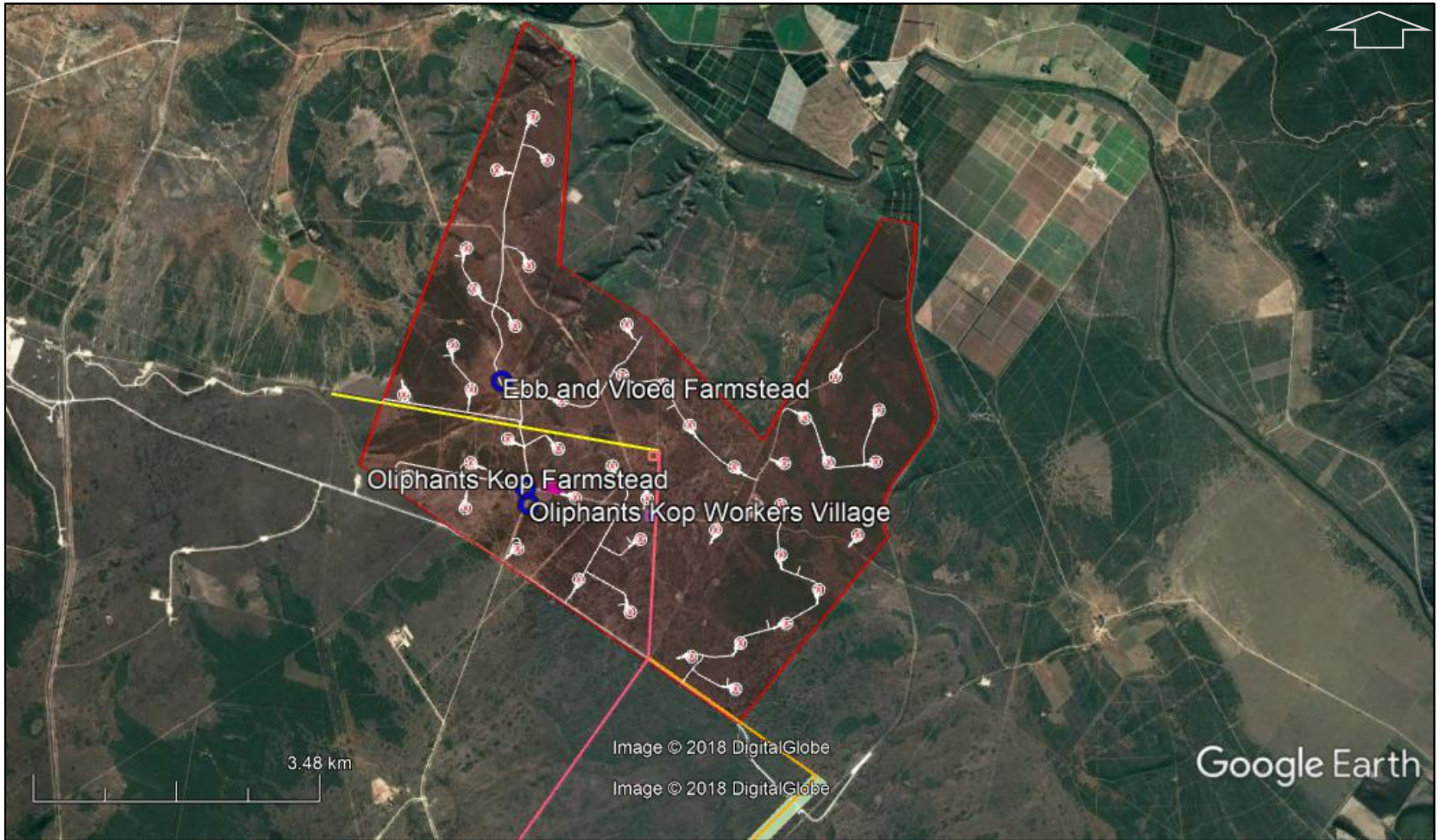
**Plate 1:** Panorama of the western portion of the *Bayview Wind Farm* study site



**Plate 2:** Panorama of the central portion of the *Bayview Wind Farm* study site



**Map 5:** Proposed layout of the Bayview Wind Farm, including turbine localities and powerline routes (courtesy EOH-CES)



Map 6: Results of the Phase 1 AIA field assessment (heritage sites – blue)



**Plate 3:** General view of the Turbine 11 locality



**Plate 5:** General view of the turbine 3 locality



**Plate 4:** General view of the Turbine 12 locality



**Plate 6:** General view of the Turbine 8 locality



**Plate 7:** General view of the Turbine 6 locality



**Plate 9:** General view of the Turbine 9 locality



**Plate 8:** General view of the Turbine 4 locality



**Plate 10:** General view of the Turbine 15 locality





**Plate 11:** General view of the Turbine 39 locality



**Plate 13:** General view of the Turbine 22 locality



**Plate 12:** General view of the Turbine 17 locality



**Plate 14:** General view of the Turbine 43 locality



**Plate 15:** General view of the Turbine 19 locality



**Plate 17:** General view of the Turbine 29 locality



**Plate 16:** General view of the Turbine 23 locality



**Plate 18:** General view of the Turbine 33 locality



**Plate 19:** General view of the Substation 1 area



**Plate 21:** General view of access roads [1]



**Plate 20:** General view of the Substation 2 area



**Plate 22:** General view of access roads [2]



Plate 23: General view of access roads [3]



Plate 25: General view of access roads [5]



Plate 24: General view of access roads [4]



Plate 26: General view of access roads [6]



**Plate 27:** Site BWF-S2 – View of the contemporary Ebb and Vloed farmstead



**Plate 29:** Site BWF-S3 – View of the contemporary Oliphants Kop farmstead



**Plate 28:** Site BWF-S2 – Close-up of the contemporary Ebb and Vloed main residence



**Plate 30:** Site BWF-S4 – View of the contemporary Oliphants Kop workers village



Plate 31: Contemporary farming infrastructure [1]



Plate 33: Natural dam / waterhole



Plate 32: Contemporary farming infrastructure [2]



Plate 34: Anthropogenically sterile exposed streambed sections



Plate 35: Site BWF-S1 – A lithic artefact [amorphous core]



Plate 37: Site BWF-S1 – Surface gravel lens within which lithic artefacts are found [2]



Plate 36: Site BWF-S1 – Surface gravel lens within which lithic artefacts are found [1]



Plate 38: Site BWF-S1 – Selected lithic artefacts

### 3 – Environmental Impact Assessment Rating

Environmental Impact Assessment (EIA) rating scales have been defined by EOH-CES for assessing and quantifying the identified impacts, according to the following criteria:

- Temporal scale;
- Spatial scale;
- Risk or likelihood;
- Degree of confidence or certainty;
- Severity of benefits; and the significance.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact.

<b>Significance Rating Table</b>	
<b>TEMPORAL SCALE (Duration of the Impact)</b>	
Short term	Less than 5 years (Many construction phase impacts are of short duration)
Medium term	Between 5 and 20 years
Long term	Between 20 and 40 years (From a human perspective almost permanent)
Permanent	Over 40 years or resulting in a permanent or lasting change that will always be there)
<b>SPATIAL SCALE (Area in which any impact will have an affect)</b>	
Localized	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area
Study area	The proposed site and its immediate surroundings
Municipal	Impacts affect the Nelson Mandela Bay Metropolitan Municipality, or any towns within the municipality
Regional	Impacts affect the wider area or the Eastern Cape province as a whole
National	Impacts affect the entire country
International	Impacts affect other countries or have a global significance
<b>LIKELIHOOD (Confidence with which one has predicted the significance of the impact)</b>	
Definite	More than 90% sure of a particular fact. Should have substantial supportive data
Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring
Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring
Unsure / Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring

Table 5: Significance Rating Table

<b>Impact Severity</b> (Severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)	
<b>VERY SEVERE</b>	<b>VERY BENEFICIAL</b>
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For ex. the permanent loss of land	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For ex. the vast improvement of sewage effluent quality
<b>SEVERE</b>	<b>BENEFICIAL</b>
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, his mitigation would be difficult, expensive or time consuming, or some combination of these. For ex. the clearing of forest vegetation	A medium to long term impact or substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or a combination of these. For ex. an increase in the local economy
<b>MODERATELY SEVERE</b>	<b>MODERATELY BENEFICIAL</b>
Medium to long term impacts on the affected system(s) or party(ies), which would be mitigated. For ex. the construction of a sewerage treatment facility where there was vegetation with a low conservation value	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimizing the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For ex. a slight improvement in sewage effluent quality
<b>SLIGHTLY SEVERE</b>	<b>SLIGHTLY BENEFICIAL</b>
Medium or short-term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For ex. a temporary fluctuation in the water table due to water abstraction	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimizing the beneficial effects are easier, cheaper and quicker, or some combination of these
<b>NO EFFECT</b>	<b>DON'T KNOW / CAN'T KNOW</b>
The system(s) or party(ies) is not affected by the proposed development	In certain cases it may not be possible to determine the severity of an impact

Table 6: Impact Severity Table



<b>Overall Significance</b> (Combination of all the above criteria as an overall significance)	
<b>VERY HIGH NEGATIVE</b>	<b>VERY BENEFICIAL</b>
These impacts would be considered by society as constituting a major and usually permanent change to the (natural / social) environment, and usually result in severe or very severe effects, or beneficial, or very beneficial effects. For ex. the loss of a species would be viewed as being of 'very high' significance, or the establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded as resulting in benefits of 'very high' significance	
<b>HIGH NEGATIVE</b>	<b>BENEFICIAL</b>
These impacts would usually result in long term effects on the natural / social environment. Impacts rated as 'high' would need to be considered as constituting an important and usually long-term change to the environment. Society would probably view these impacts in a serious light. For ex the loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating as 'high' over the long term, as the area could be rehabilitated, or the change in soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be 'high'	
<b>MODERATE NEGATIVE</b>	<b>SOME BENEFITS</b>
These impacts would usually result in medium to long-term effects on the natural / social environment. Impacts rated as 'moderate' will need to be considered as constituting a fairly important and usually medium-term change to the environment. These impacts are real but not substantial. For ex. the loss of a sparse, open vegetation type of low diversity may be regarded as 'moderately' significant	
<b>LOW NEGATIVE</b>	<b>FEW BENEFITS</b>
These impacts will usually result in medium to short-term effects on the natural / social environment. Impacts rated as 'low' will need to be considered as constituting a fairly unimportant and usually short-term change to the environment. These impacts are not substantial and are likely to have little real effect. For ex. temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels, or the increased earning potential of a people employed as the result of a development would result in benefits of 'low' significance to people who live some distance away	
<b>NO SIGNIFICANCE</b>	
There are no primary or secondary effects at all that are important to scientists or the public. For ex. a change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of 'no' significance in the overall context	
<b>DON'T KNOW / CAN'T KNOW</b>	
In certain cases it may not be possible to determine the significance of an impact. For ex. the primary or secondary impacts on the natural / social environment given the available information or the effect of a particular development on people's psychological perspective of the environment	

Table 7: Overall Significance Rating

Environmental Impact Assessment Rating: Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape								
POTENTIAL IMPACTS	TEMPORAL SCALE	SPATIAL SCALE	LIKELYHOOD	IMPACT SEVERITY	IMPACT SIGNIFICANCE		MITIGATION MEASURES	OVERALL SIGNIFICANCE
					Without Mitigation	With Mitigation		
<b>SITE(S): BWF-S1</b>								
Construction phase	Short-term	Localized	Definite	Slightly Severe	N/A	N/A	Destruction	Low Negative
Operational phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COMMENTS: Low density MSA (and LSA) lithic occurrences were ascribed a SAHRA / EC PHRA Low Significance and a Generally Protected IV-C Field Rating. Development may proceed across these areas without the developer having to comply with additional heritage compliance requirements								
<b>SITE(S): BWF-S2</b>								
Construction phase	Medium-term	Localized	Definite	Slightly Beneficial	Negative	Positive	Conservation	Some Benefits
Operational phase	Medium-term	Localized	Definite	Slightly Beneficial	Negative	Positive	Conservation	Some Benefits
COMMENTS: Site BWF-S2 receives automatic SAHRA / EC PHRA protection as a site of High Significance with a Provincial Grade II Field Rating. The site will not be impacted by the proposed development layout. Formal conservation measures, including a permanent fence with access gate, are in place								
<b>SITE(S): BWF-S3 and BWF-S4</b>								
Construction phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operational phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COMMENTS: Contemporary Period cultural resources (Sites BWF-S3 and BWF-S4) are not formally protected by the NHRA 1999. (Resources will not be impacted by the proposed layout)								

Table 8: Environmental Impact Assessment Rating

## 4 – Cultural Landscapes and Viewsapes and Cumulative Assessment

### 4.1) Cultural Landscapes and Viewsapes

A ‘Cultural Landscape’ refers to a particular geographical area that represents the unique combined work of man and nature (James & Martin 1981). The term has its origins in 16<sup>th</sup> Century Germany where ‘Cultural Landscape’ (*Kultur Landschaft*) implies ‘shaped lands’, to differentiate it from the ‘Original Landscape’ (*Umlandshaft*), or the ‘unaltered landscape’, prior to human impact. Sauer (1925) stresses the agency of culture as a force in shaping the visible features of the earth’s surface in delimited areas where the physical environment retains a central significance, as the medium with and through which human culture act. According to Sauer (1925) ‘*the cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural is the medium, the cultural landscape the result*’.

In order to better understand the concept of ‘Cultural Landscape’ it is necessary to separate the term ‘culture’ to further our understanding of its many definitions. Within the anthropological arena culture is generally understood as a ‘*complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society*’. Culture is ‘human nature’ and is acquired through a learning process. Through culture people can adapt to their environment in non-genetic ways, so people living in different environments will often have different cultures, or will develop different cultures (Van Willigen 1986). An integral part of culture is change; be it the result of a changing natural environment to which the culture has to adapt, or contact with another culture, the primary force of cultural change. Els (1992) explains that cultural contact change usually occurs according to either the process of acculturation (dominating ‘donor’ culture) or the process of enculturation (dominating ‘receiver’ culture). Both cultural process can be spontaneous, forced or guided. But cultural process is never a one-way street; any given cultural system is at once a ‘donor’ and a ‘receiver’. The essence of cultural change lies in the restructuring of the parts so that a new cultural pattern results. Bourguignon (1979) highlights the fact that this ‘restructuring’ should centre on the question of ‘*what changes are (were) necessary to make culture, as we know it, possible?*’ Culture is thus a process of constant change and adaptation; psychologically, behaviourally, technologically, politically, economically and spiritually (religiously), collectively referred to as ‘cultural evolution’. [Certain forms of society and culture could simply not have arisen before others, for example industrial farming could not have been invented before simple farming, and metallurgy could not have developed without previous non-smelting processes involving metal (Van Willigen 1986).]

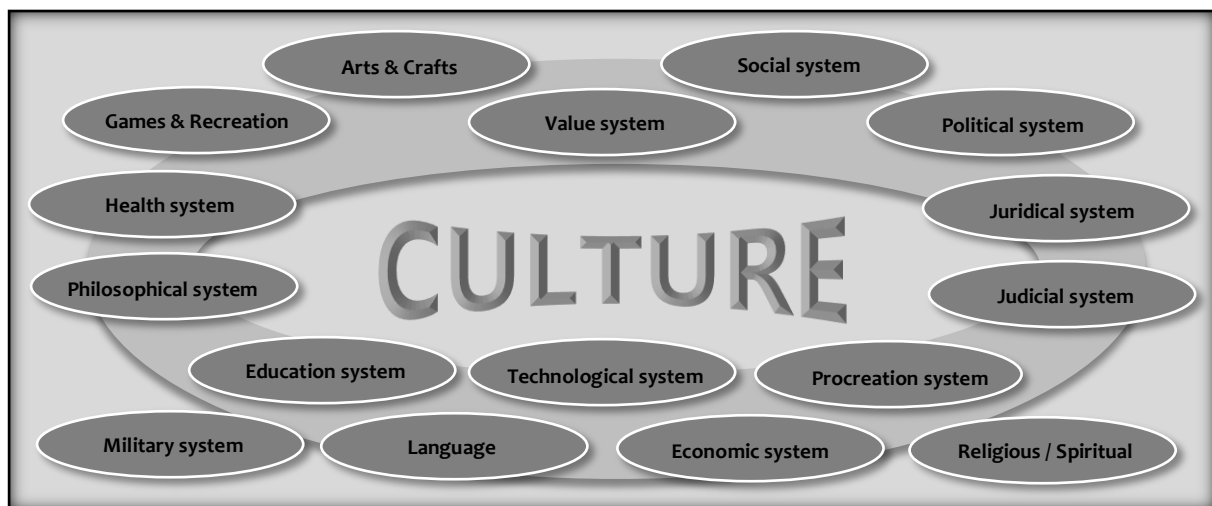


Figure 3: The sixteen (16) basic aspects of culture subject to processes of cultural change (after Els 1992)

When considering the concept of ‘Cultural Landscape’, taking cognisance of the vital force of change as an agent of culture, it is only logical that cultural change will be reflected in a changing cultural landscape.

The concept of ‘Cultural Landscape’ has also been adapted and developed within the international heritage arena (UNESCO 2005) as part of an international effort to reconcile one of the most encompassing dualisms in Western thought; that of ‘nature’ and ‘culture’. In doing so the World Heritage Committee has adopted three (3) categories of cultural landscapes:

- Landscapes most deliberately ‘shaped’ by people;
- Landscapes that reflect the full range of ‘combined’ works; and
- Landscapes least evidently ‘shaped’ by people.

The three (3) categories extracted from the UNESCO Committee’s Operational Guidelines are as follows (Punnell 2006):

- A landscape ‘designed and created intentionally by man’;
- An ‘organically evolved landscape’, which may be a ‘relict (or fossil) landscape’, or a ‘continuing landscape’; and
- An ‘associative cultural landscape’ which may be valued because of its religious, artistic or cultural associations of the natural environment.

**The MSA (and LSA) Cultural Landscape of the Bayview Wind Farm study site:** The MSA (and LSA) cultural landscape of the Bayview Wind Farm is classified, according to the UNESCO Operational Guidelines (Punnell 2006) as an ‘*organically evolved fossil landscape*’, least evidently ‘shaped’ by people. The MSA (and LSA) cultural landscape is one of which the ‘people’, human or hominin, are either extinct, or where cultural processes of change have affected the lifeways of descendants to such an extent that their Stone Age cultures are no longer practiced, as is the case with LSA hunter-gatherer (San) and herder (Khoen) groups.

**The Colonial Period Cultural Landscape of the Bayview Wind Farm study site:** The Colonial Period cultural landscape of the Bayview Wind Farm is classified, according to the UNESCO Operational Guidelines (Punnell 2006) as an ‘*organically evolved continuing landscape*’, least evidently ‘shaped’ by people. Continuing cultural evolution of the essential Colonial Period farming landscape have resulted in the Contemporary Period farming landscape, associated with intra cultural (western) processes of change, with specific reference to technological and economic systems (the evolution of farming methods and the economic role of farming on a local, regional, national and international level).

**The Contemporary Period Cultural Landscape of the Bayview Wind Farm study site:** The Contemporary Period farming landscape of the Bayview Wind Farm is classified, according to the UNESCO Operational Guidelines (Punnell 2006) as an ‘*organically evolved continuing landscape*’, least evidently ‘shaped’ by people. However, should the proposed development be approved during the Public Participation Process (PPP) and a positive EA be issued, and with reference to processes of cultural change, including technology and economy, but more specifically reflective of a change in value system, in support of the utilization of renewable energy resources, rather than non-renewable resources and their associated high impact on the environment, and with cognisance to the visual impact of the development, then the (future) Contemporary Period cultural landscape of the Bayview Wind Farm study site will be defined as an ‘*organically evolved continuing cultural landscape*’, most deliberately ‘shaped’ by people. It is noteworthy that such a process of cultural evolution will be of both inter and intra cultural origin, and classed as cultural change / evolution by choice, by implication positive change.

#### 4.2) Cumulative Assessment

Cumulative effects can be defined as impacts which combine from different projects, resulting in significant change, which is larger than the sum of the individual impacts. Cumulative Effects Assessment (CEA) is, in South Africa, an emerging process in the field of Integrated Environmental Management (IEM). It aims to provide direction in the decision-making process from a holistic point of view – through the understanding of impacts on past, present and future generations by broadening the spatial and temporal focus of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA). It focusses on the consideration of long term changes, not only as the result of a single action or development, but the combined effects of many actions over time, and on the environment in order to guide the decision-making process through an understanding of local, regional and global linkages (DEAT 2004). The concept of a tiered context analysis to guide the planning and decision-making process is not new. Possibly in its simplest form, albeit from the field of architecture, Aliel Saarinen (1873-1950) explained: ‘*Always design a thing by considering it in its next larger context – a chair in a room, a room in a house, a house in an environment, an environment in a city plan*’.

CEA can be done as a stand-alone assessment or can be incorporated in the SEA through inclusion in the EIA, with the latter approach being preferred as a result of the more applied methodology inherent therein (DEAT 2004). When CEA principles are included in the EIA level, individual aspects thereof can already be addressed on specialist assessment level. DEAT (2004) prescribes a two-tiered context for basic analysis, namely:

- Project based; and
- Regional based.

The cumulative effect of the proposed *Bayview Wind Farm* on archaeological and cultural heritage resources is described, on a project and regional base, and in accordance with the varying cultural landscapes that will be impacted on as follows:

- On a project based level the *Bayview Wind Farm* will have a Low Negative Cumulative Impact on identified MSA (and LSA) low density lithic scatters. Low artefact densities, substandard or poor technology and the ex-situ, surface restricted contexts of these scatters afforded them a SAHRA / EC PHRA *Low Significance* rating. On a regional level, and with specific reference to the Amanzi Springs and Penhill Farms sites, where stratified, ESA-MSA-LSA sequenced deposits in in-situ, subsurface contexts have been found, and scientifically excavated, with the research project on the Penhill Farms currently ongoing, Stone Age information from significant sites serves to inform the scientific and public community, on research level, on the Stone Age past of the greater region, thereby further diminishing the project based Low Negative Cumulative Impact on the MSA (and LSA) cultural landscape when considered on a regional level.
- On a project based level the identification of a single Colonial Period site (Site BWF-S2) situated on the approximate 2,636ha *Bayview Wind Farm* study site serves to argue the Low Negative Cumulative Impact of the development on the Colonial Period landscape. On a regional base level, similar type conservation of Colonial Period resources, more than often farmstead type sites, reflect an equally Low Negative Cumulative Impact on regional scale.
- Significant Contemporary Period cultural resources (Sites BWF-S3 and BWF-S4), not formally protected by the NHRA 1999, will not be directly impacted by the development. However, with consideration to the principle of cultural evolution, cumulative impact of the *Bayview Wind Farm* on the contemporary project based cultural landscape is described as a Moderate Positive Cumulative Impact. On a regional based level, and with reference to the fact that the *Bayview Wind Farm* will form a continuous extension to an existing mega wind farm complex, comprising at least three (3) independent wind farm developments, its significance with specific reference to the development proposal's potential contribution to cultural evolution enhances its impact, described as a High Positive Cumulative Impact on regional scale.

An overall Moderate Positive Cumulative Impact is ascribed to the *Bayview Wind Farm* development proposal.

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Bayview Wind Farm*, near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape, proceed provided the developer comply with the stipulated heritage compliance recommendations (See Table 9).

Field assessment of the *Bayview Wind Farm* study site yielded four (4) archaeological and cultural heritage resources, inclusive of type sites / occurrences, namely Sites BWF-S1 to BWF-S4. Two (2) of the identified resources are formally protected by the NHRA 1999, including Sites BWF-S1 and BWF-S2. The field assessment indicated a basic three-tiered Stone Age – Colonial Period – Contemporary Period cultural overlay.

- The proposed development poses no ‘fatal flaws’ with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a ‘No-Go’ option is irrelevant.
- The development will have an overall Moderate Positive Cumulative Impact on archaeological or cultural heritage resources and associated cultural landscapes.
- In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999<sup>1</sup>, being identified during the course of development the process described in ‘Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase’ should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

Heritage Compliance Summary – Bayview Wind Farm, near Port Elizabeth, NMBM, Eastern Cape				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
Bayview Wind Farm (General development co-ordinate – S33°39’56.2”; E25°39’35.9”) (Remaining Extent of Oliphants Kop 201, Portion 4 of Steyns Valley 202, Remaining Extent of Portion 8 of Ebb and Vloed 230)				
BWF-S1	MSA (and LSA) – Low density lithic occurrences	N/A	Low Significance Generally Protected IV-C	Destruction without the developer having to comply with additional heritage compliance requirements
BWF-S2	Colonial Period – Ebb and Vloed Farmstead Remains	S33°39’16.6”; E25°38’57.6”	Automatic High Provincial Grade II Significance	Conservation (Formal conservation measures in place) Temporary heritage signage during the construction phase
BWF-S3	Contemporary Period – Oliphants Kop Farmstead	S33°39’59.1”; E25°39’07.1”	-	N/A (Resource not protected by the NHRA 1999)
BWF-S4	Contemporary Period – Oliphants Kop Workers Village	S33°40’05.7”; E25°39’08.4”	-	N/A (Resource not protected by the NHRA 1999)
In the event of a positive EA being issued, the final development layout, including all WTG localities and line routes, should be subjected to an archaeological and cultural heritage micro-siting (ground-truthing) study				

Table 9: Heritage compliance summary

The EC PHRA-APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

#### <sup>1</sup> Simplified Guide to the Identification of Archaeological Sites:

- ❖ **Stone Age** – Knapped stone display flakes and flake scars that appear unnatural and may result in similar type ‘shaped’ stones often concentrated in clusters or forming a distinct layer in the geological stratigraphy. ESA shapes may represent ‘pear’ or oval shaped stones, often in the region of 10cm or larger. Typical MSA types include blade-like or rough triangular shaped artefacts, often associated with randomly shaped lithics or flakes that display use- or edge-wear around the rim of the artefact. LSA types are similar to MSA types, but generally smaller (≤3cm in size), often informally shaped, and are frequently found in association with bone, pieces of charcoal, ceramic shards and food remains.
  - **Rock Art** – Includes both painted and engraved images.
  - **Shell Middens** – Include compact shell lenses that may be quite extensive in size or small ephemeral scatters of shell food remains, often associated with LSA artefact remains, but may also be of MSA and Iron Age cultural association.
- ❖ **Iron Age** – Iron Age sites are often characterized by stone features, i.e. the remains of former livestock enclosures or typical household remains; huts are identified by either mound or depression hollows. Typical artefacts include ceramic remains, farming equipment, beads and trade goods, metal artefacts (including jewellery) etc. Remains of the ‘Struggle’ – events, histories and landmarks associated therewith are often, based on cultural association, classed as part of the Iron Age heritage of South Africa.
- ❖ **Colonial Period** – Built environment remains, either urban or rural, are of a Western cultural affiliation with typical artefacts representing early Western culture, including typical household remains, trade and manufactured goods, such as old bottle, porcelain and metal artefacts. War memorial remains, including the vast array of associated graves and the history of the Industrial Revolution form important parts of South Africa’s Colonial Period heritage.
- ❖ **Grave and Cemetery Sites** – Marked grave and cemetery sites are routinely associated with the Iron Age and Colonial Period. Unmarked grave sites associated with the Stone Age, Iron Age and Colonial Period may be uncovered during the course of development.

**Notes:** Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the environmental assessment process.

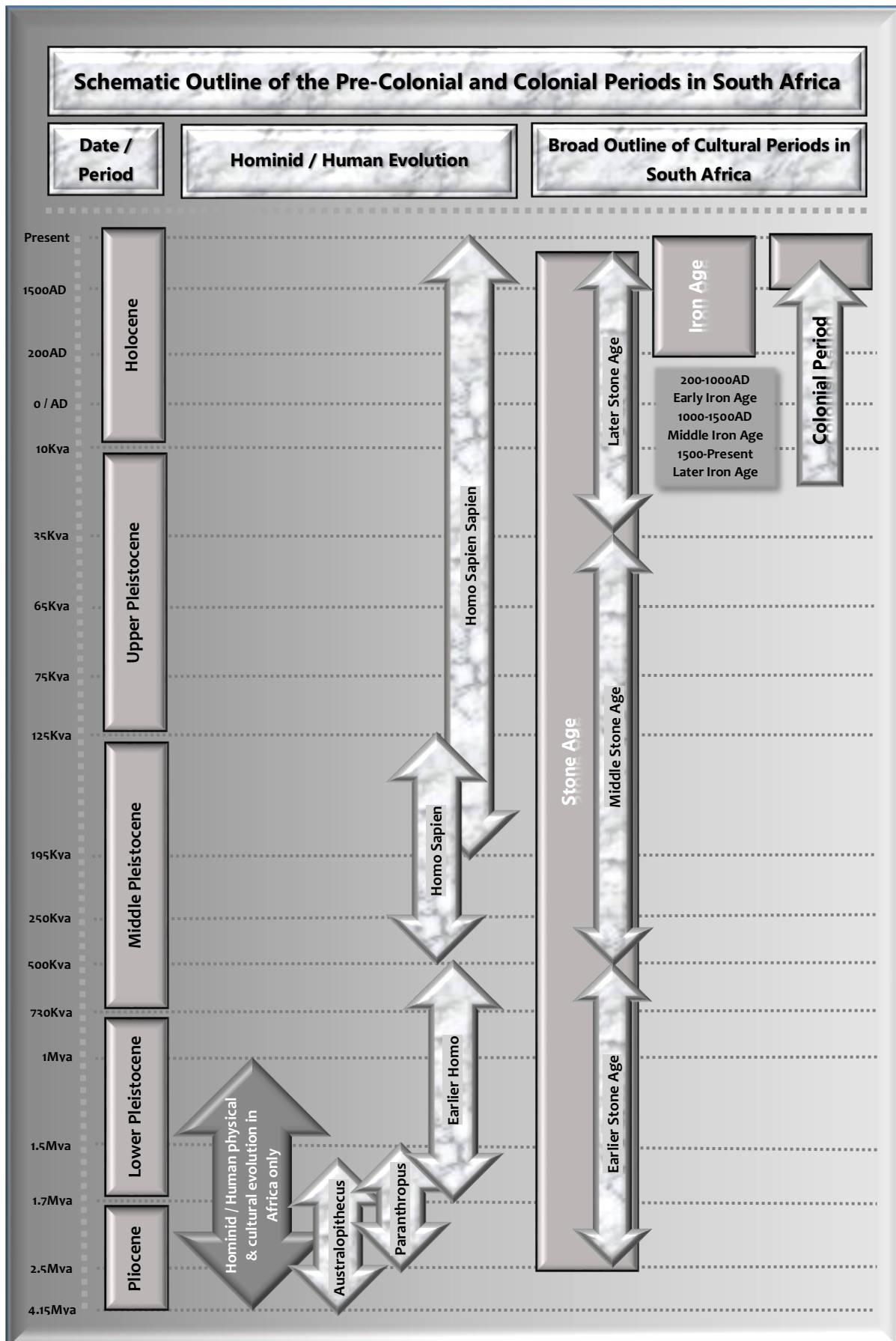
<b>List of Acronyms and Abbreviations</b>	
AD	Anno Domini (the year o)
AIA	Archaeological (and Cultural Heritage) Impact Assessment
AMAFA	Amafa aKwaZulu-Natali (Natal PHRA)
ASAPA	Association of Southern African Professional Archaeologists
BAR	Basic Assessment Report
BC	Before the Birth of Christ (the year o)
BCE	Before the Common Era (the year o)
BID	Background Information Document
BP	Before the Present (the year o)
Cm	Centimetre
CMP	Conservation Management Plan
CRM	Cultural Resources Management
DAC	Department of Arts and Culture
DEAT	Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EC PHRA	Eastern Cape Provincial Heritage Resources Agency
EIA <sub>1</sub>	Environmental Impact Assessment
EIA <sub>2</sub>	Early Iron Age
EMPr	Environmental Management Plan / Programme Report
ESA	Earlier Stone Age
Ha	Hectare
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
ICOMOS	International Council on Monuments and Sites
IEM	Integrated Environmental Management
Km	Kilometre
Kya	Thousands of years ago
LIA	Later Iron Age
LSA	Later Stone Age
M	Metre
m <sup>2</sup>	Square metre
MIA	Middle Iron Age
Mm	Millimetre
MPRDA 2002	Mineral and Petroleum Resources Development Act, No 28 of 2002
MSA	Middle Stone Age
Mya	Millions of years ago
NEMA 1998	National Environmental Management Act, No 107 of 1998
NHRA 1999	National Heritage Resources Act, No 25 of 1999
PIA	Palaeontological Impact Assessment
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of Southern Africa
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SIA	Social Impact Assessment

**Table 10:** List of Acronyms and Abbreviations



1. Almond, J., Binneman, J. & Bennie, J. 2013. (Natura Viva). *Environmental Impact Assessment for the Proposed Liquid Bulk Storage and Handling Facility in Zone 8 of the Coega IDZ. Draft Environmental Impact Assessment Report: Chapter 14. Impact on Heritage.*
2. Anderson, G. 2009. (Umlando). *Heritage Survey of the Proposed Waainek Wind Farm, Grahamstown, Eastern Cape.*
3. Binneman, J. 2010. (ECHC). *A Phase 1 Archaeological Impact Assessment of the Greater Coega Industrial Development Zone (IDZ), near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province.*
4. Binneman, J. 2011a. (ECHC). *Environmental Impact Assessment for the Proposed Ubuntu Energy Project near Jeffrey's Bay, Eastern Cape: Draft Environmental Impact Assessment Report – Chapter 11: Impact on Archaeology.*
5. Binneman, J. 2011b. (ECHC). *A Phase 1 Archaeological Impact Assessment for the Proposed Oyster Bay Wind Energy Facility, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.*
6. Binneman, J. & Booth, C. 2010. (Albany Museum). *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed 20MW Wind Farm on Three Alternative Sites: Erf 121, Driftsands (Site Alternative 1), Bushy Park Farm, Remainder of Erf 26, as well as Portions 5, 6 and 7 thereof (Site Alternative 2) and Rietfontein Farm, Erf 594), Van Stadens East (Site Alternative 3), Nelson Mandela Bay Municipality, Port Elizabeth, Eastern Cape Province.*
7. Bennie, J. 2010. (Private). *Heritage Impact Assessment (Historical Component), Coega Ridge Housing Development.*
8. Booth, C. 2011a. (Albany Museum). *An Archaeological Desktop Study for the Proposed Establishment of the Spitskop Renewable Energy Facility and Associated Infrastructure on a Site North-West of Riebeeck East, Cacadu District Municipality, Eastern Cape Province.*
9. Booth, C. 2011b. (Albany Museum). *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Cookhouse II Wind Energy Facility, Blue Crane Route Local Municipality, Eastern Cape Province.*
10. Booth, C. 2011c. (Albany Museum). *A Phase 1 Archaeological Impact Assessment of the proposed Canyon Springs Wind and Solar Facility on Portions 18, 19, 20 and 21 of Farm 258, Peddie, Wesley, Amathole District Municipality, Eastern Cape Province.*
11. Booth, C. 2012a. (Albany Museum). *A Phase 1 Archaeological Impact Assessment: Proposed InnoWind Wind Energy Facility (WEF) on Portions 1, 2 and 3 of the farm Grassridge as well as Portion 1 of the Farm Oliphantskop 201, Coega, Nelson Mandela Bay Municipality, Eastern Cape Province.*
12. Booth, C. 2012b. (Albany Museum). *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Jachtlvakte Precinct Sustainable Human Settlement Plan, Nelson Mandela Bay Municipality, Eastern Cape.*
13. Bourguignon, E. 1979. *Psychological Anthropology: An Introduction to Human Nature and Cultural Differences.* New York: Holt, Reinhart & Winston.
14. DEAT. 2004. *Cumulative Effects Assessment. Integrated Environmental Management. Information Series 7.* Pretoria: Department of Environmental Affairs and Tourism.
15. Els, H. 1992. *Akkulturasie: Teorie en Praktyk.* Pretoria: University of Pretoria Press.
16. EOH-CES. 2017a. *Project Location and Description of Components.*
17. EOH-CES. 2017b. *The Bayview Wind Farm near Port Elizabeth, Eastern Cape Province. Draft Scoping Report.*
18. EOH-CES. 2017c. *The Bayview Wind Farm near Port Elizabeth, Eastern Cape Province. Background Information Document (BID) and Invitation to Comment.*
19. Halkett, D., Webley, L., Orton, J. & Pinto, H. 2010. (ACO-UCT). *Heritage Impact Assessment of the Proposed Amakhala-Emoyeni Wind Energy Facility.*
20. <http://csg.dla.gov.za> [Accessed: December 2017].
21. [https://en.wikipedia.org/wiki/List\\_of\\_heritage\\_sites\\_in\\_Eastern\\_Cape](https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape) [Accessed: December 2017].
22. [https://en.wikipedia.org/wiki/Port\\_Elizabeth](https://en.wikipedia.org/wiki/Port_Elizabeth) [Accessed: November 2017].

23. James, P.E. & Martin, S. 1981. *All Possible Worlds: A History of Geographical Ideas*. New York: John Wiley & Sons.
24. Nilssen, P. & Van Ryneveld, K. 2012. (ArchaeoMaps). *Phase 1b and Phase 2a Exploratory Archaeological Investigation of Shell Middens. Eastern Cape Provincial Heritage Resources Authority (EC PHRA) Permit – Permit Ref. No: 2/2/APM – Permit/12/10/001. The Development of the MetroWind Van Stadens Wind Energy Facility, Rietfontein 594 and Klein Rietfontein 479, Nelson Mandela Bay Municipality, Eastern Cape.*
25. Nogwaza, T. 1994. *Early Iron Age Pottery from Canasta Place, East London District*. *South African Field Archaeology* 3: 103-106.
26. Punnell, S. 2006. *Reconciling Nature and Culture in a Global Context: Lessons from the World Heritage List*. Cairns: James Cook University.
27. Rossouw, L. 2013a. (Palaeo Field Services). *Scoping and Environmental Impact Assessment for the Provision of Maritime Infrastructure, including a General Cargo Berth and Liquid Bulk Berths at the Port of Ngqura, Nelson Mandela Bay Municipality. Chapter 12: Heritage Impact Assessment.*
28. Rossouw, L. 2013b. (Palaeo Field Services). *Phase 1 Heritage Impact Assessment of Disco Chicks Farm 2 (Farm 713), Sundays River Valley Municipality.*
29. Sauer, C. 1925. *The Morphology of Landscape*. University of California Publication on Geography 22:19-53.
30. SAHRA. 2007. *Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessments*.
31. South African Government. (No 107 of) 1998. *National Environmental Management Act*.
32. South African Government. (No 25 of) 1999. *National Heritage Resources Act*.
33. UNESCO. 2005. *Operational Guidelines for the Implementation of the World Heritage Convention*. Paris: World Heritage Centre.
34. Van Ryneveld, K. 2010. (ArchaeoMaps). *Cultural Heritage Impact Assessment: Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa.*
35. Van Ryneveld, K. 2011. (ArchaeoMaps). *Phase 1 Archaeological Impact Assessment – Proposed Construction of the Balmoral-Florida Collector Sewerage System near Uitenhage and Despatch, Eastern Cape, South Africa.*
36. Van Ryneveld, K. 2014. (ArchaeoMaps). *Phase 1 Archaeological and Cultural Heritage Impact Assessment – The Dassiesridge Wind Energy Facility (WEF) between Kirkwood and Uitenhage, Cacadu District Municipality, Eastern Cape, South Africa.*
37. Van Willigen, J. 1986. *Applied Anthropology*. New York: Bergin & Garvey Publishers.
38. Webley, L.E. 2003. (Albany Museum). *Addo Elephant National Park: Upgrading of Existing Tourist Road network and Construction of Southern Access Road near Colchester – Phase 1 Archaeological Impact Assessment.*
39. Webley, L.E. 2008. (ACO-UCT). *Heritage Impact Assessment for the Farm 294 Amanzi Estate, Portion 4 of Farm 296 Amanzi Mooi Water, Erf 296, Portion 3 of Riethuewel and Erf 296 Riethuewel, in the Nelson Mandela Bay Municipality, Eastern Cape.*






---

**Heritage Impact Assessment (HIA) –  
Bayview Wind Farm, near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape**

---

**Heritage Protocol for Incidental Finds during the Construction Phase**

---

Should any palaeontological, archaeological or cultural heritage resources, including human remains / graves, as defined and protected by the NHRA 1999, be identified during the construction phase of development (including as a norm during vegetation clearing, surface scraping, trenching and excavation phases), it is recommended that the process described below be followed.

➤ **On-site Reporting Process:**

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier's supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE / SHEQ officer.
3. The on-site SHE / SHEQ officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should immediately notify the nearest SAPS station informing them of the find].
4. The ECO / ELO officer should ensure that the find is within 72 hours after the SHE / SHEQ officers report reported on SAHRIS and that a relevant heritage specialist is contacted to make arrangements for a heritage site inspection. [Should the find relate to human remains the ECO / ELO officer should ensure that the archaeological site inspection coincides with a SAPS site inspection, to verify if the find is of forensic, authentic (informal / older than 60 years), or archaeological (older than 100 years) origin].
5. The appointed heritage specialist should compile a 'heritage site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'heritage site inspection' report should be submitted to the ECO / ELO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'heritage site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
  - Should permit specifications stipulate further Phase 2 archaeological investigation (including grave mitigation) a suitably accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The heritage specialist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 heritage mitigation program may commence.
  - Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the palaeontological, archaeological or cultural heritage resource.
  - Upon completion of the Phase 2 heritage mitigation program the heritage specialist will submit a Phase 2 report to the ECO / ELO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
  - Should the find relate to human remains of forensic origin the matter will be directly addressed by the SAPS: A SAHRA / PHRA permit will not be applicable.

**NOTE:** Note that SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find, a consultation, mitigation and re-interment / deposition process.

➤ **Duties of the Supervisor:**

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a 'No Entry – Heritage Site' zone.
3. Where development has impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context, and artefacts / objects / remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer. It is imperative that where development has impacted on palaeontological, archaeological and cultural heritage resources the context of the find be preserved as good as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the event surrounding the find. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

➤ **Duties of the SHE / SHEQ Officer:**

1. The SHE / SHEQ officer should ensure that the location of the find is recorded with a GPS. A photographic record of the find (including implementation of temporary conservation measures) should be compiled. Where relevant a scale bar or object that can indicate scale should be inserted in photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisors report, GPS co-ordinate and photographic record of the find be submitted to the ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report].
3. Any retrieved artefacts / objects / remains should, in consultation with the ECO / ELO officer, be deposited in a safe place (preferably on-site) for safekeeping.

➤ **Duties of the ECO / ELO officer:**

1. The ECO / ELO officer should ensure that the incident is reported on SAHRIS. (The ECO / ELO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting].
2. The ECO / ELO officer should ensure that the incident report is forwarded to the heritage specialist for interpretive purposes at his / her soonest opportunity and prior to the heritage site inspection.
3. The ECO / ELO officer should facilitate appointment of the heritage specialist by the developer / construction consultant for the heritage site inspection.
4. The ECO / ELO officer should facilitate access by the heritage specialist to any retrieved artefacts / objects / remains that have been kept in safekeeping.
5. The ECO / ELO officer should facilitate coordination of the heritage site inspection and the SAPS site inspection in the event of a human remains incident report.
6. The ECO / ELO officer should facilitate heritage reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the heritage specialist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

➤ **Duties of the Developer / Construction Consultant:**

The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental palaeontological, archaeological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.

---

**Resumé**  
**Karen van Ryneveld**  
**2017**

---

**Name:** Karen van Ryneveld

**Contact Details:** 1) Mobile – 084 871 1064  
2) E-mail – karen@archaeomaps.co.za  
3) Website – www.archaeomaps.co.za  
4) Postal address – Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

**Company:** ArchaeoMaps cc

**Occupation:** Archaeologist

**Qualification:** MSc Archaeology (WITS University – 2003)

**Accreditation:** 1) Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management CRM practitioner [member nr – 163]  
     ○ 2010 – ASAPA CRM Section: Principle Investigator – Stone Age  
     ○ 2005 – ASAPA CRM Section: Field Director – Iron Age & Colonial Period  
 2) SAHRA, AMAFA, EC PHRA and HWC listed ASAPA accredited CRM archaeologist

**Tertiary Education**

2015 – Present                   **University of Fort Hare (UFH), East London** (MPhil Environmental Studies)

2010                               **University of South Africa (UNISA), Pretoria** (Project Management 501)

2006 – 2007                   **Nelson Mandela Metropolitan University (NMMU), Port Elizabeth** (Undergraduate Certificate in Geographical Information Systems – GIS)

2001 – 2003                   **University of the Witwatersrand (WITS), Johannesburg** (MSc Archaeology)

1999 – 2000                   **University of Pretoria (UP), Pretoria** (BA Hons. Archaeology)

1991 – 1993                   **University of Pretoria (UP), Pretoria** (BA Archaeology & History of Art)

**Courses**

2016/01                         SPA (Safety Passport Alliance) – Petrol Retail [SA Safety Management Training Services – SMST]

**Employment – Professional Archaeology**

2007/04 – Present             ArchaeoMaps [Self-employed] (Archaeologist – CRM)

2006/06 – 2007/03           National Museum, Bloemfontein (Archaeologist – CRM, Dept. of Archaeology)

2005/04 – 2006/05           McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

2004/04 – 2005/01           Amafa aKwaZulu-Natali (HoD: Archaeology, Palaeontology & Meteorites Unit – APM Unit)

2002/09 – 2004/03           McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

**Employment – Freelance: Ground Penetrating Radar**

2015/10 – Present             Terra Scan assistant (BCM area, EC) – GPR & underground utilities focussing on petrol retail (oil & gas) industry

**Archaeology – Summary**

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of approximately 500 Phase 1 AIA studies. Phase 1 AIA work is centred in South Africa, focussing on the Northern and Eastern Cape provinces and the Free State. She has also conducted Phase 1 work in Botswana (2006 / 2007). In 2007 she started ArchaeoMaps, an independent archaeological and heritage consultancy. In 2010 she was awarded ASAPA CRM Principle Investigator (PI) status based on large scale Phase 2 Stone Age mitigation work (De Beers Consolidated Mines – Rooipoort, Northern Cape, 2008 / 2009) and has also been involved in a number of other Phase 2 projects including Stone Age, Shell Middens, Grave / Cemetery projects and Iron Age sites.

In addition to CRM archaeology she has been involved in research, including the international collaborations at Maloney's Kloof and Grootkloof, Ghaap Plateau, Northern Cape (2005 / 2006). Archaeological compliance experience includes her position as Head of the Archaeology, palaeontology and Meteorites (APM) Unit at AMAFA aKwaZulu-Natali (2004).

**Company Profile**

Company Name                 : ArchaeoMaps cc

Registration Number         : 2005/180719/23

VAT Number                   : Not VAT Registered

Accountant                    : AZIMA Financial Services

Members / Shareholders     : Karen van Ryneveld (100%)

BBBEE Status                 : Exempted Micro Enterprise (EME)