INTEGRATED HERITAGE IMPACT ASSESSMENT

In terms of Section 38(8) of the NHRA for the

PROPOSED BOULDERS WIND FARM, VREDENBURG PENINSULA, WESTERN CAPE

DEA Ref: 14/12/16/3/3/2/1057

HWC Ref: 18022002SB0314E

Prepared by

Katie Smuts

For Vredenburg Windfarm (PTY) Ltd

17 August 2019

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I, Katie Smuts , declare that --

General declaration:

- I act as the independent specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

N/A

Name of company (if applicable):

17/08/2019

Date

EXECUTIVE SUMMARY

1. Site Name

The proposed Boulders Wind Farm is to be located across several farms on the Vredenburg Peninsula.

2. Location

The project site is located at the northern end of the Vredenburg Peninsula between the towns of Paternoster, St. Helena Bay and Vredenburg, in the Saldanha Bay Local Municipality, Western Cape, at -32.7920657559S and 17.9648628474E (centroid). The project site consists of 10 properties including:

Boebezaks Kraal 2/40

Boebezaks Kraal 3/40

Boebezaks Kraal 5/40

Frans Vlei 2/46

SchuitjesKlip 3/22

DavidsFontyn 9/18

SchuitjesKlip 1/22

Het Schuytje 1/21

DavidsFontyn 7/18

Uitkomst RE/6/23

Due to environmental, visual and social constraints identified during the Scoping Phase, an area with the highest potential for development was identified within which the facility layout was designed (Layout Alternative 1). These properties are considered to have the highest potential for development and will have turbines erected on them, and include Portions 2 and 5 of Boebezakskraal 40, Portion 2 of Fransvlei 46, Portion 1 of Het Schuytie 21 and Portion 3 Schuytiesklip 22.

Further changes were made to the proposed layout of the facility after the completion of the all the specialist reports to minimise the impacts identified specifically in the Heritage, Visual (du Plessis, 2019) and Social Impact Assessment (Barbour and van der Merwe, 2018) Reports (Layout Alternative 2). This HIA was subsequently amended by adding a chapter analysing the changes in the layout of wind turbines and the implications thereof on the heritage resources identified.

3. Locality Plan

Locality Plan showing proposed project site in red (Google Earth, 2019).

4. Description of Proposed Development

Vredenburg Windfarm (PTY) Ltd has proposed the development of a wind farm, within a 5084 hectare project site. The identified development footprint within this project site is approximately 42 hectares in extent, and will include up to 45 wind turbines with a contracted capacity of up to 140MW.

5. Heritage Resources Identified

This integrated HIA comprises a collation of the impact assessment reports compiled in respect of Archaeological and Palaeontological resources, as well as visual impacts pertaining to heritage resources. The report also considers the impact of the development on the cultural landscape present within the development footprint and the surrounding areas. Site visits were conducted for the Archaeological and Visual Impact Assessments, while the Palaeontological Assessment was conducted at a desktop level and considered the proposed development to be acceptable with no further studies required for the EIA Phase.

Significant palaeontological deposits are found in the north of the project site at Soetlandskop, on SchuitjiesKlip 1/22, and include the late-Miocene Prospect Hill Formation, and possible Saldanha Formation mid-Miocene phosphatic deposits. Coastal Formations Terrain comprising early Pliocene Varswater Formation, mid-Pliocene Uyekraal Formation and the Pliocene to Quaternary Langebaan Formation may be present on SchuitjiesKlip 3/22, while the Quaternary Velddrif Formation may occur on Farm Uitkomst RE/6/23. The more southerly portions of the project site lie on the Vredenburg Pluton.

The archaeological survey identified several archaeological sites consisting of artefact/marine shell scatters within the development footprint, as well as more dense complexes of archaeological sites. Historic farm houses and werfs were identified within the development footprint, and one of these has associated burials. The significant archaeological sites of Kasteelberg, which together hold significant scientific importance for the study of early pastoralism in the Western Cape, fall outside of the proposed development footprint but within 2kms of the nearest turbines. While these turbines are within the buffers applied by Heritage Western Cape to the West Coast 1 Wind Energy Facility, they are outside the buffer of 1.5kms recommended from an archaeological perspective for this project by Halkett and Hart (2019). Heritage Western Cape (HWC) has tried to declare Kasteelberg a Provincial Heritage Site (PHS) but has not yet been successful.

The roads from Vredenburg to Stompneus Bay and from Paternoster to Stompneus Bay, have historic, scenic and visual qualities (O'Donoghue and Kaplan 2016), particularly in relation to views towards the visually prominent Kasteelberg koppie (Webley et al. 2010). Despite these qualities, none is a formally recognised scenic route, and nor are any of the roads in the surrounding area (Webley et al. 2010; Winter and Oberholzer 2013). The wider area has been proposed as a Grade II cultural landscape, consisting of scenic rolling hills, agricultural fields and historic farmsteads, layered on top of a Stone Age landscape represented by the numerous archaeological sites found throughout the study area (Sadr et al 1992; O' Donoghue and Kaplan 2016). Heritage receptors, that is heritage resources sensitive to visual impacts, include the historic farmsteads, Kasteelberg archaeological site, and the Vredenburg to Stompneus Bay and Paternoster to Stompneus Bay roads, which have scenic qualities.

6. Anticipated Impacts on Heritage Resources

The Coastal Formations Terrain in the western portion of the project site is of high sensitivity where the potential impact is **high**. The construction of the proposed Boulders Wind Farm, which will entail excavation into bedrock, will result in a **direct**, negative impact on palaeontological/scientific heritage in the absence of effective mitigation, although impacts will be limited to the construction phase. The development footprint has been designed to avoid these deposits entirely, and the anticipated impacts to palaeontological heritage resources are therefore **unlikely to occur**. From a palaeontological perspective the development of the wind farm is considered to be acceptable, with no unacceptable loss of palaeontological resources likely. No cumulative impacts are anticipated to palaeontological resources. The layout alternatives do not impact the palaeontological findings.

No “red flag” issues were identified in terms of the known archaeological resources in the project site. However given the abundant archaeological resources found in the area, such as shell middens, stone tool scatters, occupation sites, historic structures and pre-colonial and colonial period graves and graveyards, the potential for impacts is **high**. The development could have a **direct**, negative impact on archaeological resources through the disturbance and destruction of sites during ground clearing, earthworks and installation of infrastructure, where this occurs on or near to sites. Possible **indirect** impacts could arise through encroachment on sites and loss of sense of place, as well as environmental degradation that could damage sites. Any possible impacts will be limited to the construction phase. The turbine layout and associated infrastructure footprint has been designed, as far as possible, to avoid the areas indicated as having high archaeological sensitivity, namely the granite outcrops, historic farmsteads and associated graveyards, and has located infrastructure on previously or currently ploughed land. As a result of this responsive turbine placement, the anticipated impacts to archaeological heritage resources are considered **low**. Therefore, from an archaeological perspective the development of the wind farm is considered to be acceptable, with no unacceptable loss of archaeological resources likely. This makes the cumulative impacts of the wind farm on archaeological resources similarly acceptable. The layout alternatives do not impact the physical archaeological findings.

Visual impacts are likely to occur during the construction and operation phases. These impacts will be **high** within, but not restricted to, a 5-6km radius of the proposed facility (du Plessis, 2019). The impacts are **direct, negative** impacts arising from the visual intrusion of the turbines on the rural cultural landscape, and will affect observers travelling along the main and secondary roads, people living in built up centres and populated places, including the historical coastal town of Paternoster, and people living on farms. There is little mitigatory action that can be taken with regard to visual impact other than the removal of turbines from sensitive viewsheds.

The most important visual impacts to heritage resources will be to the character and sense of place of the region, specifically to the rural cultural landscape and, to a lesser extent, the historic coastal towns. While the VIA notes that the viewer incidence in the project site is low, the intrinsic value of both the cultural landscape and the site of Kasteelberg is of unquestionable significance and not dependent on visual receptors. The Saldanha Bay Municipality Heritage Resource Survey (O’ Donoghue and Kaplan 2016) identified the cultural landscape of the study area as being of Grade II cultural significance, and the scenic routes within it as having Grade III significance. While these proposed gradings have been supported by HWC, they have not as yet, been ratified. It should further be noted that the failure to declare Kasteelberg a PHS has resulted in insensitive interventions, including the erection of telecommunication masts on the

koppie, that detract from its significance. Impacts to cultural landscapes are impossible to mitigate. In this instance, however, the clustering of the Boulders Windfarm and West Coast 1 facilities serves to contain the visual impacts in a single area, which can be viewed as preferable to isolated pockets of visual intrusion across the wider landscape. Further, the removal of all turbines north of Kasteelberg (Layout Alternative 2) limits the extent of the intrusion of the new facility on the cultural landscape. The impact to the cultural landscape therefore, can be considered **moderate** and within acceptable limits of change.

Cumulative impacts of the proposed WEF and associated infrastructure on the rural cultural landscape as proposed in terms of Layout Alternative 1, in context of the authorised West Coast 1 WEF, are considered **high**. While the location of the development adjacent to West Coast 1 intends to consolidate turbines in one area, this mitigatory effect is undermined by the location of turbines west of the Vredenburg-Stompneus road. As this road falls within the proposed Grade II cultural landscape (O'Donoghue and Kaplan 2016), the preferable outcome would be that it serves as the western boundary of the development and that no turbines are placed west of it to preserve as much of that landscape intact as possible. The less preferable, but still acceptable recommendation, and the one adopted as Layout Alternative 2, is the removal of all turbines north of Kasteelberg koppie, retaining only those to the south. This changed layout does not change the cumulative impact of the development. In the design proposed, additional turbines have been added to that group to retain the overall number of turbines, but this is not seen as unduly increasing the negative impact to the cultural landscape.

It is the opinion of this specialist that, provided the recommendations below are implemented and incorporated into the EMPr, that Environmental Authorisation for this project should be awarded.

7. Recommendations

Proposed recommendations are:

Palaeontological Impact Assessment:

- Adherence to the proposed layout (Alternative 1 or 2), which avoids the deposits with palaeontological sensitivity, and restricts turbine and infrastructure to the unfossiliferous Vredenburg Pluton, is the recommended outcome from a palaeontological perspective;
- The Heritage Western Cape Chance Fossil Finds Procedure should be included in the EMPr and implemented in the case of fossil remains being encountered. See Appendix 1.

Archaeological Impact Assessment:

- Extensive sensitivity mapping by the archaeological specialist and the design of the facility in response to the on-site sensitivities has gone a long way towards mitigating impacts through avoidance on the site, and no major mitigation of physical heritage resources is anticipated. No stratified contexts were recognised;
- The Lombard and Pienaar cemetery (2011/329 at s32.80442800 e18.00421500) has been identified as a "no-go" area. As the existing farm road that passes the cemetery site will be upgraded as an access road during turbine construction it is suggested that the alignment is modified, and that the road should be shifted moderately to the west to avoid any possible impact on the cemetery;
- Avoid and conserve significant heritage resources (buffers, no-go areas, etc) around farm buildings and graveyards, archaeological sites or complexes (already achieved in both proposed layouts);
- Accidently discovered archaeological material must be reported to the Provincial Heritage Authority in terms of section 35 of the National Heritage Resources Act. The finds should also be reported to the appointed archaeologist for assessment and possible action;
- Accidently discovered human remains must immediately be reported to the Provincial Heritage Authority in terms of section 36 of the National Heritage Resources Act. The finds should also be reported to the appointed archaeologist for assessment and possible action;
- The ECO should be informed of any chance finds;
- Some monitoring of the construction activities by the archaeologist is required to determine the effectiveness of the mitigation. This will be at earthmoving stage to ensure that there are not significant buried archaeological resources being exposed.

Visual Impact Assessment (as related to impacts to heritage resources):

- At the minimum, the seven wind turbines west of the Vredenburg-Stompneus Bay road should be removed or relocated (Turbines 15, 19, 21, 27, 31, 33 and 43) – Layout Alternative 2;
- The viability of reducing the turbine size to match that of the West Coast 1 turbines should be investigated;
- Conventional mitigation by means of screening, for example, is unlikely to succeed due to the nature of the receiving environment and the development, and only the relocation of the identified turbines will reduce the visual impacts of the development
- Impacts anticipated as a result of the proposed WEF to visual character and sense of place are not possible to mitigate. There is also no mitigation to ameliorate the negative visual impacts on tourist access routes and tourist destinations within the region.
- Where sensitive visual receptors are likely to be affected, it is recommended that the developer

enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.

- It is recommended that vegetation cover (i.e. either natural or cultivated) be maintained in all areas outside of the actual development footprint, both during construction and operation of the proposed facility. This will minimise the visual impact as a result of cleared areas, power line servitudes and areas denuded of vegetation.
- Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible.
- Reduce lighting impacts through:
    - Limiting aircraft warning lights to the perimeter turbines;
    - Investigate aircraft warning lights with proximity sensors
    - Limit mounting heights of lighting fixtures, use footlights or bollard level lights;
    - Use down-lighters or shielded fixtures
    - Use motion sensors on security lighting

Once the facility has exhausted its life span, the main facility and all associated infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated.

8. Author/s and Date

HIA compiled by Kathryn Smuts

17 August 2019

Katie Smuts holds an MPhil from UCT in Archaeology (History and Archaeology of the Western Cape; 2012), having specialised in archaeological analysis of historic built fabric and forms. Prior to that, her BA (Hons), obtained from UCT with distinction in 1999, was focused on analysis of depictions of human figures in the rock art of the Western Cape.

Katie has worked both as a commercial archaeologist and as a Heritage Officer for the national Heritage Agency, SAHRA. Katie was promoted to Manager of the National Inventory at SAHRA, where she was responsible for the maintenance of the country's online heritage management platform and heritage resource database, SAHRIS (the South African Heritage Resources Information System).

Katie serves on the Executive Council of the Association of Southern African Professional Archaeologists (ASAPA), and holds accreditation in rock art, coastal shell middens, Stone Age archaeology and grave relocation. She has been a member of the Association of Professional Heritage Practitioners (APHP) since 2015, a member of the Southern African Museums Association (SAMA) since 2013, and is currently serving as treasurer of the Heritage Association of Southern Africa (HASA). She is Chair of the Stanford Heritage Committee (SHC) and Vice-Chair of the Overstrand Heritage and Aesthetics Committee (OHAC).

Katie currently works as a freelance heritage practitioner and archaeological consultant, drafting Heritage Impact Assessments, Archaeological Impact Assessments, Heritage Inventories, heritage scoping reports and heritage components for Strategic Environmental Assessments, Environmental Management Frameworks and similar planning initiatives.

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1. INTRODUCTION

1.1 Background Information on the Project

It is proposed that a Wind Energy Facility (WEF) be constructed over 10 properties (known as the project site) at the northern end of the Vredenburg Peninsula between the towns of Vredenburg, Paternoster and St. Helena Bay, in the Saldanha Bay Local Municipality, Western Cape (Figures 1a and 1b). The total extent of the project site is approximately 5084 hectares. The identified development footprint within the project site is approximately 42 hectares in extent, and will include up to 45 wind turbines with a contracted capacity of up to 140MW. Savannah Environmental is the Environmental Assessment Practitioner managing the process for this project.

The proposed WEF will comprise the following:

- Up to 45 wind turbines of up to 3.15MW in capacity each, with a maximum hub height of up to 120m. The tip height of the turbines will be up to 165m;
- Concrete foundations to support the turbines;
- Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 80m x 150m in extent to facilitate the connection between the wind farm and the electricity grid;
- An overhead 132kV power line, with a 32m servitude, to connect the facility to the electricity grid (to be assessed as part of a separate basic assessment process);
- A transformer station for each wind turbine;
- Access roads to the site and between project components with a width of approximately 6m;
- Laydown areas, crane hardstand pads, administrative buildings and offices.

Each wind turbine will consist of a concrete foundation, a steel tower, a hub (placed at up to 120m above ground level) and three turbine blades attached to the hub, with an overall turbine height of up to 165m in extent.

Sensitivity mapping of heritage resources, at the scoping phase, was used to inform Layout Alternative 1, with the result that places with strong heritage indicators (such as granite outcrops, streams, graveyards etc) were excluded. Scoping phase studies recommended the reduction of buffers established for the West Coast 1 facility, and also served to inform turbine placement to mitigate visual impacts to the coastal towns of the Vredenburg Peninsula. Further changes were made to the proposed layout of the facility after the completion of the all the specialist reports to minimise the impacts identified specifically in the Heritage, Visual (du Plessis, 2019) and Social Impact Assessment (Barbour and van der Merwe, 2018) Reports. These

were adopted as Layout Alternative 2. Subsequent to the development of Layout Alternative 2, this HIA was amended by adding a chapter analysing the changes in the layout of wind turbines and the implications thereof on the impact ratings of the layouts with regard to the heritage resources identified

1.2 Description of the Project Site and Affected Environment

The area proposed for development is located towards the northern end of the Vredenburg peninsula, some 7km east of Paternoster, 7km south west of St Helena Bay and 14km north of Vredenburg (measured from the centre of the site). The area is predominantly under wheat cultivation, with some maize, and comprises rolling agricultural fields, broken with irregular patches of Strandveld, or West Coast Renosterveld. The underlying geology consists of fairly extensive granite extrusions of the Vredenburg Pluton, mantled with deposits of older and recent sands. The granite extrusions, where these impede ploughing, often remain as pockets of indigenous flora and fauna. In pre-colonial and early historic times, these outcrops were focal landscape features for inhabitants of the area, as they provide shelter from the prevailing winds, and sometimes even act as water sources where rainwater is trapped in hollows and crevasses in the rocks.

Although there is little built fabric outside of the regional towns, the project site is heavily altered through years of intensive wheat farming, and roads, fences, dams and power lines which are widespread for this area. The 47 wind turbines of the existing West Coast 1 WEF, which has been operational since mid-2015, are a visual disruption to the otherwise rural landscape, and are in contrast to the otherwise agricultural features present.

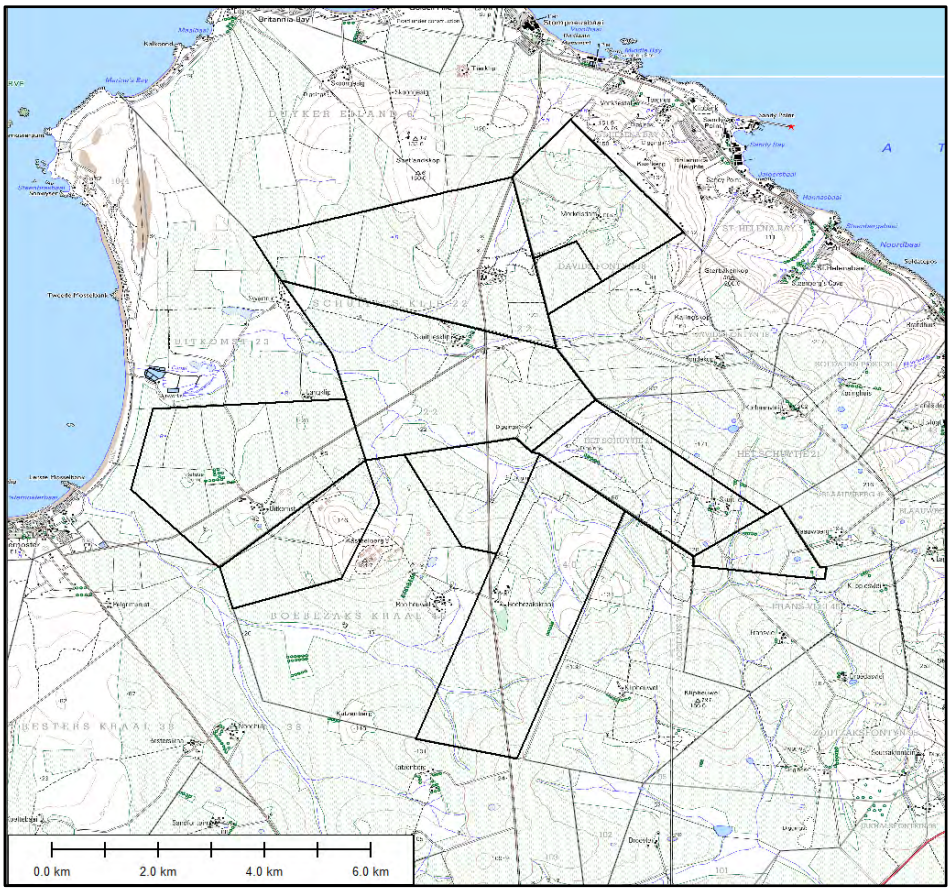

Figure 1a. The location of the proposed Boulders wind farm (black polygons) situated on the northern end of the Vredenburg Peninsula. 3217DB&DD Vredenburg, 3218CA&CC Velddrif. (Chief Director Surveys and Mapping)

Figure 1b. Aerial map of the proposed project site. Site boundary shown in red.

2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999). A NID and Heritage Scoping Report were submitted for this project, and a "Response to NID" letter was received from Heritage Western Cape (HWC) dated 29 March 2018. In that response (Appendix 3), HWC required that an HIA be submitted with specific reference to impacts on archaeological and palaeontological heritage resources, and visual impacts to the rural cultural landscape. Those impacts are addressed in this report.

2.2 Summary of Steps Followed

- Archaeologists conducted an assessment of the archaeological resources likely to be impacted by the proposed development (Halkett, D. and Hart, T. 2019 *Archaeological Impact Assessment of the Proposed Boulders Wind Farm, Vredenburg Peninsula, Western Cape*. Unpublished report prepared for Vredenburg Wind Farm (Pty) Ltd. Diep River: ACO Associates cc.);
- A palaeontologist was contracted to assess palaeontological resources likely to be disturbed by the proposed development (Pether, J. 2017. *Palaeontological Scoping Report Proposed Boulders Wind Farm Saldanha Bay Local Municipality Vredenburg District, Western Cape Wind Energy Facility on Ten Farm Portions near Vredenburg*. Unpublished report for Vredenburg Windfarm (Pty) Ltd. Kommetjie.);
- A Visual Impact Assessment was undertaken (du Plessis, L. 2019. *Proposed Boulders Wind Farm, Western Cape Province Visual Impact Assessment*. Unpublished report for Vredenburg Windfarm (Pty) Ltd. Pretoria: Logis.);
- The Social Impact Assessment was also considered (Barbour, T. and van der Merwe, S. 2018. *Social Impact Assessment Report for Boulders Wind Farm Western Cape Province*. Unpublished report for Vredenburg Windfarm (Pty) Ltd. Claremont: Tony Barbour Environmental Consulting and Research.
- The identified resources were mapped and assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999);
- Impacts to the cultural landscape were considered and evaluated;
- Specialist findings were collated into an integrated Heritage Impact Assessment (HIA).

2.3 Assumptions and Limitations

Integrated Heritage Impact Assessment:

- It is assumed that the specialist reports utilised for the integrated heritage assessment are comprehensive and reflective of the full extent of the specialists' knowledge and expertise;
- The HIA has been compiled based on the contents of the specialist reports[1] and desk-based research.

Palaeontological Impact Assessment:

- It is assumed that the fossil potential of a formation in the study area will be typical of that found in the region and more specifically, similar to that already observed in the study area.
- A limitation on predictive capacity exists in that it is not possible to predict the buried fossil content of an area or formation other than in such general terms.

Archaeological Impact Assessment:

- Assumptions about broader heritage resources on the site were based on results from previous heritage studies from the area and by looking for "heritage indicators" on aerial photos;
- It is expected that archaeological resources would be limited and overall probably of low significance;
- It is believed that the most relevant unpublished heritage reports from the area have been identified;
- Previous heritage surveys of the study area (excluding those undertaken by ACO) have not always provided track paths and it is not always clear how broadly and which areas were surveyed for heritage resources;
- Aerial photos give a broad sense of the heritage indicators and likely sensitivity, but due to angle, scale and resolution issues, they have limitations when trying to identify archaeological sites/features;
- The whole site has not been assessed in detail but rather areas identified as preferred turbine and associated infrastructure sites have been investigated;
- There has been no detailed study of the histories of the farms comprising, and adjacent to the WEF site. We have looked at some of the Surveyor General's records in order to establish a baseline for colonial settlement and resources within the area;
- The presence of graves and/or graveyards has been informed by local knowledge of current residents of the affected farms who were consulted during our site visits. Tthe possibility of other isolated unidentified graves being present cannot be excluded although the likelihood is considered to be very low;
- A number of graves and/or graveyards have been located, where assessment were close to farm werfs

1 Halkett and Hart 2018; Pether 2017; du Plessis, 2019; Barbour and van der Merwe 2018

(both modern and old). It is assumed colonial burials will be directly associated with farm werfs, or settlements while it is presumed that pre-colonial burials will be associated with clusters of pre-colonial sites, particularly on and around granite outcrops or areas where soft silty sands are available;

- There are no known "Red Flag" issues from an archaeological perspective on the site and it is noted that previously the West Coast 1 WEF was approved. The authorisations and appeals with regard to that WEF vis a vis with Kasteelberg have been noted and applied to this study;
- As far as the ACO are aware, West Coast 1 is the only constructed WEF in the vicinity of the proposed project

Visual Impact Assessment:

- This assessment was undertaken during the planning stage of the project and is based on information available at that time.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

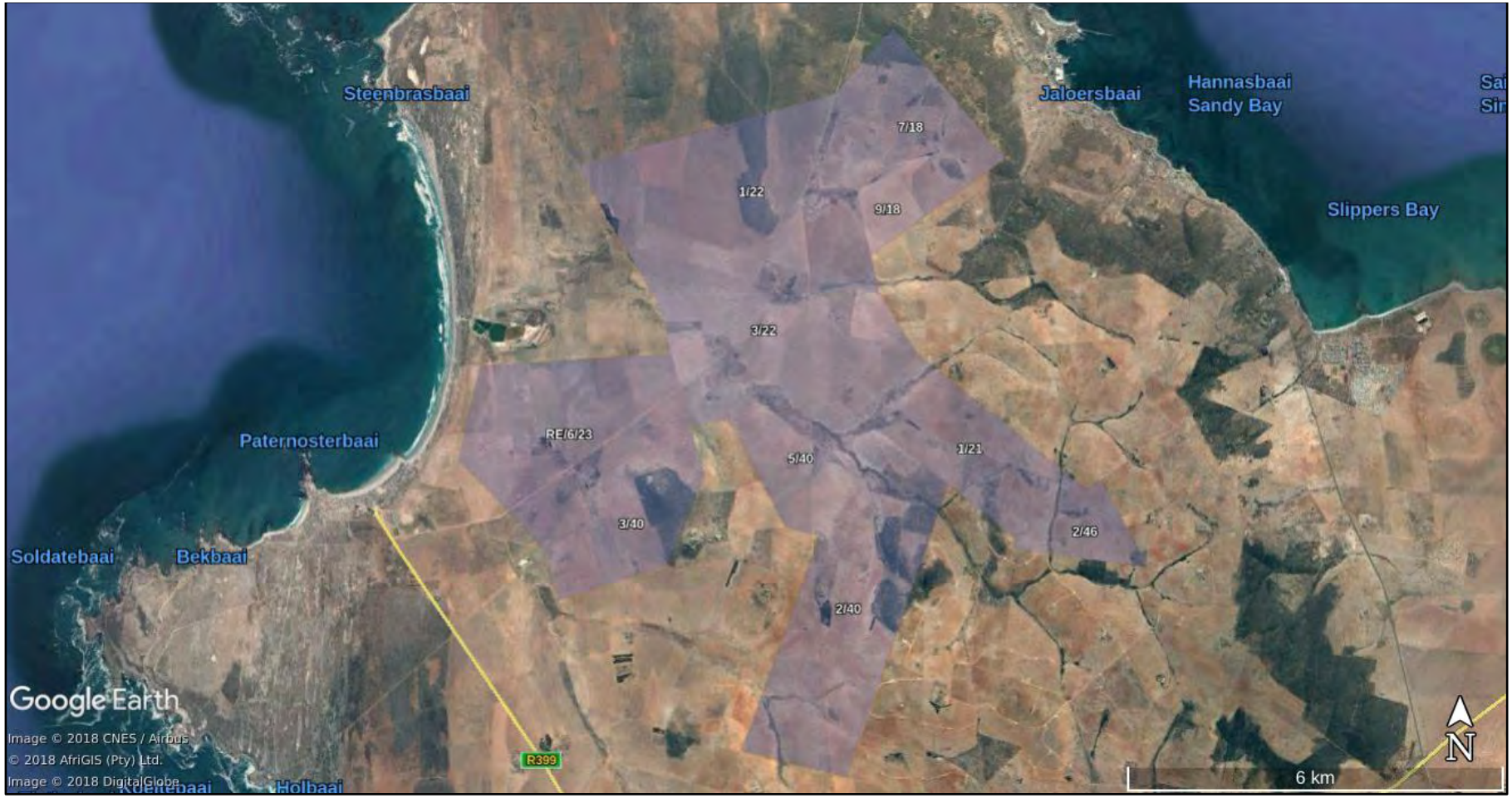

Figure 2. Close up image of the proposed Boulders Wind Farm project site, showing the relevant farm portions.

Figure 3a. Image showing proposed layout of the Boulders Wind Farm (Layout Alternative 1).

Figure 3b. Close up of the layout proposed for the Boulders Wind Farm (Layout Alternative 1).

3.1 Definition of the Property

The development of a Wind Energy Facility (WEF) with a contracted capacity of up to 140MW is proposed to be constructed and operated within a project site identified by the developer (Figure 2). The project site under consideration for the development of the Boulders Wind Farm consists of 10 properties which include:

- Boebezaks Kraal 2/40
- Boebezaks Kraal 3/40
- Boebezaks Kraal 5/40
- Frans Vlei 2/46
- SchuitjesKlip 3/22
- DavidsFontyn 9/18
- SchuitjesKlip 1/22
- Het Schuytje 1/21
- DavidsFontyn 7/18
- Uitkomst RE/6/23

Due to environmental, visual and social constraints identified during the Scoping Phase an area with the highest potential for development was identified within which the facility layout was designed (Layout Alternative 1). The properties considered to have the highest potential for development will have turbines erected on them, and include Portions 2 and 5 of Boebezakskraal 40, Portion 2 of Fransvlei 46, Portion 1 of Het Schuytie 21 and Portion 3 Schuytiesklip 22 (Figures 3a and 3b).Further changes were made to the proposed layout of the facility after the completion of the all the specialist reports to minimise the impacts identified specifically in the Heritage, Visual (du Plessis, 2019) and Social Impact Assessment (Barbour and van der Merwe, 2018) Reports (Layout Alternative 2). These changes, and their different impact ratings are addressed in Chapter 6.

3.2 Geology, Geomorphology, Climate and Vegetation

The proposed WEF is situated on predominantly agricultural land on successions of sand layers that mantle the underlying granitic Vredenburg Pluton. The receiving environment is characterised by undulating agricultural fields, interspersed with numerous outcrops of the underlying granite in the form of small koppies.

The indigenous vegetation in this area falls within the West Strandveld, Southwest Fynbos and West Coast Renosterveld Bioregions (Rutherford et al. 2006). This vegetation survives as isolated pockets within and between the cultivated wheat fields, and is often concentrated around the granite outcrops where it is not feasible to plough the land. The project site falls within the Cape Mediterranean-type climatic zone, with hot, dry summers and cool, wet winters. The peak rainfall period is April to October, and mean annual precipitation for the region is 300 mm (Mucina et al. 2006).

3.3 Paleontological, Archaeological and Historical Background of the Vredenburg Peninsula

3.3.1 Palaeontological Background

According to the SAHRIS Palaeosensitivity map, the area is underlain by geological deposits varying in degrees of sensitivity from zero to very high (SAHRIS 2014). The geology comprises two distinct rock types, the unfossiliferous granitic deposits found across the Peninsula, and the potentially fossiliferous deposits that constitute the Coastal Formations Terrain, and are present at Soetlandskop in the north of the project site and the Uitkomst Embayment at the west.

The oldest bedrock of the region consists of Malmesbury Group shales, which were laid down over 560 million years ago (Ma), at the base of the Adamastor Ocean (Gresse et al. 2006). These deposits were intruded into between 550 and 515 Ma, by molten magmas that cooled and solidified to form the "Cape Granite Suite". The Sandveld sediments of later Cenozoic age, deposited during the Neogene and Quaternary periods, i.e. during the last 20 million years overlay these sediments (Roberts et al. 2006), but have also been subject to erosion. The Malmesbury Group shales and Sandveld sediments have eroded from the area, exposing the granites in the form of koppies found across the Vredenburg Peninsula. These granites are unfossiliferous, except where they act as traps that accumulate more recent fossils in crevasses or hollows (Pether 2017).

The oldest potentially fossiliferous marine deposits preserved on the coastal plain are of mid-Miocene age, ~16-14 Ma, and are represented by mineralised phosphate deposits of the Saldanha Formation (Pether 2017). Outcrops of this formation are known at Soetlandskop in the northern extent of the project site, on Farm SchuitjesKlip 1/22 and 3/22.

Subsequent palaeoshoreline deposits have been deposited in the Uitkomst Embayment on UitkomstRE/6/23 in the western extent of the project site, and consist of Pliocene, Miocene and Recent deposits. The early Pliocene (5-4 Ma) Varswater Formation (Pether et al. 2000; Roberts & Siegfried 2014), and the mid-Pliocene (3 Ma) Uyekraal Formation (Rogers et al., 1990) can contain marine fossils and shells

(Pether 2017). These are overlain by further shallow marine deposits in the Quaternary Period, collectively referred to as the Velddrif Formation, which were probably laid down in the last 400 000 years (Pether et al. 2000), which, although generally of low fossil sensitivity, can contain extinct shell fossil fauna that are of some significance.

Aeolian deposits, which correlate with periods of low sea levels, are represented across the Peninsula in the form of calcareous dunes with calcrete crusts. Prospect Hill Formation is the oldest of these deposits, and dates to some 12-9 Ma. This formation is known to contain later Miocene fossils including eggshell fragments of the extinct ostrich *Diamantorniswardi* and bones of the extinct three-toed horse *Hipparion*, as well as indeterminate antelope bones, and also occurs on Soetlandskop. The Langebaan Formation is approximately 4 Ma (Pether 2017), and is the most significant of the aeolian deposits in this area. Excavations into these deposits have yielded substantial data on the Quaternary faunas and archaeology of the Western Cape that are of profound scientific value, and have resulted in the extensive fossil beds nearby Langebaanweg being declared a PHS.

The most recent formation in the project site is the non-calcareous, quartz-sand-rich Springfontyn Formation (Ibid.). While these are of low fossil sensitivity, the coversands can protect underlying fossils that are located on palaeosurfaces and can be exposed during development.

3.3.2 Archaeological Background

The Vredenburg area has been inhabited since the Early Stone Age (ESA), more than 1 million years ago. ESA tools, and associated faunal remains, such as those discovered at Elandsfontein Farm and Anyskop, near Langebaan, attest to this presence. The oldest known human remains in the Cape, the so called "Saldanha Man", come from Elandsfontein, and date between 700 000 and 400 000 years ago (Singer 1954, Braun et al. 2013).

This occupation continued through the Middle Stone Age (MSA), with the site of Sea Harvest in Saldanha Bay providing some of the earliest evidence in the world for human exploitation of coastal resources, over 100 000 years ago (Klein 1974, 1979). Sea Harvest, together with the nearby Hoedjiespunt, has yielded well-preserved bone, ostrich eggshell, ochre and MSA stone implements and early modern human remains from about 125 000 years ago (Churchill et al. 2000). Further MSA flakes, fossil bones and coprolites have been found in the wider region (Plasket 2013, Kaplan 2013). Fossilised footprints dated to 120 000 years ago have also been found in ancient fossil dunes at Kraalbaai, and rank among the oldest modern human footprints in the world (Berger & Hilton-Barber 2000).

More recently, Holocene hunter-gatherers exploited these coastal resources extensively, attracted to the abundant shellfish available along the rocky shores, while sea birds, fish, crayfish, seal, dolphin and even whale meat formed part of their diet. This intensive exploitation of marine resources, particularly shellfish, is attested to by the numerous shell middens along the coast, as well as by the results of several archaeological excavations in the region (Kaplan 1995a, 1995b; Orton 2009).

Sites in the vicinity of Kasteelberg on the Vredenburg Peninsula predominantly date to the Later Stone Age (LSA), and include nearly 100 sites identified to date (Figure 4). These are predominantly concentrated around granite koppies (Sadr 2009), with further sites identified more recently in the wheat fields (Webley and Orton 2010, Halkett 2011). Further significant Holocene sites in this area include Witklip, a small shelter situated on the western outskirts of Vredenburg, which provided evidence for a hunter-gatherer settlement between 3000 and 500 years ago. Several shell middens have been recorded at Paternoster and Jacobsbaai, all dated to within this crucially important time period of the past 3000-4000 years, therefore straddling the arrival in the area of the Khoekoen Pastoralists (Halkett 1996; Kaplan 1995a, 1995b; Patrick 2008). Several of these middens include human skeletal remains (Orton and Smuts 2007; Orton 2009; Dewar 2007, 2010). A megamidden along Mosselbank Street, near the Mosselbank River (on the Farm Uitkomst 23/37), at Paternoster North Site A (PNNA) that contains abundant faunal remains (Yates 2004), was declared a PHS in April 2009.

In addition to widespread evidence for exploitation of this region by hunter-gatherers, the Vredenburg Peninsula holds significant evidence of the arrival of the early Khoekhoen Herders in this region some 2000 years ago (Smith 2006). These people entered South Africa along the Cape West Coast, together with cattle, sheep and ceramics, and the significant site of Kasteelberg, on Boebezaks Kraal, forms the focus of a settlement of these pastoralist herders. The site appears to have been occupied since the MSA, but became a focus of settlement in the last 2000 years (Sadr et al. 1992), when ceramics and domesticated stock remains enter the archaeological record.

Kasteelberg is a large granite koppie comprising two granite extrusions on the farm Rooiheuwel (Boebezaks Kraal). Human occupation has centred on one of the two outcrops, with some 32 sites located around the koppie (Webley et al. 2010). The proximity of the site to the sea accounts for the large quantities of shellfish and other marine remains excavated from these sites, while stone tools appear to have been made from beach pebbles.

Five sites on the koppie have been the focus of excavation since 1981, with significant finds of the large numbers of sheep and few cattle bones from site Kasteelberg A which date to approximately 100 AD, interpreted as representing pastoralist sheep herders with some cattle (Smith 2006). Kasteelberg B has yielded large quantities of pottery, with deposits containing increasing amounts of seal and tortoise bone, but fewer sheep. This has been interpreted as evidence for large scale cattle herding, and increasing symbolic importance of livestock, as evidenced by the ritual burial of a lamb skeleton (Ibid.). The Kasteelberg C rock shelter contains a stratified deposit with domestic stock in the upper layers and microlithic artefacts in the lower layers dating to approximately 200 BC. This change through time is thought to represent the replacement of San hunter-gatherers in the area with pastoralists.

Kasteelberg is exceptionally significant in academic archaeology, as the site serves as the primary site around which the debate over the identification of pastoralists in the archaeological record is centred (Webley et al. 2010). Due to this importance, and the long sequence of stratified archaeological deposits contained in its various sites, attempts have been made since the late 1990s to recognise Kasteelberg's significance through declaration. Most recently, Heritage Western Cape (HWC) has attempted to declare the Kasteelberg Archaeological site complex as a Provincial Heritage Site (PHS); this process has not yet been finalised but remains a desired outcome.

3.3.3 Historical Background

The name of Saldanha Bay derives from that of an early Portuguese explorer, António de Saldanha, who made landfall at the Cape in 1503, though not at Saldanha itself (Worden et al. 1998). Historical records reveal that the Vredenburg peninsula was extensively utilised by Khoekhoen pastoralists for grazing in the eighteenth century, possibly as part of a seasonal movement of stock between the coast and interior, Smith (2006). The arrival of European settlers in this area not only disrupted these indigenous lifeways, but led to conflict between European factions looking to exploit the local marine resources. This conflict resulted in the construction of several Dutch and French military outposts in the Saldanha Bay area during the 17th and 18th centuries (Schrire et al. 1993). Two such outposts were established at St Helena Bay (Sleigh 1993), while a further one was established at Kraalbaai, and has been subject to extensive archaeological investigation that revealed interaction between the soldiers posted there and the local Khoekhoen some 300 years ago (Schrire et al. 1993). Not all of this interaction was peaceful, and the outposts were the site of frequent clashes between the Khoekhoen and the soldiers.

Land in this area was parcelled out to European settlers in the form of quitrent grants from the early nineteenth century, with Boebezaks Kraal being one of the earliest grants (Sadr et al. 2013). Some of these

historical farmsteads have survived and have evidence for possibly significant associated middens (Kruger 2016). While some excellent nineteenth century vernacular architecture is to be found on the Peninsula, few in this area were recorded as significant by Fransen (2004). Indeed, as Halkett and Hart (2019) note, while farming was taking place in the area from the 18th Century, farm boundaries were generally only formalised from the mid-19th Century. Along the coast, traditional fisherman's cottages survive at Paternoster and Saldanha Bay, and three have been declared a PHS (Figure 4).

Historical records also reveal much about the historic fishing, sealing and whaling industries, particularly near Marcus Island (Outer Bay) and at Salamander Point near Saldanha (David & van Sittert 2008; Malan et al. 2013). While little material evidence for these activities has been identified, it has been postulated that much evidence might remain on the seafloor, in the form of "undocumented archaeological debris such as anchors or other flotsam and jetsam" (Sharfman 2016). Fish traps also occur along this coastline, although the exact age of these structures, i.e. whether they are historic or pre-historic, remains contested (Hart &Halkett 1992, 2010; Hine 2004, 2008).

More recent remains relate to the significance of the military installations at Saldanha and the surrounding areas during World War II. Remains in the form of structures, runways and gun and radar installations are still present (Orton 2012).

3.3.4 Burials

Unmarked pre-colonial graves are known from this area and are most likely to be found along the coastline or on and around the granite outcrops (Figure 4). Extensive development in this region has resulted in many burials being identified through impact assessments. Most known pre-colonial graves have been found in the Saldanha area, including up to six burials from a single midden site in the town (Dewar 2010). Further archaeological burials have been encountered at Kasteelberg and Witklip near the proposed WEF site (Morris 1992).

Colonial burials are likely to be associated with older farm werfs, or settlements, although more isolated historic features such as old stockposts and informal settlements might also contain burials.

3.3.5 Cultural Landscape

Cultural landscapes are the interface of culture and nature, tangible and intangible heritage, and biological and cultural diversity. In contemporary society, particular landscapes can be understood by taking into consideration the way in which they have been settled and modified including overall spatial organisation,

settlement patterns, land uses, circulation networks, field layout, fencing, buildings, topography, vegetation, and structures. As such, cultural landscapes are expressions of the interplay of factors that led to their creation, and therefore unique, irreplaceable heritage resources vulnerable to disruption, disturbance and change.

The cultural landscape of the Vredenburg Peninsula comprises several elements that are layered such that they constitute separate units that are also inextricably enmeshed to create the landscape as it is seen and perceived. The cultural landscape of the development footprint can be understood to be an *organically evolved landscape*, which has resulted from "an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment" (UNESCO 2008). This environment includes the *relict*, or *fossil landscape* which is formed by processes that are no longer underway but which remain visible (i.e. palaeontology and archaeology) and the *continuing landscape* which is both current and shows evolution through time (i.e. the wheat fields and agricultural/rural landscape). As such, the linked features in the affected cultural landscape include natural landscapes, predominantly occurring along the western coast of the Peninsula that remain as reminders of the past beauty of the region. Where these contain high frequencies of LSA sites, they can be considered Stone Age cultural landscapes. An important element of this Stone Age landscape is the ancient connection between Kasteelberg koppie and the sea, represented archaeologically by the high number of shellfish remains, and preserved by the visual intactness of the vista from Kasteelberg west, towards the coast. The predominantly agricultural landscape of rolling wheat fields, punctuated by granite koppies and interspersed with farmsteads located within groves of mature trees reflects the long history of farming in the vicinity. To a degree, there also remains a maritime cultural landscape, centred on the Saldanha Bay area that reflects the area's long record of exploitation of marine resources, extending back into the archaeological past at Kasteelberg. The maritime cultural landscape, per se, is sufficiently distant from this development that it will not be affected by the wind farm. The area has long established links between the inland and the coast, arising from the seasonal pre-colonial exploitation, and year-round colonial period exploitation of marine resources. These cycles of dependence and use are manifested in visual links between the interior and the coast, and these are particularly significant where that link is not disrupted by development.

The project site has no proclaimed heritage sites in the form of either Provincial or National Heritage Sites, and there are no scenic routes proclaimed in the wider region. Kasteelberg koppie, however, retains very high significance in the landscape as the focus of human activity since the Middle Stone Age, and for religious, spiritual and symbolic purposes over the past 2000 years. Further to this archaeological

significance, it holds scientific significance for its potential to yield information about hunter-herder interaction and the development of pastoralism in the Western Cape. While much of the koppie retains its relatively intact natural vegetation and unaltered state, contrasted with the highly transformed wheat fields that surround it, recent development on the koppie has served to detract from its pristine state. Most significantly, two telecommunication towers have been erected on the koppie, and these are visually prominent and out of keeping with the heritage sensitivity of the site.

Rampant recent development on the Vredenburg Peninsula has reduced the prevalence and significance of extant cultural landscapes within the wider project site, negatively impacting the quality of the rural cultural landscape. The existing turbines of West Coast 1 represent a substantial portion of this intrusion, and have irrevocably changed the cultural landscape in the vicinity. Given the constantly evolving nature of continuing cultural landscapes, however, they can also be viewed as constituting a further layering in the rural landscape, although subjective responses to wind turbines in landscapes vary widely between receptors.

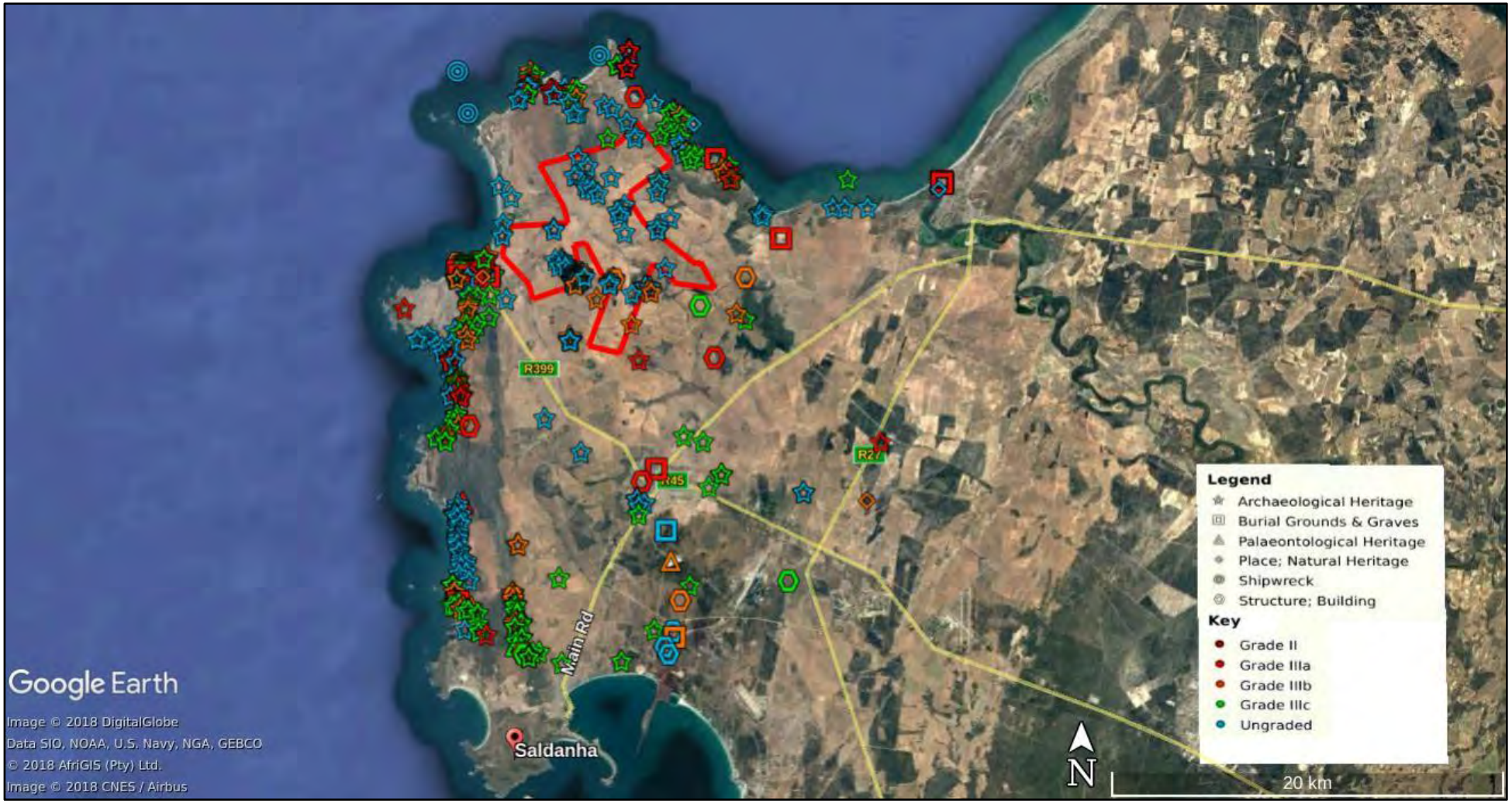

Figure 4. All known heritage sites within 20kms of the proposed project site.

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of Findings of Specialist Reports

4.1.1 Archaeological Impact Assessment

The Archaeological Impact Assessment undertaken by Halkett and Hart (2019) comprised a review of the existing literature and five days of site visits. The study noted the wealth of available literature on both archaeological and palaeontological resources in the area and concluded that the identification of heritage indicators was well informed.

The archaeologists did not identify any archaeological "red flag" issues, but did note some archaeological sites comprising artefact/marine shell scatters, as well as larger scale or density complexes of archaeological sites which are considered to be sensitive to the development of the Boulders Wind Farm. Further heritage resources identified consisted of houses and farm werfs, and their associated burials, as well as isolated buildings.

Specific Heritage Sensitivities

The archaeologists derived a "constraints and sensitivities" map based on the identified heritage indicators that extrapolates where heritage resources might be located (Figure 5). As this sensitivity information was provided to the developers at the Scoping Phase, the layout of turbines and infrastructure was planned to accommodate these buffers and no-go areas to minimise impacts on heritage resources through the avoidance of the sensitive features (Layout Alternative 1). Layout Alternative 2, proposed later, also took the proposed buffers and no-go areas into account and, therefore, poses no new impacts to archaeological resources (see Chapter 6).

This map includes the existing buffers set by the Department of Environmental Affairs (DEA) Environmental Authorisation (EA) of 16 March 2011 and HWC for the existing West Coast 1 WEF as these are applicable to the current application, as well as the no-go areas around granite koppies where archaeological resources can be expected (Appendix 3). The archaeologists considered the changes to the landscape since the buffers were created, and recommended some limited relaxation of these restrictions, particularly given the establishment of the existing West Coast 1 WEF, and the failure by the authorities to declare Kasteelberg a PHS. As such, the Stompneus Road buffer has been set at 250m on either side of the road (dark blue on Figure 5), while a 1.5km buffer to the eastern side of Kasteelberg is recommended (red ring on Figure 5). The authors do maintain, however, that no turbines should be positioned to the west of Kasteelberg in order to maintain a clear viewshed to the coast in the event that the proposed declaration of Kasteelberg as a PHS is realised (Halkett and Hart, 2019). As a result of this recommendation, the 2km

buffer has been observed there, and no turbines are located to the west of Kasteelberg. Several turbines are now proposed to the northeast of the koppie, which affects the view from Paternoster to Kasteelberg, although the view to the coast from Kasteelberg remains clear from Cape St Martin, west of Britannia Bay, to the northern head of Saldanha Bay.

The construction of the proposed Boulders Windfarm could have both direct and indirect impacts on Kasteelberg koppie as a site of archaeological heritage significance; this is as distinct from impacts to the rural cultural landscape of which the koppie is a part. Direct impacts could arise from damage and destruction of sites, while indirect impacts could arise from visual impacts which impinge on the sense of place of the koppie. While direct impacts to the archaeological sites of Kasteelberg are not expected, the turbines west of the Vredenburg-Stompneus Bay road do pose a threat to the heritage significance of Kasteelberg from a visual impact perspective. The turbines are new insertions into a vista currently devoid of turbines, unlike the view towards the south east from that road, where the West Coast 1 turbines are already present. These western turbines will crowd the view of Kasteelberg and diminish its visual prominence in the landscape. This issue is discussed further below.

The generally preferred location for the turbines consists primarily of previously or currently ploughed land (light green on Figure 5) where disturbance has diminished the significance of any archaeological heritage resources that may still be present. Archaeological cultural material located here are likely to be of relatively **LOW** significance, although the likelihood of impacts to them remains **HIGH**. No-go areas (red on Figure 5) are identified as known locations of existing heritage resources, or areas where these resources are very likely to occur based on heritage indicators. Waterways and water bodies (purple on Figure 5) are identified as heritage indicators, but since these enjoy additional protection for the reasons of ecological sensitivity, they are not likely to be disturbed. 500m buffers (blue rings on Figure 5) are placed around houses and farms and should be avoided by infrastructure.

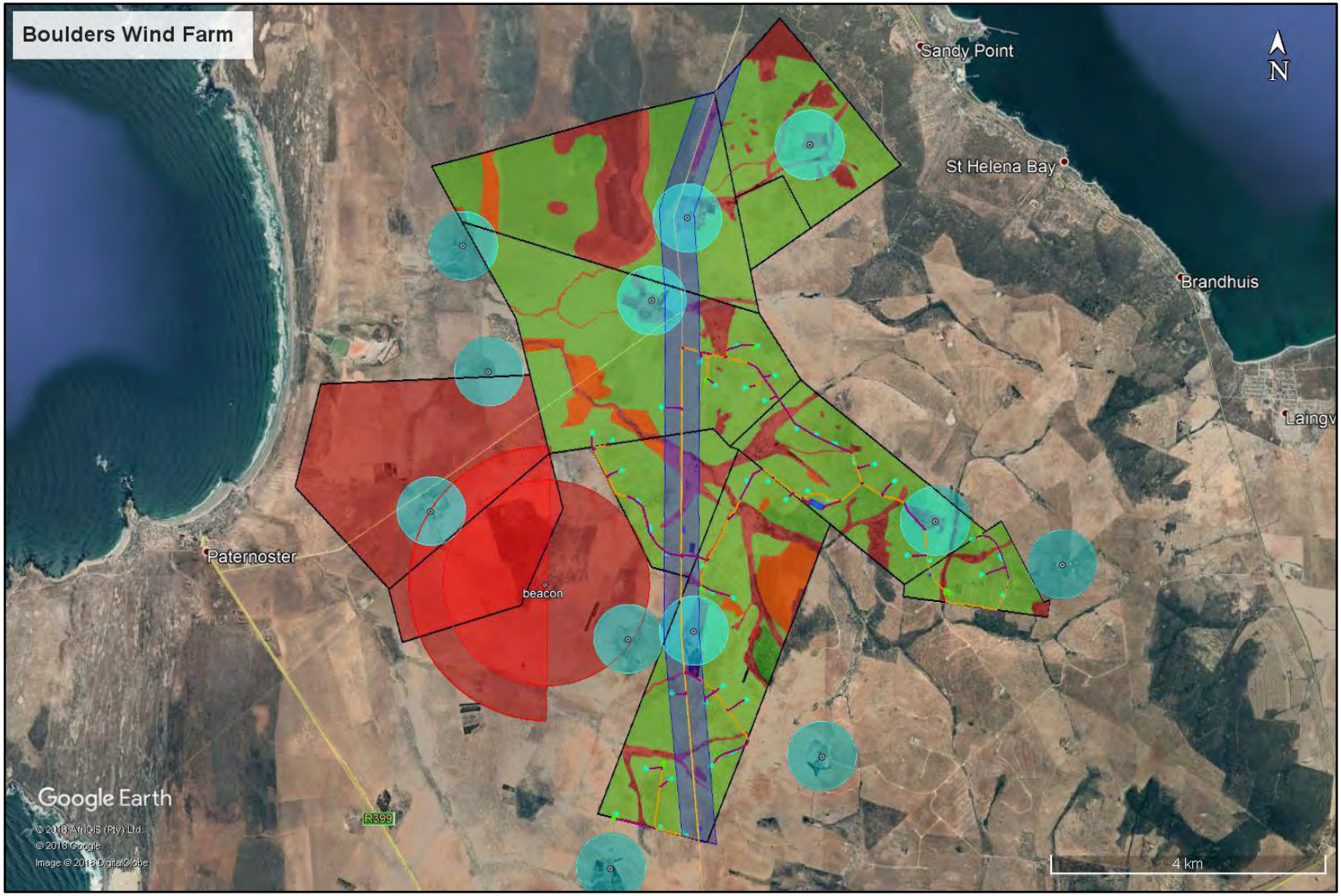

Figure 5. Revised buffers proposed for known heritage sites on the Vredenburg Peninsula for the development of the Boulders Wind Farm (Halkett and Hart, 2019).

4.1.2 Palaeontological Impact Assessment

A desktop Palaeontological Impact Assessment was completed by Pether (2017) to ascertain the likely impacts on palaeontological resources with the development of the Boulders Wind Farm. According to Pether, while the granitic formations of the Vredenburg Peninsula are unfossiliferous in themselves, it is not impossible that fossils might be found within those rocks. It is, however, far more likely that any fossils uncovered during this development will be located within the Coastal Formations Terrain (Figure 6), which is avoided by the wind farm layout. These deposits comprise the Miocene formations in the north of the study area at Soetlandskop on SchuitjiesKlip 1/22 and 3/22, and the Pliocene to Recent formations to the west, which form the infill of the Uitkomst Embayment, on UitkomstRE/6/23. According to Pether (2017) the Coastal Formations Terrain is of **HIGH** palaeontological sensitivity and the potential impact of the proposed development in that area is **HIGH**.

The revision of the proposed layout at (Layout Alternative 1) Phase and the more recent layout change (Layout Alternative 2), however, removed any infrastructure from this palaeontologically sensitive area. All turbines are now proposed for the area underlain by the unfossiliferous Vredenburg Pluton. As such, the development footprint can be considered of **LOW** palaeontological sensitivity, and the potential impact of the proposed development in that area is **LOW**.

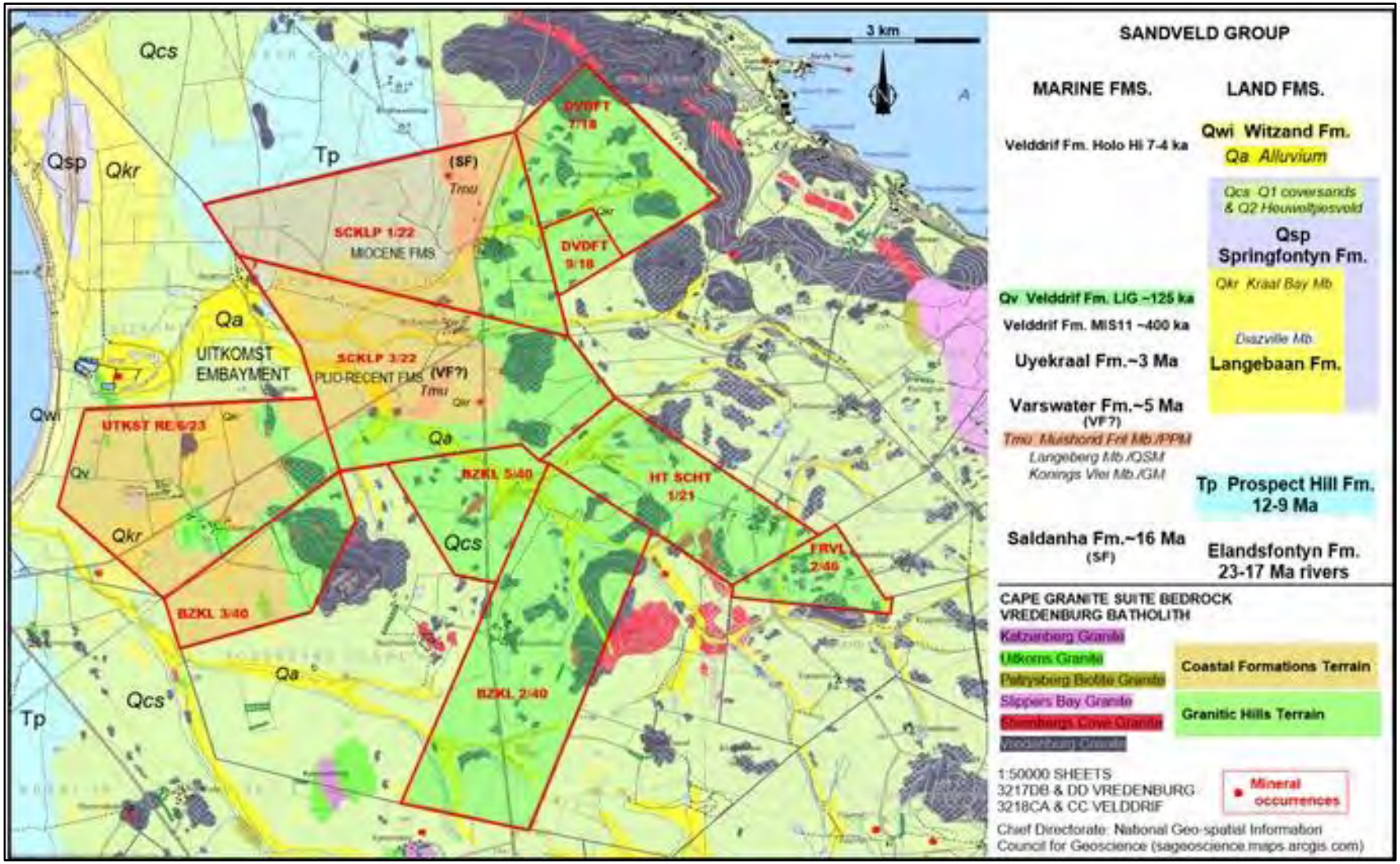

Figure 6. Mapping of Palaeontologically sensitive Coastal Formations Terrain (Pether 2017).

4.1.3 Visual Impact Assessment

A Visual Impact Assessment (VIA) was conducted by Lourens du Plessis (2019). Aspects of this report relating to tangible and intangible heritage resources, i.e. Kasteelberg and the historic town of Paternoster, and the rural cultural landscape, respectively are considered here. This assessment noted that the study area ranges from sea level at the coast to approximately 270m above sea level at its highest point, with the terrain consisting of moderately undulating plains to the west and plains to the east, and several hills such as Patrysberg, adjacent to the R399, Klipheuwel and Kasteelberg.

The VIA determined that the receiving environment generally has a high tourism value and tourism potential based on the presence of well-known holiday towns, such as Paternoster, Britannia Bay, Stompneus Bay and St. Helena Bay, as well as tourist access routes. These roads, including the Vredenburg-Paternoster road, the Vredenburg-Stompneus road and the Paternoster-Stompneus road, can be considered to have high scenic value, although none is a promulgated scenic route.

The VIA determined that the development and operation of the proposed Boulders WEF will likely have a visual impact on several potentially sensitive visual receptors, and this impact will be **high** within 5-6km of the facility, but could extend beyond this radius (Figure 7). The visual receptors identified as susceptible to this impact will include commuters and tourists travelling along the local arterial and secondary roads, specifically the Vredenburg-Stompneus and Paternoster-Stompneus roads, as well as residents and visitors to local towns and residents on farms in the area. While the visual sensitivity is reduced over distance, the presence of several large towns, many of which are popular tourist destinations, in the wider area increase the number of receptors, while specific concerns were raised over views of the turbines from the historic town of Paternoster and its beach.

The report notes the possibility **high** visual impact to the Kasteelberg site, the cultural landscape and the perceived sense of place related to this feature. The impact is anticipated along the Vredenburg-Stompneus Bay road where the turbines will interrupt observers' views of the hill and the coast at Paternoster. It is proposed that the relocation of the 13 turbines east of the road would change this impact to **low**. Further heritage receptors include the historic farmsteads in the vicinity, the scenic qualities of the local roads and the sense of place of the wider cultural landscape. The impacts to these various receptors are variable depending on the location, proximity and visibility of the WEF relative to their position (Figure 7).

In terms of cumulative impacts, when considered in conjunction with the West Coast 1 facility, the study found the Visual Absorption Capacity of the receiving environment to be low, as a result of the vegetation

and open vistas that are largely uninterrupted by urban development. This combined with the height of the proposed wind turbines results in unavoidably **HIGH** visual intrusion. It was also noted that the landscape is close to, if not already visually saturated and can possibly not accommodate the additional turbines without irrevocably changing the cultural landscape. Further to this, the greater size of the Vredenburg turbines makes them far more imposing and intrusive when viewed from the same distance as West Coast 1 turbines, and generally more visible when viewed at a distance.

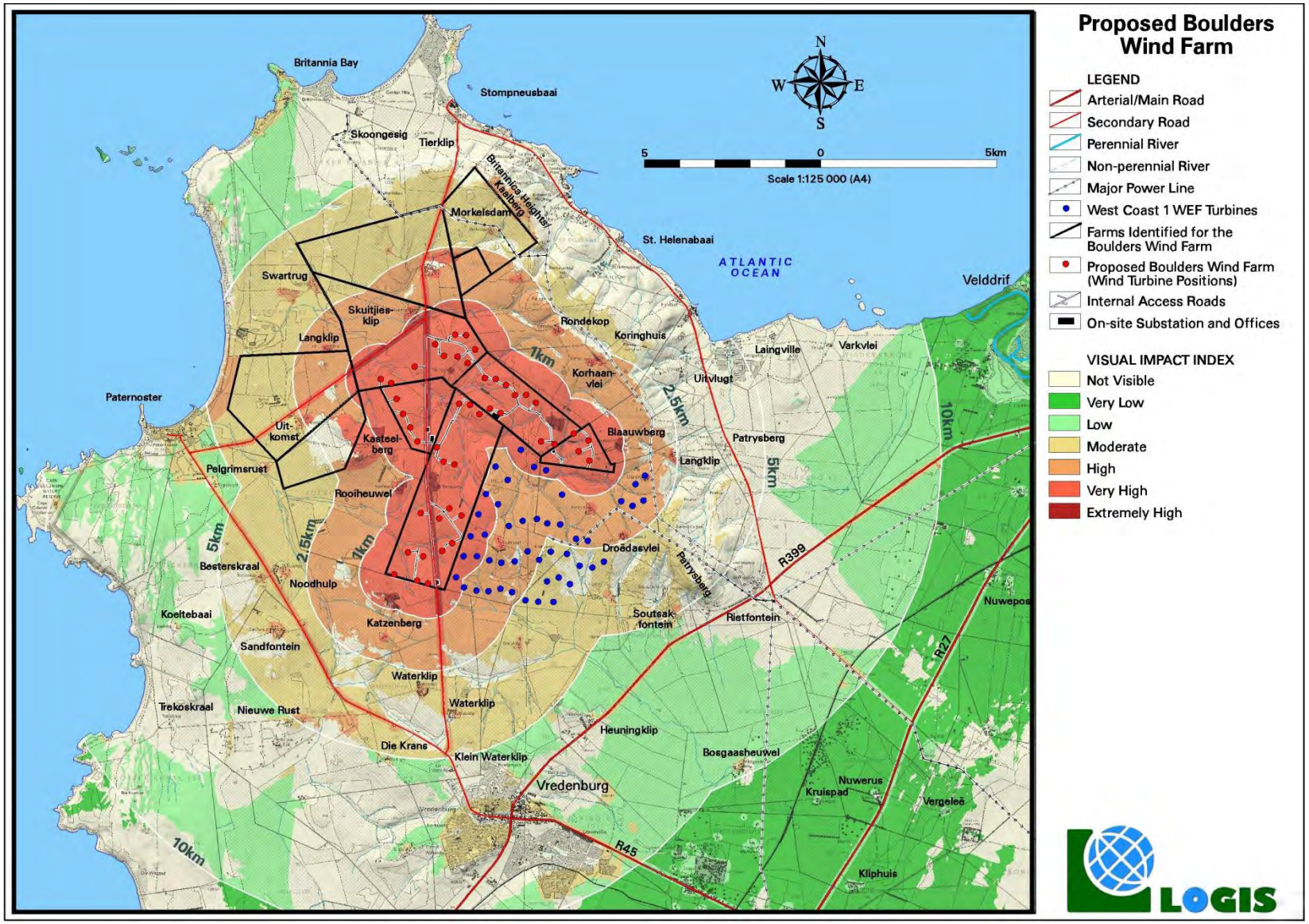

Figure 7. Visual Impact Index of the proposed Boulders Wind Farm; old layout indicated (du Plessis, 2019).

4.2 Heritage Resources identified

The following section is based on a combination of the research and desktop analysis undertaken during the Scoping Phase and site visits conducted by the various specialists. The palaeontological assessment was undertaken at a desktop level, and is supported by the detailed literature sources available.

4.2.1 Palaeontology

In terms of palaeontology, the identified fossil-bearing deposits within the project site are located within the western Coastal Formations Terrain, which is of high palaeontological sensitivity and high heritage significance. Deposits within this terrain are found at Soetlandskop, on SchuitjiesKlip 1/22 in the north of the study area, and are known to include the late-Miocene Prospect Hill Formation, but may also include Saldanha Formation mid-Miocene phosphatic deposits. The early Pliocene Varswater Formation may also be present on SchuitjiesKlip 3/22, together with the mid-Pliocene Uyekraal Formation, and the Pliocene to Quaternary Langebaan Formation. Further to this, the Quaternary Velddrif Formation is mapped on the geological maps on Farm Uitkomst RE/6/23, although its presence here has not yet been confirmed. The proposed development footprint is restricted to the unfossiliferous Vredenburg Pluton.

4.2.2 Archaeology

In addition to the five days of field survey conducted for the compilation of the Archaeological Impact Assessment, extensive use was made of previous surveys of the area by Sadr et al (1992), conducted for research purposes (Tables 1 and 2), and Halkett and Webley (2011; 2015) that were undertaken for the purposes of a previous wind energy development. This extensive coverage of the area, both for research and previous WEF developments means that the area has been comprehensively surveyed from an archaeological point of view.

While there are some 550 heritage resources within a 20km radius of the proposed project site, only 33 known sites exist within the properties earmarked for the siting of the WEF (Tables 1 and 2). All of these are archaeological in nature and ungraded, with the exception of a single ruined nineteenth century structure of rough calcrete blocks and mud-brick at the base of the Kasteelberg koppie that has been graded IIIb (Figure 8 below). The concentration of sites associated with Kasteelberg itself falls outside of the study area (Figure 9 below). Historical structures occur at the farmsteads of Rooiheuwel and Klipheuwel, while those on Boesakskraal and Frans Vlei have been substantially altered.

Table 1: Archaeological sites known within the proposed WEF project site.

SAHRIS ID	Site No.	Site Name	Site Type	Grading
91577	KAST18	Kasteelberg Kopje 18	Structures	Grade IIIb
92340	BSK1	Karim Sadr Vredenburg Survey - BSK1	Archaeological, Artefacts	Ungraded
92341	BSK2	Karim Sadr Vredenburg Survey - BSK2	Archaeological, Artefacts	Ungraded
92342	BSK3	Karim Sadr Vredenburg Survey - BSK3	Archaeological, Artefacts	Ungraded
92394	KFS1	Karim Sadr Vredenburg Survey - KFS1	Archaeological, Artefacts	Ungraded
92395	KFS10	Karim Sadr Vredenburg Survey - KFS10	Archaeological, Artefacts	Ungraded
92396	KFS11	Karim Sadr Vredenburg Survey - KFS11	Archaeological, Artefacts	Ungraded
92397	KFS12	Karim Sadr Vredenburg Survey - KFS12	Archaeological, Artefacts	Ungraded
92398	KFS2	Karim Sadr Vredenburg Survey - KFS2	Archaeological, Artefacts	Ungraded
92399	KFS3	Karim Sadr Vredenburg Survey - KFS3	Archaeological, Artefacts	Ungraded
92400	KFS4	Karim Sadr Vredenburg Survey - KFS4	Archaeological, Artefacts	Ungraded
92401	KFS5	Karim Sadr Vredenburg Survey - KFS5	Archaeological, Artefacts	Ungraded
92402	KFS6	Karim Sadr Vredenburg Survey - KFS6	Archaeological, Artefacts	Ungraded
92403	KFS7	Karim Sadr Vredenburg Survey - KFS7	Archaeological, Artefacts	Ungraded
92404	KFS8	Karim Sadr Vredenburg Survey - KFS8	Archaeological, Artefacts	Ungraded
92405	KFS9	Karim Sadr Vredenburg Survey - KFS9	Archaeological, Artefacts	Ungraded
92432	SKK-KS1	Karim Sadr Vredenburg Survey - SKK1	Archaeological, Artefacts	Ungraded
92433	SKK-KS2	Karim Sadr Vredenburg Survey - SKK2	Archaeological, Artefacts	Ungraded
92434	SKK-KS3	Karim Sadr Vredenburg Survey - SKK3	Archaeological, Artefacts	Ungraded
92435	SKK-KS4	Karim Sadr Vredenburg Survey - SKK4	Archaeological, Artefacts	Ungraded
92436	SKK-KS5	Karim Sadr Vredenburg Survey - SKK5	Archaeological, Artefacts	Ungraded
92437	SKK-KS6	Karim Sadr Vredenburg Survey - SKK6	Archaeological, Artefacts	Ungraded
92438	SKT1	Karim Sadr Vredenburg Survey - SKT1	Archaeological, Artefacts	Ungraded
92440	SWR-KS1	Karim Sadr Vredenburg Survey - SWR1	Archaeological, Artefacts	Ungraded
92441	SWR-KS2	Karim Sadr Vredenburg Survey - SWR2	Archaeological, Artefacts	Ungraded
92458	UTK1	Karim Sadr Vredenburg Survey - UTK1	Archaeological, Artefacts	Ungraded
92459	UTK2	Karim Sadr Vredenburg Survey - UTK2	Archaeological, Artefacts	Ungraded

92460	UTK3	Karim Sadr Vredenburg Survey - UTK3	Archaeological, Artefacts	Ungraded
92461	UTK4	Karim Sadr Vredenburg Survey - UTK4	Archaeological, Artefacts	Ungraded
92462	UTK5	Karim Sadr Vredenburg Survey - UTK5	Archaeological, Artefacts	Ungraded
92463	UTK6	Karim Sadr Vredenburg Survey - UTK6	Archaeological, Artefacts	Ungraded
92464	UTK7	Karim Sadr Vredenburg Survey - UTK7	Archaeological, Artefacts	Ungraded
92465	UTK8	Karim Sadr Vredenburg Survey - UTK8	Archaeological, Artefacts	Ungraded

4.2.2.1 Stone Age Sites

The majority of the identified archaeological occurrences are Late Stone age sites. These are usually identified by varying quantities of marine shell residues sometimes with associated stone artefacts and pottery. Stone artefacts are generally non-formal except for grindstones and hammerstones (Plates 1-3). Cores and occasional scrapers are noted but are not common. A single site (2011/327) appears to date to the Middle Stone Age. As with the Historical sites, LSA sites are sometimes associated with "waterbakke".

4.2.2.2 Built Environment

Of the archaeological occurrences identified during field survey, 4 contain built environment elements. None of these occurrences was considered significant.

2011/306 is the foundation of a ruined three-roomed structure approximately 15m long located on a granite outcrop, with an associated dump containing 19th C ceramics, glass, bone. Marine shell was also noted. Sites 2011/307 and 2011/308 are associated ruinous foundations of small structures where 19th c artefacts were also scattered about. All are associated with natural water reservoirs in the granite outcrop ("waterbakke"). 2011/326 is a ruined vernacular farm building.

4.2.2.3 Cemeteries

A single small farm cemetery with formal graves (2011/329) was found under a stand of bluegum trees on Portion 1 of Farm Het Schuytje 21, while a number of informal calcrete "arrangements" representing possible historical graves (2011/309) was observed on Portion 3 of Farm SchuitjesKlip 22. The graveyard contains two graves with marble headstones, both containing 2 people. According to the inscriptions, one grave contains Jacobus Lombard (died September 1891) and Jacomina Lombard (daughter, died May 1922). The other grave contains Benjamina Lombard (wife of Jacobus, died 10 August 1910) and Jacomina Pienaar (died 29 August 1910). Jacobus Lombard's grave is walled, and the cemetery is fenced but neglected.

Table 2: Sites identified in field surveys

Site Number	Description	Site Type	Significance
2011 Survey			
2011/302	Ephemeral LSA shell and stone scatter on calcretised "heuweltjie" in a ploughed field. Quartz, silcrete, quarzite and other flakes and chunks. 1 core and I broken and flaked Lower grindstone fragment. Shell consists of very sparse black mussel fragments.	Archaeological, Artefacts	Ungraded
2011/303	LSA Stone artefact scatter in a ploughed field. Quartz and silcrete predominant and likely to be an extension of Sadr's site SWR 2 where shell was not apparent. Another Sadr site, SWR 1, lies a little further to the south on the same granite koppie, and it has a denser stone artefact and shell scatter.	Archaeological, Artefacts	Ungraded
2011/304	Very ephemeral LSA quartz artefact scatter in heavily ploughed land near a stream. Stone consists of a handful of quartz chips, chunks and flakes from a large area. 1 fragment of black mussel observed.	Archaeological, Artefacts	Ungraded
2011/305	Thjs is in fact Sadr's site SKK 5, but more precisely positioned. LSA shell and stone artefact scatter on and amongst granite outcroppings in a ploughed field.	Archaeological, Artefacts	IIIc
2011/306	Foundation of a ruined structure on a granite outcrop. Approximately 15m long (3 rooms) with associated dump containing 19th C ceramics, glass, bone. Marine shell also noted. Sites 307 and 308 are associated. All are associated with natural water reservoirs in the granite outcrop ("waterbakke").	Structure	IIIc
2011/307	Foundation of a small ruin associated with site 306. 19th c dump material scattered about.	Structure	IIIc
2011/308	Foundation of a small ruin associated with site 306. 19th c dump material scattered about.	Structure	IIIc
2011/309	A number of informal calcrete "arrangements" representing possible historical graves on a soily mound area near to sites 306, 307, 308.	Burial Grounds & Graves	IIIa
2011/310	This is believed to be Sadr's site SKK 2, but more precisely positioned. Extensive LSA shell and stone artefact scatter around granite outcroppings. Associated with the "waterbakke".	Archaeological, Artefacts	IIIa
2011/311	This is believed to be Sadr's site SKK3, but more precisely positioned. LSA Shell and stone scatter.	Archaeological, Artefacts	IIIc
2011/312	Very ephemeral LSA scatter in ploughed land near a stream. A few quartz and quarzite flakes and a few black mussel shell fragments.	Archaeological, Artefacts	Ungraded

2011/313	Ephemeral LSA shell and stone scatter in heavily ploughed field. Black mussel and limpet fragments with a few quartz pieces.	Archaeological, Artefacts	Ungraded
2011/319	Ephemeral LSA shell scatter, black mussel/ limpets in ploughed land. Some whole shell. Also some 19th c glass and ceramics.	Archaeological, Artefacts	Ungraded
2011/320	Ephemeral LSA Shell scatter (limpets) with a few quartz flakes near an old farmstead and low granite outcrop. Disturbed area at a gate in the corner of a ploughed field.	Archaeological, Artefacts	Ungraded
2011/321	Ephemeral LSA scatter in ploughed land. No whole shell seen and no stone artefacts observed. Just off the edge of a limestone/calcrete ridge.	Archaeological, Artefacts	Ungraded
2011/322	Extensive ephemeral shell with similar context as site 321. No stone seen but 1 pot fragment was noted.	Archaeological, Artefacts	Ungraded
2011/323	Very ephemeral LSA shell (limpet and mussel) and stone (quartz and quartzite) scatter. Very disturbed area near a gate and water trough in the corner of a ploughed field.	Archaeological, Artefacts	Ungraded
2011/324	Fairly dense shell scatter in the middle of a ploughed field near the edge of a prominent limestone/calcrete ridge. Appears to be quite discrete (approx 25m diam). Limpet, mussel and whelk of which several whole specimens noted. Pottery fragments. Stone includes an upper grindstone, and a combination upper grindstones/ hammerstones. This may be a series of small sites that have had their edges obscured by ploughing.	Archaeological, Artefacts	IIIc
2011/325	LSA shell and stone scatter in ploughed land. Limpet, mussel and whelk with whole shells seen. Stone includes a quartzite flake and an upper grindstone.	Archaeological, Artefacts	Ungraded
KFS5	One of a series of sites previously identified by Sadr et al. It is an extensive shell and stone scatter in open ploughed land. Probably a series of smaller sites with edges obscured by ploughing. Stone includes quartz, quartzite and silcrete. Pottery was noted.	Archaeological, Artefacts	IIIc
2011/326	Ruinous vernacular farm building	Structure	IIIc
2011/327	Stone scatter in amongst granite boulders. Lots of silcrete and quartz. Much of the material might be of MSA (just outside the farm boundary of WEF)	Archaeological, Artefacts	IIIc
2011/328	Shell and stone scatter in ploughed field. Quite discrete, comprising mussel, limpet and stone artefacts including cobbles (manuports), cores, broken Upper Grindstone.	Archaeological, Artefacts	Ungraded

2011/329	Family graveyard comprising two formal graves with marble headstones. Both graves contain 2 persons. One belonging to Jacobus Lombaard (died Sept 1891?) and Jacomina Lombard (daughter 9yo, died May 192?). The other contains Benjamina Lombard (wife Jacobus - died 10 Aug1910) and Jacomina Pienaar (died 29 Aug 1910) Jacobus' grave is walled. The area is within a fence.	Burial Grounds & Graves	IIIa
2015 Survey			
D001	Scatter of marine shell, approximately 10m diameter with granatina/ granularis/ whelk with some silcrete, quartz, ostrich egg shell, pottery. There is a "klipbak" nearby	Archaeological, Artefacts	Ungraded
D002			
D003			
D004	Scatter of fragmented shellfish granatina/granularis/black mussel/ whelk close to calcrete outcrop. Quartzite flakes and cores and flaked quartzite manuports/cobbles, crypto-crystalline silicate - see also L002-L008	Archaeological, Artefacts	Ungraded
D005			
D006			
D007			
D008			
D009			
D010			
D011			
D012			
D013			
D014			
D015			
D016			
D017			
D018			
D019			
D020			
D021			
D023	Very dispersed fragmented marine shell granatina/ granularis/ argenvillei/ black mussel – see also L009 to L016	Archaeological, Artefacts	Ungraded
D024			
D025			
D026			
D028	Isolated quartz scraper	Archaeological, Artefacts	Ungraded
L001	Small ruined mud dwelling with scatter of marine shell in vicinity	Archaeological, Artefacts	Ungraded
L002	Scatter of fragmented shellfish granatina/ granularis/ black mussel/ whelk close to calcrete outcrop. Quartzite flakes and cores and flaked quarzite manuports/cobbles, crypto-crystalline silicate	Archaeological, Artefacts	Ungraded
L003			
L004			
L005			
L006			
L007			

L008			
L009	Very dispersed fragmented marine shell granatina/ granularis/ argenvillei/ black mussel. Radial core at L013	Archaeological, Artefacts	Ungraded
L010			
L011			
L012			
L013			
L014			
L015			
L016			
L017	Disturbed area with ephemeral shellfish – Granularis/ argenvillei/ black mussel. Also 2 potsherds	Archaeological, Artefacts	Ungraded
L018	Marine shell fragment – granatina with large quartzite manuport	Archaeological, Artefacts	Ungraded
L019	Granite outcrop with "waterbakke"	Natural	Ungraded

4.2.4 Visual Receptors, Scenic Routes and Cultural Landscapes

The roads from Vredenburg to Stompneus Bay and from Paternoster to Stompneus Bay, have historic, scenic and visual qualities (O'Donoghue and Kaplan 2016), particularly in relation to views towards the visually prominent Kasteelberg koppie (Webley et al. 2010). Despite these qualities, none is a formally recognised scenic route, and nor are any of the roads in the surrounding area (Webley et al. 2010; Winter and Oberholzer 2013).

The wider area has been proposed as a Grade II cultural landscape, consisting of scenic rolling hills, agricultural fields and historic farmsteads, layered on top of a Stone Age landscape represented by the numerous archaeological sites found throughout the study area (Sadr et al 1992; O' Donoghue and Kaplan 2016). Heritage receptors, that is heritage resources sensitive to visual impacts, include the historic farmsteads, Kasteelberg archaeological site, and the Vredenburg to Stompneus Bay and Paternoster to Stompneus Bay roads, which have scenic qualities (but are not formally promulgated).

The Saldanha Bay Municipality Heritage Resource Survey Phase One (O' Donoghue and Kaplan 2016) attributed Grade II cultural significance to the cultural landscape of the study, and Grade III significance to the scenic routes within it. While these proposed gradings have been supported by HWC, they have not as yet, been ratified. Nonetheless, the entire area can be considered a cultural landscape. These generally undeveloped landscapes are considered to have a high visual quality. The coastal areas have an even greater visual attraction due to their ocean views and West Coast character. This landscape has, however, been affected by rampant development, particularly in and around the coastal towns. There have been insensitive interventions on Kasteelberg koppie itself, in the form of the erection of telecommunication

towers. Most significant, however, is the establishment of the existing West Coast 1 WEF, a Wind Energy Facility comprising 47 turbines that is located immediately to the south east of the proposed project site. The area around Kasteelberg and, significantly, the area west of the Vredenburg-Stompneus Bay road are currently free of visual intrusion from turbines.

The Visual Impact Assessment (du Plessis, 2019) identified that the wind turbines would likely be exposed to residents and tourists in the area travelling along the R399, the Paternoster to Stompneus Bay Road, the Vredenburg to Paternoster Road and the Vredenburg to Stompneus Bay Road. Further to that, it will be visible to towns and farmsteads in the region, including Paternoster, St Helena Bay and Saldanha. This visibility will have the greatest impact closest to the development, with lesser impact experienced at greater distances.

The heritage receptors within 1km of the WEF (**extremely high** visual impact zone) include the historic farms of:

- Rooiheuwel
- Boebezakskraal
- As well as observers travelling along the:
- Vredenburg-Stompneus Bay Road
- Paternoster-Stompneus Bay Road

Heritage receptors 1-2.5kms from the WEF (**very high** visual impact zone) include the historic farms of:

- Klipheuwel
- Fransvlei

As well as the archaeological site:

- Kasteelberg

Heritage receptors 2.5-5kms from the WEF (**high** visual impact zone) include observers travelling along the:

- Vredenburg-Paternoster (R399) arterial road

The Visual Impact Assessment notes, however, that viewer incidence is generally low within a 5km radius of the proposed WEF. The low number of receptors can be considered to reduce the likely impacts to the sense of place, which is a primary consideration in terms of visual impacts to heritage resources generally. Impacts to these features can alter the visual landscape sufficiently to change, and detract from the user experience of that environment. However, it should be noted that the cultural landscape as a specific type of heritage resource is of intrinsic value and not dependent on visual receptors.A significant factor to consider in this assessment, with regard to visual receptor numbers is that Kasteelberg, although a

significant heritage resource, is located on private land and only accessible through prior arrangement with the landowner. Further, the existing turbines of West Coast 1 WEF do not appear to have affected the popularity of the Vredenburg Peninsula and coastal holiday towns, which would indicate minimal change to the sense of place, even along the coastline (Ibid.).

4.3 Mapping of Heritage Resources

Figure 8. Map of recorded heritage resources within the proposed Boulders Wind Farm, with site numbers (see Table 1).

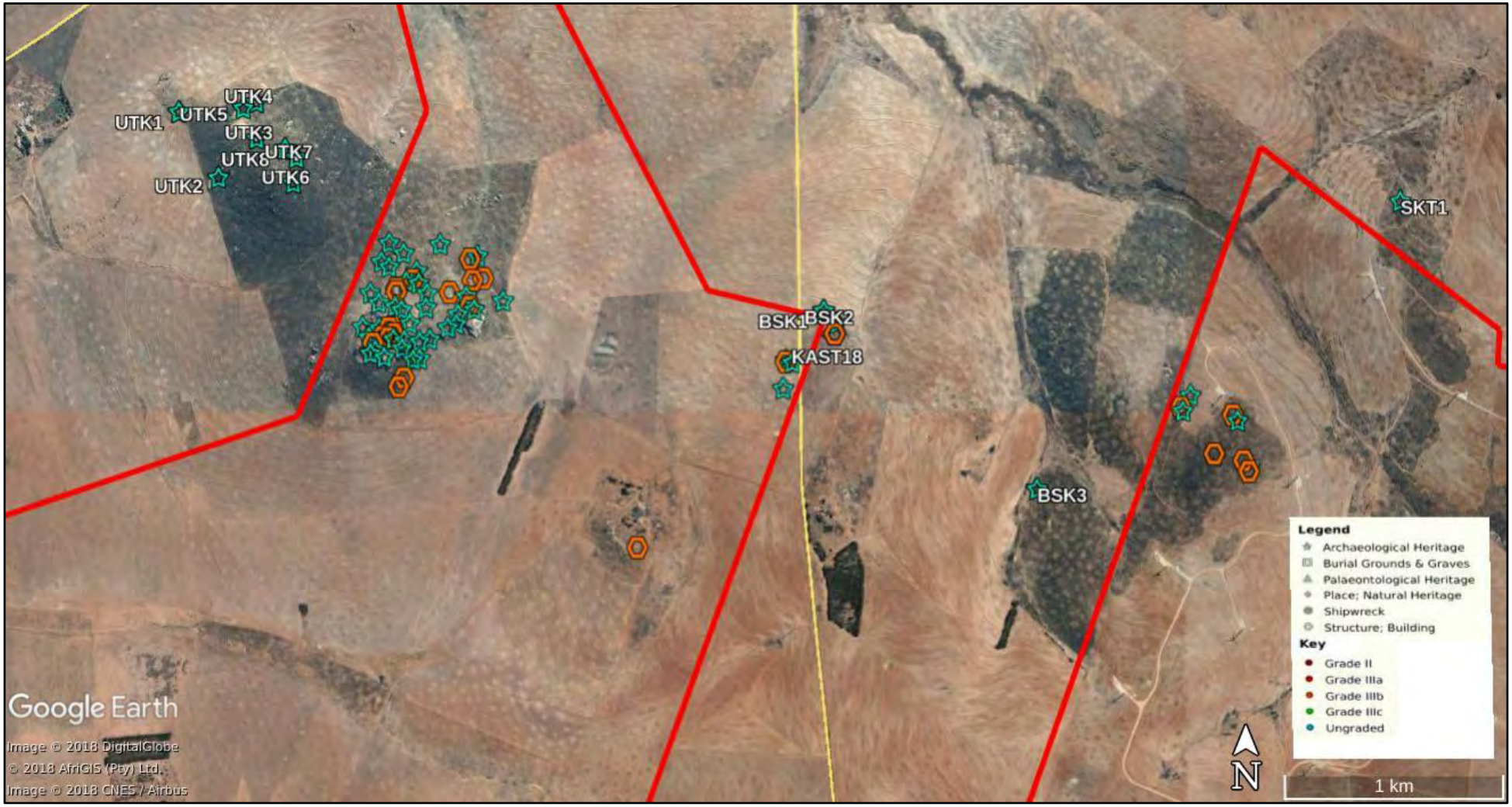

Figure 9. Close up of the Kasteelberg Sites Complex relative to proposed project site.

Figure 10: Sites identified during field survey

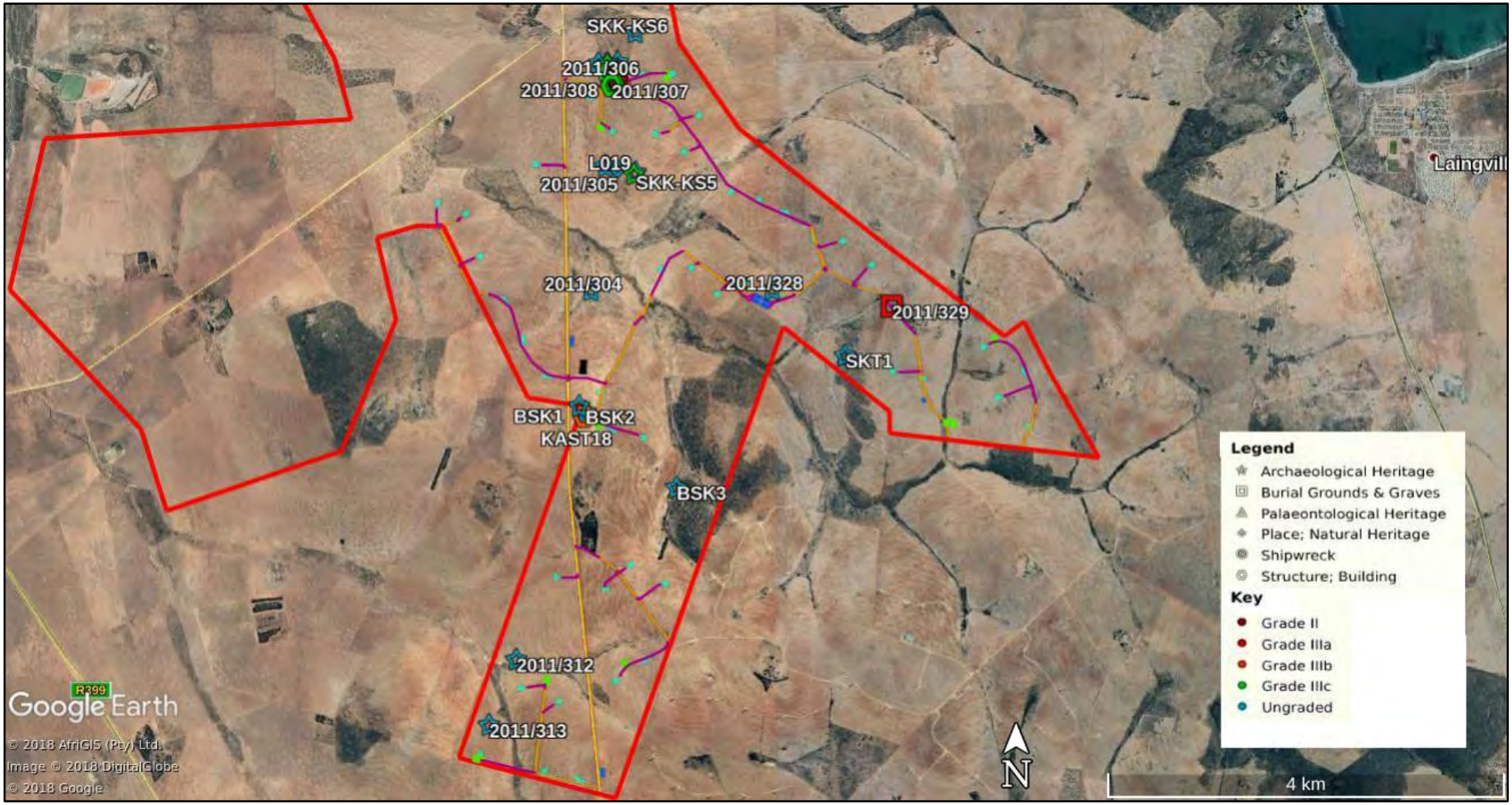

Figure 11a. All identified sites relative to the proposed Boulders Wind Farm layout.

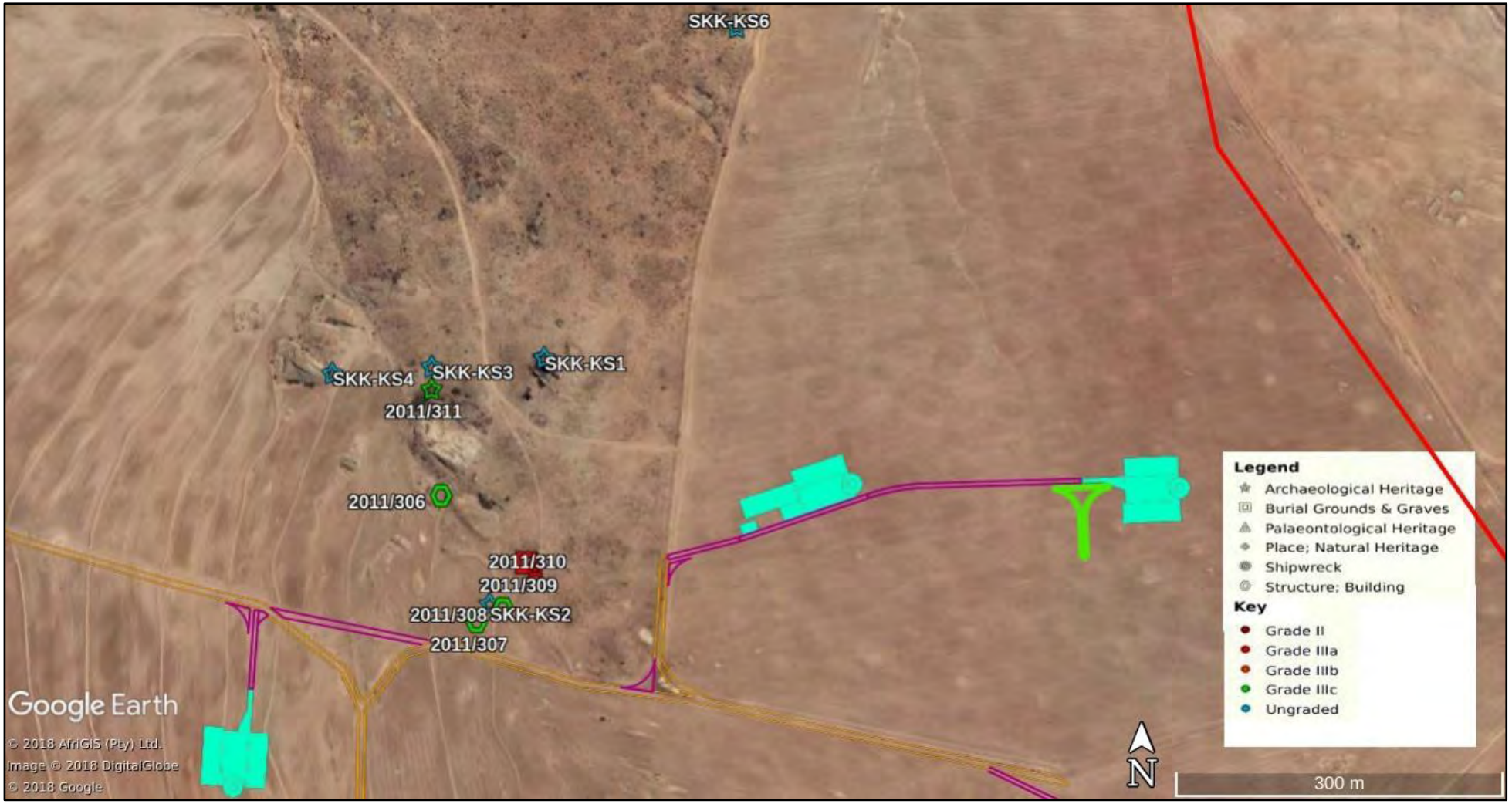

Figure 11b: Inset map showing extent of northernmost sites relative to the layout.

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of Impact to Heritage Resources

Impacts to heritage resources are expected during the construction and operation phases, with different resource types vulnerable at different stages.

5.1.1 Impacts to Palaeontological Heritage

The Project Site is mostly comprised of the Granitic Hills Terrain of low palaeontological sensitivity where the potential impact is low. The Scoping Phase PIA (Pether 2017) noted that the Coastal Formations Terrain in the western portion of the original Project Site is of high sensitivity where the potential impact would be **high**, and the construction of the proposed Boulder Wind Farm would entail excavation into bedrock, resulting in a **direct**, negative impact on palaeontological/scientific heritage. Mitigation proposed at the scoping phase entailed inspection of any excavations into the Coastal Formations Terrain by a suitably qualified palaeontologist, which would result in **positive impacts** as this development could yield scientifically important fossil samples that would otherwise not be readily available for study. Furthermore, it was noted that the possible positive contributions of excavations into bedrock meant that there are no no-go areas proposed (Ibid.).

This outcome was noted, facilitating a change in the proposed turbine placement to avoid the potentially sensitive deposits located in the western extent of the Project Site. As such, given the placement of the turbines exclusively on those areas identified as being underlain by low fossil sensitivity granitic formations, **no impacts** to significant palaeontological resources are anticipated (Table 3). In order to prevent any unintended damage to fossil material occurring in the wider area during the construction phase, it is recommended that a Chance Finds Procedure be implemented during construction and included in the EMPr.

Table 3. Impacts on palaeontological resources

Nature: Excavations into the bedrock may expose and destroy palaeontological resources of scientific value. Impacts to palaeontology are not expected as the proposed layout has been designed to avoid areas considered to be of a high palaeontological value		
	Without mitigation	With mitigation
Extent	Low (1)	Low (1)
Duration	Permanent (5)	Permanent (5)

Magnitude	Small (0)	Small (0)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (6)	Low (6)
Status	Neutral	Neutral
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation:	As the design of the development footprint avoids the palaeontologically sensitive deposits located in the wider Project Site, and is restricted to the unfossiliferous granite hills, no impacts are expected and no mitigation is necessary. Given the proximity of potentially fossiliferous deposits to the development footprint and the consequent possibility of fossils being encountered during construction activity, a Chance Fossil Finds Procedure should be implemented and included in the EMPr.	
Residual impacts:	Permanent loss of scientific value related to palaeontological resources.	

5.1.2 Impacts to Archaeological Heritage

No impacts are expected to occur for either the operation or closure phase of the proposed development, and any impacts that do occur will be limited to the construction phase of the wind farm. The Scoping Phase report (Hart et al. 2017) identified that, given the abundant archaeological resources found in the area, the potential impacts are **high**, where these are not avoided, resulting in a **direct**, negative impact on archaeological resources through disturbance and destruction of sites during ground clearing and installation of infrastructure. Possible **indirect** impacts could arise through encroachment on sites and loss of sense of place, as well as environmental degradation that could damage sites, i.e. through dust accumulation, erosion, etc. Additional people on site during the construction phase can also result in a loss of archaeological material through intentional or unintentional damage. The report further identified that the **impacts to archaeology would be low if significant sites are avoided** (Ibid.). As the layout of the proposed wind farm has taken into account and avoids the various heritage resources identified as significant and vulnerable, it is viewed as unlikely that any such resources will be impacted as a result of the development (Tables 4-7).

Table 4. Impacts on physical archaeological resources

Nature: Impacts on physical archaeological sites during the construction of the Boulders Wind Farm and associated infrastructure. Impacts on archaeology are not expected as the proposed layout has been designed to avoid sensitive areas.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (24)	Low (16)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes, should the sensitive archaeological sites not be avoided.	Yes, should the sensitive archaeological sites not be avoided
Can impacts be mitigated?	Yes	Yes
Mitigation:	Every effort has been made to design the layout to avoid sensitive areas, however accidental impacts during construction are possible, in which case the find must be reported to an archaeologist/Heritage Western Cape for assessment and action.	
Residual impacts:	Potential of finding buried archaeological resources or burials during earth moving.	

The complex of archaeological sites on Kasteelberg has been indicated as a no-go area and falls outside the project site as well as the development footprint, and therefore no direct physical impacts on archaeological resources can occur from construction activities. The buffers previously required by Heritage Western Cape with respect to the West Coast 1 WEF were reduced, however, due to the existence of the West Coast 1 turbines in the area, and the failure by HWC to proclaim Kasteelberg a PHS (Halkett and Hart, 2019). The proposed 2km buffer to the west of Kasteelberg has been left unchanged in order to retain the important visual link between Kasteelberg and the coast to the west, which is the most significant element of the relict, archaeological cultural landscape. The buffer on the eastern extent of the koppie has been reduced to 1.5km which still adequately serves to exclude areas of archaeological sensitivity. There will be no impacts to the physical archaeological resources of Kasteelberg koppie. The visual impacts to Kasteelberg have been considered and are discussed below.

Farm werfs and buildings have largely been excluded from any development activities associated with the Boulders Wind Farm (Table 5). A few small ruins were identified and are located in areas to be excluded from development.

Table 5: Impact on physical built environment heritage resources

Nature: Impacts on the physical built environment heritage resources during the construction of the Boulders Wind Farm and associated infrastructure. Impacts to the built environment are not expected as the proposed layout has been designed to avoid sensitive areas.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Minor (2)
Probability	Improbable (2)	Improbable (1)
Significance	Low (24)	Low (8)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes, should the sensitive built heritage resources be damaged or destroyed	No, sensitive built heritage resources have been identified and no infrastructure will impact due to careful layout design
Can impacts be mitigated?	Yes	Yes
Mitigation:	Every effort has been made to design the layout to avoid the sensitive built environment, however accidental impacts during construction are possible, in which case the issue must be reported to an archaeologist/Heritage Western Cape.	
Residual impacts:	No residual impacts are likely to occur to built environment features.	

The Lombard and Pienaar family cemetery (site 2011/329, at S32.80442800 E18.00421500) has been identified as a no-go area, and the alignment of the road that is planned for upgrading should be shifted west to avoid inadvertent impacts to the cemetery (Figure 13). The cemetery is already walled, and enclosed by a camp fence; the road should be moved away from the fence to ensure avoidance of the potential impact.

Figure 12. Lombard and Pienaar cemetery located at the point 329. The existing farm roads are visible and relevant parts of the camp fence in the area shown in yellow. The proposed upgrade alignment (purple). Proposed moderate re-alignment suggested by the archaeologist (white) (Halkett and Hart, 2019).

Unmarked graves are not easily identified in surveys and as a result, if found, they must be dealt with on a case by case basis (Table 6). If found, human remains must be carefully covered and cordoned off but otherwise be left further undisturbed. The find must be reported to the archaeologist who will inspect the remains and assess what action needs to be taken, in consultation with HWC. Some involvement of the relevant Heritage Authority will be required in terms of the legal process to be followed in the case of exhumation. Permits will be required in such cases.

Table 6: Impact on known cemeteries and graves

Nature: Impacts on known cemeteries and graves during the construction of the Boulders Wind Farm and associated infrastructure. Impacts to graves and cemeteries are not expected as the proposed layout has been designed to avoid the sensitive areas.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Moderate (6)
Probability	Improbable (2)	Improbable (2)
Significance	Low (28)	Low (24)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes, should the cemeteries and graves not be avoided	Yes, should the cemeteries and graves not be avoided. The loss will be mitigated by careful recovery and possibly relocation, though a change in context would occur.
Can impacts be mitigated?	Yes	Yes
Mitigation:	Every effort has been made to design the layout to avoid known graves. The new access road proposed near the Lombard graveyard should be moved west to avoid impacts resulting from the construction and use of the road.	
Residual impacts:	There is a low likelihood of uncovering human remains/graves that were not marked on the surface and accidental impacts on such finds during construction are possible. If found, the area must be cordoned and carefully covered with a plastic sheet. The find must be reported to an archaeologist and Heritage Western Cape for assessment and action.	

Table 7: Summary of impacts on physical heritage resources

IMPACT		Without Mitigation	With Mitigation
Construction Phase			
1	Impact on physical Archaeological sites during construction of WEF and infrastructure.	Low (24)	Low (16)
2	Impact on the physical built environment heritage resources during the construction of the WEF and infrastructure.	Low (24)	Low (8)
3	Impact on known cemeteries and graves during the construction of the WEF and the associated infrastructure.	Low (28)	Low (24)

5.1.3 Visual Impacts, Including Cultural Landscapes and Scenic Drives

The development is likely to result in visual impact issues related to heritage resources in the vicinity of the site, and their severity is determined by the relative proximity of features to the development (Tables 8 and 9). The historic farms of Rooiheuwel and Boebezakskraal fall within 1km of any proposed infrastructure as planned in the layout provided. The Paternoster-Stompneus Bay and Vredenburg-Stompneus Bay roads traverse the project site, and the latter road will be utilised as an access road for the development. The farms of Klipheuwel and Fransvlei fall between 1 and 2.5km from the development infrastructure, as does the site of Kasteelberg although the koppie is directly adjacent to the project site. The Vredenburg-Paternoster (R399) arterial road is more than 2.5kms away.

Visual impacts, generally, are **high** within close proximity to the WEF (less than 5km away), and are **direct** impacts arising from the visual intrusion of the turbines on the landscape. In terms of heritage resources within these areas of high disturbance, the greatest impact arising from visual intrusion is loss of sense of place and degradation of the significant rural landscape. These factors can have negative impacts on the significance of heritage resources and the cultural landscape that is difficult to mitigate due to the size of the turbines and their visibility in the landscape.

Although it is difficult to quantify the anticipated visual impact of the proposed WEF on the regional sense of place, the relatively low viewer incidence within close proximity to the proposed wind farm can be considered a mitigating factor that reduces the significance of the impact. Further, the existing turbines of the West Coast 1 WEF set a precedent for this type of development in this area, and introduced a new, industrial element into the cultural landscape that detracts from its rural character. Despite the presence of the West Coast 1 turbines, however, the popularity of the Paternoster peninsula and coastal holiday towns does not seem to have diminished since the development of the WEF, which would indicate minimal

change to the sense of place with such mitigation in place, even along the coastline. Further to this, despite the time elapsed since that development, Kasteelberg has still not been proclaimed, and HWC efforts to achieve this appear to have stalled in 2011. This means that the buffers requested by HWC with regard to Kasteelberg are not formalised through gazetting at this point. It should be noted, however, that the VIA (du Plessis, 2019) considers that the landscape may not be able to absorb the additional turbines of Boulders Wind Farm, and that this landscape may have reached saturation from a visual perspective.

In terms of the three roads in the vicinity of the development, the proposed layout takes into account the inherent scenic value of these routes, although it should be noted, again, that neither of these routes is a proclaimed scenic route, and no regulated buffers apply. The Paternoster-Stompneus Bay road falls outside of the project site, and only two turbines (33 and 41) are within 500m of the road in the original revised layout, and only one (41) in the latest revision. The layout, therefore, closely conforms to the original HWC buffers proposed for West Coast 1 (Appendix 2), and far exceeds those proposed by the archaeological specialists for this project. As such, the impacts to this road can be considered acceptable from a visual perspective, and substantial loss of scenic quality is not anticipated. The R399, from Vredenburg to Paternoster, has nine turbines within 5km (11 in the latest layout), and this impact is not expected to reduce the scenic qualities of that road. These turbines will, furthermore, largely be seen against the backdrop of the existing West Coast 1 facility, and are also not likely to intrude substantially on the views of Kasteelberg koppie from the R399.

While 13 turbines are proposed within 500m of the Vredenburg-Stompneus Bay road, less than 8kms of this road (approximately one third of its total length) has turbines within close proximity, i.e. less than 500m.Visual impacts to the scenic qualities of this road, will then be greater than to the Paternoster-Stompneus Bay road, but the extent of that impact will be restricted. Despite these measures, the positioning of turbines to the west of the Vredenburg-Stompneus Bay road, where there are currently none, constitutes an undesirable level of change to the cultural landscape, and an extension of negative impact to an area previously free of turbines. Three points are salient in this regard, however, one being that, in response to the HWC appeal against the West Coast 1 development, the applicant in that instance removed all turbines proposed for west of the Vredenburg-Stompneus Bay road (Appendix 2). The second significant factor in assessing landscapes and visual sensitivities is that cultural landscape significance is an intrinsic quality and neither defined by nor dependent on the number of visual receptors in the landscape. The third is that perceived visual saturation limits are different from the limits of acceptable change from a cultural landscape perspective.

To determine the limits of acceptable change to the cultural landscape, it is necessary to evaluate the significance of the landscape in relation to its rarity and extent. While the Vredenburg Peninsula cultural landscape has Grade II qualities (O'Donoghue and Kaplan 2016), it has not, as yet, been proclaimed as such. Despite the concessions to heritage sensitivities in the measures described above, the positioning of turbines to the west of the Vredenburg-Stompneus Bay road, where there are currently none, represents a **very high** negative impact to the cultural landscape of the Vredenburg Peninsula. Without consideration for the cultural landscape, this would, constitute an unacceptable level of change to that landscape, by extending a negative impact to an area previously free of turbines. The **preferred** recommendation is that all 13 turbines proposed to the west of the Vredenburg-Stompneus Bay road (Turbines 1-3,5, 6, 15, 19, 21, 27, 31, 33,36 and 43) be removed or repositioned in order to mitigate the impact to the cultural landscape.

As the preferred mitigation could render the project fatally flawed in terms of viability, an alternative mitigatory measure has been proposed and adopted by the applicant. This alternative is the relocation of all turbines north of Kasteelberg to the west of the road, and the retention only of those to the south; this is a less desirable outcome than the removal of all westerly turbines, but can be considered an acceptable level of change. This outcome would preserve the integrity of the cultural landscape in a relatively large area, and preserve much of the important visual links between Kasteelberg and the coast, and would constitute a **moderate** impact on the cultural landscape. Travellers along the R399 would largely experience these southerly turbines as a densification of the West Coast 1 turbines already visible, while travellers on the Vredenburg-Stompneus Bay road would still experience much of the view to the west, i.e. the area between Kasteelberg and Stompneus Bay, unobstructed by turbines. The imposition of the HWC buffers, rather than the reduced ones proposed in the AIA (Halkett and Hart, 2019), is not recommended, as this leaves two turbines to the north of Kasteelberg, and three to the south, a layout that would represent a negative impact to the landscape that is out of scale to the extent and quantity of actual infrastructure that would be erected in it.

Indirect impacts could result during the construction phase, but as these are temporary, the impact on heritage resources, including the cultural landscape, is negligible. Impacts from ancillary infrastructure are also considered negligible: the additional new access roads and substation will not be highly visible given the flatness of the landscape.

Table 8. Visual impacts on heritage resources within 5km of the proposed WEF[2]

Nature: Visual impact on scenic qualities of the Vredenburg-Stompneus Bay Road, the Paternoster-Stompneus Bay Road and the built environment heritage of Rooiheuwel and Boebesakskraal farmsteads.			
	Without mitigation (Alternative 1)	Without mitigation (Alternative 2)	With mitigation (Including Preferred Recommendation)
Extent	Local (2)	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)	Long term (4)
Magnitude	Very high (10)	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Highly Probable (4)	Probable (3)
Significance	High (64)	Moderate (48)	Moderate (36)
Status	Negative	Neutral	Neutral
Reversibility	Reversible (1)	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No	No
Can impacts be mitigated?	Yes	Yes	Yes
Mitigation:	**Planning:** Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude. **Operations:** Maintain the general appearance of the facility as a whole. **Decommissioning:** Remove infrastructure not required for the post-decommissioning use of the servitude. Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. All wind turbine positions west of theVredenburg-Paternoster Road (13 in total) must be relocated to the east (or removed).		
Residual impacts:	No residual impacts are envisaged if mitigation is undertaken.		

It is anticipated that the placement of turbines to the west of the Vredenburg-Stompneus Bay road will negatively impact the heritage significance of Kasteelberg by obscuring views of the site from that road, as

2 Distances indicated here are from nearest infrastructure rather than project site.

well as from Paternoster and the coastline towards Stompneus Bay. It is recommended that those turbines be relocated or removed from this location to prevent the resulting negative impacts to the heritage significance of Kasteelberg and the rural cultural landscape. Recognising that this recommendation could prove a fatal flaw in terms of project viability, an alternative option was proposed and adopted by the applicant. This alternative recommends the relocation of only those turbines north of Kasteelberg on the west of the Vredenburg-Stompneus Bay road, which preserves a greater extent of intact cultural landscape than the current proposal, and limits the area of visual impact.

5.2 Cumulative Impacts

Cumulative effects can be understood as the combined impacts of a single activity or multiple activities where the individual impacts from a single development become significant when combined with other impacts within the same area, or from the same type of development (Cooper 2004).

In terms of the palaeontological resources in the area, the cumulative result of coastal developments is the inevitable permanent loss of fossils (Pether 2017). However, with adequate and appropriate mitigation, the successful recovery of fossil material, can add to the body of scientific evidence and knowledge of past palaeoenvironments, faunal evolution in southern Africa and the environmental contexts of our prehistoric ancestors (Ibid.). In this instance, through careful design of turbine placement, there is expected to be no impact to the palaeontological resources of the region, and, therefore, no cumulative impacts will result. (Table 9). With the avoidance of cumulative impacts resulting from this project, it can be considered that the development of all wind farms in the wider region (Figure 14) will not result in unacceptable loss of palaeontological heritage resources.

Table 9. Cumulative impacts to palaeontological resources

Nature: Cumulative impacts to palaeontology are expected to be low as the proposed layout has been designed to avoid sensitive areas		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Low (1)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Small (0)	Small (0)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (6)	Low (6)
Status (positive or negative)	Neutral	Neutral
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	Yes	Yes
Confidence in findings	High	
Mitigation: Areas with high palaeontological sensitivity should be avoided wherever possible, and appropriate monitoring procedures must be implemented where this is not possible. Further, Chance Finds Protocols should be implemented and included in the EMPr to ensure that any fossils encountered during construction activities are reported and managed effectively.		
Residual Risks: Any fossils that might occur in surface exposures in the wider development footprint could be vulnerable during development activities, and their appropriate management is subject to the effective implementation of the Chance Fossil Finds Procedure. Residual risks are considered moderate.		

The cumulative impact to archaeological resources is difficult to measure accurately (Halkett and Webley 2017), although it is important to note that the existing West Coast 1 WEF development was achieved with minimal damage to and destruction of significant archaeological material (Webley et al. 2010). Furthermore, indications are that the accumulative impacts of WEFs to archaeology to date are insignificant in this region, with West Coast 1 the only constructed WEF in the immediate vicinity of the proposed Boulders Wind Farm facility; Isivunguvungu WEF has been authorised but not yet constructed some 20km to the south of the project site and within an industrialised area (Figure 14).

The archaeological resources on the WEF site are limited and of medium to low scientific value, though some are likely contemporaneous with the highly significant sites that comprise Kasteelberg. Significant cumulative physical impacts on the archaeology have already occurred due to agriculture, but sites tend to cluster on and around granite outcrops which are avoided during ploughing and other farming activities. Optimally, sites should be identified and excluded from development, and this has taken place in the design of Boulders WEF facility layout. Due to the nature of archaeological resources, however, it is not always possible to identify every occurrence and so some attrition does occur when buried resources are disturbed. By restricting the development footprint of the WEF to ploughed land, the cumulative impact on archaeological resources is lessened, and considered acceptable (Table 10).

Table 10. Cumulative impacts to archaeological and built environment resources and cemeteries and graves

Nature: Cumulative impacts to archaeological and built environment resources, cemeteries and graves are not expected as the proposed layout has been designed to avoid sensitive areas.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Low (1)	Low (1)
Duration	Short (1)	Short (1)
Magnitude	Low (1)	Low (1)
Probability	Improbable (2)	Improbable (2)
Significance	Low (6)	Low (6)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	Yes	Yes
Confidence in findings	Moderate	
Mitigation: Pre-screening, site survey and later micro-siting of turbines and infrastructure can assist with the identification of significant heritage resources and allow for a responsive layout design and infrastructure placement such that these can be avoided wherever possible. Where heritage resources cannot be avoided, and/or infrastructure cannot be repositioned, appropriate mitigation measures should be implemented to ensure the resources are recorded, protected and/or recovered before destruction		

Residual Risks: There remains residual risk of the chance discovery of unidentified and/or buried archaeological material or graves. Where these resources are encountered, the heritage authorities should be notified immediately.

The most likely cumulative impacts from a heritage perspective will result from the visual intrusion of this WEF on the landscape, and the accumulative presence of other similar developments in the area (Table 12). These impacts will have negative results on the cultural landscape and sense of place in this area, as well as impacts to people living and travelling through the region. Of particular significance here is the established West Coast 1 WEF, which is directly adjacent to the proposed Boulders WEF project site. The construction of the Boulders WEF adjacent to the West Coast 1 facility will result in a collective increase in the density and extent of wind turbines in the immediate area, as well as extending turbines closer to Kasteelberg koppie and the Vredenburg-Paternoster and Vredenburg-Stompneus Bay roads.

The visual exposure of the Boulders layout and the West Coast 1 WEF turbines was analysed in order to determine whether there is a significant correlation between the area of visual exposure of the two layouts, or whether the construction of the Boulders Wind Farm turbines would contribute to the potential cumulative visual exposure of wind turbine structures within the region (du Plessis, 2019). This analysis showed that the visual exposure of both developments appears similar, but that West Coast 1 spread the visual exposure further and more extensively than Boulders Wind Farm will. There is, in fact, very good correlation between the visual exposure of the two facilities with very limited additional exposure created by the development of Boulders Windfarm. The frequency of visual exposure, however, will increase within the area of combined visual exposure, thereby increasing the cumulative visual impact on sensitive visual receptors. This effect is enhanced by the increased height of the Boulders Windfarm turbines which are 50% taller than the West Coast 1 turbines. The increased cumulative impact, and the greater distance at which the taller turbines can be seen, increases the area of impact on the cultural landscape.

The existence of West Coast 1 sets precedent for the presence of the turbines in this environment and serves to moderate the impact by virtue of its established presence. The impact of this initial development – the presence of turbines in an unaltered rural landscape - represents a greater impact on the cultural landscape than the increase in number and coverage of turbines proposed in this development. By expanding the area under turbines, rather than introducing turbines to an area that currently has none, contained geographically and across a continous area, rather than localised in pockets across the region, such that the altered landscape is perceived as a single installation. Further, the agricultural processes that comprise the cultural landscapes will continue within the wind farm area, limiting the disruption even in

the areas where the turbine density is greatest. This model only holds true, however, if the area under turbines expands across adjacent, contiguous areas. The Vredenburg-Stompneus Bay road can be seen as a significant conceptual dividing line in the otherwise continuous landscape of wheatlands, which should, ideally, serve as a westerly boundary for wind turbine placement in this area.

Visual impacts to cultural landscapes are an inescapable outcome of wind farms. The consolidation rather than spreading of wind energy generation infrastructure within the region reduces the geographical extent of impacts on the cultural landscape. Further, reasonable buffers around heritage sites can limit impacts to the significance of heritage resources within the Vredenburg Peninsula that could arise from the resultant densification of turbines and infrastructure. These mitigatory factors however are undermined by the currently proposed placement of turbines to the west of the Vredenburg-Stompneus Bay road where there are currently no turbines, and this layout is not supported. It is recommended that these turbines be removed from the west of that road. Again, as the viability of the project remains at odds with this recommendation, the alternative layout proposed that removes and relocatesonly the turbines north of Kasteelberg constitutes an acceptable level of change in the landscape.

An important element to consider in the assessment of visual impacts on cultural landscapes is the notion of limits of acceptable change. Cultural landscapes cannot be destroyed but their integrity and character can be altered and depleted through inappropriate development. Impacts to the cultural landscape cannot be mitigated, but efforts to contain their spread can contain the impact, provided that the densification does not exceed the visual absorptive capacity of the environment. Due to the very subjective nature of any one person's appreciation for landscape qualities and character, this process of erosion and change is impossible to quantify and defies blanket approaches to setting limits. The degree of erosion is impossible to quantify and universal limits cannot be set. This challenge is exacerbated by the variability across a given region of the interrelated factors that comprise a cultural landscape. Broadly speaking, however, turbines – the most visually intrusive element of wind farm infrastructure – should be positioned so as not to become the visual focus in a landscape at the expense of other elements.

Table 11. Cumulative visual impacts to heritage indicators in the region

Nature: Visual impact on the historic farmsteads, observers on local roads with scenic qualities, the rural cultural landscape and the archaeological site of Kasteelberg resulting from the densification of wind turbines and expansion of area under wind farm infrastructure.			
	Overall impact of Layout Alternative 1 considered in	Overall impact of Layout Alternative 2	Cumulative impact of the project and other projects

	isolation	considered in isolation	in the area
Extent	Local (2)	Local (2)	Regional (3)
Duration	Long term (4)	Long term (4)	Long term (4)
Magnitude	Very High (10)	Moderate (6)	Very High (10)
Probability	Highly Probable (4)	Highly Probable (4)	Definite (5)
Significance	High (64)	Moderate (48)	High (85)
Status (positive or negative)	Negative	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No	No
Can impacts be mitigated	Yes	Yes	Yes
Confidence in findings	Moderate		
Mitigation: Planning: The removal or relocation of specified wind turbine positions.			
Residual Risks: The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed. Failing this, the visual impact on heritage resources and the rural cultural landscape will remain.			

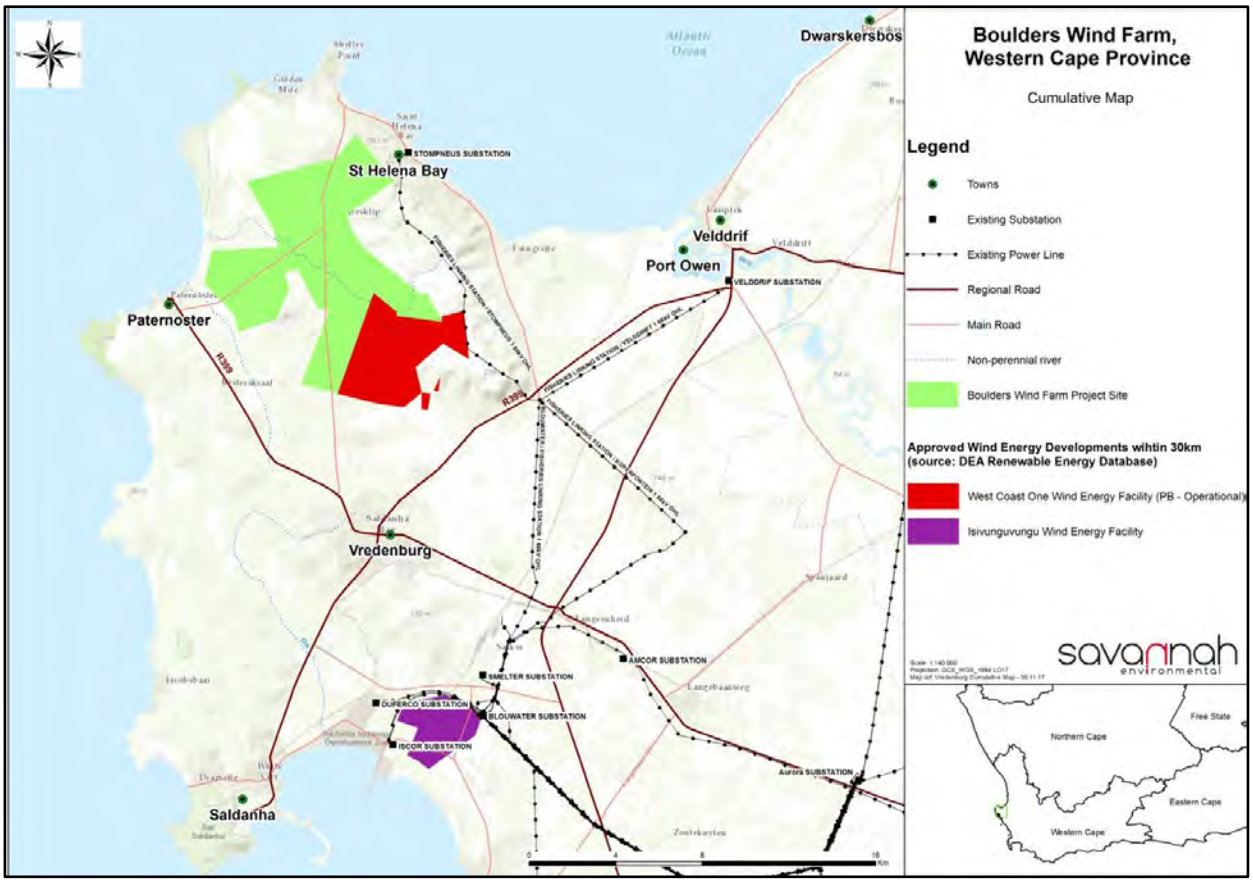

Figure 13. All Wind Energy Facilities located near the Boulders Wind Farm project site.

5.3 Sustainable Social and Economic Benefit

HWC considers the sustainable social and economic benefits of a project as contributory to the overall impacts on heritage as a function of living heritage. Potentially negative impacts to heritage need to be considered in the light of proposed developments that will have great socio-economic benefit and carry the capacity to improve people's welfare. In such instances, it is foreseeable that the value of the project should be considered greater than that of the relevant heritage resources at stake.

A Social Impact Assessment has been undertaken (Barbour and van der Merwe, 2018). This study identified that the development of Boulders Windfarm will generate employment and business opportunities in the construction and operation phases. The study further found that impacts on property values were likely to be negligible, while possible impacts on tourism could result. However, the study noted the need to consider impacts on sense of place resulting from the development and that the relevant authorities should ensure that renewable energy facilities (including wind farms) are appropriately located and do not impact on the areas scenic assets and tourism potential.

The SIA (Barbour and van der Merwe, 2018) supported the outcome of this HIA which found that the most preferable recommendation is for the removal of all turbines west of the Vredenburg-Stompneus Bay road. However, the SIA noted that the project should be seen within the context of the broader socio-economic benefits of renewable projects, in which case the adopted layout that removed the seven turbines west of that road to other locations could be considered an acceptable alternative.

5.4 Proposed Development Alternatives

No development alternatives have been proposed, although several layouts have been put forward. The scoping phase layout was amended to exclude areas north and west of Kasteelberg due to the high heritage significance and palaeosensitivity of those areas. A further layout amendment was derived based on the outcomes of the first drafts of the Heritage and Visual Impact Assessments which recommended the removal of turbines north of Kasteelberg on the west side of the Vredenburg-Stompneus Bay road.

6. CONSIDERATION OF REVISED LAYOUT

6.1 Introduction

Subsequent to the drafting and submission of the HIA for final consideration, prior to circulation for public comment, the applicants have made further alterations to the proposed layout of the windfarm turbines (Layout Alternative 1). This revised layout (Layout Alternative 2) received in November 2018 takes into consideration several sensitivity factors, including heritage sensitivities. This chapter reviews the findings of the HIA and the impact ratings of the newly proposed Layout Alternative 2.

6.2 Approach

The relocation of the seven turbines in terms of Layout Alternative 2 was considered in relation to the heritage resources identified in the study, and the impact of the new turbine placements was assessed with regard to the palaeontological and archaeological heritage resources of the area as well as the Vredenburg Peninsula cultural landscape. As Layout Alternative 2 adopted the alternative recommendation proposed as a result of the outcomes of the first drafts of this HIA, the HIA was updated accordingly.

6.3 Impacts

In response to the high heritage significance of the Kasteelberg koppie within the cultural landscape of the Vredenburg Peninsula, the developers have agreed to remove the seven turbines from the western side of the Vredenburg-Stompneus Bay road where these were proposed for north of Kasteelberg. This proposal, Layout Alternative 2, has resulted in minor densification of turbines to the east of the road where five

turbines have been moved to (Turbines 15, 19, 21, 31 and 33) and the addition of two more turbines west of that road, south of Kasteelberg (Turbines 27 and 43).

Layout Alternative 2 conforms to the suggested second alternative proposed in this report when weighing up possible mitigatory measures that might reduce the impact of the proposed project on the cultural landscape. While turbines are still planned for west of the Vredenburg-Stompneus Bay Road, this configuration limits the extent of the impact the windfarm will have on the cultural landscape, and retains the open veld north of Kasteelberg when viewed from the road (Figures 14 and 15). It also reduces the visual impacts when looking towards Kasteelberg from locations along the coast, particularly Paternoster and its beach, as evidenced in the Visual Impact Assessment (du Plessis, 2019).

In terms of the palaeontological impacts, Layout Alternative 2 has an entirely neutral effect.

It should be noted that Layout Alternative 2 has a slight positive effect on the likely impacts to the physical archaeological resources. The removal of turbines to further from the koppie can only be seen in a positive light, and the retention of open ground to the north of Kasteelberg serves to enhance the archaeological significance of that site by protecting the links between the koppie and its surrounding landscape and thereby retaining its unique sense of place.

The tables below consider the impacts to the cultural landscape of the Layout Alternative 1 compared to those of the Layout Alternative 2. Other heritage resources, i.e. the palaeontological and physical archaeological resources are not negatively affected by the change in layout and are, therefore, not represented in the table.

Table 12. Comparison of impacts from Layout Alternative 1 and Layout Alternative 2 to heritage indicators in the region

Nature: Impacts on the rural cultural landscape and the heritage significance of Kasteelberg resulting from Layout Alternative 1 and 2		
	Overall impact of Layout Alternative 1	Overall impact of Layout Alternative 2
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Very high (10)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)

Significance	High (64)	Moderate (48)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	Yes	Yes
Confidence in findings	Moderate	
Mitigation: The removal or relocation of all wind turbines west of the Vredenburg-Stompneus Bay road remains the preferred means of mitigating the impacts of the development on the Vredenburg cultural landscape and the heritage significance of Kasteelberg within that landscape. Layout Alternative 2, however, in adopting the alternative option and removing all turbines north of Kasteelberg and west of that road does reduce the impacts to within acceptable limits of change.		
Residual Risks: The impact on the cultural landscape will be diminished after decommissioning, provided the WEF infrastructure is removed, but the landscape will remain altered from a physical as well as conceptual (i.e. sense of place) standpoint. If the infrastructure is not removed, the impact on the rural cultural landscape will remain.		

Table 13. Summary of impacts to heritage resources resulting from Layout Alternatives 1 and 2

Heritage, Archaeological and Palaeontological Impacts of both Alternatives (1 & 2)	Significance with Mitigation (Alternative 1)	Significance with mitigation (Alternative 2)
Palaeontological	Low (6)	Low (6)
Archaeological	Low (24)	Low (16)
Heritage – physical built heritage resources	Low (24)	Low (8)
Impact on known cemeteries & graves	Low (28)	Low (24)
Heritage – Visual impact on Sense of Place along scenic routes and farm houses within 5km of the proposed wind farm	High (64)	Moderate (48)
Cumulative Impacts		

Heritage, Archaeological and Palaeontological Impacts	Proposed Development (Alternative 1)	Proposed Development (Alternative 2)	Proposed Dev. + other development
Cumulative Impacts – Palaeontological	Low (6)	Low (6)	Low (6)
Cumulative Impacts – Archaeological	Low (24)	Low (24)	Low (16)
Cumulative Impacts – Sense of Place (Visual)	High (64)	Moderate (48)	High (85)

6.4 Mapping

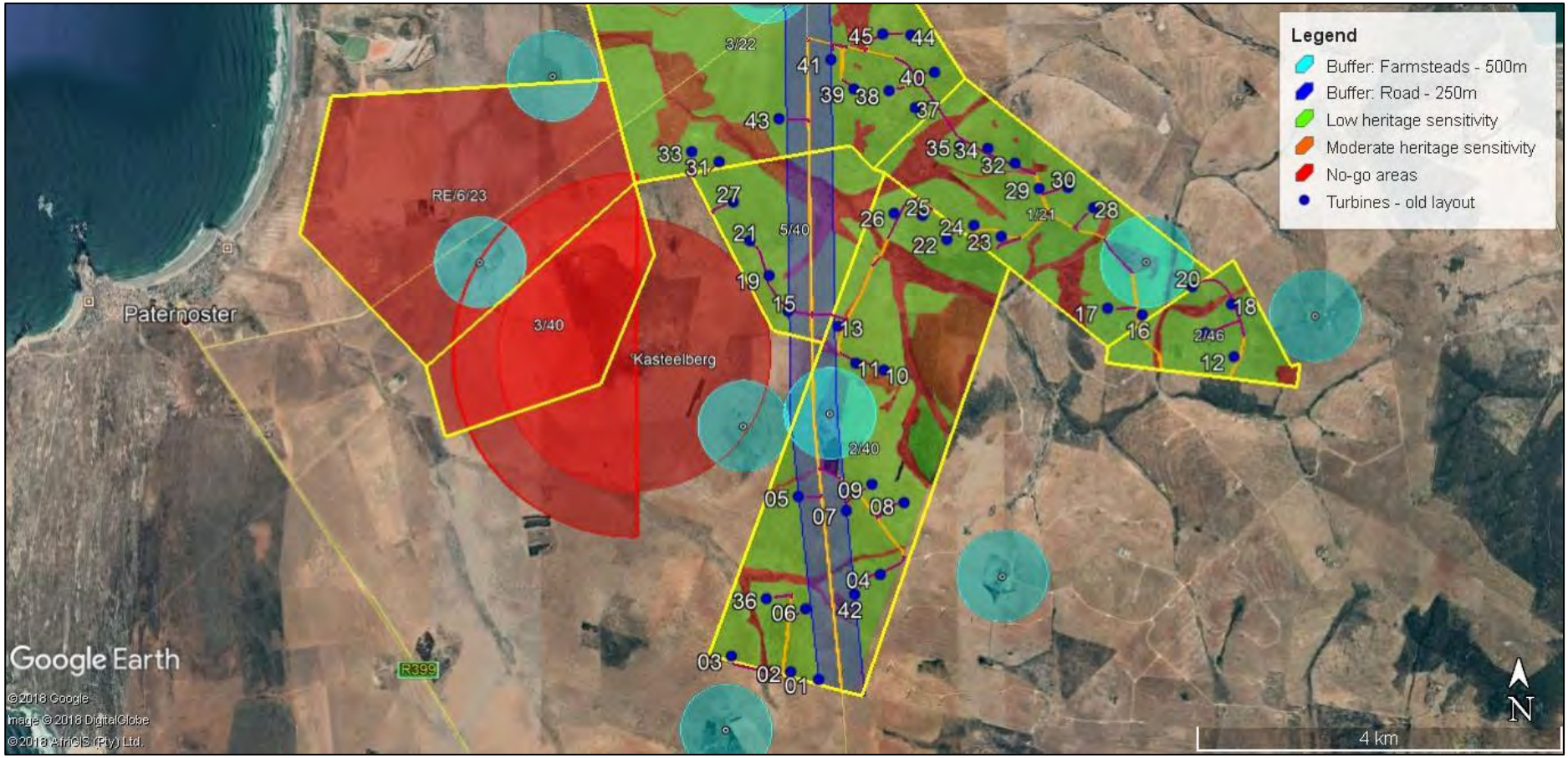

Figure 14. Heritage sensitivity mapping relative to Layout Alternative 1 (adapted from Halkett and Hart, 2019).

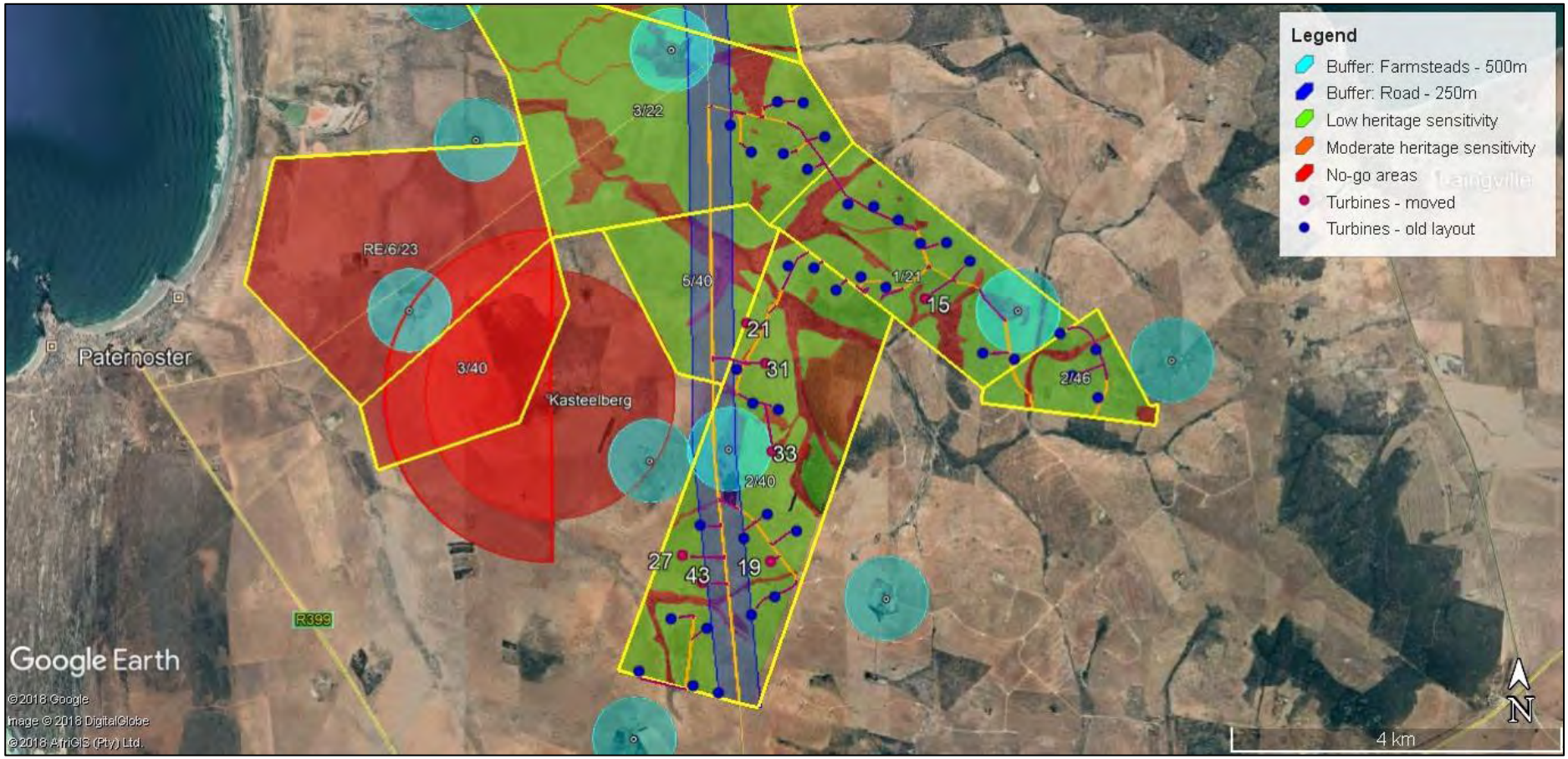

Figure 15. Heritage sensitivity mapping relative to final, revised layout indicating location of moved turbines (Adapted from Halkett and Hart, 2019).

6.5 Recommendation

It is recommended that, provided the stipulations listed in Section 8.2 of this report are followed, the proposed layout be approved.

6.6 Conclusion and Specialist Opinion

In conclusion, then, Layout Alternative 2 has responded to the specialist input made in the draft stage of this process, and has reduced the likely impacts of the proposed development on the cultural landscape. While the first proposed recommendation of the removal of all turbines west of the Vredenburg-Stompneus Bay road remains the best outcome for the cultural landscape, the revised layout serves to reduce and contain the impact of the proposed development on the significant cultural landscape of the Vredenburg Peninsula generally, and the visual and perceived prominence and importance of Kasteelberg koppie within it. This reduces the likely impact of the development to the cultural landscape from **very high to moderate** and falls within the acceptable limits of change to the landscape.

As such, it is the opinion of this specialist that, provided the recommendations below are implemented and incorporated into the EMPr, Environmental Authorisation for this project should be awarded.

7. RESULTS OF PUBLIC CONSULTATION

In compliance with the stipulations regarding public participation in Section (2)(4)(f) and (o) of the National Environmental Management Act (NEMA) (Act 14 of 2009) and Section 38(3)(d) of the NHRA (Act 25 of 1999), public consultation will form part of the EIA Phase of the project, when two phases of public participation are planned. The HIA was reviewed by Heritage Western Cape at an IACom meeting of 12 June and tabled at the APM meeting of 28 June; an interim comment on the report was provided (Appendix 4).

Extensive comment was received from the general public; these comments are provided, together with responses to the issues raised, in Appendix 5.1. The Integrated HIA was made available for review to the Saldanha Bay Municipality, and the Heritage Conservation Bodies registered for this area: the West Coast Aboriginal Council (WCAC) and Swartland Heritage. The municipalities made no comments pertaining to heritage resources, while no response was received from WCAC or Swartland Heritage. Proof of consultation is provided in Appendix 5.3. The Institution for the Restoration of Aborigines of South Africa (IRASA) had made contact with the previous project EAP in 2018 (Appendix 5.4), and were contacted during the PPP period via sms and email, but could not be reached on the contacts supplied. Site notices were erected and evidence for these is provided by site photographs (Appendix 5.5).

HWC APM and IACom Interim Comment, 1 July 2019 (See Appendix 4)

The HWC APM Committee recommended that Kasteelberg be put forward for declaration as a PHS and that the 2km buffer around Kasteelberg be maintained. The AIA had recommended the reduction of the buffer to 1.5km to the east of the koppie given that Kasteelberg remains undeclared and there are therefore no gazetted protections pertaining to it. None of the turbines proposed in the revised layout fall within the 2km buffer – the closest turbine is 2.2km from the koppie. As such, the layout as proposed does not conflict with this recommendation from HWC.

Since the significance of the site is primarily archaeological in nature, the proposed layout also does not detract from the heritage significance of Kasteelberg, nor impede its declaration. Removing all turbines from the west of the Vredenburg-Stompneus Bay road will increase the area of landscape free from turbines for any travellers along that road, however, this is not seen as crucial to preserve the Grade II significance of the site, given the site's significance as predominantly archaeological in nature. While the development will see an increase in the number and proximity of turbines in the landscape, the landscape of greatest heritage significance with regard to Kasteelberg is that between the koppie and the sea, which remains free of turbines. Indeed, the revised layout, with no turbines located north of Kasteelberg, allows for clear views to the coast from the koppie through some 230 degrees. HWC supported the removal of all turbines from west of the Vredenburg-Stompneus Bay road, and that remains the favoured recommendation of this HIA.

Should Heritage Western Cape wish to pursue the nomination of Kasteelberg as a Provincial Heritage Site, this should be undertaken regardless of the outcome of the Vredenburg Windfarm application, given the minimal impact the revised layout will have on the heritage significance of the site. The nomination of the Cape Columbine Lighthouse remains unaffected by the application as it is located over 9.5km away, in the Cape Columbine Nature Reserve.

HWC requested mapping of the cumulative impacts of wind farms on the archaeological sites and cultural landscape the Vredenburg peninsula, as well as further illustration of the visual impacts of the development. The cumulative impacts are further mapped below (Figure 16 to Figure 18).

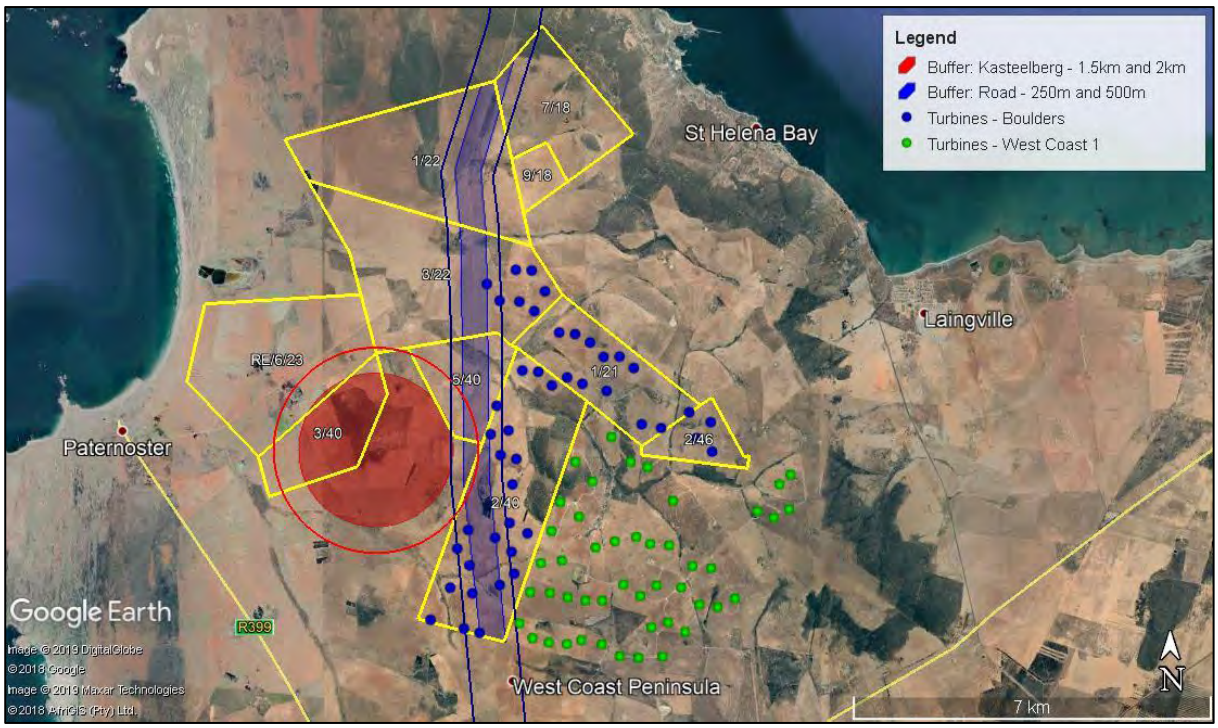

Figure 16. All turbines and relevant buffers providing overview of location and distribution of infrastructure and development constraints.

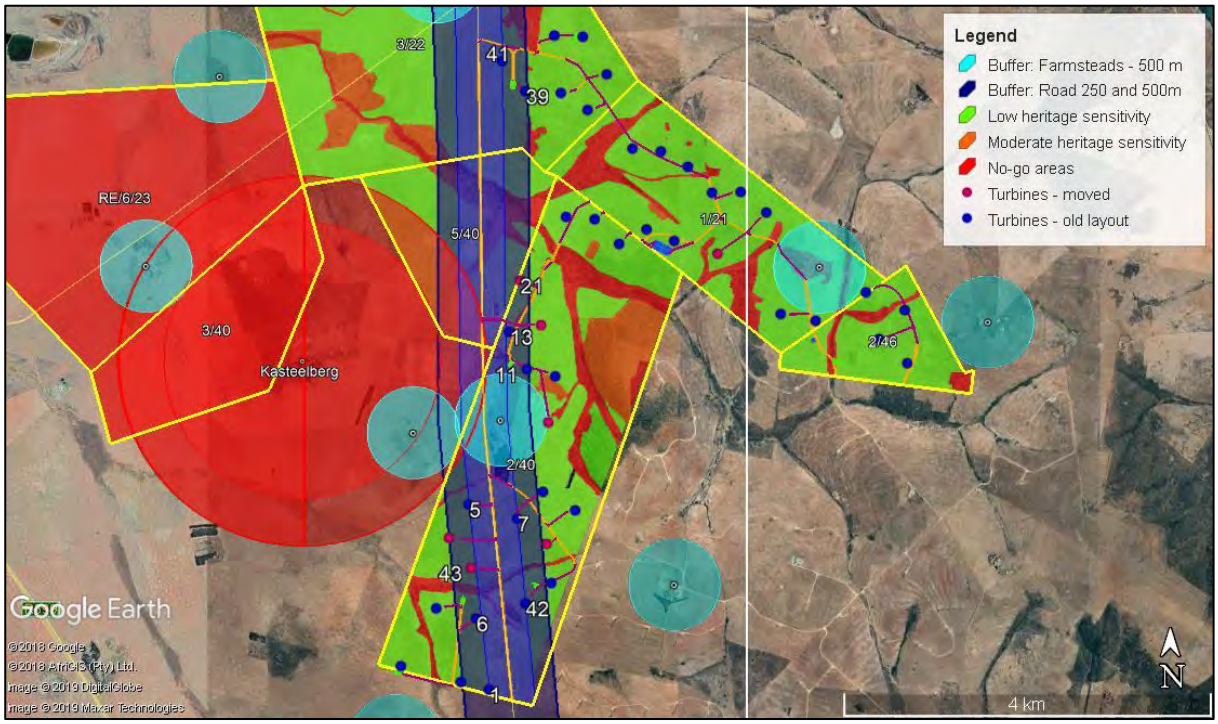

Figure 17. Detail of turbines relative to Vredenburg-Stompneus Bay road with revised 250m buffer and previous 500m buffer indicated (Adapted from Halkett and Hart, 2019).

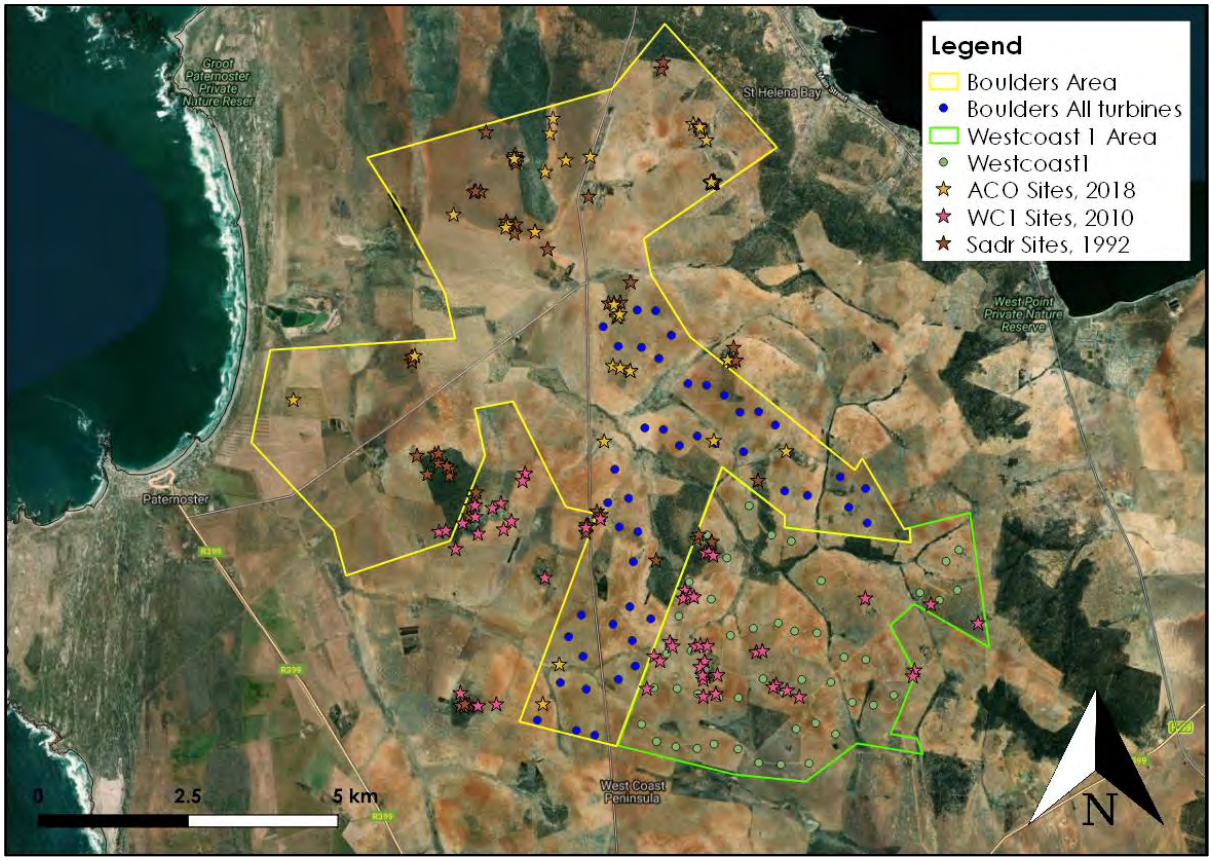

Figure 18. Location of all known sites in the area, relative to existing West Coast 1 project, and proposed Boulders Windfarm.

The VIA explores the cumulative effects of the proposed windfarm both through viewshed analyses and photomontages (du Plessis, 2019). The mapped cumulative viewshed analysis (Figure 19) shows that the visual exposure of both facilities correlates well, even based on the original layout, meaning the construction of Boulders will not increase the area of exposure to turbines greatly. The frequency of exposure within those areas will increase, however, which potentially increases the cumulative visual impact on visual receptors. An analysis of the revised layout was not provided, but the extent of exposure will be slightly reduced, as evident in the comparative analysis (Figure 20).

All maps and images provided below are from the Visual Impact Assessment (du Plessis, 2019); it is beyond the scope of this report to provide visuals that were not made available as part of that report.

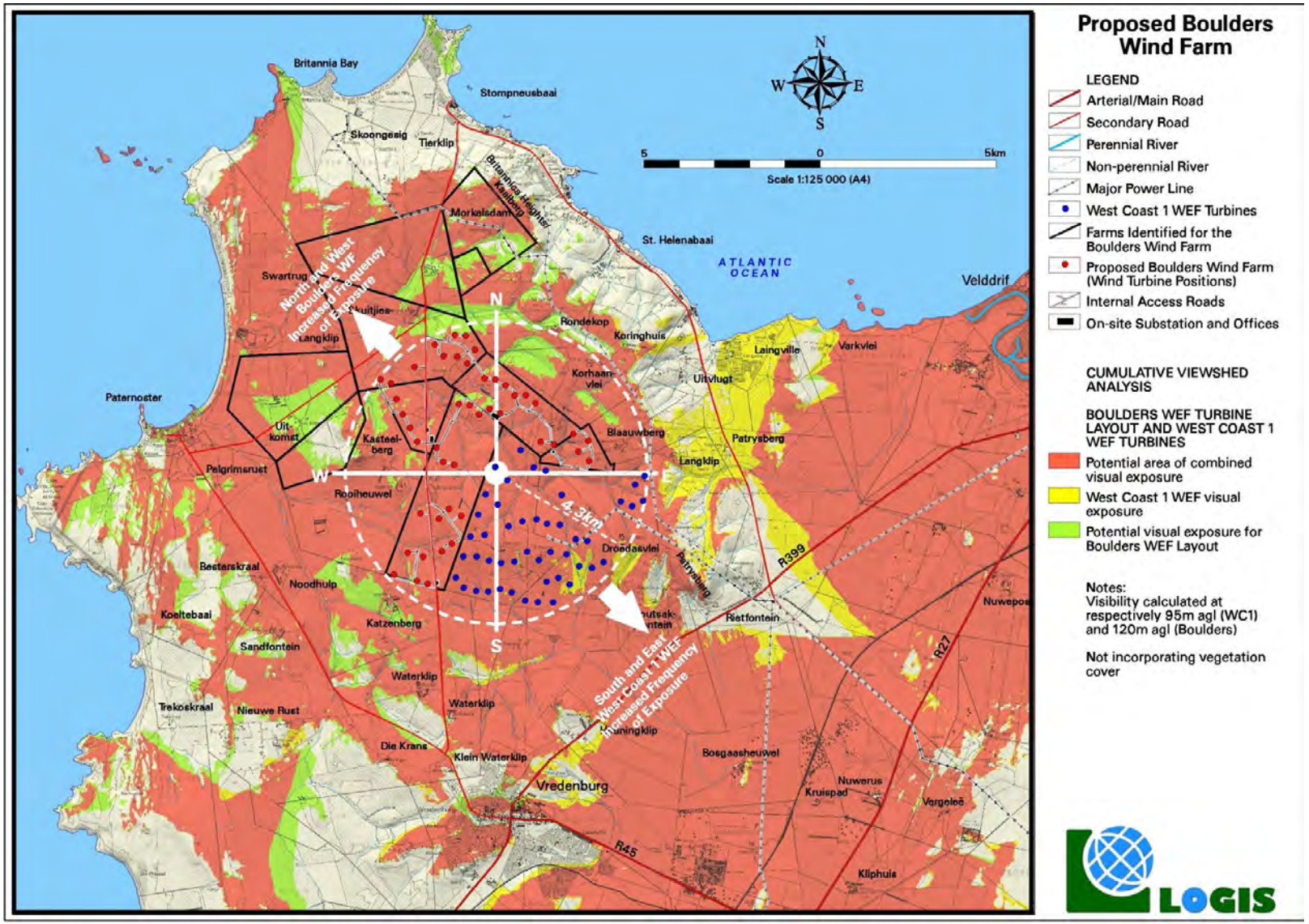

Figure 19. Cumulative viewshed analysis of Boulders and West Coast 1 turbines; note that this map reflects the original Boulders layout (du Plessis, 2019: 28).

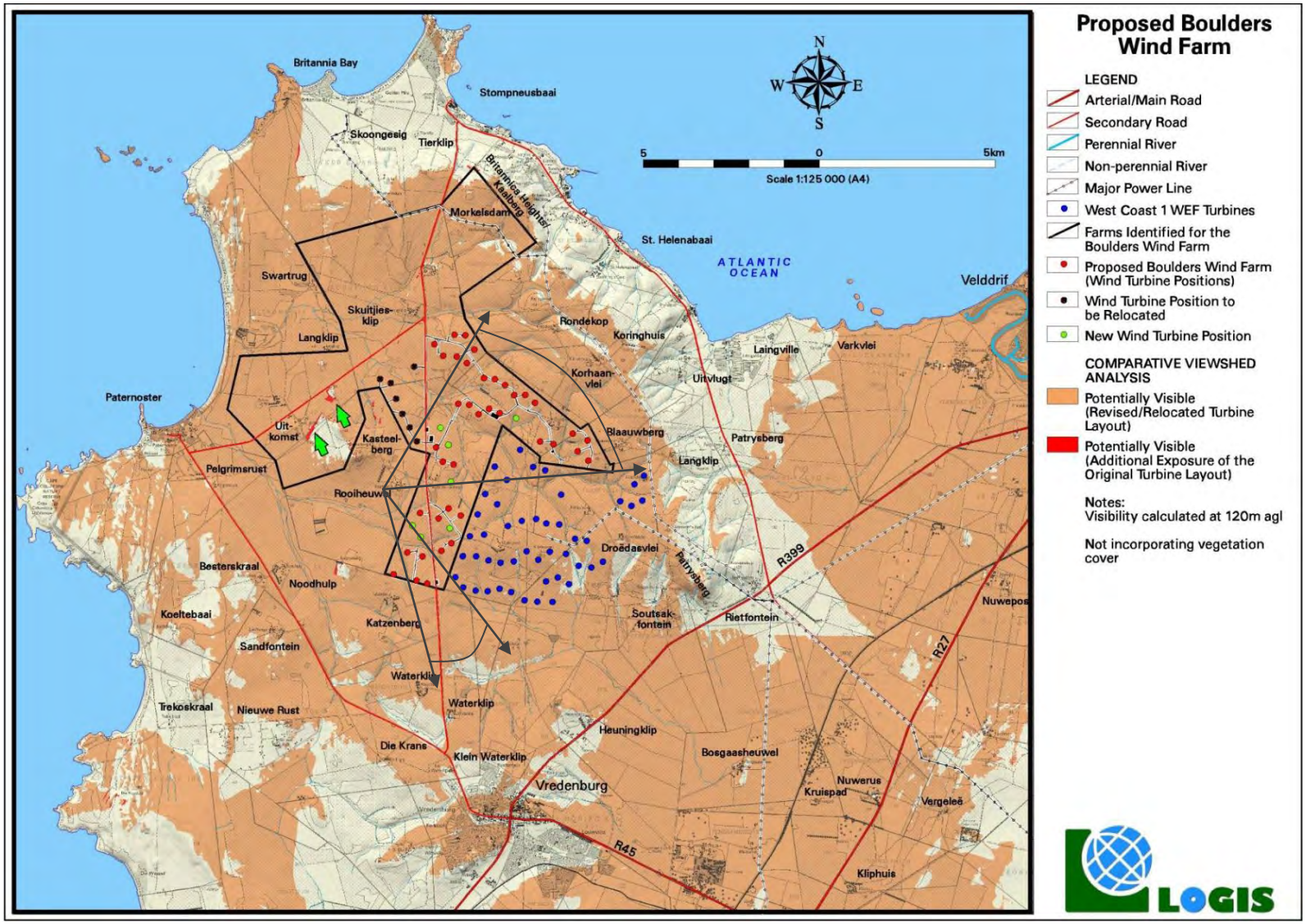

Figure 20. Revised Viewshed Analysis, showing comparison of visibility of original and amended layout; grey arrows indicate newly impacted viewcones (From du Plessis, 2019).

Photomontages were generated from 7 receptor locations (Figure 21) for the original layout. The revised layout was considered from three locations (Receptors 3, 4 and 6), where the changed layout made a significant difference to visual impacts. These montages are reproduced below (illustrating the current landscape, the proposed original layout and the amended layout.

As indicated above, the revised layout reduces the extent to which the proposed Boulders Windfarm turbines will intrude on the views from Kasteelberg to the sea (some 230° remain clear of intrusion). Turbines intrude into a currently undeveloped landscape to the north east of the koppie (through approximately 52°), although it is some 9.5km to the coast in that direction. To the south east of the koppie, new turbines intrude into as yet undeveloped land (through approximately 22°) but views in this direction are towards Vredenburg, with the Saldanha harbour beyond that.

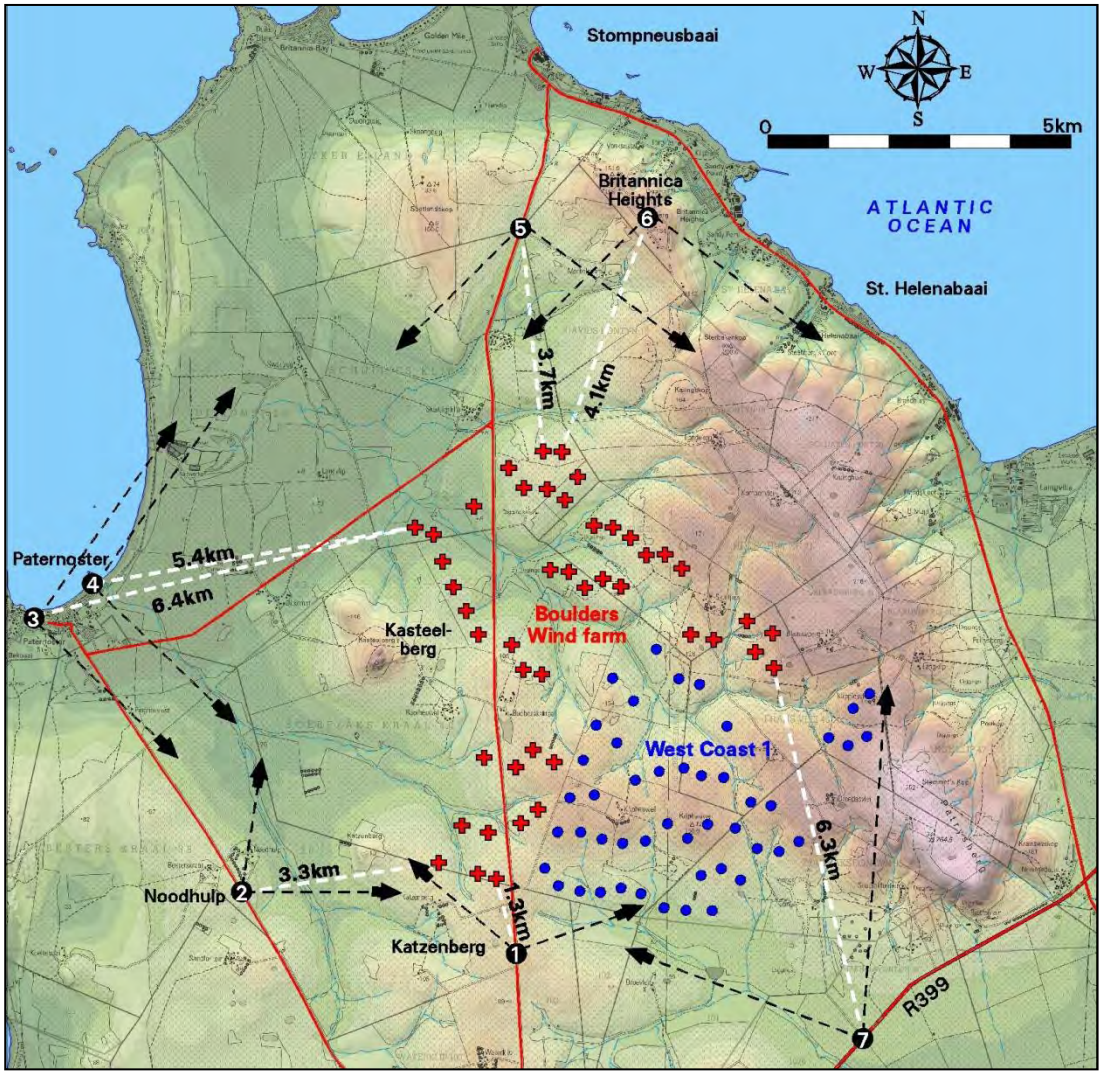

Figure 21. Receptor location map with the original layout indicated (du Plessis, 2019: 69).

Figure 22. Receptor 4 showing current layout (top), original layout (middle), amended layout (bottom) (From du Plessis, 2019).

Figure 23. Receptor 3 showing current layout (top), original layout (middle), amended layout (bottom) (From du Plessis, 2019).

Figure 24. Receptor 6 showing current layout (top), original layout (middle), amended layout (bottom) (From du Plessis, 2019).

These images show that, while the turbine relocation ameliorates the visual impact to some degree, the intrusion posed by the new facility relative to that posed by the existing one, from these receptor locations, remains high. This high impact could be somewhat alleviated by the reduction of turbine height, which would be particularly effective from receptor locations 3 and 4.

The image below (Figure 25) provides an illustration of the proximity of the Boulders Windfarm to the Vredenburg Stompneus Bay Road, with the buffer relaxed from 500m to 250m in accordance with the AIA (Halkett and Hart, 2019). This montage reflects the original layout, so it should be noted that some of the distant turbines on the left of the image will be reduced (du Plessis, 2019). In terms of the proposed new layout, eleven turbines fall within the 500m buffer, while all respect the 250m buffer (Turbines 1, 5, 6, 7, 11, 13, 21, 39, 41, 42 and 43). These closest turbines are clustered towards the south of the development, with only two falling within 500m of the road north of Kasteelberg; four of them are located west of the road, south of the koppie (Figure 17). The closest West Coast 1 turbine is 550m from the road, also at the southern end of the project area. Given the height of the turbines, the reduction in visual impact achieved by the 250m additional buffering offered by a 500m buffer is not substantial, and the West Coast 1 turbines already disturb the views to the east from the Vredenburg-Stompneus road sufficiently that the reduced buffer can be supported.

Figure 25. Receptor 1 showing the West Coast 1 turbines (above) and combined West Coast 1 and Boulders Windfarm turbines (below) in proximity to the Vredenburg-Stompneus Road. Kasteelberg is visible at far left of image (du Plessis, 2019).

A final consideration in terms of the visual impacts of the project is the potential for night time light pollution. In a largely flat, agricultural landscape with only scattered residences and little other light pollution, it is likely that the lights from the facility will be noticeable across considerable distances. This effect is illustrated below (Figure 26).

Figure 26. Aircraft warning lights on wind turbine hubs; note this is an example only, and not a photomontage of the Boulders Windfarm site or infrastructure (du Plessis, 2019: 61).

The VIA (du Plessis, 2019) rates the anticipated lighting impact as of **moderate-high** significance, noting that mitigation can reduce this to **moderate**. Mitigatory measures include limiting the mounting height of flood lights, or using footlights or bollard level lighting for general requirements. Aircraft warning lights as prescribed by the Civil Aviation Authority should be limited only to the perimeter of the facility, while the use of proximity sensors that are triggered only by aeroplanes should be investigated.

Again, it must be stressed that the proposed amended layout will not significantly impact the heritage significance of Kasteelberg koppie, as this is largely archaeological, and the most important element of its cultural landscape is the visual links to the sea to the southwest. No archaeological sites pertaining to Kasteelberg will be impacted or encroached on through this development, and no turbines or other infrastructure are proposed to the south west of the koppie. Indeed, current telecommunication infrastructure on the koppie serves as a far greater risk to the heritage significance of the site.

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The proposed construction of the Boulders WEF will likely result in local economic growth, job creation and skills transfer, while also contributing much needed clean energy to the national grid. The proposed location site is of well described, known heritage sensitivity, and contains significant archaeological, palaeontological heritage resources, as well as comprising an important cultural landscape. These sensitivities, however, are spatially defined – the archaeology is largely clustered around the granite koppies and old farmsteads, the palaeontologically sensitive areas are confined to the Coastal Formation Terrains, and the visual sensitivity to visual receptors such as people and roads, while the heritage receptors listed above (i.e. Kasteelberg and built environment features) are also sensitive to visual intrusions. In response to this, it was possible to employ a sensitive development layout and responsive turbine positioning to mitigate against negative impacts to heritage resources (Layout Alternative 1). The resulting design and layout of the proposed development (Figures 3a and 3b above) responds to the mapped sensitivity buffering (Figure 5 above) and avoids those areas of high heritage significance by respecting the buffers recommended by the specialists. The redesign of the layout, Layout Alternative 2, retains these buffers and observances, and the design ensures that impacts to archaeological resources are low, and to palaeontological resources are unlikely.

The greatest impact will be to the largely rural cultural landscape, and this impact cannot be mitigated. Furthermore, the significance of the cultural landscape is not predicated on the incidences of visual receptors within it. The presence of an existing wind farm in the area sets the precedent for this kind of insertion in this cultural landscape, and, as such, the location of the Boulders Wind Farm adjacent to the West Coast 1 facility serves to consolidate the impact within a restricted area, which is preferable to extensive scattering of turbines across a wider area. This model, however, is undermined by the proposed location of wind turbines to the west of the Vredenburg-Stompneus Bay road in Layout Alternative 1. In order to limit the extent and degree of degradation of the rural quality of the cultural landscape the road should, ideally, serve as a material boundary to the area considered for wind farm infrastructure. Layout Alternative 2 sees the removal of all turbines north of Kasteelberg. This change is considered an acceptable response to the heritage sensitivity of the cultural landscape and preserves the intactness of a much greater area of the Vredenburg Peninsula cultural landscape. As such, Layout Alternative 2 is considered to fall within the acceptable limits of change to the cultural landscape.

It is the opinion of this specialist that, provided the finalised recommendations are implemented, and incorporated into the EMPr, Environmental Authorisation for this project should be awarded.

8.2 Recommendations

Proposed recommendations are:

Palaeontological Impact Assessment:

- Adherence to the proposed layout (Alternative 1 or 2), which avoids the deposits with palaeontological sensitivity, and restricts turbine and infrastructure to the unfossiliferous Vredenburg Pluton, is the recommended outcome from a palaeontological perspective;
- The Heritage Western Cape Chance Fossil Finds Procedure should be included in the EMPr and implemented in the case of fossil remains being encountered. See Appendix 1.

Archaeological Impact Assessment:

- Extensive sensitivity mapping by the archaeological specialist and the design of the facility in response to the on-site sensitivities has gone a long way towards mitigating impacts through avoidance on the site, and no major mitigation of physical heritage resources is anticipated. No stratified contexts were recognised;
- The Lombard and Pienaar cemetery (2011/329 at s32.80442800 e18.00421500) has been identified as a "no-go" area. As the existing farm road that passes the cemetery site will be upgraded as an access road during turbine construction it is suggested that the alignment is modified, and that the road should be shifted moderately to the west to avoid any possible impact on the cemetery;
- Avoid and conserve significant heritage resources (buffers, no-go areas, etc) around farm buildings and graveyards, archaeological sites or complexes (already achieved in both proposed layouts);
- Accidently discovered archaeological material must be reported to the Provincial Heritage Authority in terms of section 35 of the National Heritage Resources Act. The finds should also be reported to the appointed archaeologist for assessment and possible action;
- Accidently discovered human remains must immediately be reported to the Provincial Heritage Authority in terms of section 36 of the National Heritage Resources Act. The finds should also be reported to the appointed archaeologist for assessment and possible action;
- The ECO should be informed of any chance finds;
- Some monitoring of the construction activities by the archaeologist is required to determine the effectiveness of the mitigation. This will be at earthmoving stage to ensure that there are not significant buried archaeological resources being exposed.

Visual Impact Assessment (as related to impacts to heritage resources):

- At the minimum, the seven wind turbines west of the Vredenburg-Stompneus Bay road should be removed or relocated (Turbines 15, 19, 21, 27, 31, 33 and 43) – Layout Alternative 2;
- The viability of reducing the turbine size to match that of the West Coast 1 turbines should be investigated;
- Conventional mitigation by means of screening, for example, is unlikely to succeed due to the nature of the receiving environment and the development, and only the relocation of the identified turbines will reduce the visual impacts of the development
- Impacts anticipated as a result of the proposed WEF to visual character and sense of place are not possible to mitigate. There is also no mitigation to ameliorate the negative visual impacts on tourist access routes and tourist destinations within the region.
- Where sensitive visual receptors are likely to be affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.
- It is recommended that vegetation cover (i.e. either natural or cultivated) be maintained in all areas outside of the actual development footprint, both during construction and operation of the proposed facility. This will minimise the visual impact as a result of cleared areas, power line servitudes and areas denuded of vegetation.
- Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible.
- Reduce lighting impacts through:
    - Limiting aircraft warning lights to the perimeter turbines;
    - Investigate aircraft warning lights with proximity sensors
    - Limit mounting heights of lighting fixtures, use footlights or bollard level lights;

    - Use down-lighters or shielded fixtures
    - Use motion sensors on security lighting
- Once the facility has exhausted its life span, the main facility and all associated infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated.

Impacts to the Cultural Landscape

- It should be recognised that impacts to cultural landscapes are unmitigable except by removal of turbines from the landscape, but that this can render projects that are necessary and desirable from a socio-economic standpoint unviable. As such, alternative recommendations are presented:
- The preferred recommendation, in order to limit impacts to the cultural landscape, is that all turbines west of the Vredenburg-Stompneus Bay road be relocated or removed (Turbines 1-3, 5, 6, 15, 19, 21, 27, 31, 33, 36, 43);
- A less preferable alternative recommendation is that all turbines north of Kasteelberg be relocated, but that the turbines south of the koppie remain. This limits the degradation of the landscape to a smaller area, and preserves more of the significant link between Kasteelberg and the coast and can therefore be considered as an acceptable alternative. This recommendation has been adopted as Layout Alternative 2 by the applicant.

Further recommendations arising from PPP

- HWC should proceed with the declaration of Kasteelberg as a Provincial Heritage Site;
- HWC should proceed with the declaration of Cape Columbine Lighthouse as a Provincial Heritage Site;

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APPENDICES

Appendix 1. HWC Fossil Finds Procedure

HWC PROCEDURE: CHANCE FINDS OF PALAEONTOLOGICAL MATERIAL
June 2016

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO

It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.

Procedure to follow if it is likely that the material identified is a fossil:

i. The ECO or site agent must ensure that all **work ceases** immediately in the vicinity of the area where the fossil or fossils have been found;

ii. The ECO or site agent must **inform HWC of the find immediately.** This information must include photographs of the findings and GPS co-ordinates;

iii. The ECO or site agent must compile a **Preliminary Report and fill in the *Fossil Discoveries: HWC Preliminary Record Form*** within 24 hours without removing the fossil from its original position. The **Preliminary Report** records basic information about the find including:

- The date
- A description of the discovery
- A description of the fossil and its context (e.g. position and depth of find)
- Where and how the find has been stored
- Photographs to accompany the preliminary report (the more the better):
  - ➔ A scale must be used
  - ➔ Photos of location from several angles
  - ➔ Photos of vertical section should be provided
  - ➔ Digital images of hole showing vertical section (side);
  - ➔ Digital images of fossil or fossils.

Upon receipt of this **Preliminary Report**, HWC will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

v. **Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags.** This protection should allow for the later excavation of the finds with due scientific care and diligence. HWC can advise on the most appropriate method for stabilisation.

vi. If the find cannot be stabilised, **the fossil may be collect with extreme care** by the ECO or the site agent and put aside and protected until HWC advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until HWC has indicated, in writing, that it is appropriate to proceed.

FOSSIL DISCOVERIES: HWC PRELIMINARY RECORDING FORM		
Name of project:		
Name of fossil location:		
Date of discovery:		
Description of situation in which the fossil was found:		
Description of context in which the fossil was found:		
Description and condition of fossil identified:		
GPS coordinates:	Lat:	Long:
If no co-ordinates available then please describe the location:		
Time of discovery:		
Depth of find in hole		
Photographs (tick as appropriate and indicate number of the photograph)	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
Temporary storage (where it is located and how it is conserved)		
Person identifying the fossil	Name: Contact:	
Recorder	Name: Contact:	
Photographer	Name: Contact:	

Appendix 2. West Coast 1 Environmental Authorisation correspondence

2.1 Excerpt from Environmental Authorisation - 16 March 2011:

10.7 Historical/ Paleontological Resources

10.7.1 No turbines, substations, roads, cable trenches and other associated infrastructure should be located around the foot of the archaeological site of Kasteelberg (this include Turbines 53, 51, 50,47, 45,44, 42, 40, 39, 38 and 38). The buffer of at least 2km around Kasteelberg must be discussed and agreed upon further by the applicant and Heritage Western Cape prior to

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Department of Environmental Affairs
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commencement of the project. Such agreement must be submitted to the Director: Environmental Impact Evaluation at the Department.

10.7.2 If there are any changes to the layout of the turbines, then additional survey work will be required in order to ensure that no sites are directly impacted and/or to identify the need for an excavation permit.

10.7.3 Heritage sites in proximity of Turbine 2, 32, 37 and 47 must be fenced off by an archaeologist to ensure that they are no impacted by roads or tower footings.

10.7.4 Turbines must be placed at least 2km from the local road to Stompneus Bay, 2 km from the R45 route to Paternoster and 500m from the farmsteads of Rooiheuwal and Klipheuwel.

10.7.5 Field samples of natural and artificial rock exposure within the study area as a whole must be undertaken by a qualified palaeontologist to identify specific areas or horizons of paleontological sensitivity on the ground and to determine if fossils could occur.

2.2 Developer letter to HWC re Kasteelberg buffer - 24 October 2011:

MOYENG energy

Heritage Western Cape

Protea Assurance Building

Green Market Square

CAPE TOWN

8000

Attention: Mr Andrew Hall

cc: Ms Jenna Lavin

24 October 2011

Dear Sir

PROPOSED WEST COAST ONE WIND ENERGY FACILITY

Reference is made to a meeting held at the HWC offices in Cape Town on 17 October 2011. Moyeng takes note of the proposition for the declaration of the Kasteelberg Archaeological Site and Cultural Landscape as a Provincial Heritage site.

Attached is a Google Earth file showing a turbine layout including 55 turbines which is the preferred option for Moyeng Energy. Please note that this layout makes provision for a 2km buffer around the Kasteelberg Archaeological Site as per the Heritage specialist report in the Environmental Impact Assessment.

As an alternative and following our meeting Moyeng proposes to exclude the development of turbine numbers 48 – 50 which are located on the western side of the site. I understand and trust that this solution will provide for the preservation of this site whilst also allowing Moyeng Energy to continue with the Wind Energy Facility.

I look forward to your favorable response at the proposed committee meeting scheduled for the 1 November 2011. Pending on the final decision Moyeng Energy will need your

6-10 Woodlands Drive, Lincolnwood Office Park, Block E, First Floor, Woodmead, Sandton

MOYENG energy

assistance in addressing and resolving the Heritage Western Cape appeal against this Environmental Authorisation.

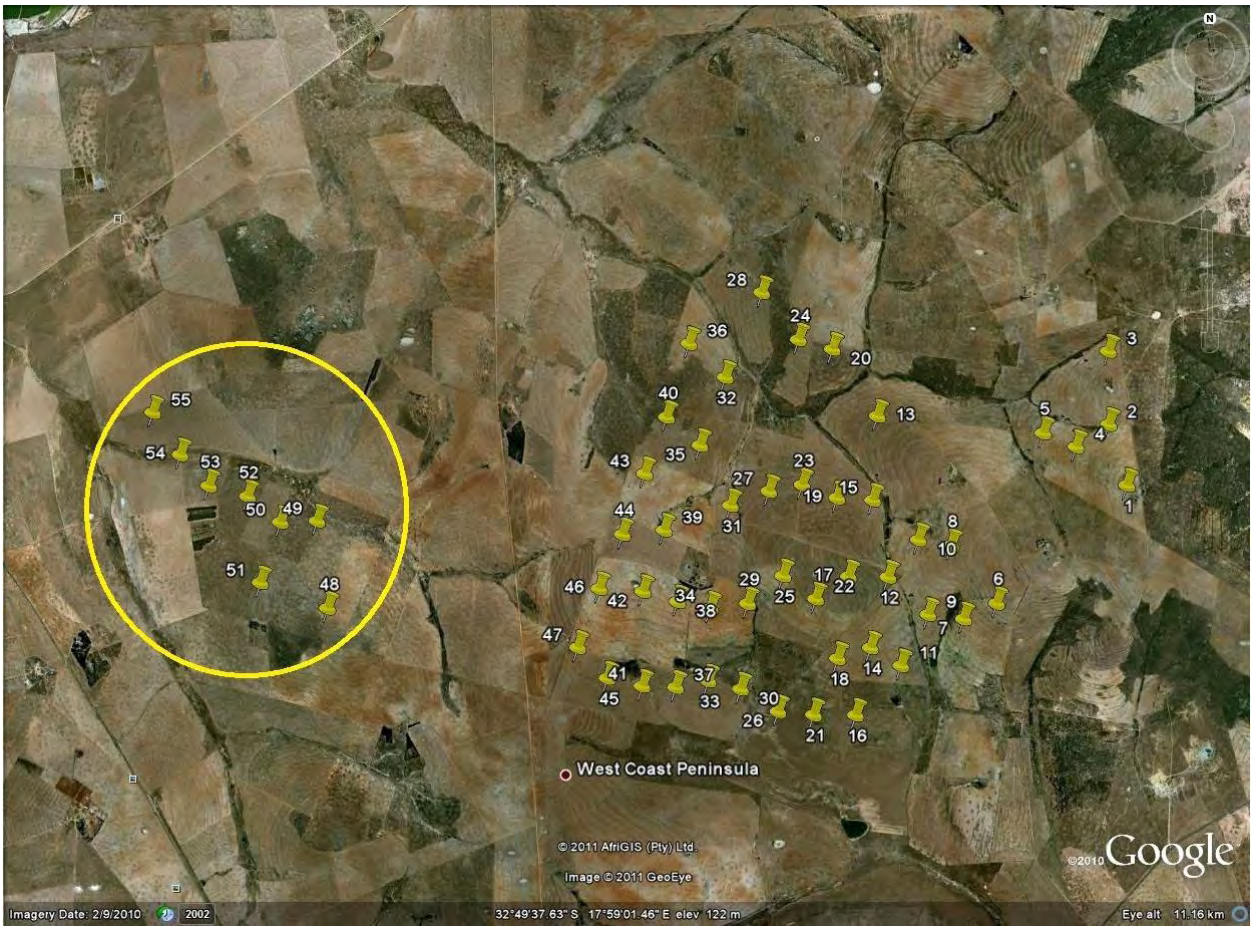
I remain at your disposal for any further questions and queries you may have in this regard.

Yours sincerely,

Sanjith Mungroo

Moyeng Energy (Pty) Ltd

Chief Executive Officer



Google Earth image provided by developer to HWC with turbines to be excluded indicated in yellow circle

2.3. HWC response to developer – 10 November 2011

Our Ref: HM/WEST COAST/SALDANHA BAY/VREDENBURG/VARIOUS FARMS/WEST COAST ONE WIND ENERGY FACILITY

ILifa leMveli IeNtsimbi Kelomi
Erfenis Wes-Kaap
Heritage Western Cape

Enquiries	Jenna Lavin	**Date:**	10 November 2011
Tel:	0214839685	**Case No:**	x111024JL15
Email:	jenna.lavin@pgwc.gov.za	**Auto IDs:**	1152 - 1601

FINAL COMMENT
In terms of section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

Attention: Mr Sanjith Mungroo
Moyeng Energy
6-10 Woodlands Drive
Sandton
2191

CASE NUMBER: x111024JL15
DRAFT EIA: PROPOSED WEST COAST ONE WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE, PTN 1 (REMAINDER) & PTN 4 BOEBEZAKS KRAAL 40, PTNS 1,2,3,4,5,6 & 9 OF FRANS VLEI 46 & PTNS 4&5 OF ZOUTZAKSFONTYN 95, VREDENBURG, SALDANHA BAY, WEST COAST

The matter above has reference.

Heritage Western Cape is in receipt of your correspondence on the above matter, dated 25 October 2011;

1. The submitted new layout excludes turbines 48 to 55.
2. The mitigated layout addresses HWCs primary concerns regarding the view shed and the cultural landscape associated with Kasteelberg.

Decision;
The proposed mitigated layout is supported.

Terms and Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for the proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to Heritage Western Cape immediately.

Should you have any further queries, please contact the official above and quote the case number above.

Yours faithfully

Andrew B Hall
Chief Executive Officer
Heritage Western Cape

www.capegateway.gov.za/culture_sport

Street Address: Protea Assurance Building, Green Market Square, Cape Town, 8000 • **Postal Address:** Private Bag X9067, Cape Town, 8001 • **Fax:** +27 (0)21 483 9842 • **E-mail:** hwc@pgwc.gov.za

Straatadres: Protea Assuransie-gebou, Groentemarkplein, Kaapstad, 8000 • **Posadres:** Privaatsak X9067, Kaapstad, 8001 • **Fax:** +27 (0)21 483 9842 • **E-pos:** hwc@pgwc.gov.za

2.4. West Coast 1 EA amendment after appeal – 8 April 2013

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA
Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

NEAS Reference: DEA/EIA/12086/2010
DEA Reference: 12/12/20/1581
Enquiries: Ms Tebogo Mapinga
Telephone: 012-395-1805 **Fax:** 012-320-7539 **E-mail:** TMapinga@environment.gov.za

Mr Sanjith Mungroo
Aurora Wind Power (RF) (Propriety) Limited
P.O.Box 4778
RIVONIA
2128

Fax: 011 804 5844

PER FACSIMILE / MAIL

Dear Mr Mungroo

AMENDMENT OF ENVIRONMENTAL AUTHORISATION: WEST COAST ONE WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR VREDENBURG, WESTERN CAPE PROVINCE

The Department's decision on the above application issued on 16 March 2011 and your correspondence dated 24 January 2013 refers.

Based on a review of the reason for requesting an amendment to the above authorisation, the Department, in terms of regulation 42 of the Environmental Impact Assessment Regulations, 2010, has decided to amend the environmental authorisation (EA) dated 16 March 2011 as follows:

Vegetation, Wetlands and Water Resources
Specific Condition 10.2.12: "All feasible (as determined by Cape Nature) areas of high botanical sensitivity (identified in Helme, 2010) must be formally declared and registered as a Contract Nature Reserve with CapeNature's Stewardship Program.

The said mitigation measure is amended as follows:

Specific Condition 10.2.12: "*Aurora Wind Power (RF) (Propriety) Limited will co-operate with all relevant parties to incorporate high sensitive botanical areas into the Stewardship Programme*".

Historical/Paleontological Resources
Specific Condition 10.7.4: "Turbines must be placed at least 2km from the local road to Stompneus Bay, 2km from the R45 route to Patemoster and 500m from the farmsteads of Rooiheuwel and Klipheuwel".

The said mitigation measure is amended as follows:

Specific Condition 10.7.4: "*Turbines must be placed at least 500m from the local road to Stompneus Bay, 2km from the R45 route to Paternoster and 500m from the farmsteads of Rooiheuwel and Klipheuwel*".

This amended letter should be read in conjunction with the EA dated 16 March 2011. Other conditions set out in the original Environmental Authorisation dated 16 March 2011 remain unchanged and must be adhered to.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010 (the Regulations), you are instructed to notify all registered interested and affected parties, in writing and within 12 (twelve) days of the date of the Department's decision in respect of the amendment made as well as the provisions regarding the submission of appeals that are contained in the Regulations.

Your attention is drawn to Chapter 7 of the Regulations, which prescribes the appeal procedure to be followed. This procedure is summarised in the attached document. Kindly include a copy of this document with the letter of notification to interested and affected parties.

Should the applicant or any other party wish to appeal any aspect of the amendment decision a notice of intention to appeal must be lodged by all prospective appellants with the Minister, within 20 days of the date of the EA, by means of one of the following methods:

By facsimile: 012 320 7561;
By post: Private Bag X447,
Pretoria, 0001; or
By hand: 2nd Floor, Fedsure Building, North Tower,
Cnr. Lilian Ngoyi (Van der Walt) and Pretorius Streets,
Pretoria.

If the applicant wishes to lodge an appeal, it must also serve a copy of the notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection, should you intend to submit an appeal.

Please include the Department *(Attention: Director: Integrated Environmental Authorisations)* in the list of interested and affected parties, notified through your notification letter to interested and affected parties, for record purposes.

Appeals must be submitted in writing to:

Mr Z Hassam, Director: Appeals and Legal Review of this Department at the above mentioned addresses or fax number. Mr Hassam can also be contacted at:

Tel: 012-310-3271
Email: AppealsDirectorate@environment.gov.za

The authorised activities shall not commence within twenty (20) days of the date of signature of the authorisation. Further, please note that the Minister may, on receipt of appeals against the authorisation or conditions thereof suspend the authorisation pending the outcome of the appeals procedure.

Yours sincerely

Mr Mark Gordon
Chief Director: Integrated Environmental Authorisations
Department of Environmental Affairs
Date: 08 April 2013

CC:	Ms. Jo-Anne Thomas	Savannah Environmental (Pty) Ltd	Tel: 011 656 3237	Fax: 086 684 0547
	Mr S Malaza	Compliance Monitoring (DEA)	Tel: 012-310-3397	Fax: 012-320-5744

Appendix 3. Boulders Windfarm HWC Response to NID – 29 March 2018:

ILifa leMveli leMtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

REGISTERED POST

Our Ref:	HM/ WEST COAST / MATZIKAMA / VREDENBURG FARM 2/40, 3/40, 5/40, 2/46, 3/22, 9/18, 1/22, 1/21, 7/18, 6/23
Case No.:	1802202SB0314E
Enquiries:	Stephanie-Anne Barnardt
E-mail:	stephanie.barnardt@westerncape.gov.za
Tel	021 483 9370
Date:	29 March 2018

Thomas Nicolaas, John Bester
PO Box 909
Vredenburg
7380
tommybester@kingsley.co.za

RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: HIA REQUIRED
In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

NOTIFICATION OF INTENT TO DEVELOP: PROPOSED WIND ENERGY FACILITY, VREDENEBURG, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

CASE NUMBER: 1802202SB0314E

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received on14 March 2018. This matter was discussed at the Heritage Officers meeting held on 27 March 2018.

You are hereby notified that, since there is reason to believe that the proposed wind energy facility, Vredeneburg **will impact** on heritage resources, HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of section 38(3) of the NHRA be submitted. This HIA must have specific reference to the following:

- Visual impacts of the proposed development on the rural landscape
- Impact of the proposed development on paleontological fossil remain
- Impact on archaeological remains of the developed area

The required HIA must have an integrated set of recommendations.

Please note, should you require the HIA to be submitted as a Phased HIA, a written request must be submitted to HWC prior to submission. HWC reserves the right to determine whether a phased HIA is acceptable on a case by case Basis.

The comments of relevant registered conservation bodies; all Interested and Affected parties; and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

HWC reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully

.....
P.E Meyer
Acting Deputy Director, Heritage Western Cape

www.westerncape.gov.za/cas

Street Address • Postal Address • Tel • E-mail

Straatadres • Posadres • Tel • E-pos

Appendix 4. Boulders Windfarm IACom and APM Interim Comment 1 July 2019

ILifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

Our Ref: HM/ WEST COAST / MATZIKAMA / VREDENBURG
FARM 2/40, 3/40, 5/40, 2/46, 3/22, 9/18, 1/22, 1/21, 7/18, 6/23
Case No.: 18022025B0314E
Enquiries: Stephanie-Anne Barnardt
E-mail: stephanie.barnardt@westerncape.gov.za
Tel 021 483 9370
Date: 1 July 2019

CES - Coastal and Environmental Services (PTY) Ltd PO Box 909
Vredenburg
7380
info@cesnet.co.za, info@cesnet.co.za, m.talbot@cesnet.co.za, katie.smuts@gmail.com

INTERIM COMMENT
In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

HERITAGE IMPACT ASSESSMENT: PROPOSED BOULDERS WIND FARM, VREDENBURG PENINSULA, WESTERN CAPE, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

CASE NUMBER: 18022002SB0314E
DEADP Reference: 14/12/16/3/3/2/1057

The matter above has reference.

This matter was discussed at the Impact Assessment Committee (IACom) meeting held on 12 June 2019.

The matter was tabled at Archaeology, Palaeontology and Meteorites Committee (APM) meeting held on the 28 June 2019 whereby the following was discussed:

COMMENT

- *The proposed nomination of the Kasteelberg archaeological precinct and Cape Columbine lighthouse as a PHS is strongly supported.*
- *The 2km buffer around the Kasteelberg archaeological precinct should be maintained.*
- *The recommendation that no turbines are to be constructed to the west and northwest of the Paternoster-Stompneus Bay link road is strongly supported in order to maintain a view corridor between the Kasteelberg archaeological complex and the sea.*
- *The cumulative impact of existing and proposed wind farms on the archaeological sites and the wider cultural landscape of the Vredenburg Peninsula must be assessed and indicated geographically.*

DECISION
APM Committee resolved that the Kasteelberg archaeological complex is graded Grade II and is nominated as a Provincial Heritage Site.

INTERIM COMMENT
The Committee will await the updated submission for Final Comment.

HWC reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully

.....
Dr Mxolisi Dlamuka
Chief Executive Officer, Heritage Western Cape

www.westerncape.gov.za/ces

Street Address: [illegible] Postal Address: [illegible]
Tel: [illegible] Email: [illegible]

Straatadres: [illegible] Posadres: [illegible]
Tel: [illegible] E-pos: [illegible]

Appendix 5. PPP

5.1 Comment arising from PPP, 15 July 2019

Boulders Wind Farm EIA - Comments Response Trail: Heritage	**Response**
Kotze, Danie; 30 June	
5.1. Background If you are not aware, my farm Boebezaks Kraal 0/40 and 4/40 was part of The West Coast One Wind Energy Facility project but was excluded from the project due to a 3,5 km no wind turbine buffer zone around Kasteelberg (KBS) set by Heritage Western Cape (HWC Case Number 1152) and no turbines within 2km on both the western and eastern side of the Stompneusbay gravel road(P2160). These heritage buffer zones resulted in my farm being excluded from the WEF resulting in a huge loss of income for me, my family and farmworkers. 5.2.History. During the EIA process and development of the West Coast One WEF (WC1 WEF), 19 turbines was placed on my farm on the lower slopes of Kasteelberg and to the Southern part of my farm. The heritage specialists as part of the EIA process, recommended in the HIA, not less than 2km buffer zone around Kasteelberg and a 500 m buffer on both sides of Stompneusbay road. These Heritage buffer zones resulted in less footprint for turbines on my farm and the remaining 12 turbines was placed on the southern part of my farm outside of Kasteelberg 2km and road 500 m buffer zones suggested by HIA specialists. Heritage Western Cape (HWC) then commented on EIA on 3 November2010 (attached please find HwcCommentonEIA.pdf) and recommended a NO GO option for the West Coast One WEF with the reasons stipulated. The DEA somehow disregarded this comment by HWC and the Environmental Authorisation(EA) was granted on 13 March 2011 with the 2km buffer around Kasteelberg, with condition that the Heritage buffer zones be further discussed and agreed upon between WEF developer and HWC(please find WCOneAuthMarch2011.pdf) on page 14 and 15 (10.7.1 and 10.7.4). HWC then appealed against Environmental Authorisation on 19 April 2011 (please find HWCAppealWC1.pdf) and in this document HWC clearly states reasons for the High Heritage Significance of Kasteelberg and the NO GO option for the WEF. a) The High Heritage Significance of the Kasteelberg Archaeological sites. b) Impacts of Sense of Place and Cultural Landscape. The grounds for appeal was given on page 3 of this document and at the bottom of page 3 and top of page 4, HWC clearly states that 2 km buffer zone around Kasteelberg was inadequate and that a buffer of at least 5 km, possibly more should be placed. The NO GO option for the West Coast One WEF was given by HWC. This document was signed by CEO of HWC, Mr. Andrew Hall. The developers of WC1 WEF and myself tried numerous times to persuade the CEO of HWC to reduce the 5 km buffer zone, by corresponding with HWC with no positive response. The WEF developers asked HWC if a mitigated layout of no turbines on western side of gravel road to Stompneusbay would be approved, but still no positive response from HWC. On 14 September 2011 Kasteelberg was nominated as Provincial Heritage Site (PHS) due to its importance as Grade 2 Heritage site by HWC. Me and my family was worried about security and asked for more information from HWC due to people visiting this PHS without our concent, with no reply from HWC. At this stage the developers mitigated the layout of the WC1 WEF to only having turbines on the Eastern side of Stompneusbay road (P2160) with 500 m buffer from this road on eastern side, with no turbines on western side, excluding my farm from WC1 WEF completely, due to the 5 km buffer zone set by CEO of HWC. The developers replied to DEA, against Appeal from HWC, and asked for approval if they set a 3.5 km buffer around Kasteelberg with no turbines placed on western side of the road, excluding my farm from the WEF.	ACO's revision of the proposed no-go zone was taken in light of the restricted distribution of sites on and around the koppie, which is well established, and HWC's failure in the time the since West Coast 1 study was undertaken, to declare Kasteelberg a PHS. Until such time as the site is declared, and such buffers are gazetted, any recommendations are open to revision. HWC undertaking to revisit the declaration process is commendable, and, as such, the 2km buffer as stipulated in the Environmental Authorisation for WC1 (8 April 2013; Appendix 2.4) has been respected until such time as the site is officially declared. Should HWC chose to enforce the 500m buffer around the Vredenburg-Stompneus Bay road, in light of their decision to pursue declaring Kasteelberg, they will need to indicate this, as, again, the reduced buffer was recommended in light of the stalling of the declaration process.

5.3. Decision. On 2 November 2011 at an Impact Assessment Meeting held at offices of HWC, the CEO of HWC and IACOM members agreed to support the mitigated layout of the WC1 WEF developers with the 3.5 km buffer around Kasteelberg. I was present at this meeting where the CEO of HWC, Mr. Andrew Hall supported this revised layout and set the 3.5 km buffer zone around Kasteelberg and 2km on either side of Stompneusbay road (P2160) for future development. The Minutes of this meeting was done by Me. Jenna Lavin. The lack of feedback from HWC resulted in the nomination for PHS of Kasteelberg being put on hold. The DEA then approved and amended the EA for WC1 WEF. My farm was excluded from the WC1 WEF and that was the reason why the buffer zone was not changed in the amended EA. This decision made by the CEO of HWC, Mr. Andrew Hall resulted in my farm being excluded from the West Coast One WEF, resulting in total loss of income from this WEF, for my family and farm workers. 5.3 New Heritage Impact Assessment. The Heritage Impact Assessment(HIA) from Archeological Contracts Office (ACO) for the Boulders windfarm varies drastically from the HIA for West Coast One Wind Farm also compiled by ACO! A Heritage officer/specialist of ACO was present at the IACOM meeting held on 2 November 2011 at HWC where the 3.5 km buffer zone was implemented. So ACO should know the extreme significance of this site, and should have implemented a 3.5 km buffer zone from the start. It is exactly the same kind of development and impacts stay exactly the same, so the outcome of the HIA should be exactly the same or even higher buffer zones should have been implemented. Why was? a) The 2km buffer zone around Kasteelberg reduced to 1.5km on eastern side. b) The 500 m buffer zone from Stompneusbay road was reduced from 500 m to 250 m c) Why is this proposed PHS Kasteelberg with Grade 2 Significance now suddenly not so important by ACO? The reasons given by ACO in HIA are unfair and ungrounded and was merely the opinion of one of their own heritage specialists. The viewsheds from the existing WC1 WEF towards Kasteelberg is still unchanged. The viewsheds from Vredenburg on Stompneusbay road towards Kasteelberg to the western side is still unchanged. The viewsheds from Brittanica Heights(Stompneusbay/St Helena Bay) to Kasteelberg is unchanged with turbines to the far east, 3.5 km away. The viewsheds from Paternoster PHS and the sea to Kasteelberg is unchanged with turbines in the far back with 3.5 km space in between. Apparently the independence and integrity of ACO was compromised in the compiling of this HIA, or my farm was apparently victimized by ACO during the compiling of WC1 WEF HIA?	
I have a Heritage resource on my farm (KBS) Kasteelberg and there are a 3.5 km no wind turbine buffer zone around it set by Heritage Western Cape's CEO Mr. Andrew Hall on 2 November 2011 and no turbines within 2km on both Western and Eastern Side of the Stompneusbay gravel road (P2160) to protect sense of place of this Grade 2 Heritage site.	See above.

Todd, A&J; 1 July	
Can CES please clarify whether the seven turbines (15, 19, 21, 27, 31 ,33 , 43) moved from West to East were as a result of the Kasteelberg Heritage site, OR so as to not cause conflict when CES's other project for the proposed mine prospecting gets underway.	The turbines were moved after the first HIA draft indicated that area as unsuitable for turbines due to the visual impacts to Kasteelberg.
Although the seven turbines have been moved Eastwards "to avoid impacting on Kasteelberg", they have now been moved further into the faces of Britannica Heights residents, especially those one Km further East from where the CES presentation took place and which no one from CES has visited.	Britannica Heights retains extensive views of Paternoster and the coast, and only partial, although unfortunate, occlusion of Kasteelberg.
Brand, Deon; 2 July	
The Heritage Impact Assessment (the "HIA") I would like to bring the following to the attention of Ms Smuts, the author of the HIA: My comments in respect of the VIA above; My comments respect of the UE report above and that the UE report seems fundamentally flawed; My comments respect of the SIA above; On page VII she confirms that the impacts to the cultural landscape are unmitigable except by removal of the turbines from the landscape. She however seems to assume that the value of the socio-economic benefits exceeds the damage to the cultural landscape by such a margin that the project should still be considered. I could not find a valuation of the socio-economic benefits in order to evaluate this assumption and requires this valuation.	The preferred outcome is the removal of all turbines west of the Vredenburg-Stompneus Bay road.
Slabig, Hedwig; 2 July	
Were any representatives from the Khoi-Khoin approached to comment about Kasteelberg?	Public comment is open to all, and the West Coast Aboriginal Council, the HWC registered Conservation Body for the region, were notified;
It is now finally agreed that all Turbines will be 2 km from Kasteelberg? Turbines of the same hight as WC1 will be far more acceptable.	Yes, and a reduction in height has been recommended
All the roads around Kasteelberg have recently being included in a heritage and cultural study done for SBM by O'donahue and Kaplan as a Scenic route/drive. This report has been accepted by the SBM.	The O'Donoghue report has not yet been ratified by Heritage Western Cape and, as such, remains only a recommendation.
It therefor follows that WC1 10.7.4 must strictly be adhered to and that turbines must be placed at least 2 km from the local road from Vredenburg to Stompneus Bay. It would also makes sense to ask for an offset in the form of the landowner agreeing to the formal declaration of Kasteelberg as provincial heritage site.	The 500m buffer around the Vredenburg-Stompneus Bay road was reduced in light of the stalling of the declaration process.

No Boulders Wind Farm Group Petition& Roon(Aksie Paternoster Aksie); 1&2 July	
According to Klein & Cruz-Uribe 1989; Smith et al 1991 there is to be no development/change to this heritage area within a 2km radius from Kasteelberg . However this stipulation does not specify from what point of Kasteelberg (top of the koppie or where the ritual sites were?) The difference may well have an effect of an extra 1km, which might impact on 5 turbine positions.	Given the nature of archaeology, which is usually located below ground level, it is customary to use the centre point of a site as the location from which to establish a buffer zone. The centre of Kasteelberg has been used in this instance, although the extensive research undertaken at the site has provided us with a clearer than usual understanding of the likely limits of the site. This, in turn, has implications for the second part of the comment.
One of the demonstrated supporters (K Sadr- School of Geography, Archaeology and Environmental Studies at WITS) put in a conditional support, stating- as long as no turbines and associated infrastructure are constructed anywhere higher than the 80m (above sea level) contour line of the hill Kasteelberg. Most of the proposed turbines are positioned at more than 80m above sea level. Considering that both tops of Brittania Heights and Kasteelberg are approximately 150m above sea level and the turbines positioned at an average level of 95m plus 165m will dwarf Kasteelberg with more than 100m. This leaves little ambience for a heritage site.	The 80m restriction, as indicated by Prof. Sadr, refers only to the “80 m (above sea level) contour line of the Rooiheuwel portion of the hill Kasteelberg”, with 40m indicated on “the farm Uitkomst to the northwest of Rooiheuwel”. These restrictions pertain to the distribution of archaeological sites on and around the koppie, and do not speak to the visual impacts to the site.
The R45 towards Paternoster is regarded a scenic route and as such may not be spoiled by the Boulder project. The integrated Heritage Impact Assessment and Assessment of Economic Impacts both refer to the importance of Vredenburg-Stompneus Bay and Paternoster-stompneus Bay roads but totally ignore the historic, scenic and visual qualities of the Vredenburg-Paternoster Road, particularly in relation to views towards the visually prominent Kasteelberg koppie against a backdrop of moving wind turbines.	The Boulders turbines are all more than 3km from the Vredenburg-Paternoster road, and, for the most part will be seen against the backdrop of WC1 turbines
According to Conditions of the previous Environmental Authorisation 12/12/20/1581 par. 10.7.4 Turbines must be placed at least 2km from the local road to Stompneus Bay. If this was adhered to, 13 less turbines would have been placed on West Coast One project and 30 could not be placed with the Boulders proposal.	This EA was supplanted by the EA of 8 April 2013, and that 500m buffer was reduced in the AIA in recognition of the lack of formal protection of Kasteelberg or the landscape

Referring to the impact on the SENSE OF PLACE under Report 6.9.1 and 6.9.2 - An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The potential cumulative visual impact of the wind farms on the visual quality of the landscape. – The cumulative visual impact of the West Coast 1 WEF and the Boulders WF is expected to be of high significance.	The removal of the westernmost turbines, as recommended, will serve to limit the impacts to a part of the landscape already affected.
Paternoster is characterised by West Coast architecture that offers a picturesque view of the residential area against the backdrop of large areas of low sensitivity croplands alternating with occasional intact or near-natural fragments of indigenous vegetation and rocky outcrops. In terms of 4.1.3 the cumulative impacts, when considered in conjunction with the West Coast 1 facility, the study found the Visual Absorption Capacity of the receiving environment to be low, as a result of the vegetation and open vistas that are largely uninterrupted by urban development. This combined with the height of the proposed wind turbines results in unavoidably HIGH visual intrusion. It was also noted that the landscape is close to, if not already visually saturated and can possibly not accommodate the additional turbines without irrevocably changing the cultural landscape. Further to this, the greater size of the Boulders turbines makes them far more imposing and intrusive when viewed from the same distance as West Coast 1 turbines, and generally more visible when viewed at a distance. In addition 5.1.3 mentions that the greatest impact arising from visual intrusion is loss of sense of place and degradation of the significant rural landscape. These factors can have negative impacts on the significance of heritage resources and the cultural landscape that is difficult to mitigate due to the size of the turbines and their visibility in the landscape. Even with the proposed moving of 7 turbines to the east these well-defined description in the Report are still applicable and enough reason NOT to proceed.	A reduction in turbine height is recommended, as is restriction of turbines to the east of the Vredenburg-Stompneus Bay road, both of which will reduce the visual impacts on Paternoster
Portsmouth, Doug; 2 July	
•SENSE OF PLACE. I am concerned that the sense of place that is enjoyed by our communities and businesses will be destroyed by the intrusion of the Boulders WEF. The countryside between Britannica Heights and Paternoster creates a unique and beautiful sense of place. It is a rare part of the country where a harmonic balance between coast, landscape, agriculture and nature has been established over a long period of time. It is for this sense of place that our local tourism economy is so long established and successful. It is my belief that the unacceptable risk of loss of the sense of place creates a fatal flaw to this application.	Britannica Heights itself has expanded greatly, much of that expansion taking place since the construction of WC1. While loss of views is unfortunate, Britannica Heights itself is not a heritage resource, nor are views towards Paternoster occluded, with the impingement on views ranging from 12° through 33°.

AVDS Enviro Consulting(Andre vd Spuy); 19 Jun	
Heritage Impact Assessment findings significant (but irrational conclusion). 63 An integrated Heritage Impact assessment by Katie Smuts is included as Appendix D7 of the DEIR. 64 The proposed BWEF receiving environment was found to have significant paleontological deposits and archaeological sites. The Kasteelberg site is of particular concern and which Heritage Western Cape (HWC) has tried to declare a Provincial Heritage Site but without success as yet. The HIA recognizes the scenic and cultural value of the potentially affected landscape. 65 The HIA agrees with most of the impact ratings and findings of the LoGIS VIA and regards the removal of the 7 turbines north of Kasteelberg as being effective in reducing the associated High negative potential impact to "moderate" whereas the LoGIS VIA states that ALL of the turbines to the west of the Stompneus Bay road are required to be removed in order to reduce the High negative impact rating. This is an important difference and it is relevant to point out that the LoGIS VIA findings must take precedent over the HIA finding in this instance on account of the "risk averse and cautious approach" that must be followed in pursuit of achieving sustainable development. In other words the removal of just the 7 turbines may be an "acceptable" mitigation to Ms. Smuts but it is not so to Mr. Du Plessis (it is merely regarded by him as being "a step in the right direction"). 66 The HIA states that, "(t)he most important visual impacts to heritage resources will be to the character and sense of place of the region, specifically to the rural cultural landscape and, to a lesser extent, the historic coastal towns. While the VIA notes that the viewer incidence in the project site is low, the intrinsic value of both the cultural landscape and the site of Kasteelberg is of unquestionable significance and not dependent on visual receptors." 67 Various recommended mitigation measures are derived from the HIA (page vii) and the following pertinent ones are extracted here: 67.1 The viability of reducing the turbine size to match that of the West Coast 1 turbines should be investigated; 23 67.2 At the minimum, the seven wind turbines west of the Vredenburg-Stompneus Bay road should be removed or relocated (Turbines 15, 19, 21, 27, 31, 33 and 43); 67.3 The relocation or removal of various combinations of the north western turbines should be considered – these are the turbines visible from the historic town of Paternoster and from its beach (Turbines 11, 13, 15, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 37, 38, 39, 40, 41, 43, 44, 45); 67.4 The viability of reducing the turbine size to match that of the West Coast 1 turbines should be investigated; 68 Based on the information in the DEIR the Applicant has only implemented the second mitigation measure above and has ignored the rest. It is fair to say then the Applicant has made very limited effort to mitigate the significant high negative visual impacts on cultural resources and the landscape and it is thus difficult to understand how Ms. Smuts can therefore come to an objective conclusion that, "It is the opinion of this specialist that, provided the recommendations below are implemented and incorporated into the EMPr, that Environmental Authorisation for this project should be awarded.". Accordingly, we now examine her rationale in reaching such an opinion, bearing in mind that Appendix 6 of the EIA Regulations require that any appointed specialist be objective (and independent). 69 In so far as Ms Smuts' recommends that the HIA mitigations measures be included in the "EMPr" it is pointed out that this is impractical and irrational. For instance, one of the tabled mitigation measures, the reduction of turbine height to match that of the West Coast 1 WEF, is a measure that will have to be decided upon by the Applicant before submission of the FEIR. To reduce the turbine height as part of the EMPr implementation (i.e. after possible approval fo the application) will violate the EA that must be delivered by the Competent Authority and which will specify then the height of turbines that will be authorized (or not). The point is that the Applicant has to commit, or not, to the implementation of (some) technical-based mitigation measures now during the current EIA phase and before submission of the FEIR for decisionmaking by the Competent Authority. Failure to do otherwise will constitute incremental development of the proposed BWEF at a known ultimate cost to the environment and local community – this approach is illegal.	The HIA provides an integration of specialist reports, in this case palaeontological, archaeological and visual. The VIA as relevant to the HIA pertains only to visual impacts to heritage resources, and not visual impacts more broadly. As such, recommendations made in the VIA are not necessarily pertinent to heritage resources, nor "must" they take precedence. The HIA contends that the project is not fatally flawed from a heritage perspective with the current layout, but that further improvements could be effected by removal of all turbines west of the Vredenburg-Stompneus Bay road and reduction in turbine heights. HWC indicating that they will pursue declaration of Kasteelberg is welcomed, but still does not demand the removal of the south western turbines to be effected. As such, my recommendations stand. The final comment by HWC will determine what does go into the EMPr.

70 Under Section 5.3 of the HIA the specialist makes a critical error as she steps outside of her field of expertise and "borrows" the proclaimed social and economic benefits outlined in the SIA (Barbour and van der Merwe, 2018) to justify approval of the 24 proposed BWEF over the significant negative impacts determined by her own findings. Under Section 8.1 "Conclusion" Ms. Smuts states: "The proposed construction of the Boulders WEF will likely result in local economic growth, job creation and skills transfer, while also contributing much needed clean energy to the national grid." The above issues have no place in the consideration of heritage issues and it is rather the duty of the EAP to conduct the final inter-disciplinary weigh-up of potential impact findings. NEMA Section 2 provides specific criteria for consideration in the integration of different disciplinary issues in order to assess the sustainability fo a particlaur prososed activity. It most definitely is not the duty of a specialist such as Ms. Smuts to undertake this task especially as she will have no full knowledge of the complete range of potential impact findings from amongst other specialist studies. 71 Ms. Smuts has used selected findings, plus her crude and flawed personal views, to justify her reasoning for approving of the proposed development. However, we find no information anywhere as evidence of her being an energy expert or economist. In fact the opposite is can be justifiable said of her personal views and the facts show that wind farms do NOT create permanent jobs and that they ultimately will result in huge electricity costs to the national population and which consequences in South Africa will be most sorely felt by the poorest. As case evidence of these high costs of renewable energy, and its failure to curb carbon emissions, one need look no further than the rapidly failing example of Germany's "Energiewende" (see Appendix A). The real costs (not price) of large-scale renewable energy to South Africans will far exceed (see Appendix B which is an assessment by Rob Jeffery, a credible economist operating in the field of costs of energy generation) those of any other power generation source (in fact they already are). 72 There is no provision in the EIA Regulations for a specialist to operate outside of his/ her field of expertise and to use selected outside information in a subjective and unquantified manner such as Ms. Smuts has done. Further more, this review reveals that the proclaimed benefits seen in the SIA are unfounded themselves, and exaggerated for the benefit of the Applicant's interests. Ms. Smuts makes her self complicit in such actions by adopting flawed information, from outside of her discipline, into her analysis. Her final opinion is therefore irrational and not objective and must be dismissed accordingly. Ms. Smuts will no doubt be concerned to see that a rational and objective analysis, in this review, of all the impacts related to the proposed BWEF finds that 87% of all the potential impacts are negative, and this analysis includes the impact assessments made in the SIA and which she has borrowed from. 73 In conclusion, when Ms. Smuts HIA assessment is considered in terms of only the facts and findings of its own discipline (i.e. removing her personal views related to the flawed social, economic and energy information which she has introduced) the proposed BWEF posses in fact a real and significantly high potential negative impact and should probably not be receiving her conditional approval. Whatever the case, Ms. Smuts will be obliged to revisit her study and reconsider her conclusion properly and rationally.	HWC's " Guidelines for Heritage Impact Assessments required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999)" (2016) stipulates the following as a minimum requirement for an HIA: An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development; As such, the inclusion of the consideration of socio-economic impacts is not a "critical error"

5.2 Letter regarding Kasteelberg site sensitivities, Prof. K. Sadr, 15 August 2016

University
of the Witwatersrand,
Johannesburg

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Dipl. Geol. Thomas Siepelmeyer
CEO IPD Power (Pty) Ltd. - Vredenburg Windfarm (Pty) Ltd.
Unit 207 - Salt Circle - 19 Kent Road
Woodstock - Cape Town - 7925

15 August 2016

Re: Kasteelberg archaeological sites and IPD Power developments

Dear Thomas,

I have geo-referenced the map of turbine locations and buffers you sent me in mid-Januray 2013, and have checked these against the distribution of known archaeological sites on the portion of the hill Kasteelberg on Mr Kotze's farm Rooiheuwel.

As far as I can see, the position of turbines as shown on your January 2013 map (the black dots) poses no immediate risk to the known archaeological sites on Kasteelberg.

Obviously, there are unknown archaeological sites in this landscapes and any of the construction works associated with the turbine installations may uncover new finds. This risk will no doubt be mitigated in any permit application by a standard clause requiring the attention of an archaeologist when such matters arise. The authorization document to Moyeng serves as an example.

In general, my opinion is that as long as no turbines and associated infrastructure are constructed anywhere higher than the 80 m (above sea level) contour line of the Rooiheuwel portion of the hill Kasteelberg there will be no significant damage to the unique archaeological evidence for precolonial herding societies found on this hill. On the farm Uitkomst to the northwest of Rooiheuwel, archaeological sites are located lower on the hill slopes and no construction should take place above the 40 m contour line.

With all best wishes,

Yours sincerely,

Professor Karim Sadr

5.3 Proof of Consultation

30 May

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PUBLIC PARTICIPATION PROCESS EXTENSION OF DRAFT EIR & HIA REVIEW DEADLINE

Proposed Boulders Wind Farm, Western Cape Province

Notice is given of the public review period on the Draft Boulders Wind Farm Environmental Impact Assessment Report (EIR) as per Government Notice R 982, 2014 (as amended by GN R 324 in 2017) of the National Environmental Management Act (NEMA), Act No. 107 of 1998, and subsequent amendments. In addition, notice is hereby given of the public review period of the Heritage Impact Assessment Report (HIA), in terms of Section 38(3)(d) of the National Heritage Resources Act (NHRA), Act No. 25 of 1999.

Proposed Activity: The proposed development of up to 45 wind turbines, with a maximum output capacity of 140MW, and associated infrastructure including a substation, access roads and laydown areas.
Applicant: Vredenburg Windfarm (Pty) Ltd.
Environmental Company: Coastal & Environmental Services (Pty) Ltd. t/a CES
Location: The proposed project site is located directly adjacent to the operational West Coast One Wind Farm and is ~14km north of Vredenburg and ~7km east of Paternoster within the Saldanha Bay Local Municipality, West Coast District Municipality. The project site includes 10 affected properties:

- Boebezaks Kraal 2/40
- Boebezaks Kraal 3/40
- Boebezaks Kraal 5/40
- Frans Vlei 2/46
- Schuitjes Klip 3/22
- Schuitjes Klip 1/22
- Davids Fontyn 9/18
- Davids Fontyn 7/18
- Het Schuytje 1/21
- Uitkomst RE/13/23

Environmental Impact Assessment Process: In terms of the NEMA EIA Regulations, the proposed development requires a full Scoping and Environmental Impact Assessment (EIA) Process. Vredenburg Windfarm has appointed CES to undertake the EIA Phase of the project, including the legislated Public Participation Process (PPP).
The Draft EIR (and all associated reports, including the HIA) is available for public review and comment from 16 May – 2 July 2019. The draft reports can be viewed at the Vredenburg Public Library (2 Akademie Street, Vredenburg), the St Helena Bay Public Library (2 Albatros Street, St Helena Bay), and at the Paternoster Public Library (St Augustine's Way, Paternoster). The draft reports are also available for download on the following website: http://www.cesnet.co.za/boulders-wind-farm-eia**.** The due date for written comment is **2 July 2019**. A public Open Day for all Interested and Affected Parties will be held on the 19th of June at the Paternoster Hotel (St Augustine Road, Paternoster) from 16h00 – 20h00.
For further information, registration as an Interested and/or Affected Party (I&AP) or submission of written comments, please submit your name, contact information, interest in the project and comments to:

Mr Michael Johnson or Ms Maura Talbot

The Point, Suite 408, 4th Floor,
76 Regent Road, Sea Point,
Cape Town, 8060
Tel: **021 045 0900**
Email: m.johnson@cesnet.co.za or
m.talbot@cesnet.co.za
Website: www.cesnet.co.za

Email Address	Opens	First Name	Last Name
nazeema.duarte@sbm.gov.za	9	Nazeema	Duarte
Quentin.Jordaan@sbm.gov.za	7	Quentin Raoul	Jordaan

This email served to update an email sent out in early May advising of the availability of the DEIR for review from 16 May – 18 June, a period later extended. This email was sent to:

Email Address	Opens	First Name	Last Name
wcacouncil@gmail.com (West Coast Aboriginal Council – registered Conservation Body)	1	Charika	Bardens
sharon.scholtz@sbm.gov.za (Saldanha Bay Municipality)	2	Sharon Marionette	Scholtz
Quentin.Jordaan@sbm.gov.za (Saldanha Bay Municipality)	8	Quentin Raoul	Jordaan

Email notification of public meetings held in June was sent out to:

Email Address	Opens	First Name	Last Name
cjmalherbe@wcdm.co.za (West Coast District Municipality)	1	Charles	Malherbe
bsmit@matzikamamun.co.za (Matzikama Municipality)	2	Briaan	Smit

5.4 IRASA communications

Greetings Gabriele

Subject: The Environmental Impact Assessment (EIA) for the Boulders Wind Farm and associated infrastructure, Western Cape Province (DEA Ref. No.: 14/12/16/3/3/2/1057)

In the interest of cultural cohesion, thank you for acknowledging our initial correspondence and for an opportunity to provide further insight into our submission w.r.t. the PPP for the Boulders Wind Farm.

Background:

1. In 2005 the United Nations Economic and Social Council appointed a Special Rapporteur Rudolfo Stavenhagen whose report is listed as E/CN.4/2006/78/Add.2 15 December 2005, investigating the Human Rights and Indigenous Issues 'Mission to South Africa'.

2. In September 2007 the government of South Africa along with 143 Countries signed the United Nations Declaration on the Rights of Indigenous Peoples UNDRIP.

3. The UNDRIP reiterates a series of situations where Free Prior and Informed Consent FPIC should become the standard best practice for negotiations between indigenous peoples and any other party thereby recognizing the duty of states to secure the principles of FPIC .

   In this circumstance:

   3.1 We are identifying the dispossession of cultural, intellectual, religious and spiritual property.

   3.2 We are identifying Indigenous lands which was confiscated or taken, occupied, used or damaged.

IRASA
Institute for the Restoration of the Aborigines of South Africa
2003/031074/08

Contact details:
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Prof: Thomas Wyroll

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Call: +27(0)784659316

Project Facilitator:
Andre Ward
Call: +27(0)846437052

VERIFICATION CODE:

76935

Authorized signatory: Date: 17 August 2018 Page 1 of 2

3.3 We are identifying Indigenous lands, territories and resources before adopting and implementing legislative or administrative measures prior to the approval of any project affecting Indigenous lands or territories and other resources, particularly in connection with the development, utilization or exploitation of minerals, water or other resources.

4. Given the historical and current situations of the Aboriginal KhoiSan Peoples, we require mechanisms for the inclusion in infrastructure projects and highlighting the need for capacity building and knowledge sharing.

5. We cannot ignore the consequences of resource developments on the Aboriginal KhoiSan Peoples which includes the denial of Restitution Land Rights and our traditional way of life.

We look forward to the confirmation of a consultation with you, Chief Ishaqua Sabodien [South Peninsula Customary Council] and our Advisory Council.

Blessings
Chief Tania Kleinhans-Cedras

IRASA
Institute for the Restoration of the Aborigines of South Africa
2003/031074/08

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VERIFICATION CODE:

76935

Sms sent at initiation of PPP 16 May 2019:

+27768359007Delivered to mobile1.002019-05-16 10:26::

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The Draft Environmental Impact Report for the proposed Boulders Wind Energy Facility is
available for review and comment from 16 May to 21 June 2019. The report can be viewed
at the Vredenburg Public Library (2 Akademie Street Vredenburg) and at the Paternoster
Public Library (St Augustines Way Paternoster) and the St Helena Library (2 Albertros
St St Helena Bay) The report is also available for download on the following website:
http://www.cesnet.co.za/boulders-wind-farm-eia.  The due date for written comment is
21 June 2019.  Please submit your comments to m.johnson@cesnet.co.za.
```

Follow up email sent 7 August 2019

Gmail

Katie Smuts <katie.smuts@gmail.com>

Comments of Draft Boulders Wind Farm EIA

1 message

Maura Talbot <m.talbot@cesnet.co.za> 7 August 2019 at 15:06
To: "irasa169@gmail.com" <irasa169@gmail.com>, "zelda.williams05@gmail.com" <zelda.williams05@gmail.com>
Cc: Katie Smuts <katie.smuts@gmail.com>

Dear IRASA an Zelda

I am contacting you to ask if you would still like to submit any comments on the above mentioned EIA report which was reviewed by the public in May and June 2019. We did not receive your contact details until the end of the public review period and there was no response from the contacts that we did have for IRASA and Ms Charika Bardens from WC Aboriginal Council. The public review period was also advertised locally.

In their submission, the Municipality specifically asked that we seek comments from yourselves and provided your contact details. This is because the proposed development is close to the Kasteelburg Heritage site between Vredenburg and Paternoster.

Please let me know if you do intend to submit comments. We will need these as soon as possible as we are in the final stages of responding to all the comments and completing all the reports. You can send them directly to me.

The EIR reports, including the Heritage Assessment can be accessed at the CES website (www.cesnet.co.za/boulders-wind-farm-eia). I have also copied in Katie Smuts to this mail as she did the Heritage Assessment.

Regards

Maura

5.5 Site Photos – PPP signage

Sign location 1

Sign location 5

Appendix 6. Palaeontological Impact Assessment

Appendix 7. Archaeological Impact Assessment

Appendix 8. Visual Impact Assessment