Bear's Down Wind Farm, St Ervan & St Mawgan, Cornwall

Reassessment of Proposed Turbine 1

Heritage Consultancy

SOUTHWEST ARCHAEOLOGY

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Executive Summary

The repowering of this wind farm would see 16×57m (to tip) wind turbines replaced by 5×150m (to tip) turbines. In a scenario where only 4×150m replacement turbines were erected, there would be some additional benefit to the historic environment.

For direct impacts, it would reduce the footprint of the development by 20%, remove a turbine from a field where archaeological features were identified during the survey work, and minimise the risk of accidental damage to the two scheduled monuments in that field.

For indirect impacts, a group of four large turbines would probably have a very similar visual effect on distant designated heritage assets as five, especially given they would be backdropped or foregrounded by the five turbines on Denzell Down. That said, the reduction in number would have a beneficial effect on the overall aggregate impact, and there would be a beneficial effect for some of the closest assets, especially the barrows on Bear's Down itself.

Client	Cleanearth Energy Ltd.
Parish	St Ervan & St Mawgan
County	Cornwall
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1 INTRODUCTION

1.1 PROJECT BACKGROUND

This report is an addendum to a heritage impact assessment (HIA) issued as part of the supporting documentation for a planning application (PA23/10324). This application covers the repowering of an existing permanent windfarm, replacing ×16 57m to tip turbines with ×5 150m to tip turbines. The report was produced by South West Archaeology Ltd. on behalf of the client, Cleanearth Energy Ltd.

1.2 SCOPE AND CONTEXT

The original impact assessment and addendum considered the likely harms arising from the decommissioning of the extant ×16 wind turbines and their replacement with **×5** larger turbines. This report considers what difference, if any, replacing the ×16 turbines with **×4** larger turbines would make to the impact assessments in the original report. The turbine that would be removed from the new scheme would be T1 (NGR: 189720 67822), located just to the south of the covered reservoir.

It should be noted that the Bear's Down Wind Farm (×16 turbines, 57m to tip) is, unlike many, a *permanent* wind farm. In line with all the other specialist contributions it is considered to form part of the baseline.

1.3 LOCATION, TOPOGRAPHY, GEOLOGY, SOILS

The proposed turbines would be erected on the upper north-facing slopes of Bear's Down, at an elevation of 150-170m AOD. The soils of this area are the loamy permeable upland soils over rock with a wet peaty horizon and bleached subsurface horizon, often with thin iron pan, of the Hafren Association[1]. These overlie the sandstones, siltstones and mudstones of the Staddon Formation[2].

1.4 METHODOLOGY

The original desk-based research and impact assessment were undertaken in accordance with the relevant guidance and in line with the SWARCH HIA methodology[3]. This was followed by a high-level overview of high-value designated heritage assets within a 30km radius of the site that fall within the ZVI (zone of visual influence) of the proposed turbines[4]. This report provides a comment on the likely impact of removing turbine T1 from the proposals.

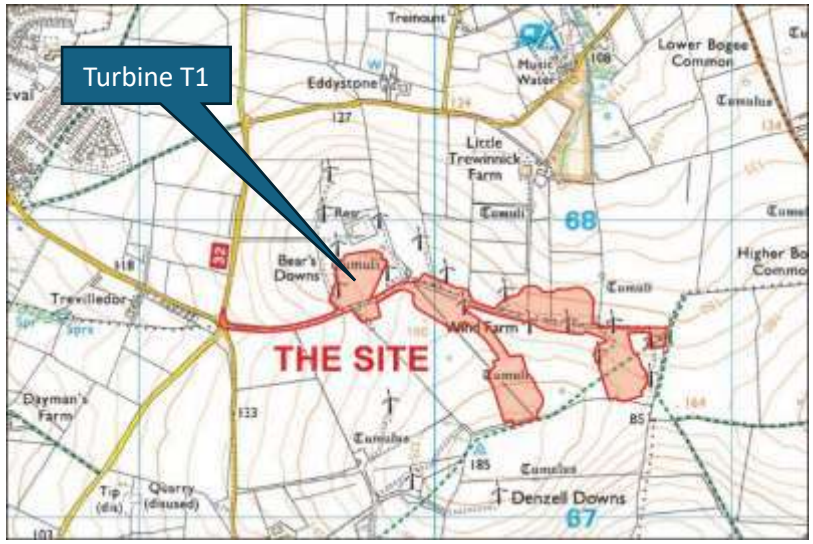

FIGURE 1: LOCATION MAP (©CROWN COPYRIGHT 2025. ALL RIGHTS RESERVED. LICENCE NUMBER 100022432); THE LOCATION OF THE SITE IS INDICATED.

1.5 LIMITATIONS AND CAVEATS

This report is a desk-based review of the impact assessments made in the original reports. The ZVIs used are based on bare-earth data and thus reflect a worst-case scenario. Note that this report adopts the distinction between ZTV (zone of theoretical visibility), and ZVI (zone of visual influence) set out in the Setting of Heritage Assets[5].

The former includes the screening provided by buildings and vegetation; the latter provides a strictly bare-earth model.

1.6 QUALITY ASSURANCE

This assessment has been undertaken by South West Archaeology Ltd. (SWARCH) is a Registered Organisation (RO) with the Chartered Institute for Archaeologists (CIfA) and a member of the Federation of Archaeological Managers & Employers (FAME). SWARCH employees working on this project are appropriately qualified academically and commercially, and are Members (MCIfA) of the Chartered Institute for Archaeologists; SWARCH directors hold doctoral qualifications in archaeology.

1.7 PREVIOUS WORK

The site was the subject of a geophysical survey and monitoring works in the early 2000s[6]. Given the different and larger footprint of the proposed repowering, another geophysical survey was carried out, together with the fieldwork for the HIA, in 2024[7].

2 IMPACT ASSESSMENT

2.1 INTRODUCTION

The purpose of heritage impact assessment is twofold: Firstly, to understand – insofar as is reasonably practicable and in proportion to the importance of the asset – the significance of a historic building, complex, area, monument or archaeological site (the 'heritage asset'). Secondly, to assess the likely effect of a proposed development on the heritage asset (direct impact) and/or its setting (indirect impact).

This assessment was undertaken in accordance with best practice and builds on the approach taken in the HIA (i.e. with reference to *Conservation Principles*[8], *The Setting of Heritage Assets* [9], *Statements of Heritage Significance*[10] and the *Principles of Cultural Heritage Impact Assessment* in the UK produced by CIfA, IHBC and IEMA[11].

2.2 DIRECT IMPACTS

Removing turbine T1 from the proposals would have a direct and meaningful effect on the archaeological impact of the proposed scheme. It would reduce the overall footprint of the development by 20% and remove groundworks from arguably the most sensitive part of the site.

The field containing turbine T1 contains two of the Scheduled round barrows that form part of the group '*seven round barrows and a ring barrow on Bear's Downs and Denzell Downs 850m north-east of Higher Denzell*' (list no.1021007). The most northerly of the group would fall only just outside the redline boundary of the site; the second barrow would be within 70m of the redline boundary. Removing T1 would remove the possibility of damage to these monuments and decrease the probability of encountering other ancillary archaeological features (e.g. satellite burials).

In addition, the geophysical survey (Figure 2) that was undertaken identified a line of pits orientated SSW-NNE, running past the footprint of the development. It is unclear what this line of pits represents, but avoiding damage or disturbance to these features would preserve their archaeological integrity and reduces avoidable cost.

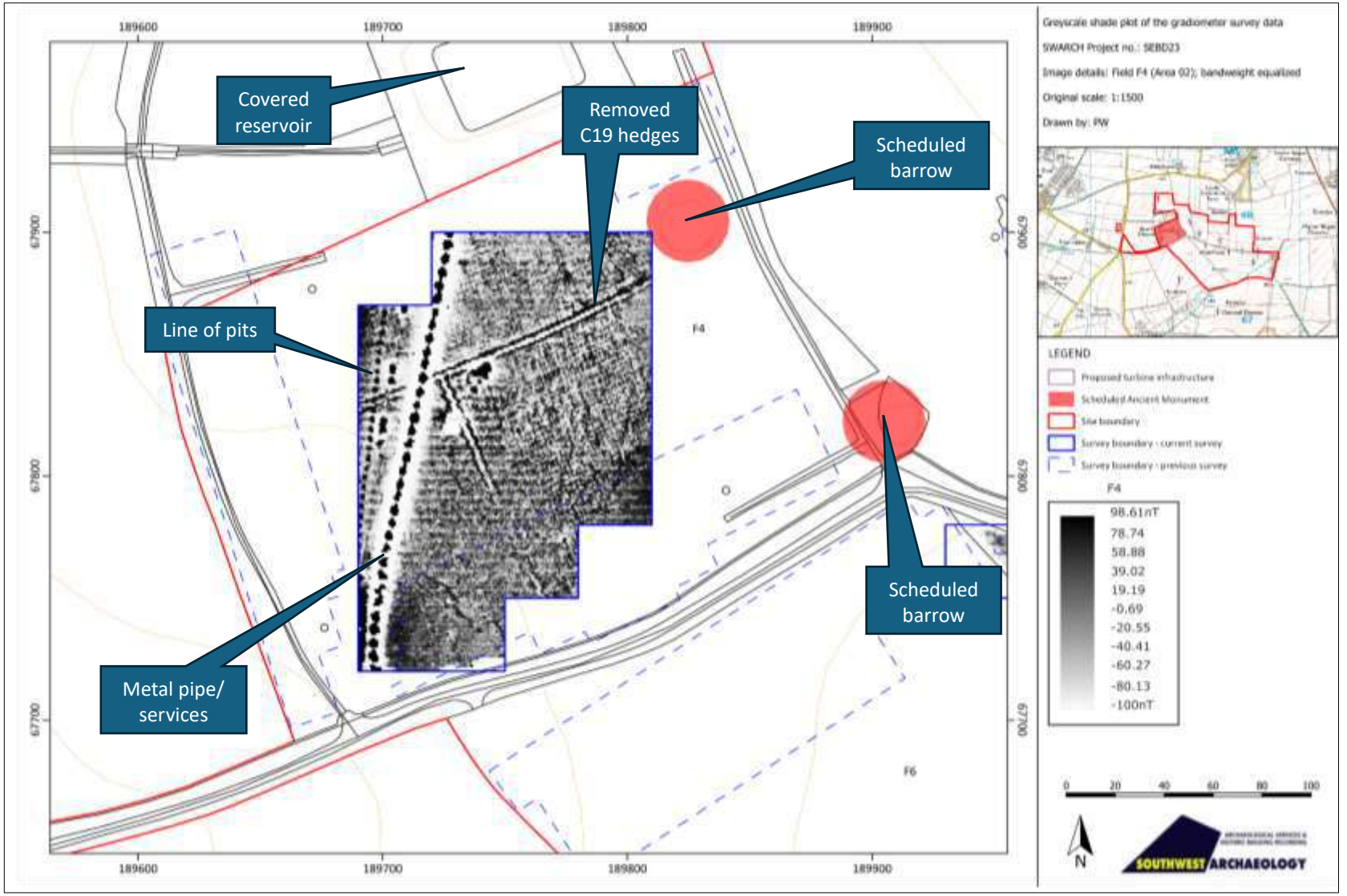

FIGURE 2: THE RESULTS OF THE GEOPHYSICAL SURVEY IN THE FIELD CONTAINING THE PROPOSED TURBINE T1.

2.3 INDIRECT IMPACTS

2.3.1 QUANTIFICATION

The ZVI generated for these turbines is extensive – the combined coverage covers much of the north Cornish coast and hinterland. Individually, the ZVI of the five proposed turbines have a slightly different visual effect (see Figures 3-7).

Ordnance Survey Panorama data was used to generate a Zone of Visual Impact (ZVI) for the proposal. The data was processed using *QGIS* v.3.16.11 and plugin *Visibility Analysis* v.1.8. The parameters of this analysis were: a target height of 1.6m and observer heights (as determined by the difference elements of the turbine) of 150m, 82m, 14m and 0m.

2.4 CAVEAT

In this context it is useful to remember that *setting is not itself a heritage asset, nor a heritage designation… its importance lies in what it contributes to the significance of the heritage asset or to the ability to appreciate that significance*[12]. *The contribution of setting to the significance of a heritage asset is often expressed by reference to views*[13], but …*setting is different to general amenity. Views out from heritage assets that neither contribute to significance nor allow appreciation of significance are a matter of amenity rather than of setting*[14]. Thus it is possible for views between and across heritage assets and a development to exist without there necessarily being an effect. In undertaking this assessment it has become clear that it is, for the most part, the second factor – *the ability to appreciate that significance* – that is the principal issue: to assess to what extent the tall towers and moving blades of the proposed wind turbines constitute a very minor alteration to a key characteristic (a *negligible* effect), a minor alteration to a key characteristic (a *minor* effect) or a partial loss or damage of a key characteristic (a *moderate* effect) (as per Table 3) (note all of these effects tend to fall towards the lower end of the *less than substantial harm* scale as defined by the NPPF).

2.4.1 COMMENT

Unlike the direct impacts – where reducing the number of planned replacement turbines has a demonstrable benefit and minimises the archaeological risk – the complex (and subjective) relationships between a monument or building and its setting, taking into account visibility, distance, screening etc., means that reducing the number of proposed turbines does not necessarily correlate with a similar reduction (i.e. 20%) in potential harms.

Figures 3-7 demonstrate the five proposed turbines each have slightly difference ZVIs, but that the differences between them relates to the visibility of the turbine base/base of the rotor sweep; the ZVIs are essentially identical for visibility to nacelle and rotor tip (with the usual caveat that this is a bare-earth ZVI and screening is not factored in). That being the case, a group of ×4 turbines, rather than ×5, when viewed from any distance, will still present as a group, and be seen in relation to the group of turbines on Denzell Down. It is the scale of these turbines, and the kinetic character of the rotors, that ensures their visibility in the landscape. The individual assessments in the HIA and its addendum are therefore unlikely to change.

That said, the assessments in the HIA assume the operational ×16 turbine wind farm forms part of the baseline, and on that basis those assessments calculate a benefit would arise from replacing those turbines with fewer – albeit larger – models. It stands to reason, therefore, further reducing the number of replacement turbines would have an incremental effect that, in aggregate terms (i.e. the assessment of effect of one development on multiple assets), there would be a beneficial effect, albeit one that would not be significant in planning terms.

Note that for three assets/asset groups near the proposed turbines there *would* be a benefit in removing turbine T1 from the scheme. These are: the *guidepost at SW89256765*; *seven barrows and one ring barrow on Bear's Down and Denzell Down*; and *four barrows south-east of Little Trewinnick*. It would not change the assessments in the HIA (*negligible adverse*, *minor adverse* and *minor adverse*, respectively) as the assessment bands are quite broad, but there would be a benefit. If we disaggregated the eight barrows of *seven barrows and one ring barrow on Bear's Down and Denzell Down* and assessed each one individually, there would undoubtedly be a significant beneficial effect for the northernmost two barrows (B1 and B2) of the group. Both would fall within the 'loom' zone of T1, and B1 would almost lie within the sweep of the T1 blades.

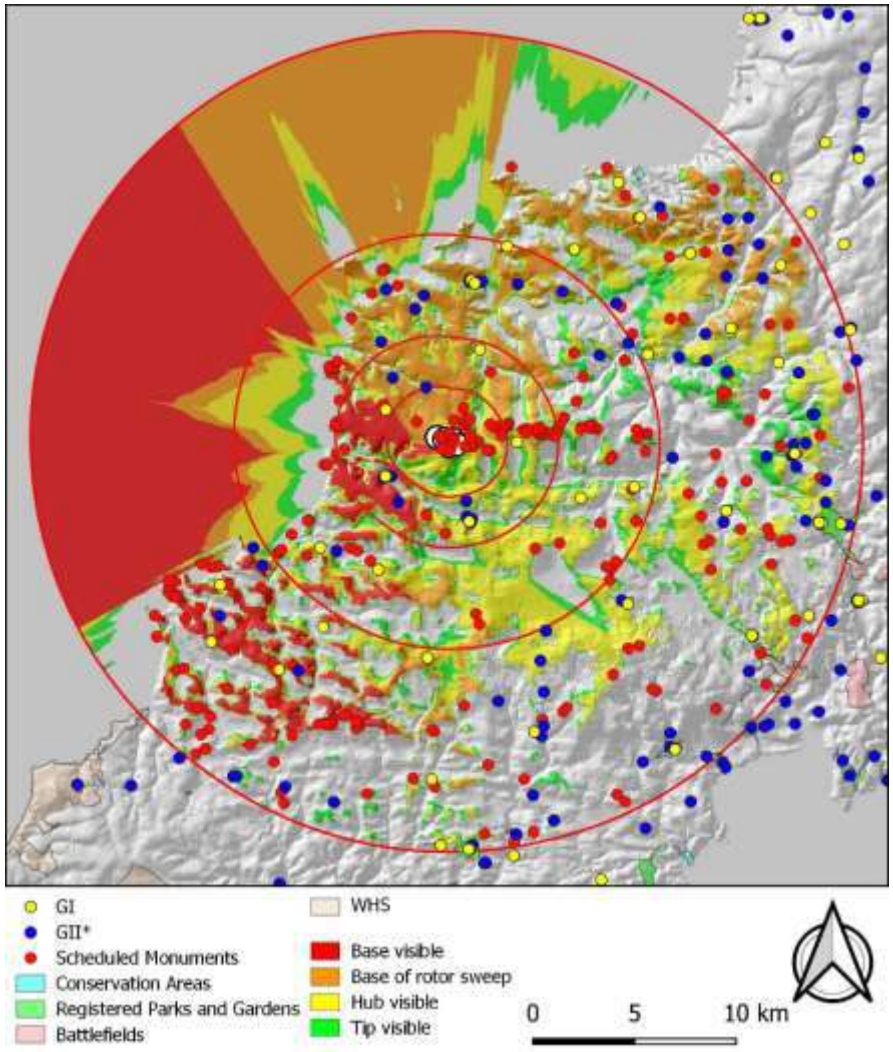

FIGURE 3: INDIVIDUAL ZTV FOR THE **TURBINE 1**. BUFFERS AT 2.5KM, 5.0KM, 10KM AND 20KM. THE COLOURS CORRESPOND TO THE PROPORTION OF THE TURBINE VISIBLE FROM ANY ONE LOCATION. DATA USED UNDER THE OGL V.3.0.

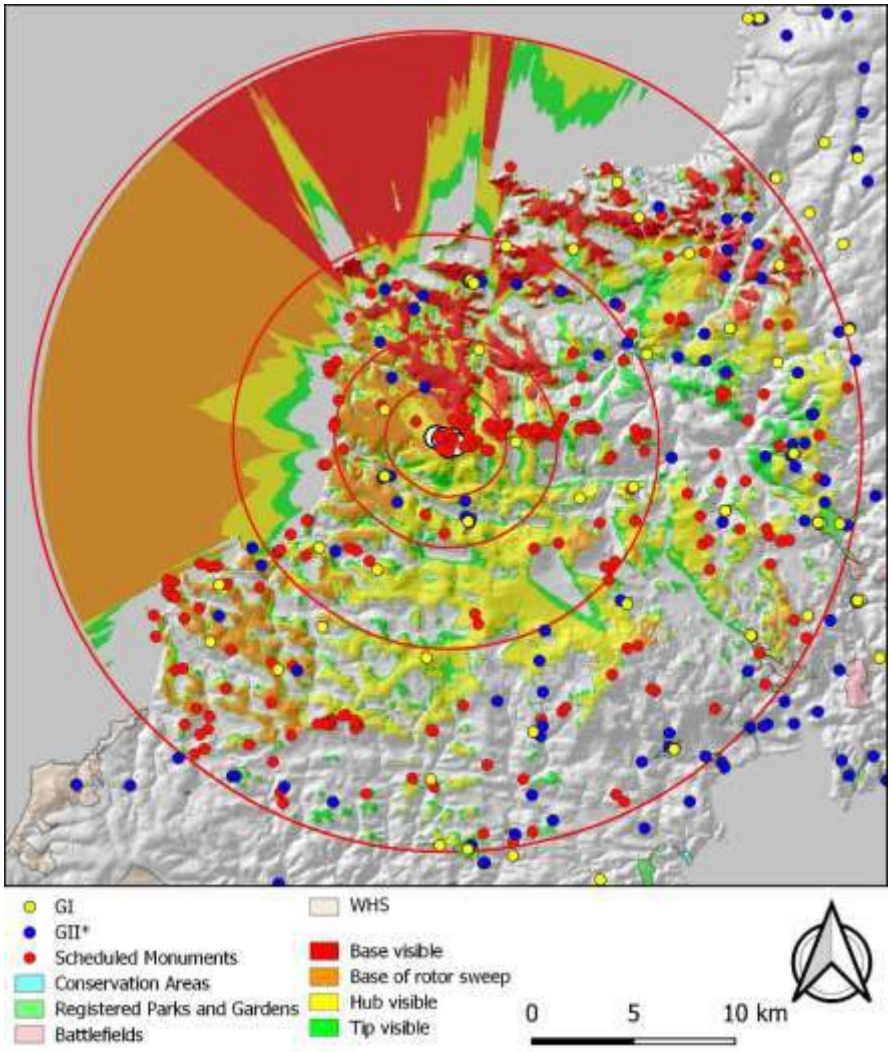

FIGURE 4: INDIVIDUAL ZTV FOR THE **TURBINE 2**. BUFFERS AT 2.5KM, 5.0KM, 10KM AND 20KM. THE COLOURS CORRESPOND TO THE PROPORTION OF THE TURBINE VISIBLE FROM ANY ONE LOCATION. DATA USED UNDER THE OGL V.3.0.

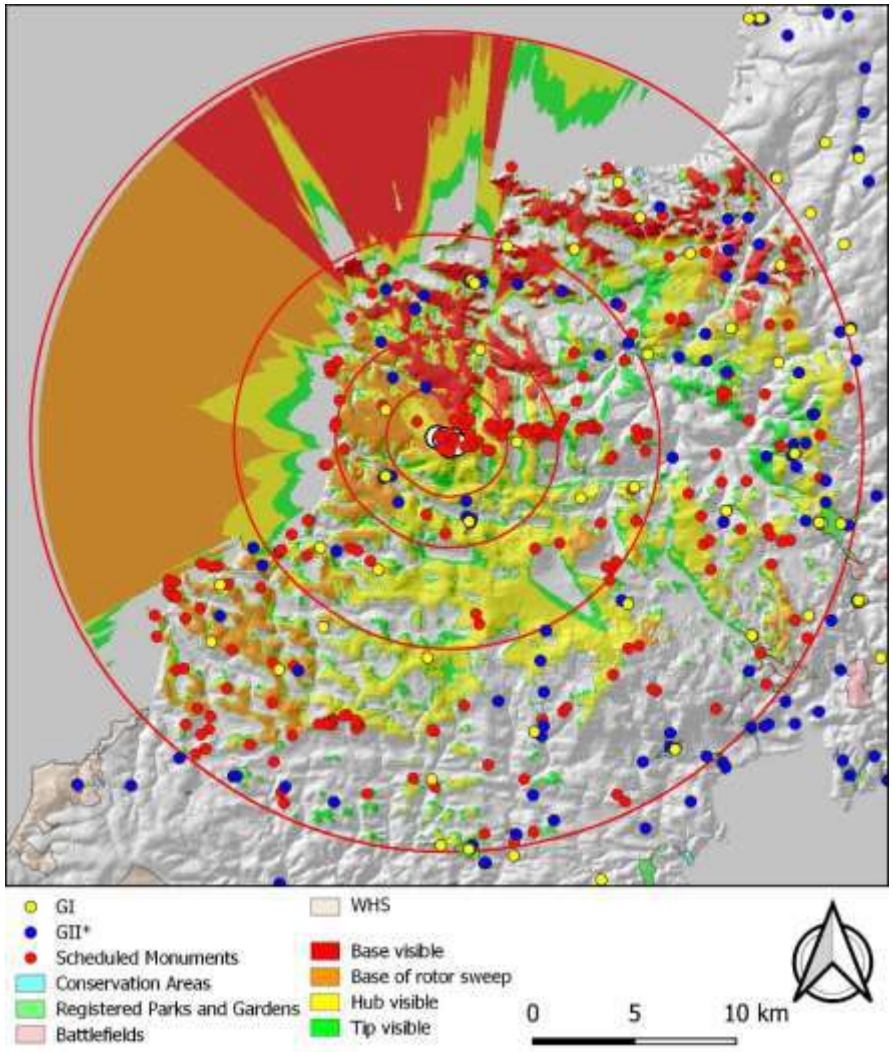

FIGURE 5: INDIVIDUAL ZTV FOR THE **TURBINE 3**. BUFFERS AT 2.5KM, 5.0KM, 10KM AND 20KM. THE COLOURS CORRESPOND TO THE PROPORTION OF THE TURBINE VISIBLE FROM ANY ONE LOCATION. DATA USED UNDER THE OGL V.3.0.

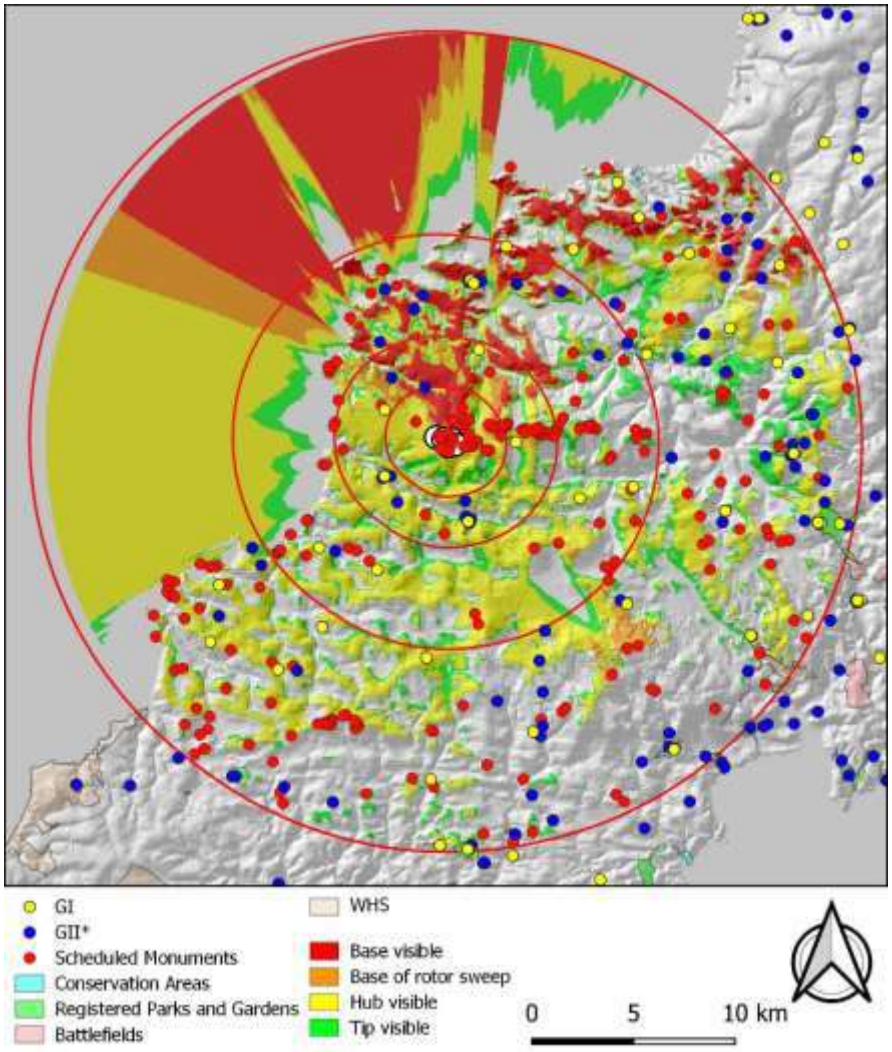

FIGURE 6: INDIVIDUAL ZTV FOR THE **TURBINE 4**. BUFFERS AT 2.5KM, 5.0KM, 10KM AND 20KM. THE COLOURS CORRESPOND TO THE PROPORTION OF THE TURBINE VISIBLE FROM ANY ONE LOCATION. DATA USED UNDER THE OGL V.3.0.

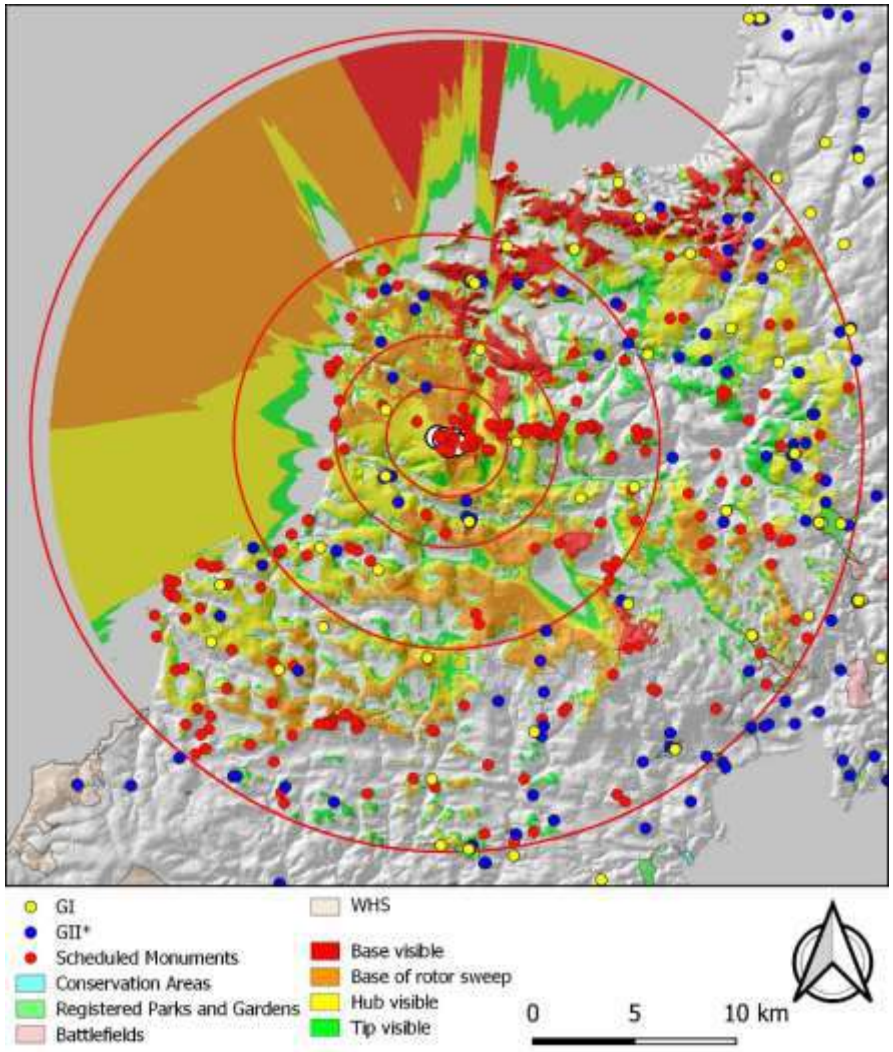

FIGURE 7: INDIVIDUAL ZTV FOR THE **TURBINE 5**. BUFFERS AT 2.5KM, 5.0KM, 10KM AND 20KM. THE COLOURS CORRESPOND TO THE PROPORTION OF THE TURBINE VISIBLE FROM ANY ONE LOCATION. DATA USED UNDER THE OGL V.3.0.

3 CONCLUSION

The repowering of this wind farm would see 16×57m (to tip) wind turbines replaced by 5×150m (to tip) turbines. In a scenario where only 4×150m replacement turbines were erected, there would be some additional benefit.

For direct impacts, it would reduce the footprint of the development by 20%, remove a turbine from a field where archaeological features were identified during the survey work, and minimise the risk of accidental damage to the two scheduled monuments in that field.

For indirect impacts, a group of four large turbines would probably have a very similar visual effect on distant designated heritage assets as five, especially given they would be backdropped or foregrounded by the five turbines on Denzell Down. The reduction in number would have a beneficial effect on its overall aggregate impact, and there would be a beneficial effect on some of the closest assets, especially the barrows on Bear's Down itself.

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APPENDIX 1: SUMMARY METHOD STATEMENT

TABLE 1: THE HIERARCHY OF VALUE/ IMPORTANCE (DERIVED FROM DMRB LA104 TABLE 3.2N).

Value (Sensitivity) of Receptor / Resource	Typical description
Very High	Very high importance and rarity, international scale and very limited potential for substitution e.g. elements of a WHS that convey OUV
High	High importance and rarity, national scale, and limited potential for substitution e.g. Grade I and II* buildings; Scheduled Monuments
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution e.g. Grade II buildings
Low	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale.

TABLE 2: SIGNIFICANCE OF EFFECTS MATRIX (DERIVED FROM ICOMOS 2011, 9-10).

		Scale and Severity of Change/Impact				
		No Change	Negligible Change	Minor Change	Moderate Change	Major Change
		Significance of Effect (either adverse or beneficial)				
Value	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

TABLE 3: PROFESSIONAL JUDGEMENT OF IMPACT (DERIVED FROM DMRB LA104 TABLE 3.4N).

Magnitude of Impact		Typical Description
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements; improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features, or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features, or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features, or elements.
No change		No loss or alteration of characteristics, features, or elements; no observable impact in either direction.

TABLE 4: SCALES OF IMPACT AS PER THE NPPF, AS RELATED TO TABLE 3.

Scale of Impact		
No Change	*Neutral*	No impact on the heritage asset.
Less than Substantial Harm	*Negligible Adverse*	Where the developments may be visible or audible but would not affect the heritage asset or its setting, due to the nature of the asset, distance, topography, or screening.
	Minor Adverse	Where the development would have an effect on the heritage asset or its setting, but that effect is restricted due to the nature of the asset, distance, or screening from other buildings or vegetation.
	Moderate Adverse	Where the development would have a pronounced impact on the heritage asset or its setting, due to the sensitivity of the asset and/or proximity. The effect may be ameliorated by screening or mitigation.
Substantial Harm	*Major Adverse*	Where the development would have a severe and unavoidable effect on the heritage asset or its setting, due to the particular sensitivity of the asset and/or close physical proximity. Screening or mitigation could not ameliorate the effect of the development in these instances.
Total Loss	*Total Loss*	The heritage asset is destroyed.

[1] SSEW 1983: *Legend for the 1:250,000 Soil Map of England and Wales*.
[2] BGS 2024: https://geologyviewer.bgs.ac.uk
[3] SWARCH 2024: *Impact Assessment Methodology v.2.02*.
[4] SWARCH 2025: *Land at Bear's Down, St Ervan & St Mawgan, Cornwall. Heritage Impact Addendum*. SWARCH report 250422.
[5] Historic England 2017: *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3* (2nd ed.). The callout box on page 9.
[6] References in the original HIA.
[7] SWARCH 2024: *Land at Bear's Down, St Ervan & St Mawgan, Cornwall. Results of a Revised Heritage Impact Assessment*. SWARCH report 240524.
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[10] Historic England 2019: *Statement of Heritage Significance: Analysing Significance in Heritage Assets*. HEAN 12.
[11] IEMA, IHBC & CIfA 2021: *Principles of Cultural Heritage Impact Assessment in the UK*.
[12] Historic England 2017: *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3* (2nd ed.). Paragraph 9.
[13] Historic England 2017: *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3* (2nd ed.). Paragraph 10. The sentiment is also expressed in the PPG glossary.
[14] Historic England 2017: *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3* (2nd ed.). Paragraph 16.