



Trewoofe, St. Buryan, Cornwall

Archaeological assessment of proposed wind turbines



Historic Environment Projects

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The viewshed mapping was carried out by Francis Shepherd.

The views and recommendations expressed in this report are those of Historic Environment Projects and are presented in good faith on the basis of professional judgement and on information currently available.

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Cover illustration

Looking north across the site proposed for the Trewoofe wind turbines towards the West Penwith Moors 10km away on the skyline.

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Abbreviations

EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
NGR	National Grid Reference
OS	Ordnance Survey

1 Summary

Historic Environment Projects, Cornwall Council, was approached by Nicola Davies of Capture Energy Ltd on 07 February 2013 with a request to provide costs for an archaeological assessment of a proposed pair of wind turbines near Trewoofe, St. Buryan as part of a proposed planning application. Following a site visit with Nick Russell of English Heritage to discuss the proposal, a cost schedule for the work was approved on 03 April 2013.

The proposal is for a pair of 100Kw wind turbines with hub heights of 22.5m and maximum blade tip heights of 34.2m to be sited on farmland at Trewoofe in the eastern part of the parish of St. Buryan at SW 43514 25796 and SW 43653 25791. The site chosen for the wind turbines lies in an area of farmland laid out during the medieval period on a north-facing valley side above the stream which reaches the sea at Lamorna on the south coast of West Penwith.

The assessment consisted of a desk-based assessment, viewshed analysis out to 10Km from the turbine locations and a walkover survey.

Given the nature of the location chosen for the wind turbines, despite their relatively small scales, it was considered by English Heritage that there was some potential for negative impacts on the settings of some of the important group of ceremonial Scheduled Monuments centred on the Merry Maidens stone circle not far to the south. The site also lies close to a substantial number of Listed Buildings, most particularly at Trewoofe and Trevider, one of these being Listed Grade II*. Some impacts on the Historic Landscape Character of the landscape surrounding the proposed wind turbines are also anticipated.

Overall, setting impacts resulting from the development were considered likely only at the Scheduled Pipers standing stones to the south of the site, at Trevider Grade II* Listed farmhouse and associated buildings to the north west of the site, in relation to a pair of Grade II Listed agricultural barns sited immediately next to the development site, and on the Historic Landscape Character of the immediate landscape.

A report summarising the results of the assessment and its conclusions was prepared for the client.

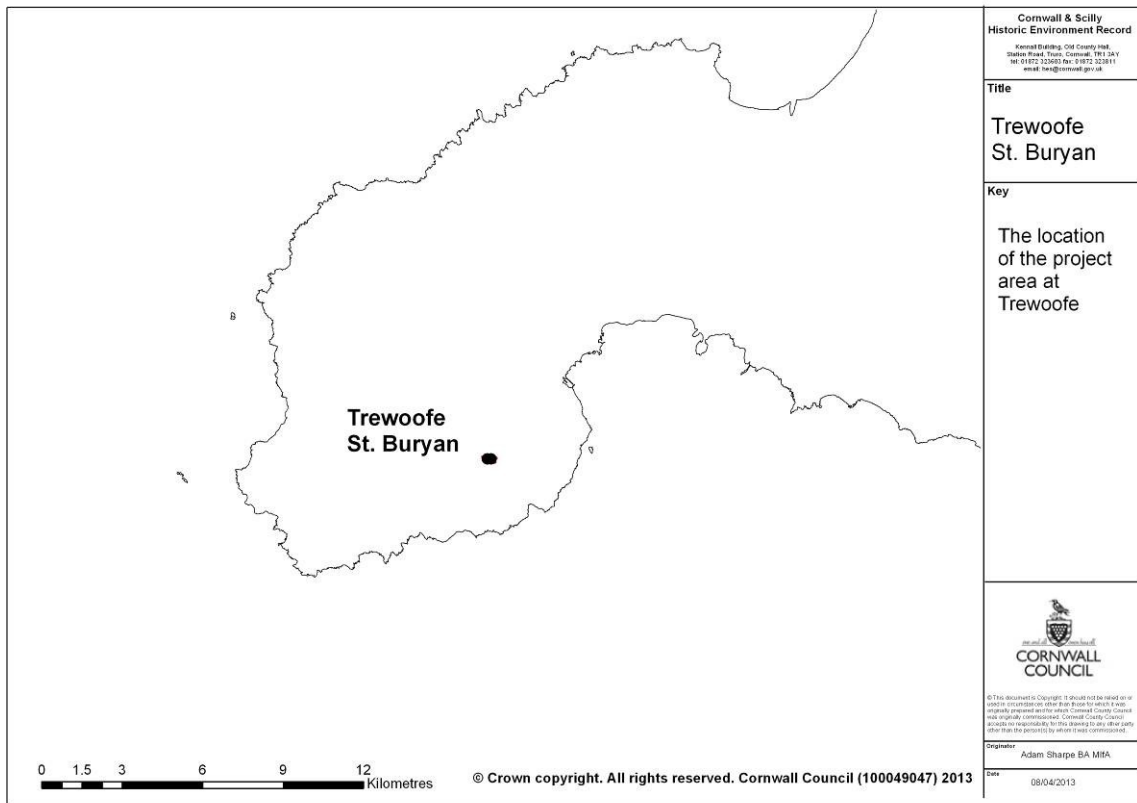


Fig 1. The location of Trewoofe.

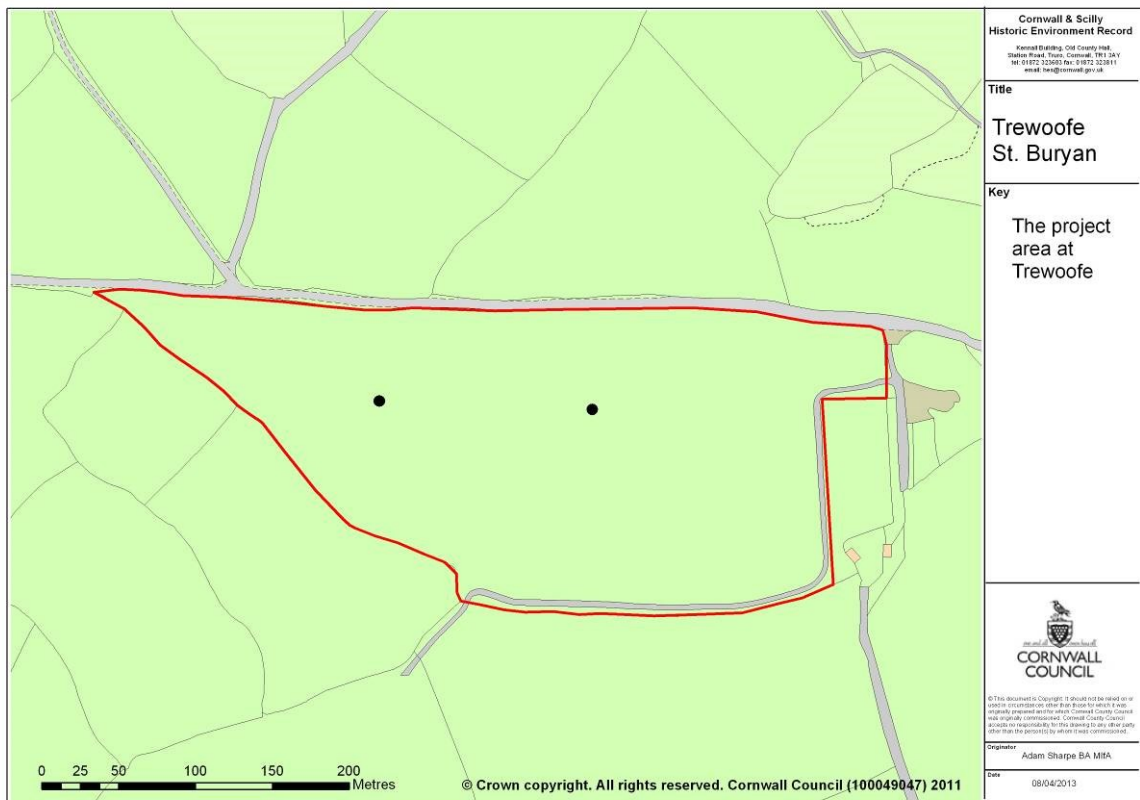


Fig 2. The locations proposed for the wind turbines at Trewoofe.

2 Introduction

2.1 Project background

Historic Environment Projects, Cornwall Council, were approached by Nicola Davies of Capture Energy Ltd on 07 February 2013 with a request to provide costs for an archaeological assessment of a proposed pair of wind turbines near Trewoofe, St. Buryan as part of a proposed planning application. Following a site visit with Nick Russell of English Heritage, A cost schedule for this work was approved on 03 April 2013.

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The assessment consisted of a desk-based assessment, viewshed analysis out to 10Km from the turbine locations and a walkover survey.

Given the nature of the location chosen for the wind turbines, despite their relatively small scales, it was considered by English Heritage that there was some potential for negative impacts on the settings of some of the important group of ceremonial Scheduled Monuments centred on the Merry Maidens not far to the south. The site also lies close to a substantial number of Listed Buildings, most particularly at Trewoofe and Trevider. Some impacts on the Historic Landscape Character (HLC) of the landscape surrounding the proposed wind turbines were also anticipated. Local topography may, in practice, constrain the visibility of the wind turbines, particularly to the south and east.

An initial planning assessment (number PA12/10843) for two 100Kw turbines and associated infrastructure was made on 07/12/2012, this determining that the application was considered not to be an EIA Development within the meaning of the EIA Regulations.

The potential for cumulative impacts was considered and the following judgement made in the assessment:

A 12.6 metre turbine was granted at Castallack Farm, Castallack, Paul under decision notice number PA12/03836. A 34.6 metre turbine was refused at Velansaga Barton Farm, Tregadgwith, St. Buryan under decision notice number PA12/04088. It is therefore considered that there will be no significant or adverse culmination with other development in this particular location.

A brief prepared on 07/02/2013 by Mr Phil Markham, Historic Environment Planning Advice Officer, Cornwall Council, was used to guide this archaeological assessment, in conjunction with the advice on assessing the impacts of such developments on the settings of designated sites provided by English Heritage in 2012 and specific advice on required ZTV radii in an email from English Heritage dated 21/03/2013.

2.2 Aims and objectives

The principal aim of the study is to gain a better understanding of the impacts which would result from the construction of a pair of wind turbines on land at Trewoofe in the parish of St. Buryan.

The overall project aims are to:

- Draw together historical and archaeological information about the development site and its surroundings, including relevant information held within the Cornwall Historic Environment Record.

- Review and analyse historic map evidence for the site.
- Follow the approach outlined in Section 3 of the English Heritage guidance on setting.
- Identify the construction, use and 'end of life' impacts of the current proposals on the significance of the setting of these assets and on the proposal site.

The site specific project aims are to:

- Produce a report containing the desk based assessment and survey in interpreted form.
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains or other mitigation is recommended.

The objective of the project is to produce a report setting out the likely range of impacts (both direct and on settings) of the development on heritage assets within the site or the surrounding locality, as defined above.

2.3 Methods

2.3.1 Desk-based assessment

As part of the desk-based assessment (DBA), historical databases and archives were consulted in order to obtain information about the history of the site and its surroundings, and the structures and features recorded within the site boundaries. The main sources consulted were as follows:

- Published sources available in the Cornwall and Scilly HER.
- Historic maps including
 - Norden's Map of Cornwall (printed in 1728 but mapped *circa* 1600)
 - Joel Gascoyne's map of Cornwall (1699)
 - Thomas Martyn's map of Cornwall (1748),
 - OS 1 inch survey (*circa* 1810)
 - St. Buryan Tithe Map (*circa* 1840),
 - 1st and 2nd Editions of the OS 25 inch maps (*circa* 1880 and *circa* 1907).
- Modern maps.
- National Mapping Programme transcripts from aerial photographs.
- Other aerial photographs in the Cornwall and Scilly HER.
- Historic Landscape Characterisation mapping.
- Cornwall and Scilly Historic Buildings, Sites and Monuments Record (HBSMR).
- Information held as GIS themes as part of the Cornwall and Scilly HER.

The historical and landscape context of the site was also considered during this stage of the assessment in order to establish the nature of the heritage assets which are located within the area surrounding the proposed wind turbines.

2.3.2 Viewshed analysis

An assessment of the impacts of the proposals was made from the surrounding area using the guidelines and methodological approaches set out in English Heritage's recent consultation draft guidance on the setting of heritage assets. This was based on GIS-based viewshed mapping produced using a model of theoretical inter-visibility between the wind turbines proposed for the site and significant heritage assets within the surrounding landscape; the viewshed (ZTV or Zone of Theoretical Visibility) was

generated using ArcGIS software. The methodology employs a Digital Terrain Model (DTM), which ignores potentially temporary surface features such as buildings, woodland, vegetation, etc. to provide a surface model of potential intervisibility between the proposed wind turbines and key heritage assets within the surrounding landscape. A viewshed was generated for an 'observer point' based on the location of the proposed wind turbines.

When performing viewshed analyses, several variables are used to limit or adjust the calculation including offset values, limitations on horizontal and vertical viewing angles (azimuth) and distance parameters (radius) for each observer point. For the proposed wind turbines at Trewoofe, the viewsheds were based on an 'overall observer elevation value' made up of the 'elevation value' or height above sea level of the ground at the observer viewpoint, with added to this additional offsets of 22.5m to represent the height of the turbine hubs and 34.2m to represent that of their blades.

These viewsheds were checked on the ground, given that vegetation and other factors may substantially block views to and from key sites, whilst significant heritage assets within the theoretical viewsheds were visited (where access was possible) and the landscape within which they sit considered to determine intervisibility with the proposed development site and the natures of their settings, both locally and at a distance. This informed the likely scales and types of any visual impacts which might affect their settings, as required by English Heritage (2011). Viewshed radii of either 10Km or 3Km were used to determine potential impacts on designated heritage assets (as appropriate) and a radius of 1Km for undesignated heritage assets (see Figures 17 to 32).

Sites identified through intersection of the ZTV modelling with GIS layers containing designated and undesignated heritage assets produced data sub-sets which were further filtered according to their intersection with ZTV zones representing 1Km, 3Km and 10Km from the site, as required by the HEPAO brief and English Heritage guidance.

The site types within these data sets were then analysed to determine their likely sensitivity to impacts on settings. Those site types which had no setting (documented sites) were excluded from further analysis, as were those which by their nature have very localised settings (for example, milestones, wayside crosses and fingerposts) except where in very close proximity to the application site. The resultant site lists were further filtered by close examination of the ZTV data and a 2005 vertical aerial photograph GIS layer to remove from the lists those sites where mature vegetation or proximal buildings would almost certainly block intervisibility and where intrusion into key views was unlikely. Designated sites with limited settings (most Grade II Listed Buildings) and those with local settings such as associated urban development which were more than 2Km from the application site tended to be excluded from assessment at this stage unless specific reasons such as wholly unimpeded intervisibility were identified for their retention.

The resultant site list consisted of a mixture of designated landscapes with substantial intervisibility with the proposal site, Scheduled Monuments whose original settings were intended to include large areas of the surrounding landscape (for example, prominent hilltop barrows, hillforts, standing stones and stone rows), or which were designed to function as part of intervisible elements of larger groups with landscape settings (for instance barrow cemeteries), other high grade designated historic structures which were intended when built to be highly prominent within the landscape (predominantly church towers), and upstanding undesignated sites in close proximity to the development site. This filtered group of sites was assessed to determine impact (see below).

2.3.3 Fieldwork

In order to check the validity of the Zone of Theoretical Visibility (ZTV) indicated by the viewshed analysis, and thus the potential impacts on key heritage assets within the

ZTV, site visits were made to both the site proposed for the wind turbines, and to the selected key locations within the surrounding landscape. A visual check and photographic record were made of intervisibility (or the lack of it) between the proposed development site and heritage assets indicated by the ZTV mapping as being likely to be within the viewshed and whose settings were assessed as vulnerable to impacts from the development where public access was available. Where this was not the case, the nearest possible vantage point from which views including both the heritage asset and the development proposal site was utilised, preferably one in which the proposed development site formed the backdrop to a view of the designated heritage site or was within the same view.

A walkover survey of the site proposed for the wind turbines and for their cabling was also undertaken to examine the site for upstanding archaeology and to record the nature of the boundary types which might be impacted upon during the development. A list of sites visited is contained within Section 9 of this report.

2.3.4 Post-fieldwork

On completion of the project and following review with the HE Project Manager the results of the study were collated as an archive in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006*. The site archive will initially be stored at ReStore, with the eventual aim of deposition at Cornwall Record Office.

An archive report (this report) has been produced and supplied to the Client. This report will be lodged with the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation once a planning application for the site has been made. A copy of the report will be supplied to the National Record of the Historic Environment (NRHE) in Swindon, to the Courtney Library of the Royal Cornwall Museum and to the Cornish Studies Library. All digital records will be filed on the Cornwall Council network.

An English Heritage/ADS online access to the index of archaeological investigations (OASIS) record has been made covering this assessment project.

3 Location and setting

The sites proposed for the wind turbines are at SW 43514 25796 and SW 43653 25791 within a large agricultural enclosure. The site is located on a north-facing, gently-sloping valley side falling to the Lamorna Stream (Figures 1, 2 and 12), the proposed wind turbines being sited at 70m and 74m OD. The site has relatively closed-in views, particularly to the south where the topography blocks views back to the Merry Maidens ceremonial complex from ground level, and to the east, west and north east, where, again, the local topography is a constraining feature. To the north west, however, the views are somewhat more open out towards the south western parts of the West Penwith uplands, though again, constraints on visibility imposed by topography apply.

The development area is characterised in the Cornwall and Scilly Historic Environment Record (HER) as 'Anciently Enclosed Land (Farmland Medieval)': that is land whose boundary arrangements were reorganised to a substantial degree during the medieval period. It is likely, however, that this land has been farmed continuously since late prehistory.

The parent bedrock underlying the application site consists of the Lands End granite, whilst the soils are recorded as Moretonhamstead loams. No superficial (drift) deposits are recorded by the British Geological Survey. The agricultural classification of this land is Grade 3.

The site lies within the West Penwith South (Land's End to Newlyn) Landscape Character Area, which is considered to have a moderate-high sensitivity to wind energy

development outside the AONB and a high sensitivity within the AONB. The site lies adjacent to, but outside, the AONB.

It was further noted that: *The absorption capacity of the landscape character area, as a whole, is therefore fairly low, and the nature of the development proposed may not be easily accommodated.*

4 Project extent

The archaeological assessment was focussed on those heritage assets (whether designated or not) which might be physically impacted upon by activities associated with the erection of the wind turbines, including cable trenching, siting of temporary compounds, cranes or other equipment and with any associated semi-permanent infrastructure.

The assessment also takes into account and quantifies impacts on the settings of heritage assets (both designated and undesignated) within the viewshed of the proposed turbine sites in line with paragraph 129 of the 2012 National Planning Policy Framework (NPPF), sections 16(2) and 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 Chapter 9, and English Heritage guidance relating to the setting of historic assets (2011) and on wind energy and the historic environment (2005), namely:

- Non-designated heritage assets – 1Km radius.
- Grade II Listed Buildings, World Heritage Site Areas and Conservation Areas – 3Km radius.
- Scheduled Monuments, Grade I and II* Listed Buildings, Registered Battlefields and Registered Parks and Gardens – 10Km radius.

5 Designations

5.1 International

None apply to the site. The nearest point within the Cornish Mining World Heritage (The St. Just Mining District, Area 1) is 6.35km away to the north.

5.2 National

No national designations apply to the site proposed for the development.

The 10Km radius viewshed zone includes 54 potentially intervisible Scheduled Monuments (Figure 29. See also figures 17 and 24).

The 10Km radius viewshed intersects one Registered Park and Garden (Figures 30 and 31).

The 10Km radius viewshed includes 1 Grade I Listed Building and 8 Grade II* Listed Buildings (Figure 25, also figures 19 to 23).

The 3Km radius viewshed mapping indicates that there could be no intervisibility between the proposed wind turbines and any Conservation Areas (Figure 26).

Within the 3Km radius viewshed, the wind turbines would be theoretically intervisible to some degree with a number of Grade II Listed Buildings or groups of Grade II Listed Buildings, including those at Trevider and Trewoofe (see Figure 25).

5.3 Regional/county

The sites proposed for the wind turbines are designated Areas of Great Historic Value (AGHV) and Areas of Great Landscape Value (AGLV); the nearby Lamorna Valley is

designated an Area of Great Scientific Value (AGSV) and an Area of Outstanding Natural Beauty (AONB), whilst low-lying ground immediately to the north of the site is designated as a Cornwall Wildlife Trust Site.

5.4 Local

No local designations apply to the site proposed for the development.

5.5 Rights of Way

No rights of way traverse the sites proposed for the wind turbines, nor the remainder of the area across which the cabling will be undergrounded. This area is not registered as open access land under the CROW Act 2005.

6 Results of desk-based assessment

The sites proposed for the wind turbines lie within a large agricultural enclosure on a north-facing, gently-sloping valley side falling to the Lamorna Stream (Figures 1, 2 and 12). This area, characterised by field patterns of evolved medieval form set around farms, many of which have names with *tre* prefixes such as Trewoofe, Trevider, Trevorian, Trembothick or Trevelloe, indicating pre-Conquest origins as farming hamlets; others, particularly to the south have *bos* prefixes (such as Bosliven, Boskenna, Boleigh), indicating rather smaller farms of equivalent date, whilst south east towards the coast are a scatter of farms with *ros* prefixes (Rosemodress, Roslucombe) indicating areas of more marginal downland at the time of their naming.

This generally wind-protected landscape, with its relatively deep and fertile soils, its many small valleys and ready access to the coast is West Penwith's agricultural heartland, and has long been farmed. This inevitable processes of landscape evolution over two millennia have eroded away much of the physical evidence for earlier settlement within the locality, though the earthworks relating to late prehistoric/Romano-British enclosed farm settlements survive at Castalack Roundago not far to the east of Trewoofe and at Boskennal just to the south east of St. Buryan. The fogou (underground chamber) at Boleigh half a kilometre to the south is within a further example, and it is probable that most of the local pre-Conquest farms had similar antecedents.

It is clear that all of the suitable surrounding landscape would have been farmed in late prehistory, the valleys providing sources of timber for building and fuel, the nearby sea providing rich fishing grounds, whilst the moors to the north would have provided extensive areas of rough summer grazing and sources of gorse for fuel and bracken for animal bedding, as well as the sites for further ceremonial and funerary monuments.

Strong hints as to even earlier settlement within the area are to be found in the existence of the extensive and unusually-well-preserved Neolithic to Bronze Age relict ceremonial/funerary complex centred around the Merry Maidens stone circle just over a kilometre to the south. This includes not only the stone circle itself, deliberately set within the landscape so as to include views of (and possibly also reference) Chapel Carn Brea to the north west, but also others documented at Boscawen Ros and Tregurnow, standing stones at Gun Rith, the Pipers, Tregurnow, Velensaga and Boscawen Ros, barrows at Boscawen Ros, Rosemodress and Tregiffian, a cist grave at Tregiffian, holed stones at Rosemodress, a cup-marked stone at Tregiffian and a Neolithic entrance Grave at Tregiffian. There are also lithic scatters dating to the Mesolithic, Neolithic and Bronze Age periods. This concentration of early prehistoric monuments is unrivalled anywhere else in West Penwith, and clearly indicates a location of very great significance to the occupants of the area during this period, who would have lived in settlements within the surrounding landscape.

The Domesday Book (1086) does not mention Trewoofe. This part of the Cornish landscape, within the 'Lands of St. Michael's' would have been part of the holding of St.

Buryan (an important early ecclesiastical centre), held by the Canons of St. Buryan, and being free land before 1066, the church being established in about 930AD during the reign of Athelstan. One of the earliest monasteries in Cornwall was established here at the time, this being enlarged and rededicated in 1238, lying at the centre of a Royal Peculiar (coming under the direct jurisdiction of the King, rather than that of the Bishop of Exeter). By the 14th century, St. Buryan has become an important regional centre, and had been granted a weekly market and two annual fairs.

Trewoofe itself was first mentioned in 1302, when it was called *Trewoeff*. The place name incorporates the prefix *tre* – a farmstead; the suffix represents a personal name. Trewoofe Wartha (Higher Trewoofe) was first mentioned in 1440, as *Trewoyeff Wartha*.

The first mapping depicting this area dates to the 17th century, when John Norden's map (drawn up at the end of the 17th century, though not published until 1728, Fig 3) depicting the Hundred of 'Penwith', showed churches, settlements and principal houses within West Penwith, and marked Trewoofe as an important house/farm within the locality, the seat of *Arthur Laelius*. The application site was at the eastern end of the ecclesiastical parish of St. Buryan.

Joel Gascoyne produced his detailed map of Cornwall in 1699 (Fig 3) and depicted the landscape around St. Buryan churchtown as containing a large number of farmsteads. Tracks and roadways traversed this landscape, linking these farms with market centres and churchtowns, as well as with each other. *Trewoof* was again named as a significant house, occupied by *Mad^m Vosper*. Thomas Martyn's map (Fig 5) drawn up a few decades later showed rather more detail of this landscape, and again depicted *Trewoof*.

The 1st Edition of the Ordnance Survey 1" to a mile mapping (Fig 6), dating to the first decade of the 19th century, showed a relatively dense network of roads and lanes linking local farms, the terrain-oblivious example passing the site proposed for the wind turbines representing the direct road between St. Buryan and Paul, suggesting that this might well be a long-established highway linking the two churchtowns.

The site proposed for the wind turbines lies within the ecclesiastical parish of St. Buryan, this now single large agricultural enclosure at the time of the circa 1840 Tithe Map (Fig 7) being occupied by ten small fields. These were part of two farms, though Boscawen Farm was in more than one occupancy.

Fields 3603 to 3605 were recorded as being part of the very large farm known in 1840 as Boscawen, owned by the Earl of Falmouth. Plots 3603 and 3604 were leased and occupied by Simon Boase, as follows:

- 3603 Near Green Downs Arable 2 acres, 1 pole, 5 perches
- 3604 Great Town Field Arable 5 acres, 1 pole, 13 perches

Field 3605 was a further part of Boscawen farm, occupied by Thomas Edmonds:

- 3605 Town Field Arable 2 acres, 0 poles, 4 perches

Plots 3095 to 3010 were part of *A tenement in Trewoof* extending to 20 acres, 1 pole and 7 perches, owned and occupied by Harvey Roberts:

- 3095 Mowhay Field Arable 2 acres, 2 poles, 28 perches
- 3096 Park Hill Arable 1 acre, 2 poles, 16 perches
- 3097 Little Hill Arable 1 acre, 0 poles, 20 perches
- 3098 Five Corners Arable 1 acre, 3 poles, 22 perches
- 3099 Middle Field Arable 2 acres, 1 pole, 13 perches
- 3100 Square Field Arable 1 acre, 2 poles, 28 perches
- 3101 Shelter Field Arable 1 acre, 3 poles, 0 perches

It is notable that all of these field names are in English, suggesting their relatively late establishment, possibly within an originally larger earlier enclosure (or pair of enclosures) of perhaps poorer quality lying on the fringes of the Trewoof and Boscawen estates.

The boundaries of these ten fields remained unchanged during the late 19th century (Fig 8), as also in the first decade of the 20th century. The sites proposed for the wind turbines both lie on the lines of former boundaries (Fig 9).

During the 20th century all of these boundaries were removed (the last of these which was shown on the OS Landranger mapping has also now gone) and the ten smaller fields have been incorporated into a single enclosure, as can be seen on the 2005 Cornwall County Council aerial photograph (Fig 10), when the combined field had been ploughed for arable.

The analysis of historic aerial photographs undertaken as part of the English Heritage National Mapping Programme (Figure 13) suggests the location of a small ditched enclosure to the west of the site, its form possibly suggesting that of a late prehistoric settlement enclosure.

7 Results of site walkover

See Figures 33 to 42.

A site walkover was undertaken on 12 April 2013. The weather was variable, the morning being characterised by rather cloudy skies, though as the day went on, the cloud cover became more patchy.

The site proposed for these wind turbines had been cropped prior to the date of the survey and parts had been shallowly ploughed; this field seems to have been used for arable cultivation on a regular basis over the past few years. It is enclosed within low Cornish Hedges topped with thorn bushes in most areas, though mature trees occupy the hedges at the western end of the field. This vegetation assists in blocking views out of the field, particularly to the south. The field falls from south to north overall, though there is also a slope from the eastern end towards the centre. There seems some likelihood that soil creep has occurred on the slopes as a result of repeated cultivation activities. The bare soil showed evidence for manuring scatters incorporating post-medieval midden material, as well as the importation of beach sand (in the form of pebbles). A few flakes of worked flint were exposed on the field surface.

There were no impediments to survey, and during the site walkover good visibility was possible in all directions. To the south, from ground level, the skyline was formed by the hedgeline at the upper edge of the field; to the west, mature trees blocked local views, though the elevated ground of Chapel Carn Brea, Bartinney and Caer Bran formed the skyline to the north west. To the north there were clear views out to the West Penwith Moors at Ding Dong, the Greenburrow Shaft engine house being a skyline feature, whilst to the north-east, rising wooded ground on Trevelloe Carn formed the local skyline. To the east the skyline was formed by the high ground around Castalack.

Views of the landscape to the north of the application site were generally open out towards the southern flanks of the West Penwith Moors across a number of intervening hilltops. Elsewhere, almost all views were closed in and very local.

8 Results of viewshed analysis

See Figures 14 to 32.

Given the topography of the site and its surroundings and the relatively low heights of the turbine towers, the viewshed analysis suggests that their Zones of Theoretical Visibility (ZTV) will be significantly constrained in some directions. In line with the

requirements of English Heritage guidance, however, the ZTV has been mapped to a distance of 10Km from the site. The visibility of the turbines will diminish with distance, and will, at many local sites, be blocked by intervening buildings within settlements or farmsteads or by mature groups of trees (albeit on a temporary basis, should such trees subsequently be felled).

8.1 1 km radius ZTV

See Figures 17 to 23.

Given the nature of the local topography and the relatively limited elevation of the proposed wind turbines, the ZTV suggests that the turbine masts or blades will be visible from approximately 85% of this zone, the exception being the southern side of the ridge to the south and the low ground in the valley of the Lamorna Stream. The zone extends to the northern end of the Lamorna Valley to the south east, to Trevelloe Carn to the east, Kerris Vein to the north east, Bojewans Carn to the north, Penmennor Farm to the west and Boleigh Farm to the south. The zone includes Grade II* Listed Buildings at Trevider and Trevelloe, and Grade II Listed Buildings at Trevider, Trewoofe and Trevelloe.

8.2 1km to 3km radius ZTV

See Figures 24 to 28.

The wind turbines will be visible from around 35% of the 1km to 3km radius area around them, their visibility being notably limited by local topography, particularly within exclude valleys and hillsides not facing the site. To the north this zone extends to Drift, to the east to Paul, it follows the coast from Slinke Dean to the south east to St. Loy Cove to the south south west, includes St. Buryan to the west and Tregonebris to the north west.

To the west it seems likely that the wind turbines are unlikely to be intervisible with St. Buryan, to the south the ZTV cuts off completely at 2km, as also to the east, to the north east it extends patchily out towards the outskirts of Newlyn but terminates around 3km from the site. To the north west, the ZTV seems to terminate around 5km and only to the north does it extend beyond this distance onto facing slopes of higher ground above Penzance and towards the line of the A30 between Penzance and Crows an Wra.

This zone contains a number of potentially intervisible Scheduled Monuments, though the majority of these are within agricultural enclosures (Figure 24).

The zone contains no Registered Parks and Gardens. No Conservation Areas fall within the ZTV within the 3km zone (Figure 26). The zone also includes a number of Grade II Listed farmsteads (Figure 25).

8.3 3km to 10km radius ZTV

See Figures 29 to 32.

This zone extends to Pendeen and Morvah to the north, to Chysauster to the north east, to Marazion to the east north east, then includes all points on the southern coast of West Penwith from Marazion to the east north east as far as Cape Cornwall to the north west.

As noted above, visibility of the wind turbines within this zone is likely to be low, being limited to an arc from the north west to the north east. Even within this zone, intervisibility with sites will be constrained and patchy. The wind turbines will potentially be visible from around 20% of this zone, most particularly to the north of the site proposed for it.

Within this zone, although there will be some degree of intervisibility with the wind turbines, a pronounced fall-off in their visual prominence will occur.

Whilst this zone contains a substantial number of Scheduled Monuments and a small scatter of Listed Buildings, (Figure 25), very few of them will have any significant degree of intervisibility with the proposed wind turbines at Trewoofe. This zone includes one Registered Park and Garden at Trengwainton (Grade II*) to the east (Figures 30 and 31).

8.4 Scheduled Monuments within the 10 km radius ZTV

See Figure 29, as also figures 17 and 24.

There are 54 Scheduled Monuments within 10km of the proposed wind turbine sites at Trewoofe and falling within its ZTV, as follows:

Note – some of these sites have multiple entries in the Schedule of Monuments.

- 1 entrance grave
- 2 portal dolmens
- 5 standing stones
- 3 individual barrows
- 3 barrow groups
- 1 cairn
- 1 stone circle with standing stones
- 2 round houses
- 2 hillforts
- 10 prehistoric settlements with associated fields
- 1 prehistoric field system
- 1 courtyard house
- 3 courtyard house settlements
- 4 rounds
- 1 fogou
- 1 chapel and holy well
- 1 early Christian memorial stone
- 11 crosses, cross base or cross heads
- 1 barrow, field system and china clay works (area scheduling)

Some of these potentially intervisible Scheduled Monuments consist of structures such as wayside crosses, churchyard crosses, inscribed stones, chapels and holy wells, whose settings are inherently very local. None are close to the sites proposed for the wind turbines, and, in line with English Heritage guidance, no assessment on impacts on their settings therefore needs to be made.

Hillforts, barrows, standing stones and stone circles, in contrast, were intended, when constructed, to have far-ranging settings. Some of the Scheduled Monuments within the 10Km viewshed consist of monuments of these types, and assessments of impacts on the settings of a number of these were judged to be required where they lay relatively close to the site proposed for the wind turbines, where substantial intervisibility was likely, where they were judged to have sensitive settings or where impacts on or intrusion into key views of the sites appeared likely to occur.

Although there is likely to be some degree of intervisibility between these sites and the proposed wind turbines, in some cases views of them will tend to be distant, in some partial and in others locally blocked by nearby vegetation or structures. Given the

topography of the sites selected for the Trewoofe wind turbines, negative impacts on the settings of most Scheduled Monuments are unlikely.

One group of sites close to the Trewoofe site – the Merry Maidens prehistoric ceremonial complex – was judged as potentially sensitive to setting impacts and close to the proposed turbine sites.

8.5 Registered Parks and Gardens and Registered Battlefields within the 10km radius ZTV

See Figures 30 to 31.

Some parts of the Grade II* Registered Park and Garden at Trengwainton may be intervisible with the wind turbines within this zone, though at such a distance that the wind turbines are likely to be barely perceptible as landscape objects. No negative impacts on the setting of this designated landscape are likely to occur, therefore.

There are no Registered battlefields within 10Km of the sites proposed for the wind turbines at Trewoofe.

8.6 Grade 1 and II* Listed Buildings within the 10km radius ZTV

See Figure 25. The majority of these buildings are within 3km of Trewoofe.

There are 130 Listed Buildings of all grades within 10Km of the proposed wind turbines at Trewoofe within the ZTV.

The following building intersected by the 10km ZTV is Listed at Grade I:

- 1312533 – The Church of St. Maddern

The following buildings (or groups of buildings) intersected by the 10km ZTV are Listed at Grade II*:

- 1143822 – Church of St. Credan
- 1143918 – Trevelloe House
- 1327506 – Kerris Manor and associated buildings (three separate entries)
- 1143899 – Trevider farmhouse
- 1143932 – Chyoone Cross
- 1311523 – Cross at St. Credan's Church
- 1327506 – Kerris Manor (two separate entries)
- 1143823 – Cross at St. Credan's Church

Designated features such as crosses have relatively local settings and most are at a sufficient distance from the wind turbines for no impacts on their settings to occur.

Three Grade II* Listed Buildings lie considerably less than 5Km away from the proposed wind turbine sites, and were judged to be potentially vulnerable to impacts on their settings:

1327506 – Kerris farmhouse

1143899 – Trevider farmhouse

1143918 -Trevelloe farmhouse

8.7 Conservation Areas within the 3km radius ZTV

See Figure 26.

No Conservation Areas fall within the 3km radius ZTV.

8.8 Grade II Listed Buildings within the 3km radius ZTV

See Figure 25.

Within the 3km zone there are 35 Listed Buildings of all grades. Of these, the following are Listed Grade II, as follows:

- 3 farmhouses
- 5 barns
- 3 piggeries
- 2 cartsheds
- 1 shippon
- 1 trough
- 6 cottages
- 3 crosses
- 1 cross base
- 2 gate piers and gates
- 1 mounting block (two entries)

Note – some Listed Buildings have multiple entries in the GIS to distinguish separate elements, though have single List numbers.

Impacts on the settings of all of these feature types are very unlikely unless they are in very close proximity to the proposed wind turbines. These include structures like guideposts, milestones, stiles, churchyard walls, lych gates, etc., headstones or chest tombs, crosses, bridges and village halls. Others such as houses, farmhouses and manors have rather more extensive settings, but none of the Grade II Listed features noted above have extensive settings.

As a result, impacts on potentially sensitive Grade II Listed Buildings have been evaluated within an area extending out to approximately 2Km from the proposal site (though this has been varied according to local topography, taking in the openness and general orientation of views).

- The piggeries and barns at Trevider are close to the site proposed for the wind turbines at Trewoofe, and will have partial intervisibility with them.

Given their distances from the site of the proposed wind turbines, the local topography and vegetation and the site types (and hence their sensitivities), no impacts on the settings of the remaining sites are likely.

8.9 Undesignated sites within the 1km ZTV

See Figure 14.

The ZTV mapping suggests that around 90% of the landscape within a 1km radius of the Trewoofe site will be intervisible with all or part of the proposed wind turbines. Within this zone, the Cornwall and Scilly Historic Environment Record (HER) records 39 intervisible sites, as follows:

Prehistoric

- MCO51752 – Kerris round (cropmark)
- MCO8102 – Kerris round (cropmark)
- MCO51749 – Bellowal field system (cropmark)
- MCO41645 – Bellowal lithic scatter

- MCO27050 – Kerris Vean Iron Age grave (documented site)
- MCO8101 – Kerris Vean round (documented site)
- MCO3829 – Trevider barrow (possible site)
- MCO802 – Kerris Iron Age findspot
- MCO6877 – Kerris fogou (documented site)
- MCO801 – Kerris Iron Age findspot
- MCO3715 – Tremewan barrow (documented site)
- MCO51747 – Penmenna field system (cropmark)
- MCO45073 – Trewoofe lithic scatter
- MCO45071 – Trewoofe lithic scatter
- MCO51759 – Trevolla field system (cropmark)
- MCO5162 – Trevolla field system (cropmark)
- MCO51760 – Tregona field system (cropmark)
- MCO51746 – Boleigh field system (cropmark)
- MCO20586 – Boleigh field system (cropmark)
- MCO844 – Lamorna findspot
- MCO2134 – Boleigh barrow
- MCO231 – Boleigh findspot
- MCO230 – Boleigh findspot
- MCO26960 – Boleigh holed stone
- MCO7340 – Boleigh standing stone

Undated

- MCO845 – Kerris Vean findspot
- MCO810 – Kerris Vean findspot
- MCO808 – Kerris Vean findspot
- MCO1708 – Trevider findspot
- MCO1615 – Tremewan findspot
- MCO232 – Boleigh findspot

Medieval

- MCO11030 – Bellowal settlement
- MCO11588 – Trevider settlement
- MCO51757 – Kerris Vean medieval enclosure
- MCO5175 – Kerris Vean findspot
- MCO10353 – Trewoofe Wartha chapel (documented site)
- MCO18093 – Trewoofe settlement
- MCO11053 – Boleigh settlement

Post-medieval/modern

- MCO51744 – Boleigh field system

Given the natures of these sites, the proposal for wind turbines at Trewoofe would have no significant impact on their settings.

9 Field verification of ZTV

See Figures 43 to 50.

The viewshed mapping and potential impacts were, wherever possible (given constraints on public access) ground checked from a number of locations, including sites at, adjacent to or overlooking St. Buryan, the Merry Maidens stone circle and adjacent monuments, near Castallack Roundago, Boscawen-Un stone circle, Trevelloe, Kerris, Trewoofe and Trevider.

At each accessible designated heritage site the potential visibility (and proportional visibility) of the proposed wind turbines was considered. Views out from the site towards key heritage assets were checked from the application site itself. Though true levels of intervisibility were impossible to determine from ground level given that the turbines have not yet been constructed and views were only available from ground level, the general degree of openness of the views out from the site could be assessed.

Where possible, photographs were taken from key locations within the surrounding landscape and from the locations at Trewoofe back to these sites. Whilst views from the surrounding ground allowed the locations of the proposed wind turbines to be determined within the landscape, in the lower lying ground field hedges, woods and other tree plantings blocked views back towards the site; within settlements, groups of buildings and mature trees and shrubs also blocked many views back to the site. The visibility cut-off imposed by the local topography suggested by the viewshed mapping was confirmed, though from ground level some areas of suggested intervisibility were closed up by woods and other tree plantings.

Field verification tended to confirm the viewshed mapping, from ground level the areas of intervisibility seem likely to terminate just over 1km to the south of the site; to the east and north east mature woodland on Trevelloe Carn just over a kilometre away may well block any views further in this direction. To the west, the viewshed mapping suggests intervisibility with the wind turbines up to a maximum of two kilometres away around Bosliven. From ground level, trees and hedges greatly reduced this distance. Given the orientation of the hillslope proposed for the wind turbines it is not unsurprising that views out to the north were extensive, terminating along hilltops from Chapel Carn Brea, Bartinney, Caer Bran, Sancreed Beacon and the West Penwith Moors around Ding Dong near Boskednan.

However, sites on or near these skylining features are between 5km and 10km away from the site at Trewoofe, and are viewed across intervening hilltops and ridges. Setting impacts beyond 2km from the site were considered very unlikely in this direction.

10 Cumulative impacts

Recent English Heritage guidance requires assessments of renewables applications to take account of cumulative impacts, as well as those relating to specific proposals.

The EIA screening option for this site has indicated no potential for cumulative impacts (see above), and there are currently only a small number of small-scale wind turbines operational or at application or pre-application stages within the south part of West Penwith, those within 3km of the Trewoofe site being at Kerris (12m to tip, approved), Castallack (10m, approved), Downs Barn Farm (9m, approved), Santry Farm (12m, approved), Trelew Farm (2 x 15m, approved). A 34.6m to tip wind turbine at Velensaga was refused permission, permission for a wind turbine at Tregagwith has lapsed and that for a 34.4m to tip turbine at Higher Trevorian has been withdrawn by the applicant.

There are, therefore, few areas within this general locality where wind turbines are prominent within local views, except to the south of Chapel Carn Brea, where there are a pair of visually-prominent operational medium-sized (34.4 and 34.6m to tip) turbines.

11 Synthesis

Neither the desk-based assessment nor the walkover survey indicated the presence of any significant upstanding archaeology which might be directly impacted upon by the proposed wind turbines and cabling at Trewoofe.

Impacts on both designated and undesignated heritage assets within the local landscape resulting from the construction of two wind turbines on land at Trewoofe will vary with their distance from the turbine sites, their state of preservation, their nature, and the effects of reduced or blocked intervisibility due to local topography, vegetation (including hedge plantings) or the presence of other buildings. In the case of some designated assets around the application site, even where intervisibility will be present, distance from the site will significantly reduce any impact.

There is the potential for moderate negative impact on the settings of sensitive receptors within the immediately local landscape out to two kilometres from the site, including high grade Listed Buildings and Scheduled elements of the prehistoric ceremonial complex centred on the Merry Maidens, in particular the Pipers standing stones. Beyond this zone, any impacts are likely to be negligible or neutral in character.

There will be some impacts on the Historic Landscape Character of the surrounding landscape, given that these will be the first structures of this type within what is, essentially, a wholly agricultural landscape whose character reflects its medieval origins.

12 Policies and guidance

The following section brings together policies and guidance (or extracts from these) used in the development of the assessment and its methodology.

12.1 National Planning Policy Framework 2012

The following paragraphs within the above document frame planning policy relating to the Historic Environment and are germane to this assessment:

128 *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*

129. *Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.*

132. *When considering the impact of a proposed development on the significance*

of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. As heritage assets are irreplaceable, any harm or loss should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*

133. *Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:*

- *the nature of the heritage asset prevents all reasonable uses of the site; and*
- *no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
- *conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and*
- *the harm or loss is outweighed by the benefit of bringing the site back into use.*

134. *Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.*

135. *The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*

139. *Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.*

12.2 Former Cornwall Structure Plan

The following policies in the Cornwall Structure Plan relate to the historic environment are currently used to guide responses to applications.

12.2.1 Policy 1

'Development should be compatible with:

The conservation and enhancement of Cornwall's character and distinctiveness;

The prudent use of resources and the conservation of natural and historic assets;

A reduction in the need to travel, whilst optimising the choice of modes, particularly opportunities for walking, cycling and the use of public transport;

Through developing the principles of Policy 1 it is intended to integrate environmental values with land use and transport policies, achieving patterns of development that reflect strong environmental protection and stewardship of resources.'

12.2.2 Policy 2

'Throughout Cornwall, development must respect local character and:

- *Retain important elements of the local landscape, including natural and semi-natural habitats, hedges, trees, and other natural and historic features that add to its distinctiveness;*
- *Contribute to the regeneration, restoration, enhancement or conservation of the area;*
- *Positively relate to townscape and landscape character through siting, design, use of local materials and landscaping.*
- *The conservation and enhancement of sites, areas, or interests, of recognised international or national importance for their landscape, nature conservation, archaeological or historic importance, including the proposed World Heritage Site, should be given priority in the consideration of development proposals.'*

12.3 Former Penwith Local Plan 2004

Although now part of Cornwall Council, Penwith District Council's policies listed in its local plan continue to be relevant. Relevant policies concerning the historic environment are listed below.

Local Plan Objective 1. To ensure that development does not have an adverse effect on landscape, nature, conservation, historic, archaeological and geological values;

Local Plan Objective 15. To provide a framework that supports initiatives for the management and enhancement of the countryside in terms of its landscape, nature conservation, historic, archaeological and geological values;

Policy CC-1: Development will not be permitted where it would significantly harm the landscape character, amenity, nature conservation, archaeological, historic or geological values of the coast and countryside of Penwith.

Policy CC-2: Proposals which maintain, enhance and facilitate the enjoyment and understanding of landscape character, amenity, nature conservation, archaeological, historic and geological values in the coast and countryside will be permitted.

Policy CC-3: Proposals for development conflicting with the objective to conserve and enhance the area of outstanding natural beauty will not be permitted.

Policy CC-12: Proposals for development which would result in the loss or damage to trees, woodland, hedgerows and Cornish Hedges which make a significant contribution to the character of the landscape and nature conservation will not be permitted.

Policy CC-15: Proposals for development which would damage Scheduled Ancient Monuments and other nationally important archaeological remains, or their setting, will not be permitted.

Policy CC-16: Proposals for development within areas of great historic value and those affecting archaeological remains of County importance will not be permitted where it would harm:-

- (i) The historic character of the landscape; or
- (ii) The value, character or setting of the remains.

Policy CC-17: Proposals for development which would adversely affect Historic Parks and Gardens, or their setting, will not be permitted.

12.4 Hedgerow Regulations

Under the current, 1997 Hedgerow Regulations, owners wishing to remove all or part of a hedgerow considered to be historically important must notify the Local Planning Authority (LPA). Criteria determining importance include whether the hedge marks a pre-1850 boundary, and whether it incorporates an archaeological feature. The LPA may issue a hedgerow retention notice prohibiting removal.

13 Likely impacts of the proposed development

13.1 Types and scale of impact

Two general types of archaeological impact associated with wind turbine developments have been identified as follows.

13.1.1 Types of impact, construction phase

Construction of the wind turbines could have direct, physical impacts on the buried archaeology of the site through the construction of the turbine foundations, through the undergrounding of cables, and through the provision of any works compound, together with any permanent or temporary vehicle access ways into and within the site. Such impacts would be **permanent** and **irreversible**.

13.1.2 Types of impact, operational phase

These wind turbines might be expected to have a visual impact on the settings of some key heritage assets within their viewsheds during the operational phase, given their heights (34.2 metres), the topography of the site and the nature of the local landscape. Such factors also make it likely that the development would have an impact on Historic Landscape Character. These impacts would be **temporary** and **reversible** should the turbines subsequently be dismantled and not re-powered or replaced.

13.1.3 Scale and duration of impact

The impacts of the wind turbines on the historic environment may include positive as well as adverse effects. For the purposes of assessment these are evaluated on a seven-point scale:

positive/substantial

positive/moderate

positive/minor

neutral

negative/minor

negative/moderate

negative/ substantial

Negative/unknown is used where an adverse impact is predicted but where, at the present state of knowledge, its degree cannot be evaluated satisfactorily.

The assessment also distinguishes where possible between **permanent** and **temporary** effects, or between those that are **reversible** or **irreversible**, as appropriate, in the application of the scale of impacts.

13.1.4 Potential and residual impacts

Potential adverse impacts may be capable of mitigation through archaeological recording or other interventions. In the assessments forming Section 13.2, where appropriate, both 'potential' and 'residual' impacts are given; that is, expected impacts 'before' and 'after' such work, principally in relation to the development phase. A proposed mitigation strategy is outlined below in Section 14.

13.2 Assessment of impact

Overall, the impacts of the proposed wind turbines on the archaeological resource are assessed as having a potential scored as **negative/minor**, principally dependant on proximity to the proposed turbine sites and intervisibility with them. The impact of the current proposal is assessed as **negative/minor** on the Pipers standing stones and

potentially also on the Grade II* Listed farmhouse at Trevider and to a lesser degree to its associated Grade II Listed barns and piggeries.

Impacts on the settings of designated heritage sites between 3km and 10km from the proposed turbine sites have been assessed as **neutral** overall as have those lying between 3km and 10km from the field at Trewoofe.

There may be some potential for impacts on sub-surface archaeology within the development site, though this is likely to be minor in scope.

The assessments supporting this general statement are outlined in the following sub-sections. To comply with current policies and guidance (Section 12) these provide assessments of impact in terms of different aspects of the archaeological resource - its individual sites, the settings of sites, Historic Landscape Character, and field boundaries. There are inevitably areas of overlap between these categories of impact; the assessment is adjusted accordingly to avoid 'double counting' of impacts.

13.2.1 Impacts on archaeological sites within the development area

Ground disturbance associated with the installation of foundations for the wind turbines, cabling or ancillary works during the construction phase could result in permanent, irreversible loss of below ground remains of archaeological sites within the development area, or of elements of these. The works, if deeper than current ground levels, might affect undetected buried cut features.

Scales of impact will vary with the degree of significance of individual sites, and with the proportion of the whole site which would be affected. The presence of a possible late prehistoric defended enclosure not far to the west of the site might suggest some potential for impacts on potentially significant sub-surface archaeology to take place.

13.2.2 Impacts on the settings of surrounding key heritage assets

The proposed wind turbines are considered likely to have an impact on the setting of key surrounding heritage assets, this being summarised as **negative/minor**, in particular in relation to the more closely-set Listed Buildings within the 3km zone and to a degree on the setting of some elements of the relict ceremonial landscape centred on the Merry Maidens, though not necessarily to all of its individual components.

Such impacts will be **temporary/reversible** overall should the wind turbines be dismantled in the future and not be replaced:

- There are a number of Scheduled sites located within 5km of the site proposed for the wind turbines which would have been intended, when constructed, to be important focal points within the local landscape. These include, in particular, the prehistoric ceremonial complex focussed on the Merry Maidens stone circle not far to the south. Whilst there may not be substantial intervisibility between some of these sites and the proposed wind turbines, they will occupy the same general area of the local landscape, and the construction of the wind turbines may alter visitors' perceptions of the area.
- These impacts are likely to be greatest in the case of the Pipers standing stones when viewed from the south from the nearby main road, as it seems likely that the upper sections of the turbine blades will appear over the intervening ridge from this direction. However, there is currently no public access the standing stones, and the only viewpoints of them are from a narrow and sometimes busy roadway through occasional gaps in the scrub cover on its flanking hedges.
- Although there will be theoretical intervisibility between some other elements of the ritual complex, in practice this will most likely be blocked by intervening vegetation. In the case of the Tregiffian entrance grave, the view towards the proposed wind turbines is backed by the immediately neighbouring main road and by a telephone pole, with overgrown field hedges beyond these. The

Longstone is set against a further overgrown hedgeline and can only be viewed from the east (the wind turbines will be to the north).

- There are no clearly visible individual wind turbines or wind farms within the surrounding landscape, and as a result, the area retains its essentially long-standing agricultural character. The erection of a pair of wind turbines at Trewoofe will, therefore, introduce the first highly-visible modern feature into this landscape, and this will, as a result, impinge to some degree on the settings of some Scheduled Monuments and Listed Buildings in the immediate locality.
- Other Scheduled Monuments within the 3km to 10Km viewshed are either types which have only limited settings or are at distances from the proposed wind turbines where their settings are unlikely to be impacted upon.
- During the operational phase the wind turbines are likely to impact to some degree on the settings of the Listed Buildings within their viewsheds and within about 1km of it. However, intervisibility at these sites may well be constrained by trees and by modern farm buildings. In the case of Trevider, whilst there will be views of the wind turbines from the upper floor of the Grade II* Listed farmhouse, the view will include closely-set modern barn-type farm buildings. Trevelloe (Grade II*) is right on the edge of the ZTV. No access was available to this site, and although it seems probable that views will be available from the house, they will not be from its principal elevation. In the case of Kerris, the principal elevation of the farmhouse faces away from the proposed wind turbines. Views of this frontage looking towards the wind turbines will be blocked by other closely-set structures within the building complex.
- There are no Registered Battlefields within the 10Km radius viewshed of the proposed wind turbines.
- There will be no impacts on the settings of the Conservation Area at St. Buryan.
- Any impacts on heritage assets within the landscape surrounding the proposed wind turbines would be temporary and reversible should they be dismantled in the future.

13.2.3 Designated heritage assets within the 10km radius viewshed

Preliminary filtering of the potential for the likelihood of impacts on these sites is discussed above (Section 8). Only those for which it was considered that some level of impact might occur are listed below and assessments of impact made.

Scheduled Monuments (SM) – see Figure 19.

Identifier	Site	Impact
1006731	The Merry Maidens stone circle	Neutral
1006732	The Pipers standing stones	Negative/minor
1013665	Tregiffian entrance grave	Neutral
1004359	The Longstone	Neutral
1003112	Barrow near the Merry Maidens	Neutral
1006678	Boscawen-Un stone circle	Neutral
1004651	Goldherring courtyard house settlement	Neutral
1004651	Castallack Roundago	Neutral

Despite the relative proximity of the majority these sites to the proposed wind turbines, the topographical character of the local landscape will limit setting impacts on many of these sites, as indicated above. Should public access to the Pipers standing stones or a clear view of them from the south be created, it is anticipated that the impact of the proposal would rise to **negative/moderate**.

Grade I Listed Buildings - see Figure 25.

None affected.

Grade II* Listed Buildings - see Figure 25

Identifier	Site	Impact
1143899	Trevider farmhouse	Negative/minor
1327506	Kerris farmhouse	Neutral
1327506	Trevelloe	Neutral

In the case of Trevider farmhouse, the presence of the large and utilitarian modern agricultural buildings nearby is felt to diminish potential setting impacts; mature trees at the western end of the field proposed for the wind turbines will also considerably reduce intervisibility. However, should the barns be demolished and not replaced on the sites they now occupy and should the trees die or be felled, setting impacts would rise to **negative/moderate**.

13.2.4 Designated heritage assets within the 3km radius viewshed.

Grade II Listed Buildings – see Figure 25.

Identifier	Site	Impact
1327514	Barn at Trewoofe	Neutral
1327495	Piggery at Trevider	Negative/minor
1143902	Barn at Trevider	Negative/minor
1143900	Piggery at Trevider	Negative/minor
1327496	Barn at Trevider	Negative/minor
1143901	Shippons at Trevider	Negative/minor
1327515	Barn	Negative/moderate
1143862	Cartshed	Negative/moderate
1143921	Piggery, swill kitchen and wash house at Kerris	Neutral

The wind turbines will be in full view of the barn and cartshed immediately to the south east of the development field, and some impact on their settings is therefore inevitable, as also to the other Listed Buildings at Trevider, though this will to an extent be mitigated by their limited settings and the partial blocking of intervisibility by trees at the western end of the field proposed to site the wind turbines. The loss of this tree screen to disease or through felling would raise the level of impacts on the agricultural buildings at Trevider.

Conservation Areas

See Figure 26.

None falling within this zone.

13.2.5 Undesignated heritage assets within the 1Km radius viewshed

See Figure 14.

None likely to be affected given that the majority are either cropmarks or documented sites/place names.

13.2.6 Impacts on Historic Landscape Character

A wind turbine installation at Trewoofe can be predicted to have some degree of negative impact on the historic character of the landscape. The expected effect on HLC has been assessed as **negative/moderate**. Factors contributing to this assessment are as follows;

- Some significant visual impact throughout the operational phase would occur, affecting the integrity of this area as former medieval farmland through the introduction of a pair of highly visible modern features into this landscape, even though their visibility within the landscape would be limited in extent.

- The land-take for the proposed development is small in comparison with the area of the HLC Units of former downland within the surrounding landscape.
- There would be no impacts in terms of physical loss during the construction phase of features which form the visible components of this type of HLC.
- Any impacts on the legibility of HLC would be temporary and reversible should the wind turbines be dismantled in the future.

14 Mitigation Strategy

A range of means to mitigate the potential impacts identified in this assessment may be considered by the Historic Environment Planning Advice Officer, who may choose to recommend one or more of the following.

14.1 Site redesign

Mitigating any potential impacts on the setting of elements of the Merry Maidens ceremonial complex might be possible through a degree of relocation of the wind turbines to remove them from key views of these monuments. English Heritage may require the production of photomontages demonstrating that any submitted proposal could achieve this aim.

14.2 Archaeological recording

In a case where the finalised site design would seem likely to result in unavoidable physical impacts on below-ground or above ground features, a brief for work to mitigate these impacts would be prepared by Cornwall Council's Historic Environment Advice Officer (West), setting out its scope. A Written Scheme of Investigation (WSI) to meet the brief would need to be prepared and agreed to establish and direct a programme of mitigating archaeological work.

In the instance of the site at Trewoofe, there is an indefinable possibility of at-present unrecorded below ground remains being directly impacted upon by the proposal to construct wind turbines at these locations. The Historic Environment Planning Advice Officer may require a geophysical survey of the sites proposed for the turbines to provide a level of information sufficient to determine the potential for sub-surface impacts on archaeological features before a recommendation for the granting of planning permission could be made.

Archaeological recording in the form of the recording of elements of the site which might be negatively impacted upon by the works might take the form of a watching brief (observation by an archaeologist during mechanical ground reduction activities) where any significant features or areas of ground are to be disturbed (for instance for the foundations for the turbines or during cable trenching), in areas where significant features might have been identified through the site walkover, or where the balance of probability suggested that sub-surface archaeology might survive. This approach provides for preservation by record of upstanding or buried archaeological features or artefacts and reduces any impacts on the archaeology of the sites to **negative/minor**. Any resultant impacts would be reduced to **permanent** and **irreversible**.

In the instance of the proposed wind turbines at Trewoofe, no indications were found that this is likely to be required.

It should be noted that the form of any mitigation applied to the site would be determined by the HEPAO, who might require studies additional to this assessment in order to determine his recommendations.

15 References

15.1 Primary sources

Cornwall County Council 2005 aerial mapping of Cornwall.

Joel Gascoyne's 1699 Map of Cornwall

Martyn's 1748 Map of Cornwall

Ordnance Survey, 1809, *1 inch mapping* First Edition (licensed digital copy at HE)

Ordnance Survey, c1880. *25 Inch Map* First Edition (licensed digital copy at HE)

Ordnance Survey, c1907. *25 Inch Map* Second Edition (licensed digital copy at HE)

Ordnance Survey, 2007. *Mastermap Digital Mapping*

Tithe Map and Apportionment, c1840. *Parish of St. Buryan* (digital copy available from CRO)

15.2 Publications

English Heritage 2005, *Wind energy and the Historic Environment*

English Heritage 2011, *The setting of Heritage assets: English Heritage guidance*

Herring, P. 1998, *Cornwall's historic landscape: presenting a method of historic landscape character assessment*, Cornwall Archaeological Unit

Norden, J. 1724, *Map of Cornwall*, reprinted University of Exeter 1972

Padel, O.J. 1988, *Cornish place-names*, Penzance

Thorn, C. and Thorn, F. (eds.) 1979, *Domesday Book, 10: Cornwall*, Chichester

15.3 Websites

<http://www.heritagegateway.org.uk/gateway/> English Heritage's online database of Sites and Monuments Records, and Listed Buildings.

16 Project archive

The HE project number is **146250**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration.
2. Digital photographs stored in the directory R:\Historic Environment (Images)\SITES.Q-T\Trewoofe wind turbine assessment 2013
3. English Heritage/ADS OASIS online reference: cornwall2-148513
4. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites T\Trewoofe wind turbine assessment 2013\Report\Trewoofe wind turbine assessment.doc



Fig 3. The proposed turbine site and its surroundings, as shown on John Norden's Map of Cornwall. The project area is circled in red.



Fig 4. The project area and its surroundings, shown on Joel Gascoyne's 1699 Map of Cornwall. The project area is circled in red.

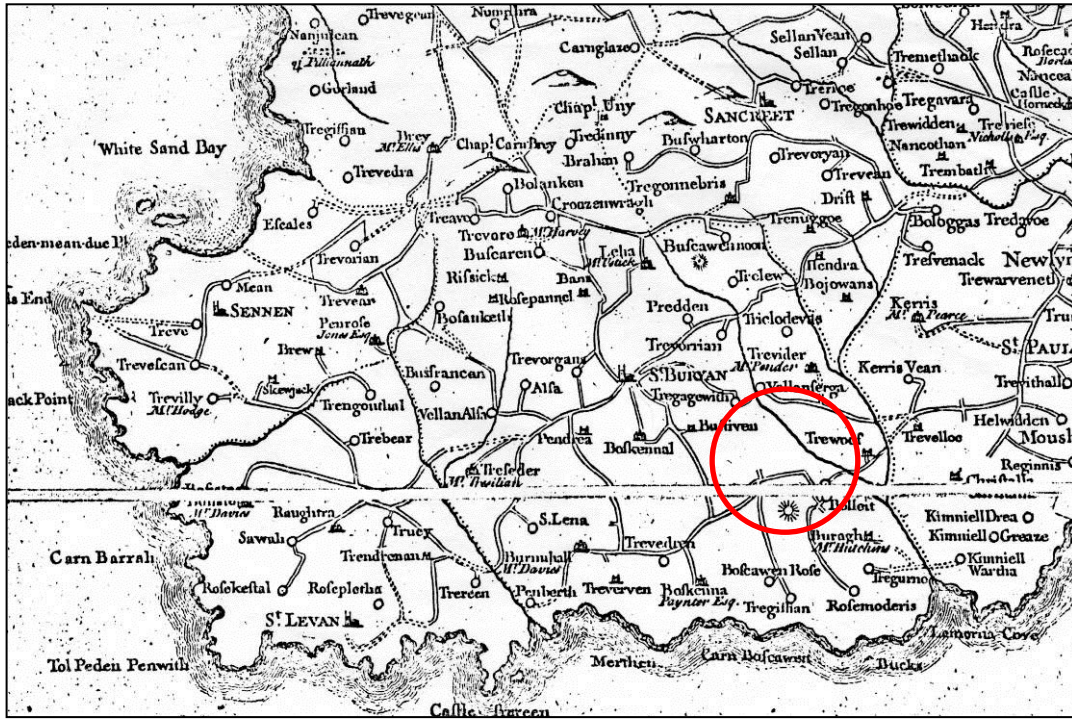


Fig 5. The proposed turbine site and its surroundings, as shown on Martyn's 1748 Map of Cornwall. The project area is circled in red.



Fig 6. The project area and its surroundings as shown on the circa 1807 1st Edition OS mapping. The turbine project area is slightly offset because of the differing projections used by the 19th century OS surveyors and modern mapping.

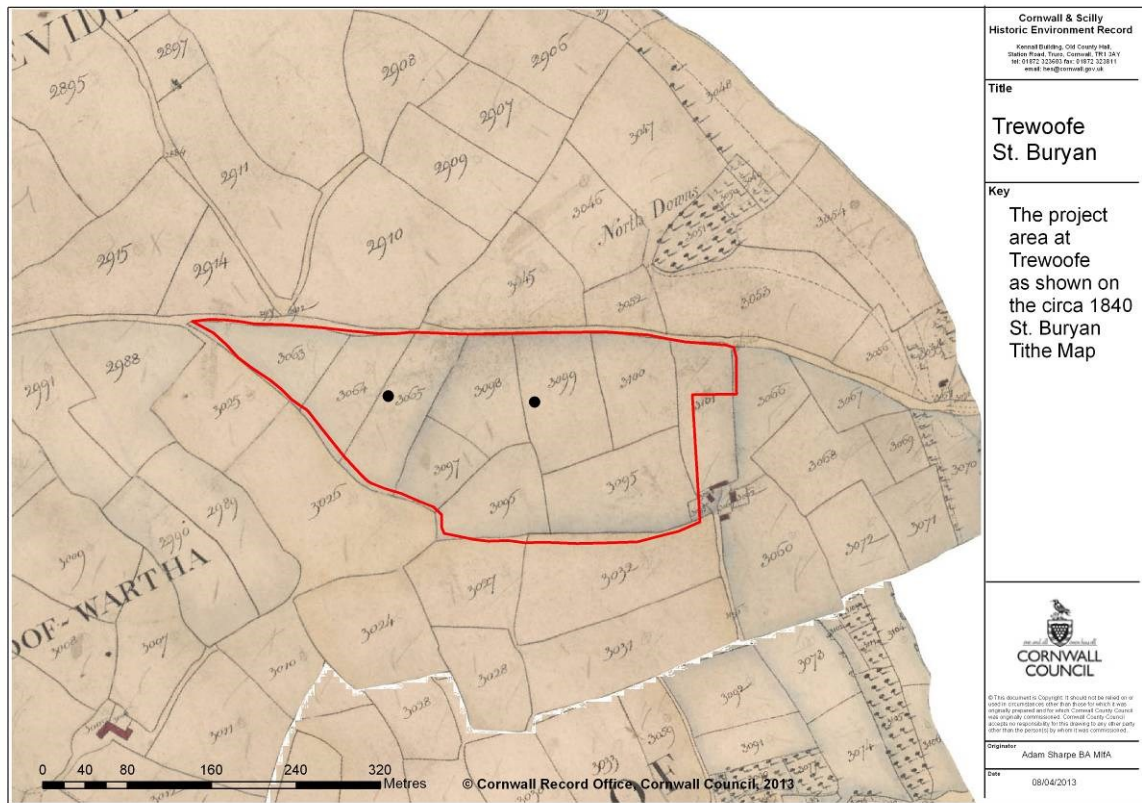


Fig 7. The project areas as shown on the circa 1840 St. Buryan Tithe Map. The proposed turbines are indicated by black dots.

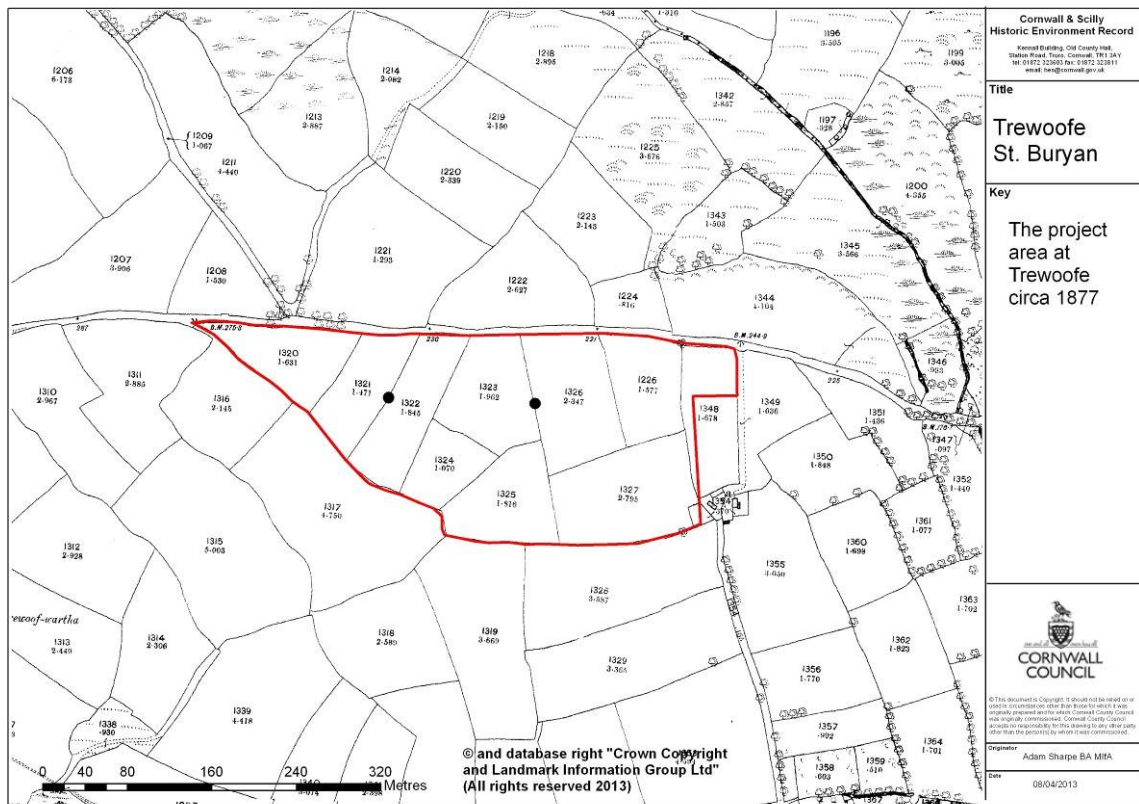


Fig 8. The project area as shown on the circa 1877 1st Edition OS 25" to the mile mapping.

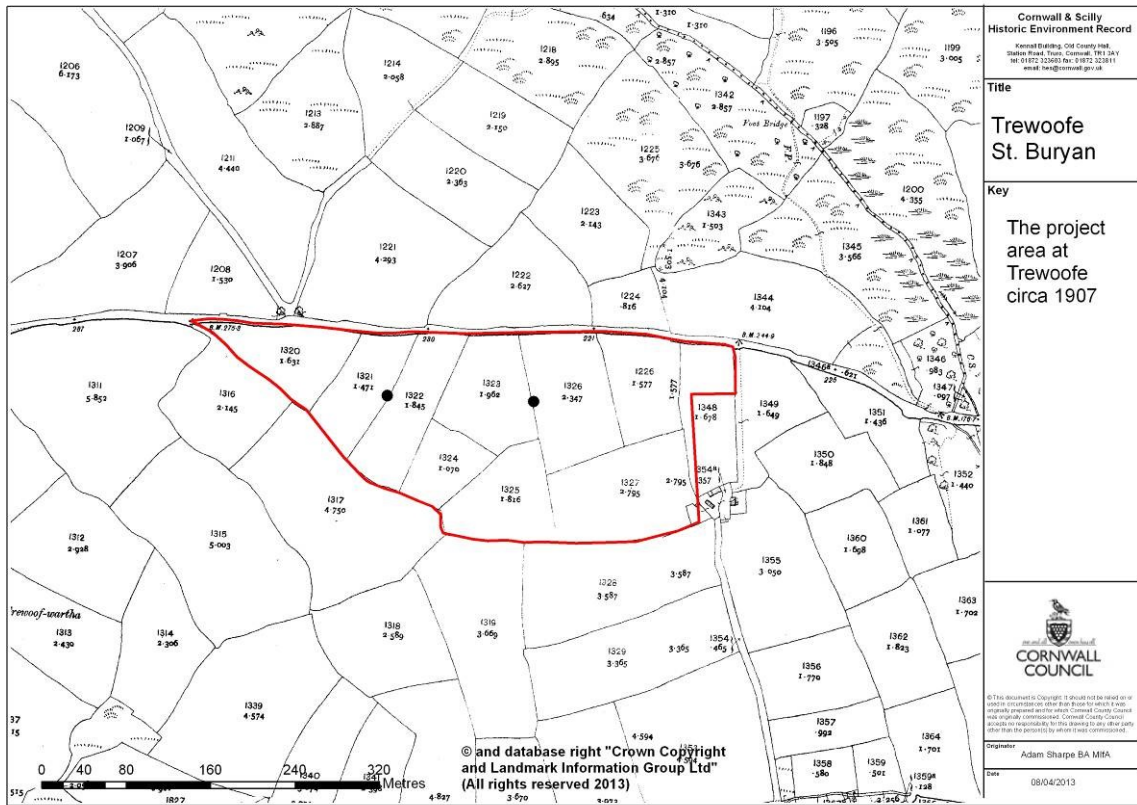


Fig 9. The project area as shown on the circa 1908 OS 25" to the mile mapping.

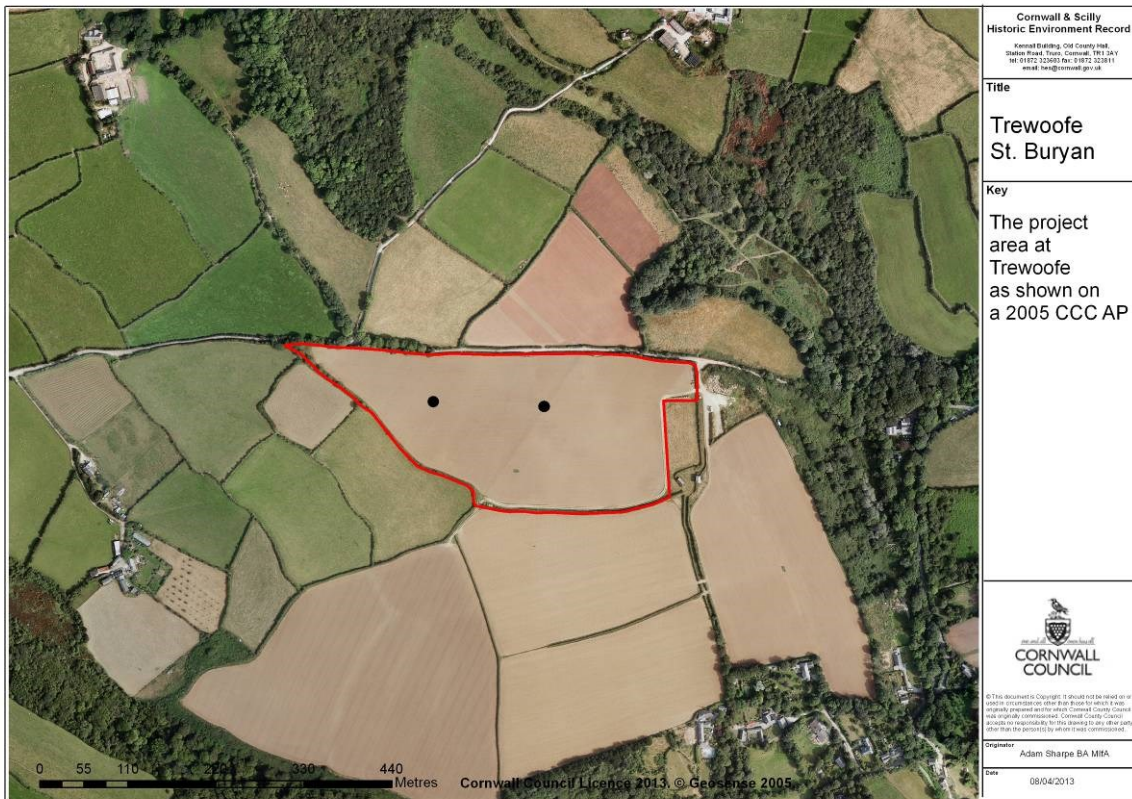


Fig 10. The project area as shown on a 2005 CCC aerial photograph.

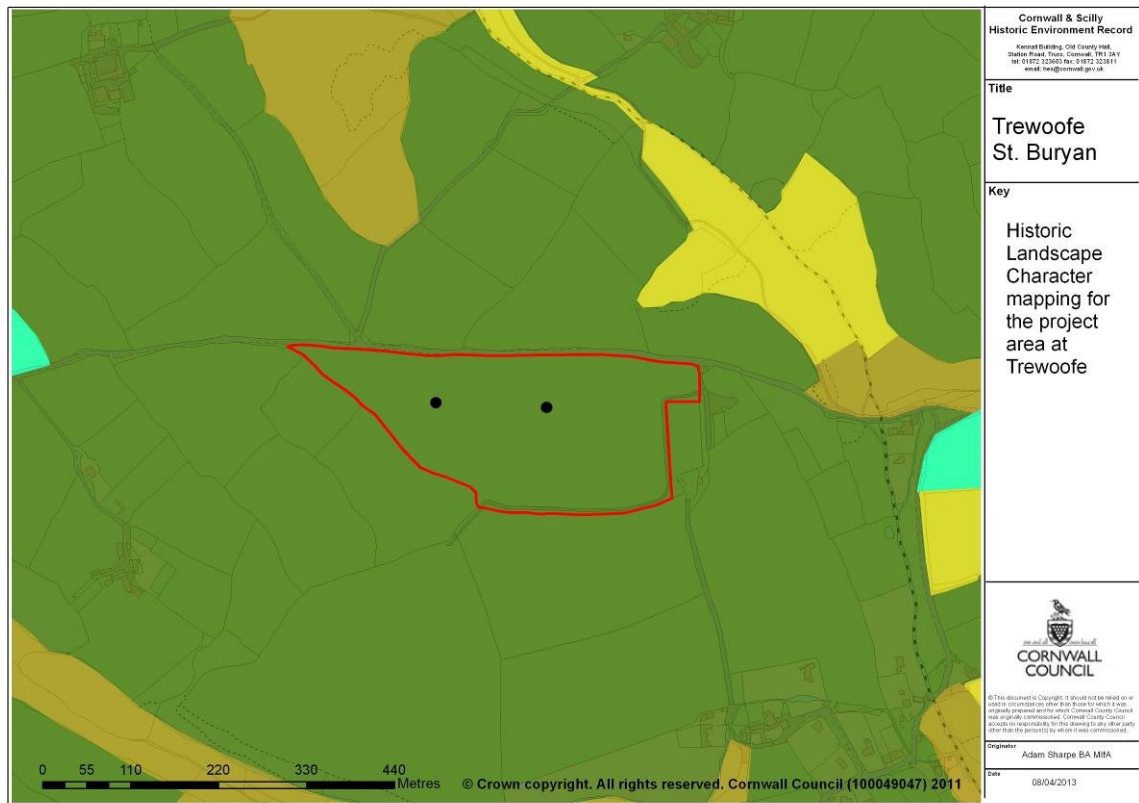


Fig 11. Historic Landscape Character mapping showing how this area of countryside is derived from land enclosed during the medieval period.

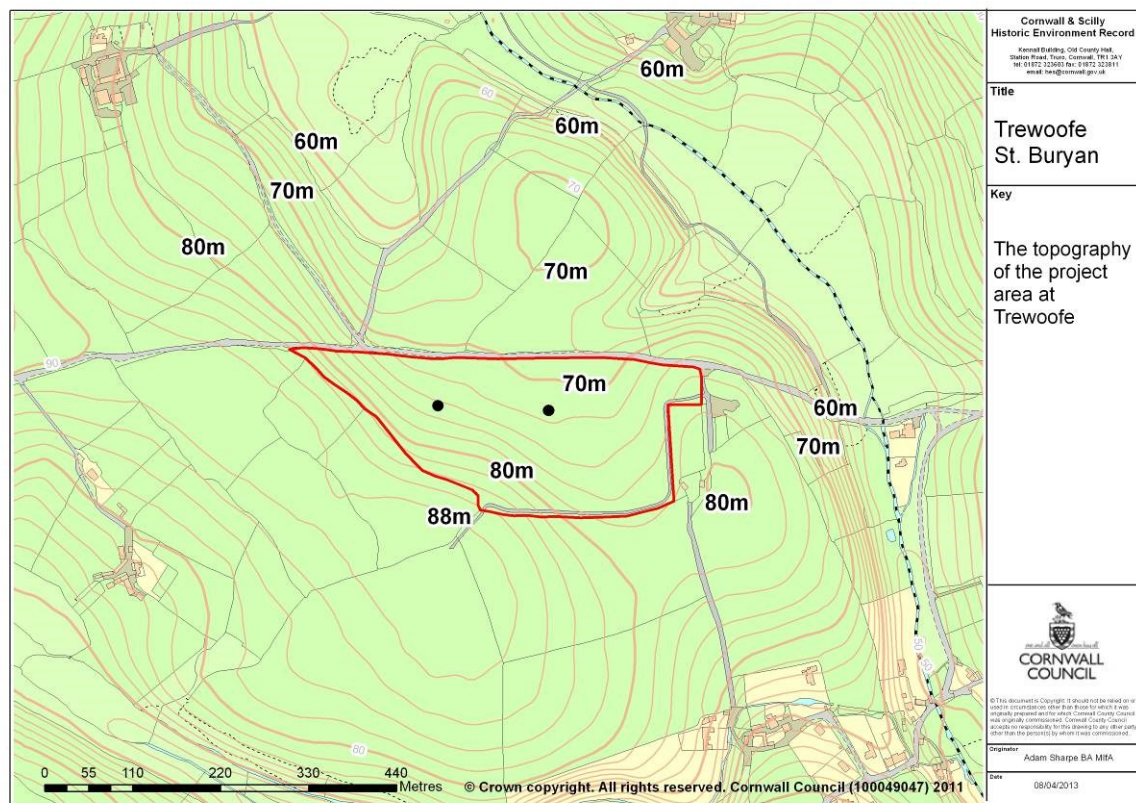


Fig 12. OS contour data for the area immediately surrounding the proposed wind turbines show their sites located on a north sloping valley side.

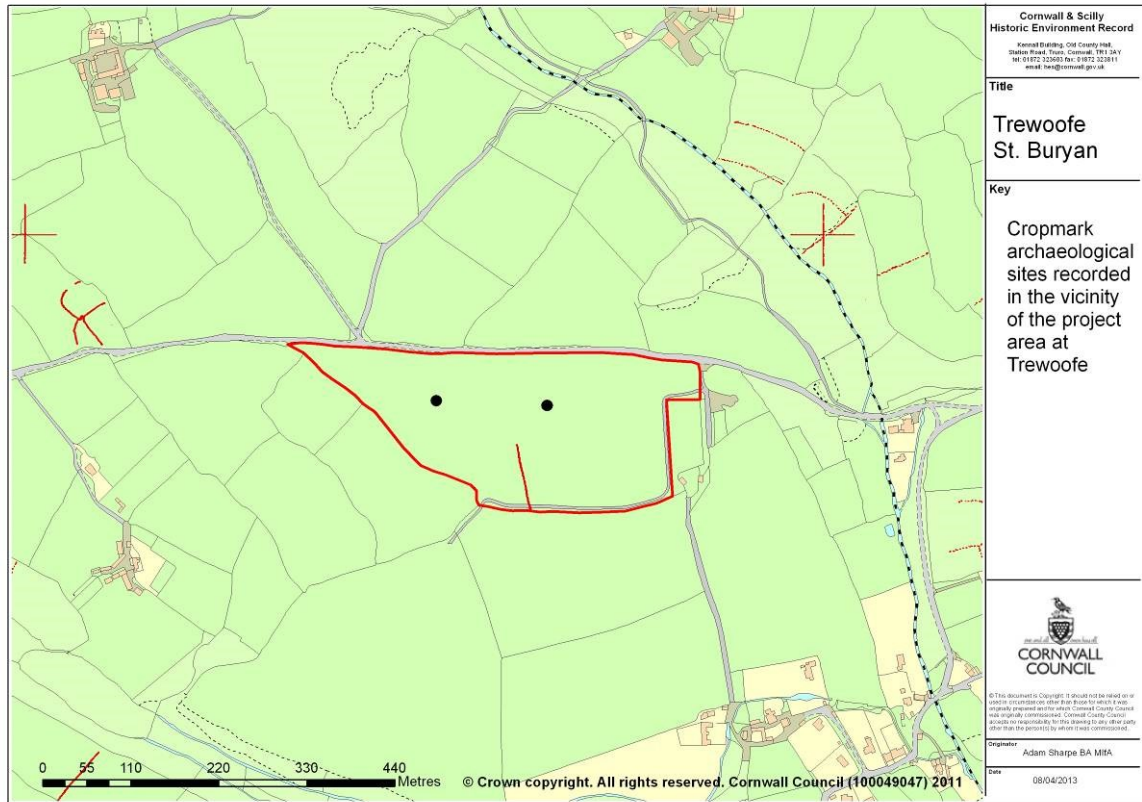


Fig 13. Cropmark archaeological sites within the vicinity of the site at Trewoofe recorded by the National Mapping Project.

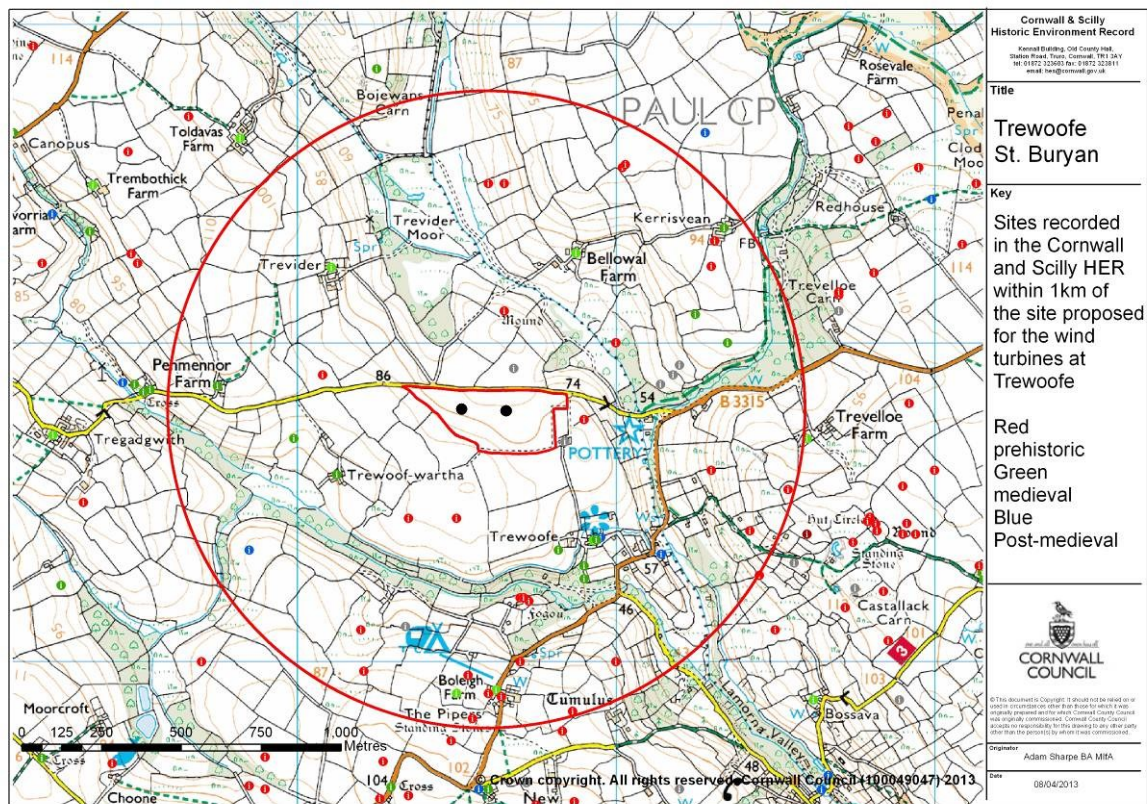


Fig 14. Sites within the vicinity of Trewoofe recorded in the Cornwall and Scilly HER.

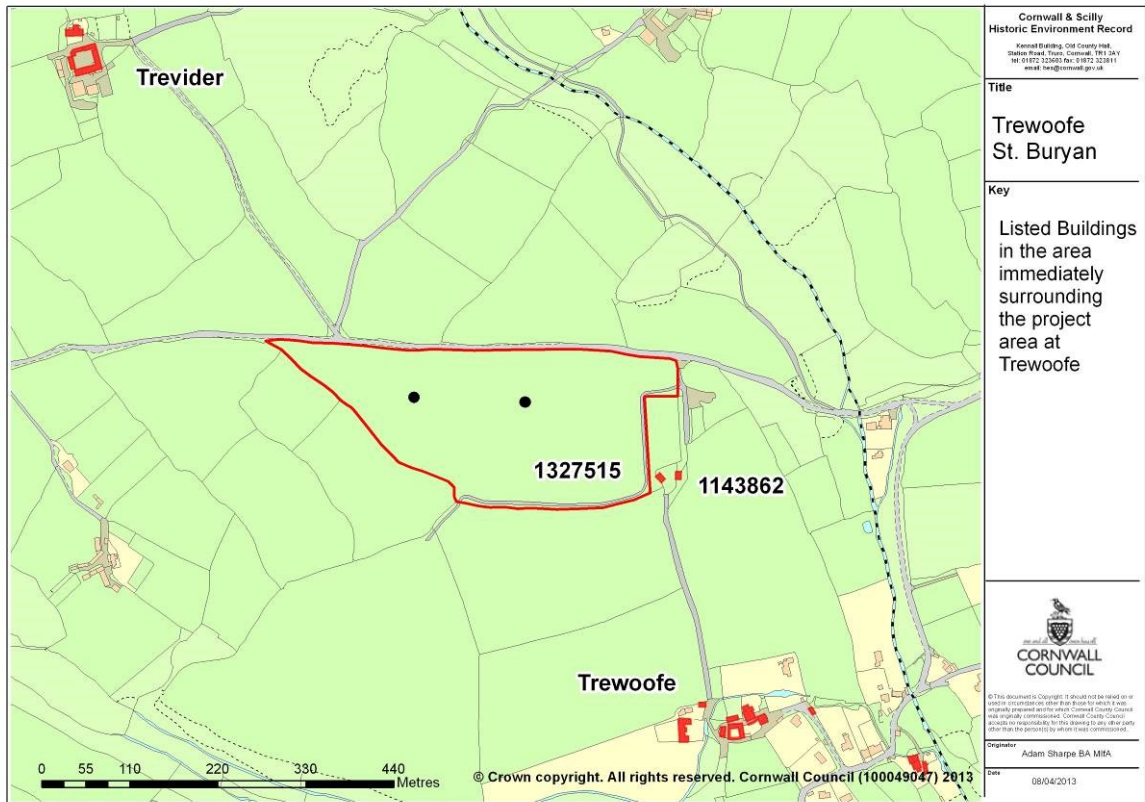


Fig 15. Listed Buildings within the landscape immediately surrounding Trewoofe.

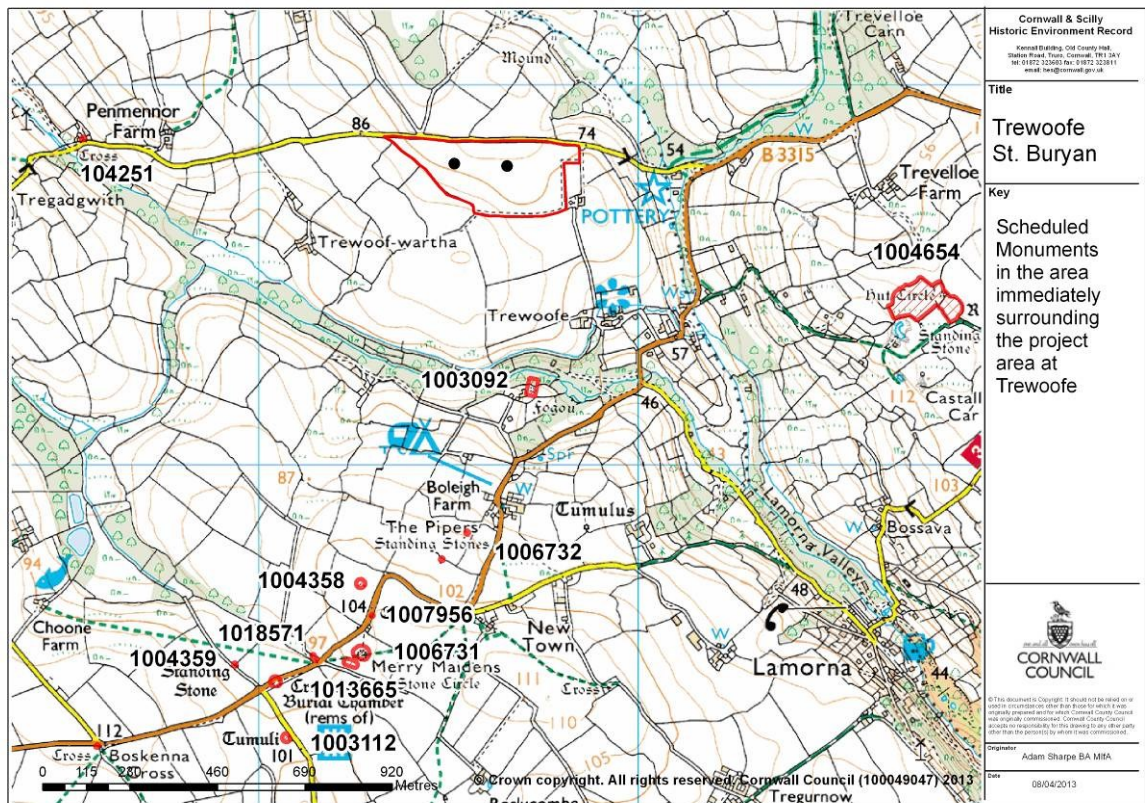


Fig 16. National Monument Numbers for Scheduled Monuments within the landscape immediately surrounding Trewoofe.

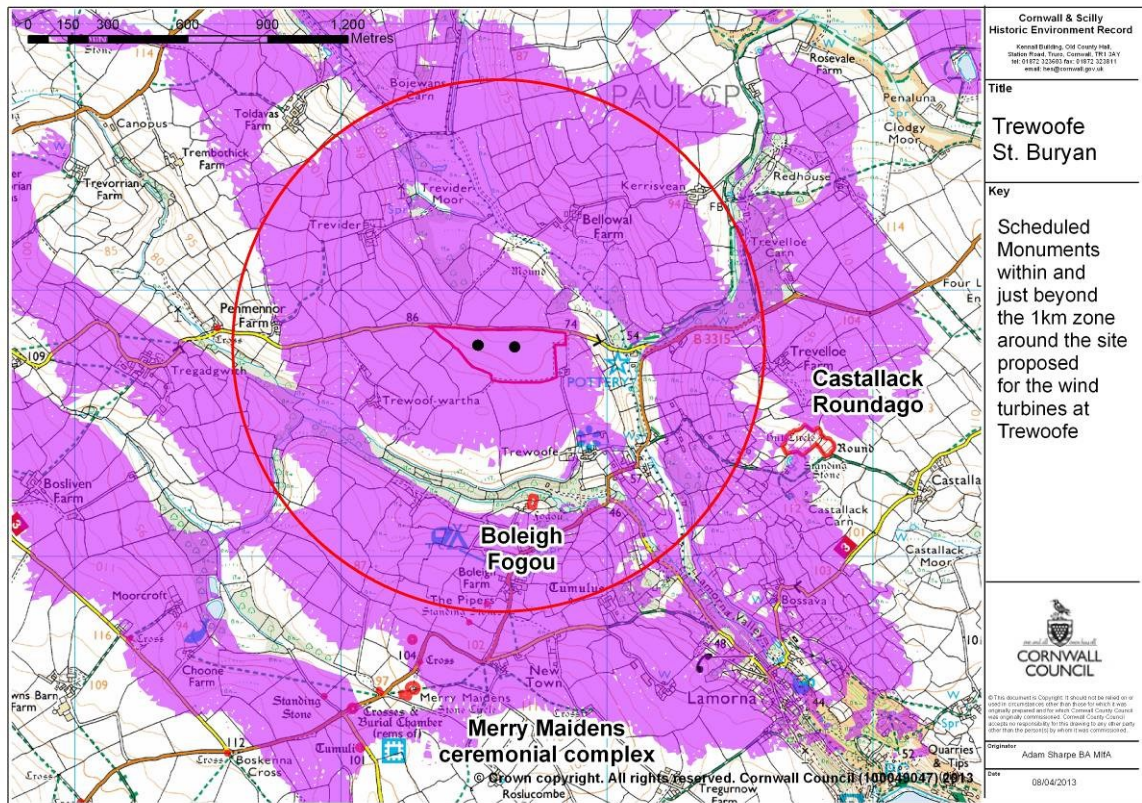


Fig 17. Mapping showing potentially intervisible Scheduled Monuments in and around the 1Km radius ZTV of the site proposed for the wind turbines.

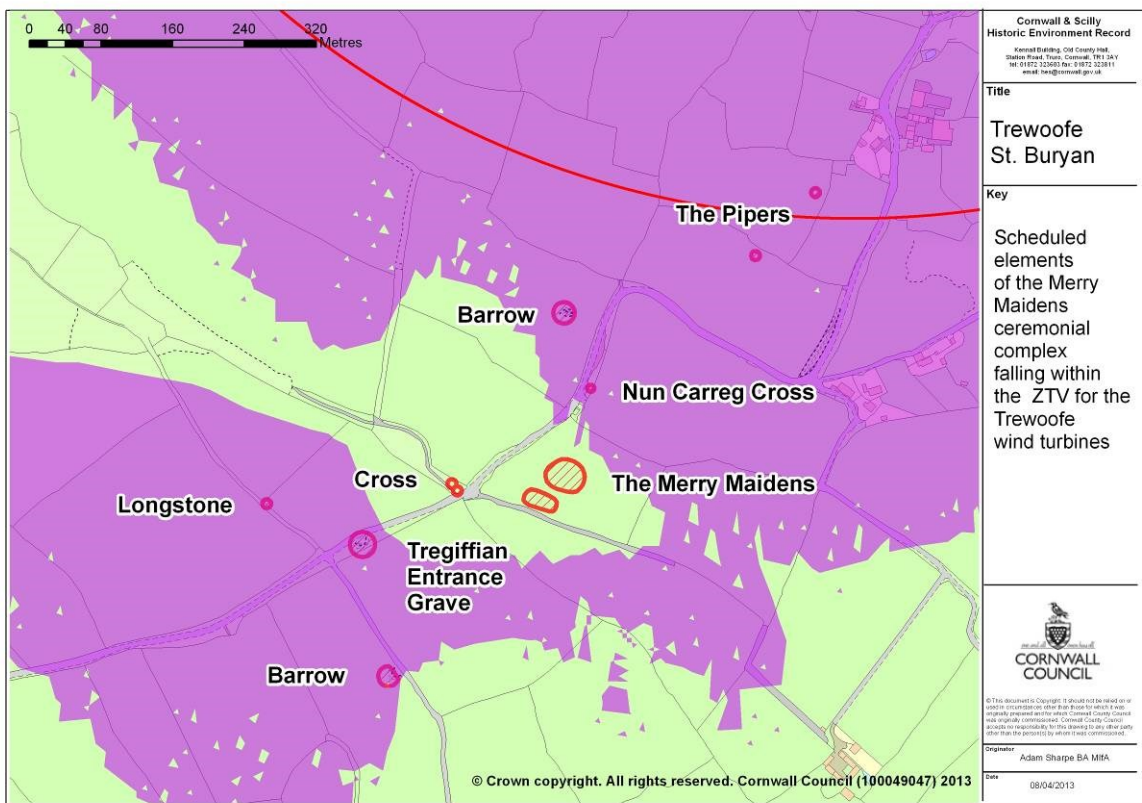


Fig 18. Detail of the ZTV mapping for the Scheduled components of the Merry Maidens ceremonial complex.

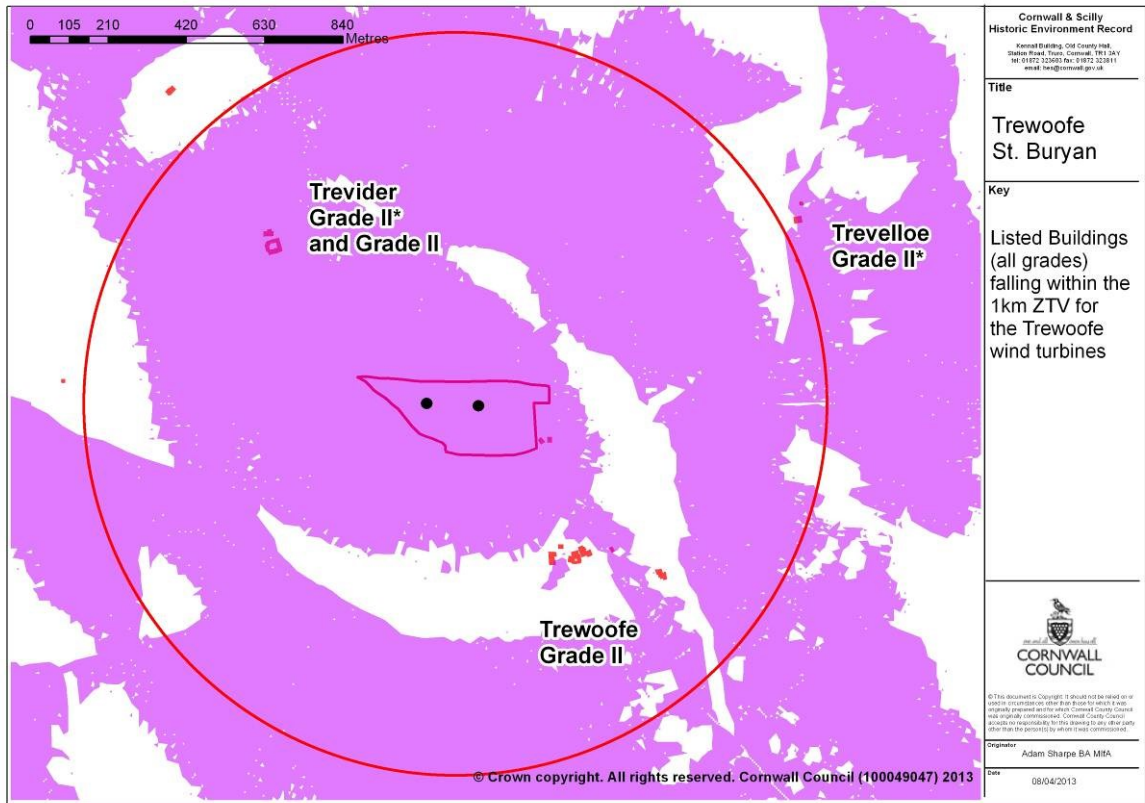


Fig 19. Mapping showing potentially intervisible Listed Buildings within and close to the 1Km radius ZTV of the site proposed for the wind turbines.



Fig 20. Detail of the ZTV mapping for Listed Buildings at Trevider, all of which theoretically lie within the ZTV at less than 1km distance.

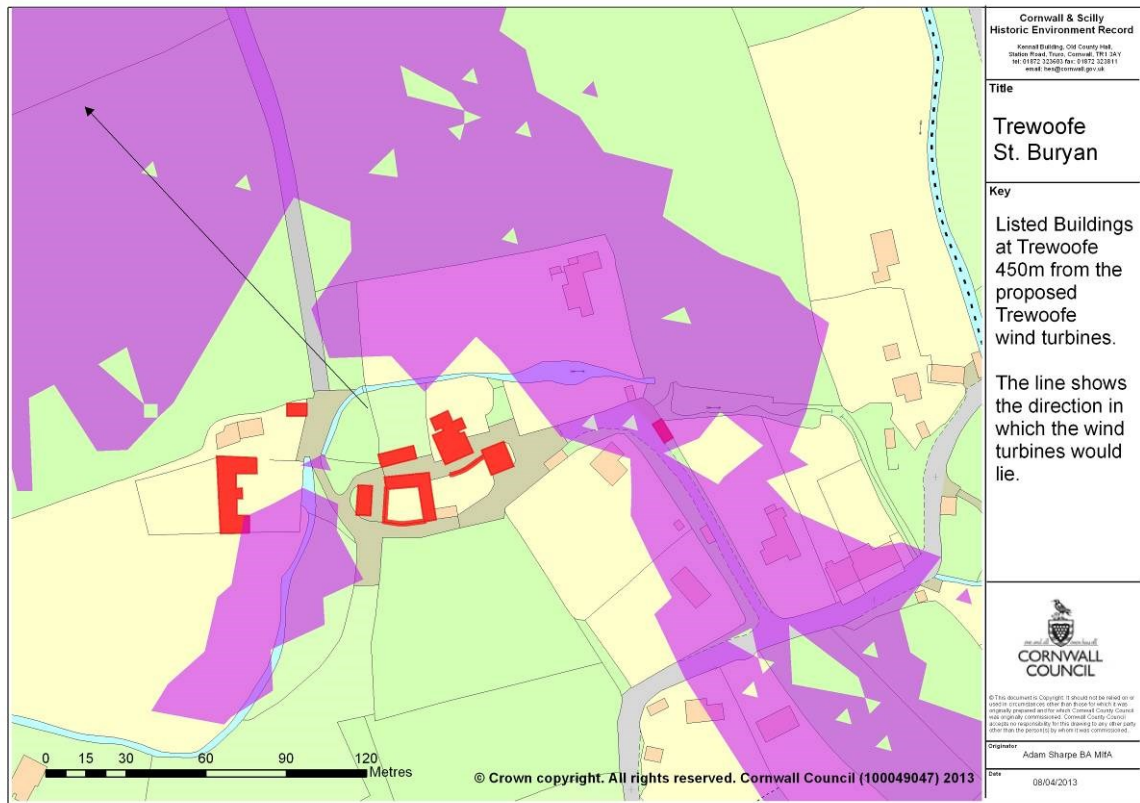


Fig 21. Detail of the ZTV mapping for Listed Buildings at Trewoofe, only one of which theoretically lies within the ZTV at less than 1km distance.

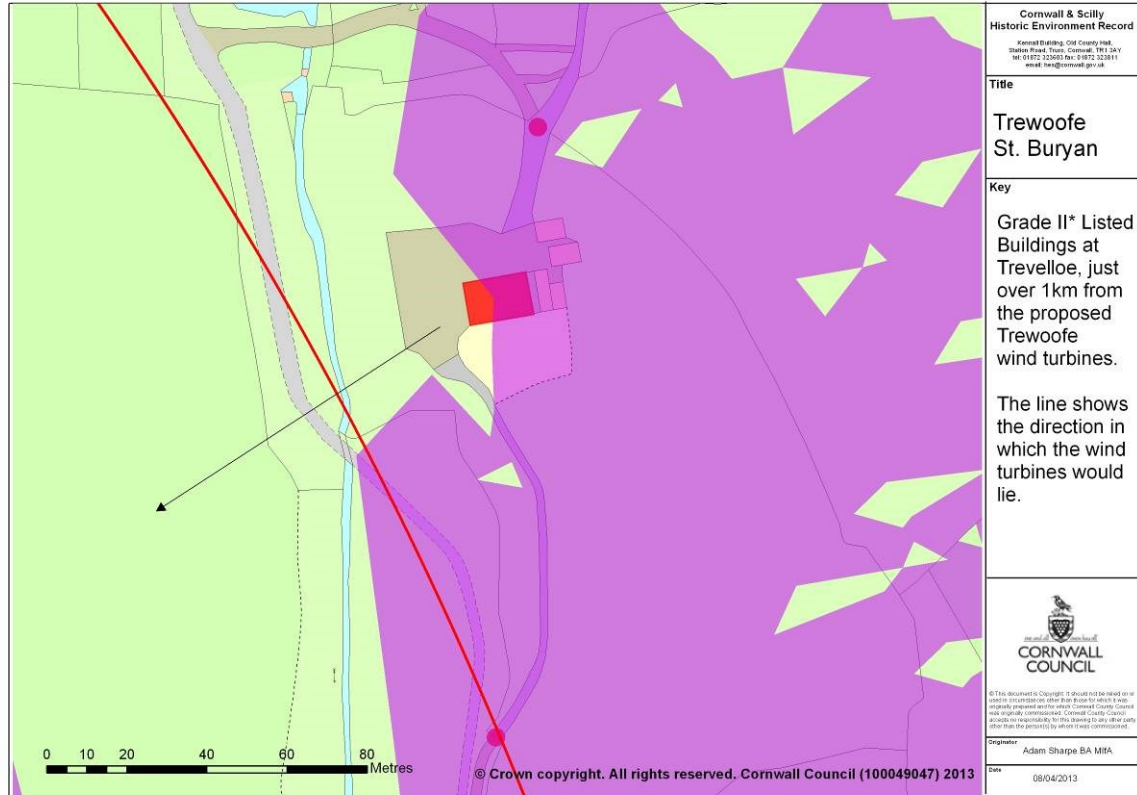


Fig 22. Detail of the ZTV mapping for Listed Buildings at Trevelloe, all of which theoretically lie within the ZTV at just over 1km distance.

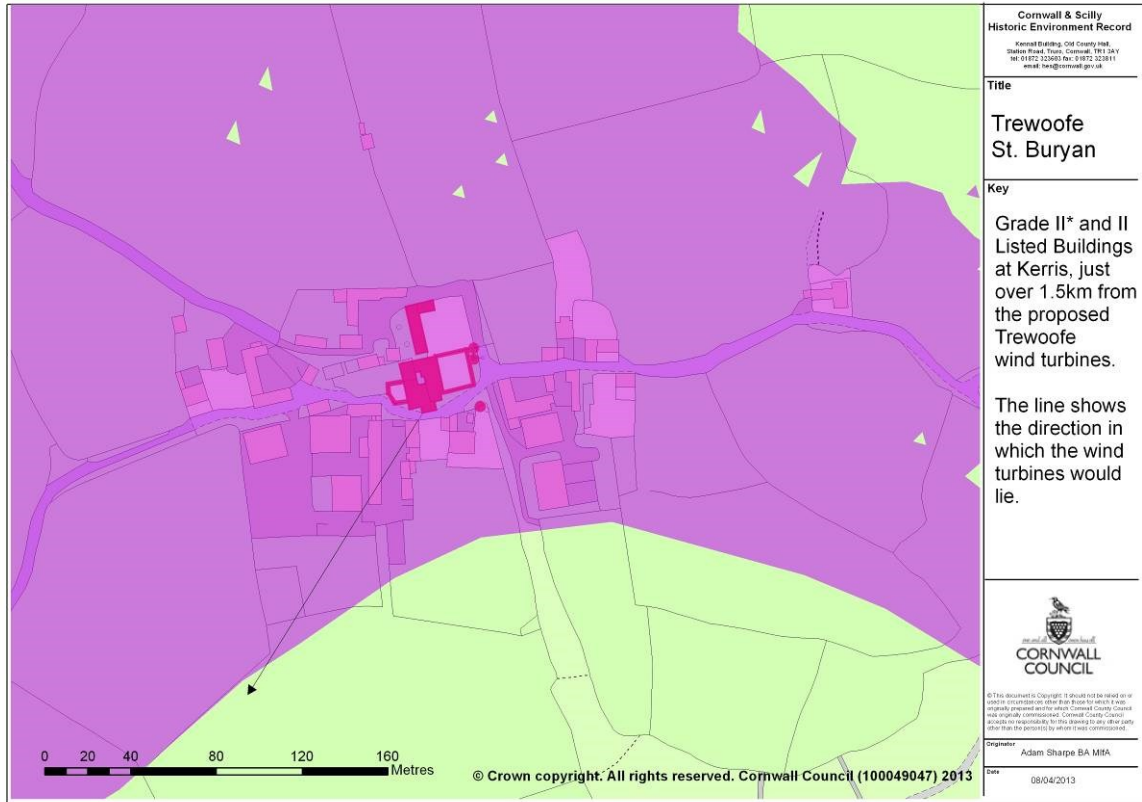


Fig 23. Detail of the ZTV mapping for Listed Buildings at Kerris, around 1.5km distance from the site proposed for the wind turbines.

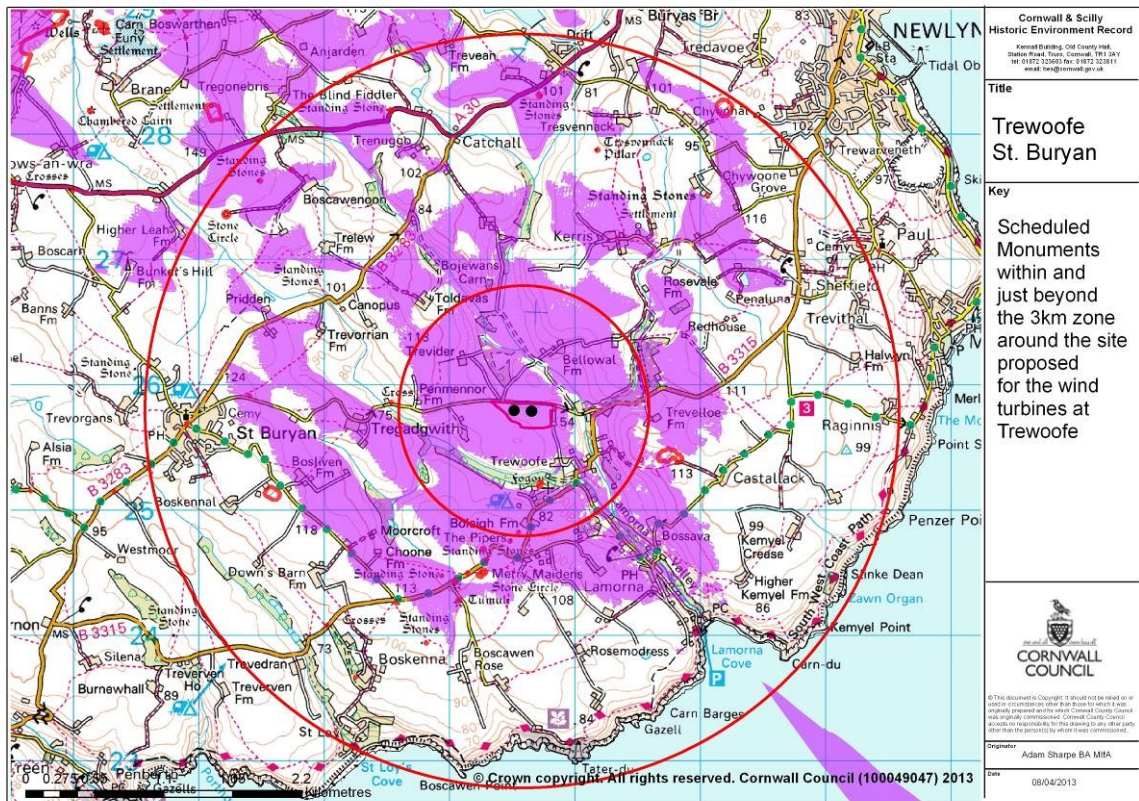


Fig 24. Mapping showing potentially intervisible Scheduled Monuments within and close to the 3km radius ZTV of the site proposed for the wind turbines.

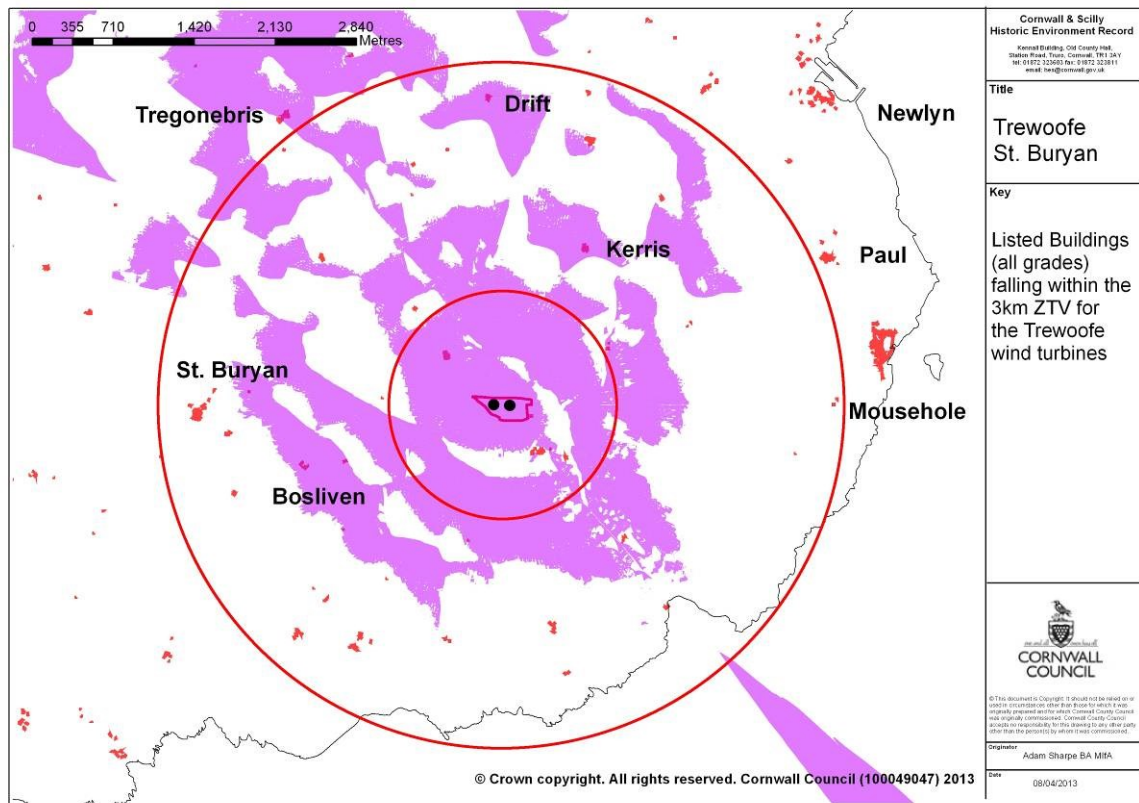


Fig 25. Mapping showing potentially intervisible Listed Buildings within and close to the 3Km radius ZTV of the site proposed for the wind turbines.

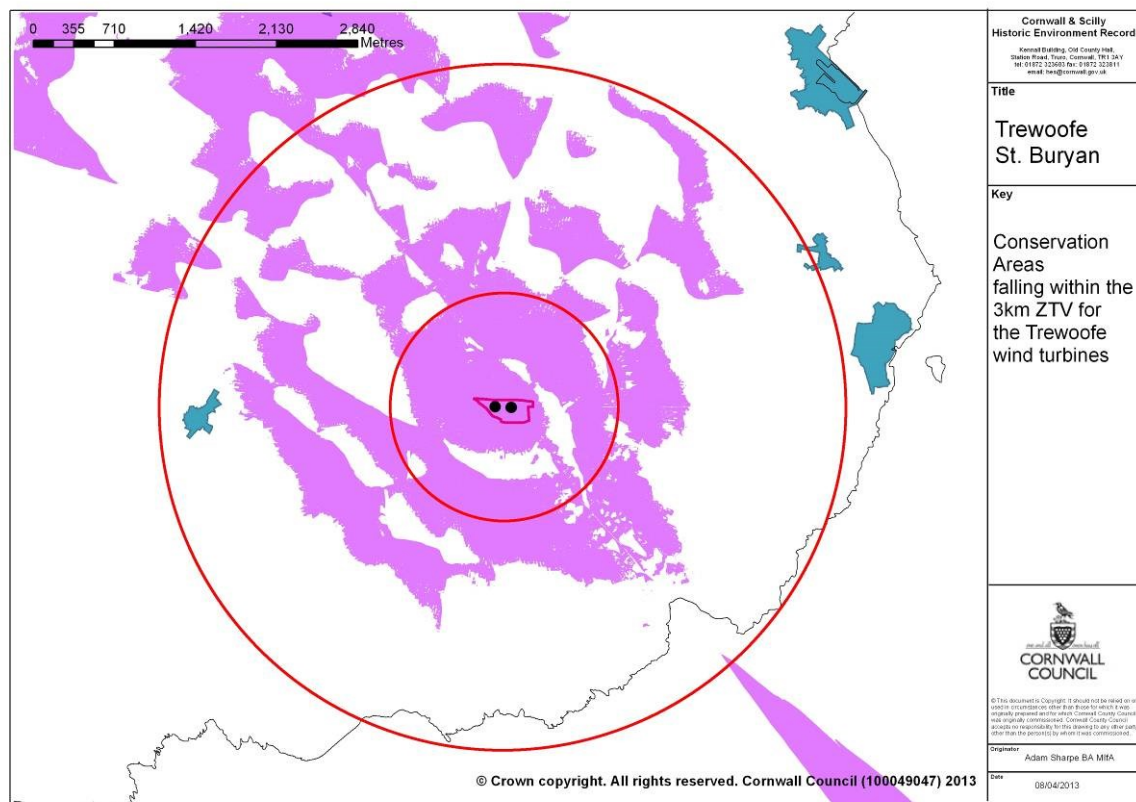


Fig 26. Mapping showing that no Conservation Areas within 3km of the site proposed for the wind turbines are likely to be intervisible with them.

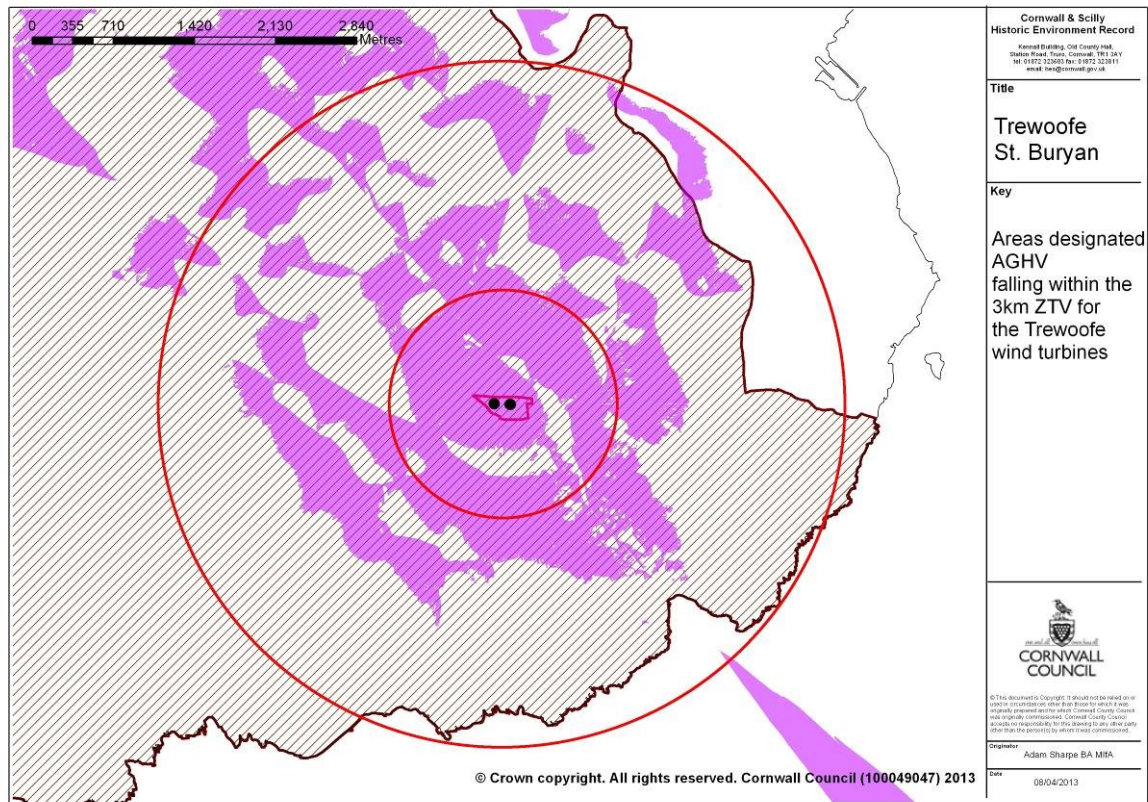


Fig 27. Mapping showing the extent of landscape designated as AGHV likely to be intervisible with the wind turbines within the 3km zone.

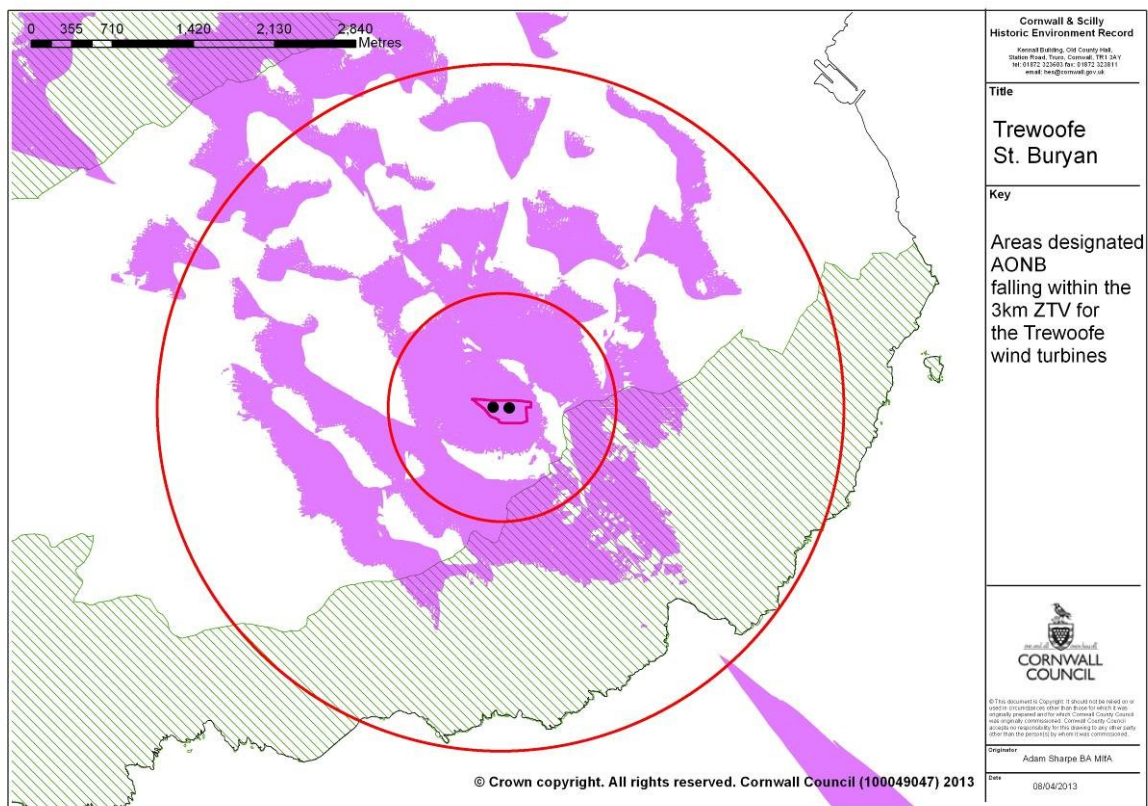


Fig 28. Mapping showing the extent of landscape designated as AONB likely to be intervisible with the wind turbines within the 3km zone.

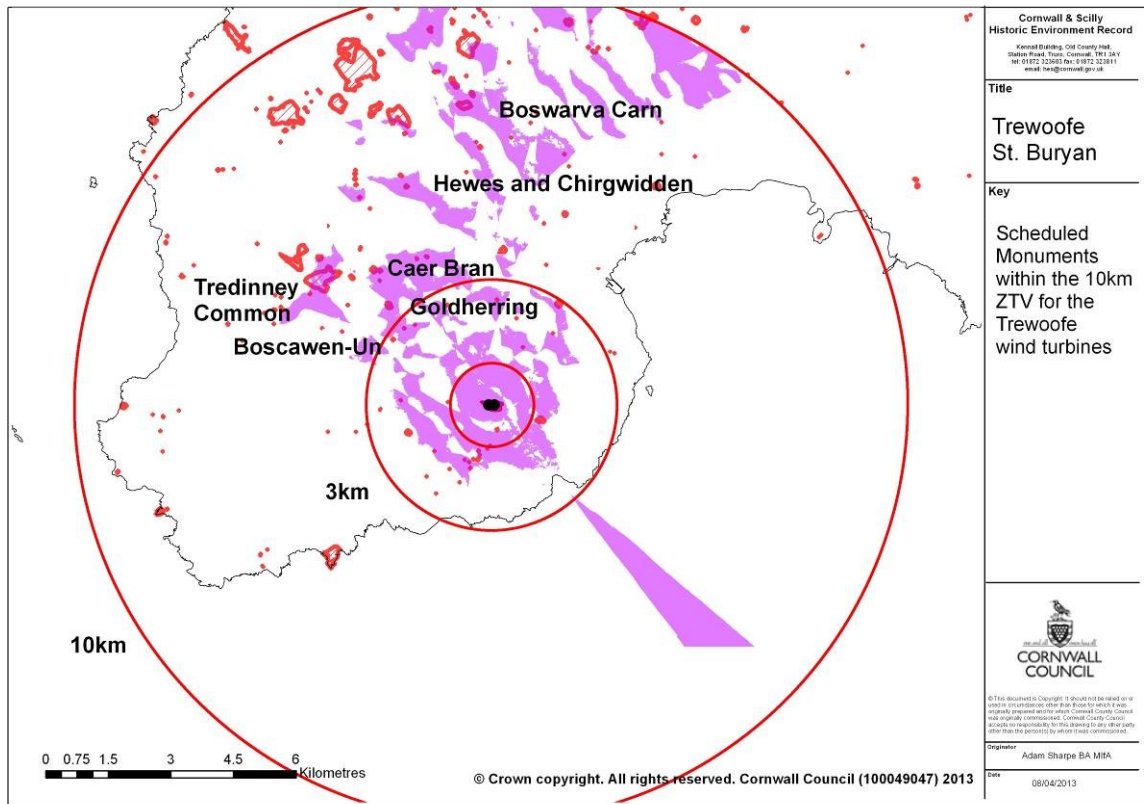


Fig 29. Mapping showing potentially intervisible Scheduled Monuments within the 10km radius zone.

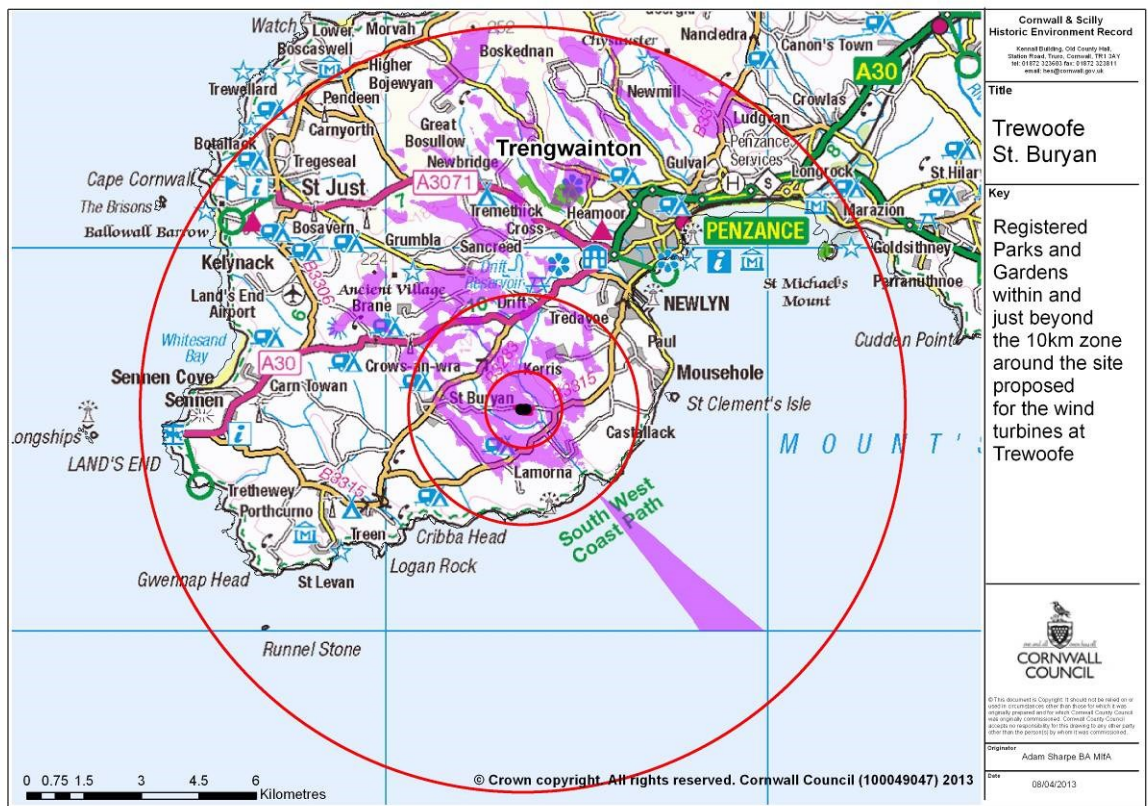


Fig 30 Mapping showing potentially intervisible Registered Parks and Gardens within the 10km radius zone.

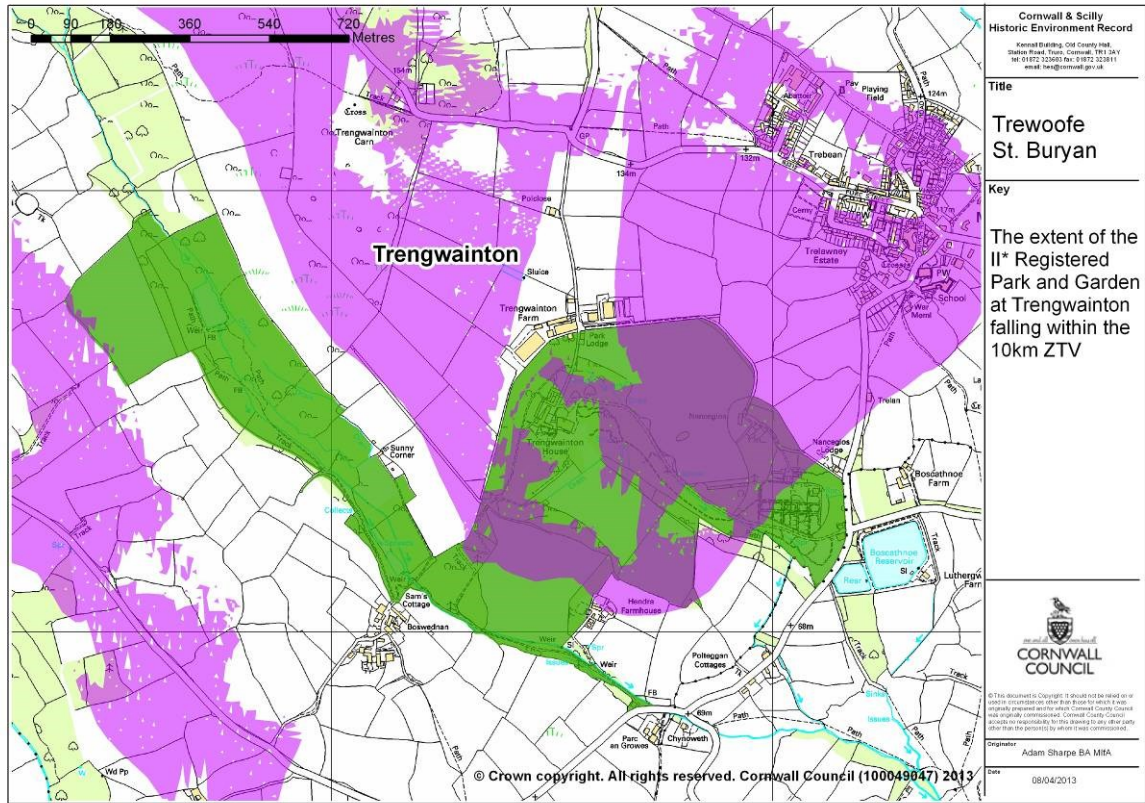


Fig 31. Detail of the ZTV mapping showing the extent of Trewainton Park and Garden which is likely to fall within the viewshed of the wind turbines at Trewoofe.

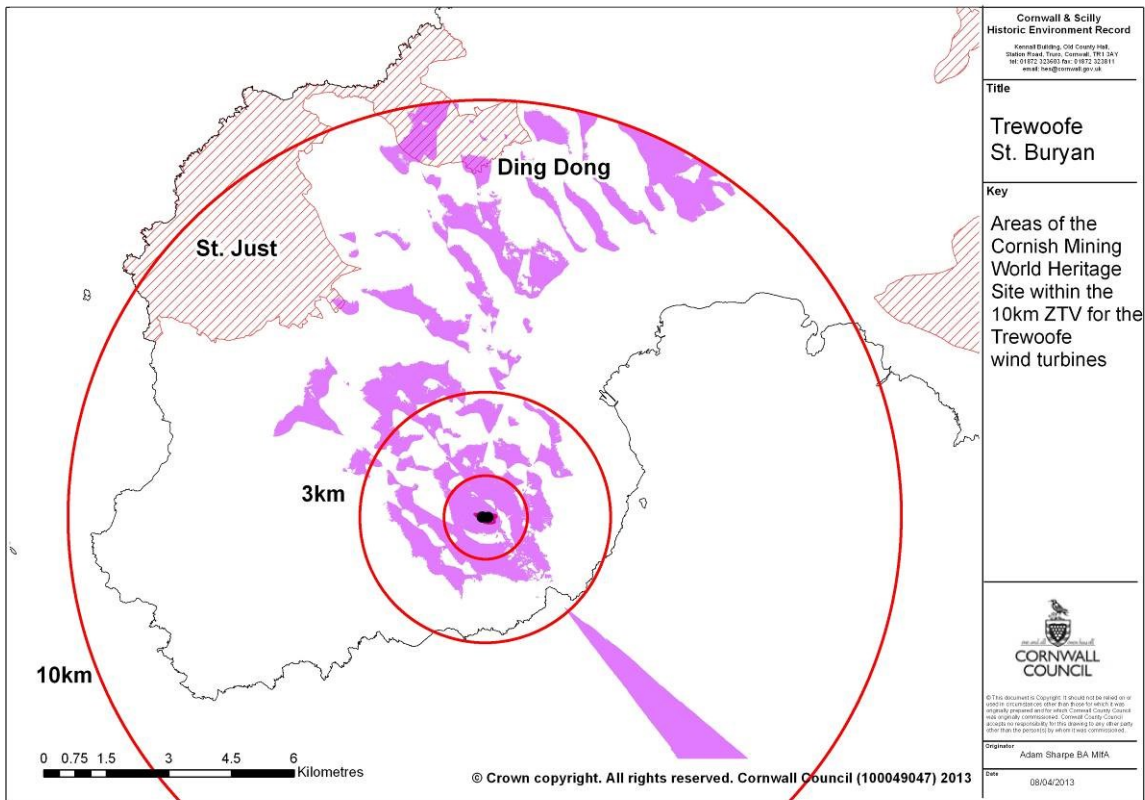


Fig 32. Mapping showing potentially intervisible parts of the Cornish Mining World Heritage Site within the 10km radius zone.



Fig 33. A general view of the field proposed for the wind turbines from its eastern end. The sites of the proposed turbines approximate to the two areas of disturbed ground (centre).



Fig 34. Looking east across the site towards the pair of Grade II Listed agricultural structures.



Fig 35. Mature trees on the hedgeline at the western end of the site.



Fig 36. Looking north west across the site towards Trevelloe Carn, topped by woodland.



Fig 37. Looking just south of east from the field to the south of the site towards Castallack Roundago on the ridgetop.



Fig 38. The open view north from the site towards the skylining Greenburrow engine house at Ding Dong.



Fig 39. The view north west from the site towards Bartinney Hill (left) and Caer Bran (right).



Fig 40. The view to the north of the site towards Bellowall Farm, with the Carn Galva ridge forming the skyline in the far distance to the right.



Fig 41. The Trevider farm complex from the upper part of the field proposed for the wind turbines. Bartinney Hill forms the skyline.



Fig 42. The Trevider farm complex as seen from a gateway on the nearby road, showing the modern agricultural barns abutting the Grade II Listed farmhouse (right) and Grade II Listed piggeries and barns.*



Fig 43. The eastern (principal) frontage of the Grade II Listed Kerris Manor farmhouse.*



Fig 44. The pair of Grade II Listed agricultural buildings in the enclosure immediately adjoining the field proposed for the wind turbines.



Fig 45. A view across the Scheduled Castallack Roundago in the direction of the proposed wind turbines at Trewoofe, which are unlikely to be visible from this site.



Fig 46. The view from Creeg Tol across Boscawen-Un stone circle (centre right) towards the wind turbine site (mid distance, just in front of the area covered in agricultural plastic sheeting). The blade tips might just be visible from this vantage point and from the Goldherring courtyard house settlement just upslope to the north.



Fig 47. The view across the Scheduled Boscawen-Un stone circle in the general direction of the proposed wind turbines, which would not be visible from this location.



Fig 48. A view across the Scheduled Merry Maidens stone circle in the direction of the proposed wind turbines, which would be out of view from ground level.



Fig 49. Looking across the Scheduled Tregiffian entrance grave in the direction of the proposed wind turbines. Note the adjoining road and the hedge vegetation and telephone pole, which would probably block any significant intervisibility.



Fig 50. A glimpse of the Scheduled Pipers standing stones from a gap in the hedge vegetation along the nearby road. The blades of the wind turbines would appear over the left hand end of the ploughed field (left centre).