Report No: 2014R021

Levalsa Farm, St Ewe

Archaeological assessment of proposed wind turbine

Cornwall Archaeological Unit

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This study was commissioned by Cornwall Council and carried out by Cornwall Archaeological Unit, Cornwall Council (CAU).

The viewshed mapping was carried out by Krysia Truscoe.

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

Freedom of Information Act

As Cornwall Council is a public authority it is subject to the terms of the Freedom of Information Act 2000, which came into effect from 1st January 2005.

Cornwall Archaeological Unit, Cornwall Council is a Registered Organisation with the Institute for Archaeologists

Cover illustration

The proposed turbine field, centre, and surrounding landscape viewed from adjacent to Lanhadron Medieval Cross.

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Abbreviations

ADS	Archaeological Data Service
BGS	British Geological Survey
CAU	Cornwall Archaeological Unit
CC	Cornwall Council
DBA	Desk-based Assessment
DTM	Digital Terrain Model
EH	English Heritage
EIA	Environmental Impact Assessment
GIS	Geographical Information Systems
HBSMR	Historic Buildings Sites and Monuments Record
HER	Cornwall and the Isles of Scilly Historic Environment Record
HEPAO	Historic Environment Planning Advice Officer
IfA	Institute for Archaeologists
LB	Listed Building
LPA	Local Planning Authority
MoRPHE	Management of Research Projects in the Historic Environment
NGR	National Grid Reference
NMP	National Mapping Programme
NPPF	National Planning Policy Framework
NRHE	National Record of the Historic Environment
OASIS	Online Access to the Index of Archaeological Investigations
OD	Ordnance Datum
OS	Ordnance Survey
SM	Scheduled Monument
WHS	World Heritage Site
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

1 Summary

Cornwall Archaeological Unit, formerly Historic Environment Projects, Cornwall Council, was approached by Cornwall Council in September 2013 with a request to provide costs for an archaeological assessment of the potential impacts of construction of a wind turbine at Levalsa Farm, St Ewe as part of a proposed planning application by Cornwall Council (ref GCWEP).

The proposal is for a wind turbine with a hub height of 54m and a maximum blade tip height of 78m positioned on agricultural land at Levalsa Farm, to the south of Sticker, in the parish of St Ewe at SW 98833 48677 (NGR; Figure 1). The wind turbine is to be sited at a height of approximately 82m OD on the northern end of a ridge crest. The area surrounding the site proposed for the turbine is recorded as Farmland, Medieval in Cornwall's Historic Landscape Characterisation.

The assessment consisted of a desk-based assessment, viewshed analysis out to 10km and consideration of designated sites up to 15km from the proposed turbine location, and a walkover survey.

Given the location chosen for the wind turbine, it was anticipated that there was some potential for negative impacts on the settings of a number of important Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Conservation Areas within a 15km radius. Visibility of the site was particularly good from the ridge-tops that characterise the area. The intervening valleys were often narrow and substantially vegetated, inhibiting views back to the proposed turbine site. The heritage assets are spread quite equally around the proposed turbine site although at approximately 5km the coastline cuts across from south to north in the easterly sector. A small section in the northern part of the Charlestown World Heritage Site Area is potentially intervisible with the proposed turbine, though the distance from the site at Levalsa limits the impacts. Cumulative impacts were also assessed as a result of the increasing number of existing and proposed turbines in the area.

Seven Scheduled Monuments are located within 5km of the proposed turbine site and one Grade II* Listed Building, Levalsa Farmhouse, is within 2km. There are also a significant number of Grade II Listed Buildings relatively close to the turbine site, these predominantly being farmhouses, cottages and agricultural buildings. The 24 undesignated sites within 1km of the site generally survive only as documentary records.

Overall the potential impacts of the proposed wind turbine on the identified heritage assets are rated as minor, though the potential setting impacts on Lanhadron and Sticker are assessed as moderate.

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

Figure 1: Location of the proposed wind turbine in south-central Cornwall.

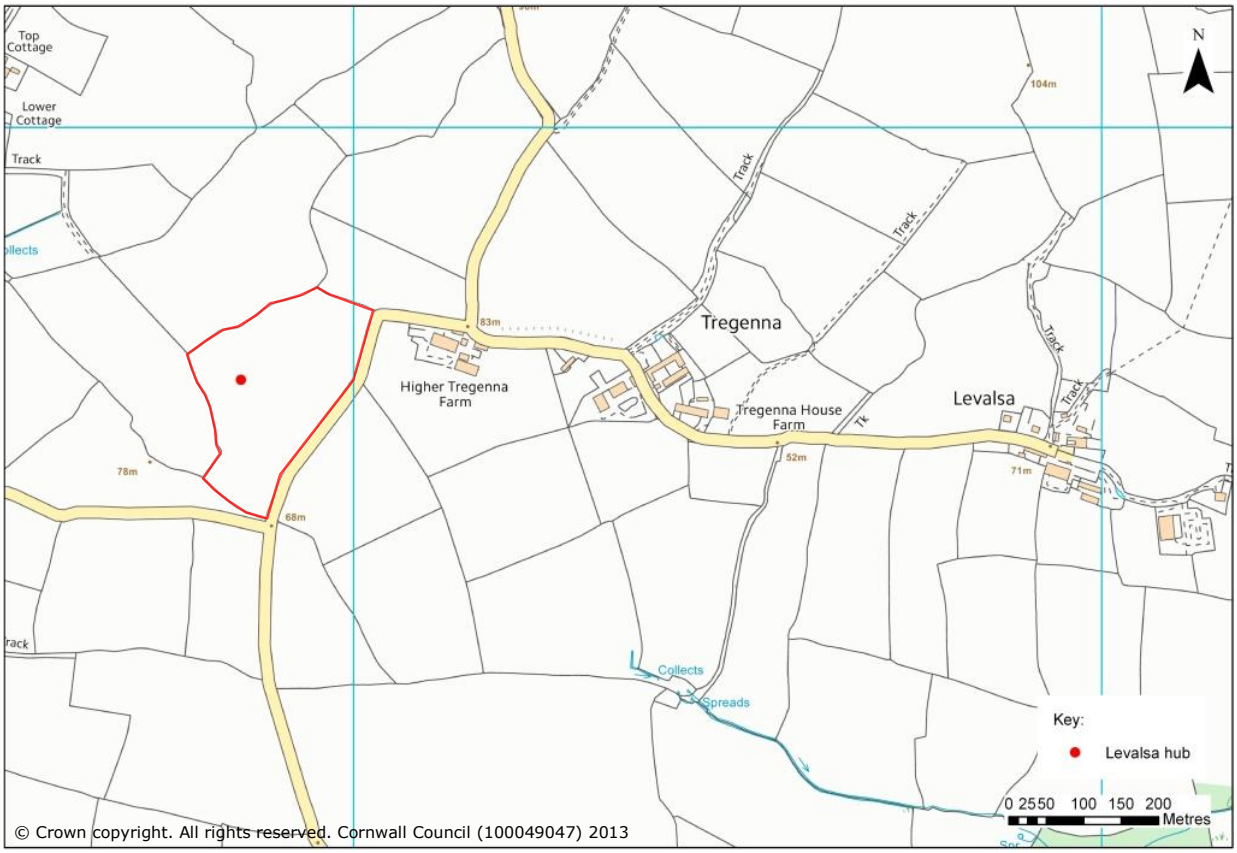

Figure 2: Location of proposed wind turbine at Levalsa Farm.

2 Introduction

2.1 Project background

Cornwall Archaeological Unit, formerly Historic Environment Projects, Cornwall Council, was approached by Cornwall Council in September 2013 with a request to provide costs for an archaeological assessment of a proposed wind turbine planning application. The proposal is for a wind turbine with a hub height of 54m and a maximum blade tip height of 78m. This proposal is part of the Cornwall Council GCWEP project.

The site chosen for the wind turbine is currently semi-agricultural land at an elevation of approximately 82m OD to the west of a ridge-top at SW 98833 48677. The site lies to the west of the Levalsa Farm buildings, in the parish of St Ewe (Figures 1 and 2). The area surrounding the site proposed for the turbine is recorded as Farmland, Medieval. This forms Cornwall's agricultural heartlands, containing farming settlements documented before the 17th Century whose field patterns are morphologically distinct from the generally straight-sided fields formed as a result of the later Enclosure Acts.

Pre-application screening for a turbine and associated infrastructure has determined that the application is not considered an EIA Development within the meaning of the EIA Regulations.

A model brief prepared by the Historic Environment Planning Advice Team, Cornwall Council, was used to guide this archaeological assessment, in conjunction with the advice provided by English Heritage (2011). The brief states:

An assessment of the archaeological potential of the site and the potential impacts of the development on surrounding historic assets will be required to provide information in support of a planning application for the proposed development in accordance with the requirements of National Planning Policy Framework paragraph 128.

Cornwall Council Historic Environment Service believes high quality design should play a key role in minimising any adverse effects of renewable energy projects, whether this is directed at the disposition of wind turbines and energy crops in the landscape or the positioning of photo-voltaic cells on historic buildings or within the countryside. Fundamental to achieving high quality design will be a sound understanding of the character and importance of the historic asset involved, whether at the scale of individual buildings and sites or more extensive historic areas and landscapes.

Cornwall Council Historic Environment Planning Advice Officer's further advice dated late May 2013 states:

Our current guidance (agreed with EH & Planning) for medium-sized (61 to 99m) turbines is:

- *All proposals will require an archaeological assessment. Those in 'Anciently Enclosed Land' with HER sites within 500m will also require a geophysical survey.*
- *An assessment of the settings of designated heritage assets will be required when Scheduled Monuments, Listed Buildings, Conservation Areas, the World Heritage Site, Registered Battlefields or Registered Parks and Gardens lie within 10km (60m to tip) or 15km (100m to tip).*

The assessment consisted of a desk-based assessment, viewshed analysis out to 10km and consideration of designated sites out to 15km from the turbine location, a walkover survey of the location and site visits intended to determine setting impacts on designated sites within the surrounding landscape. The potential for cumulative impacts was considered. Given the location of the proposed wind turbine, the potential for negative impacts upon important heritage assets or their settings as a result of erecting the wind turbine was anticipated. Of those identified, the Listed Buildings at Levalsa, the Registered Park and Garden at Heligan and the Scheduled Monuments of Sticker Camp and Polgooth Mine were of particular interest as these sites lie within 2km of the

proposed wind turbine location and may be subject to the greatest negative impacts (Figures 19 and 20).

2.2 Aims and objectives

The principal aim of the study is to gain a better understanding of the archaeological impacts which would result from the construction of a wind turbine at Levalsa Farm, St Ewe.

The site specific aims are to:

- Establish viewsheds of the proposal site.
- Draw together existing historical and archaeological information about the site and its landscape setting from published and unpublished sources and information on designated and undesignated assets from national and local Historic Asset registers (such as the HER, NRHE, Heritage Gateway, etc.).
- Review and analyse historic map evidence for the site.
- Consider any geotechnical or geophysical data for the site.
- Undertake a site 'walkover'.
- Produce 'statements of significance' for all designated historic assets, that are identified as potentially impacted on by the current proposals following the initial filtering of the ZTV. Where currently undesignated assets are identified their likely significance should be indicated i.e. 'national', 'regional' or 'local'.
- Inform whether archaeological recording of any extant remains is required.
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains is required (for instance by means of a geophysical survey).
- Inform whether palaeoenvironmental sampling would be required.
- Identify the construction, use and 'end of life' impacts of the current proposals on designated heritage assets (as listed in the NPPF, but including the Outstanding Universal Value of the World Heritage Site) and on undesignated historic assets.
- Follow English Heritage Guidance 'The Setting of Heritage Assets' (2011) to produce assessments of the significance of setting of affected assets and the impacts of the proposals on those settings.

The principal project objective is to produce an illustrated report setting out the range of potential impacts of the proposal, the relative significances of the potentially affected sites and suggestions for suitable mitigation measures.

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 Ewe Tithe Map (*circa* 1839),
  - 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 turbine.

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. The methodology employs ArcGIS software and 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 turbine and key heritage assets within the surrounding landscape. A viewshed or ZTV (Zone of Theoretical Visibility) was generated for an 'observer point' based on the location of the proposed wind turbine (Figures 13-15).

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 turbine at Levalsa Farm, the viewshed was 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 54m to represent the height of the turbine hub and 78m to represent that of the blade tips.

This viewshed was 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 likely intervisibility with the proposed development site, inclusion within key views, 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 10km or 5km were used to determine potential impacts on designated heritage assets (as appropriate); a radius of 1km was used for undesignated heritage assets (Figure 17).

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 zones representing 1km, 5km and 10km from the site, as required by the HEPAO model 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 would be unlikely. Designated sites with limited settings and those with local settings 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 to justify their retention.

The resultant site list consisted of a mixture of designated assets having 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, and rounds), or which were designed to function as parts 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.

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 setting impacts on key heritage assets within the ZTV, site visits were made to both the site proposed for the wind turbine, and to 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 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 turbine and for its 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.

2.3.4 Geophysical Survey

Grid locations

A magnetometer survey was commissioned from Stratascan Ltd (part of the Sumo Group).

The location of the survey grids was plotted together with referencing information. Grids were set out using a Leica 705auto Total Station and referenced to suitable topographic features around the perimeter of the site or by using Leica Smart Rover RTK GPS, (Real-time Kinematic Global Positioning System) which can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. A SmartNet RTK GPS uses Ordnance Survey's network of over 100 fixed base stations to give an accuracy of around 0.01m.

Survey equipment and gradiometer configuration

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTeslas (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. The instrument consists of two fluxgates very accurately aligned to nullify the effects of the Earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Each gradiometer has a 1m separation between the sensing elements so enhancing the response to weak anomalies. Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a 30m x 30m grid. The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m, though strongly magnetic objects may be visible at greater depths. The collection

of data at 0.25m centres provides an optimum methodology for the task balancing cost and time with resolution.

The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

2.3.5 Post-fieldwork

On completion of the project and following review with the CAU 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 site is located approximately 82m OD at SW 98833 48677. It is approximately 15km east of Truro and 5km southwest of St Austell (Figures 1 and 16). Topographically the site is on the northern end of a northeast-southwest orientated ridge-top plateau. At the western edge of the proposed site the landscape initially slopes gently down but is overlooked by a steep scarp slope at a distance of around 500m. The landscape to the north and south slopes down gradually whilst to the east it remains quite level (Figure 11).

The topography predominantly defines the views to and from the site, with the greatest intervisibility being to and from the higher ground. Agricultural activities immediately surround the site, whilst pockets of designed landscapes populate the wider area. Levalsa Farm occupies a south facing slope, the turbine being proposed to be located just over a kilometre to its west (Figures 2 and 11).

From the proposed turbine site the views in all directions are quite extensive. To the north, the spoil dumps of the china clay industry are clearly visible and form the horizon (Figure 24). Tregenna Farm dominates the view eastwards although the sea is also visible down an apparently narrow valley. The farmland to the south and west immediately adjacent to the proposed turbine field is not visible from ground level due to the slope and Cornish hedges; however at a distance of around 500m there is a steep slope up to another ridge which is highly visible (Figures 23 and 26).

The bedrock geology in this location consists of sandstone and mudstone of the Gramscatho Formation. This is a sedimentary bedrock formed approximately 375-398 million years ago in the Devonian Period in a deep sea environment. No superficial deposits are recorded (British Geological Survey website).

The Historic Landscape Characterisation (HLC) of the turbine site is recorded as Farmland, Medieval (Anciently Enclosed Land). This HLC Type forms Cornwall's agricultural heartlands, and contains farming settlements documented before the 17th Century set within morphologically distinct field patterns of Medieval or Prehistoric origins (Figure 10).

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 turbine, 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 and selected radii 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 Conservations 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). These impacts were assessed out to the following distances:

- Non-designated heritage assets – 1km radius.
- Grade II Listed Buildings and Conservation Areas – 5km radius.
- World Heritage Sites – 10km
- Scheduled Monuments, Grade 1 and Grade II* Listed Buildings and Registered Parks and Gardens – 15km radius.

5 Designations

The table below cross-references the designated and undesignated assets with the radial distance of their locations from the study area (Figure 22). The distances used refer to the English Heritage guidance relating to the setting assessments of potentially impacted heritage assets. Where assets cross over between two distances, the closest distance to the study area has been used to account for that asset. The first number in each box refers to the total number of assets within that radius, the second refers to those which fall within the ZTV. For the 10-15km zone there was only a consideration of sites within it, not a full viewshed analysis so the single number represents the total number of sites of each designation within the zone.

Designation	Within 1km/ viewshed	1-5km/ viewshed	5-10km/ viewshed	10-15km	Total/ viewshed
Undesignated Sites (Regional/ Local)	24/20	-	-	-	24/20
Conservation Areas (National)	-	3/3	-	-	3/3
Registered Parks and Gardens (National)	-	1/1	4/4	2	7/5
Grade II Listed Buildings (National)	1/1	318/101	-	-	319/101
Grade I & II* Listed Buildings (National)	-	15/8	43/12	56	114/20
Scheduled Monuments (National)	1/1	7/6	19/17	73	100/24
World Heritage Sites (International)	-	-	1/1	-	1/1

Table 1 Quantification of sites within 15km of the study area and those which fall within the viewsheds.

5.1 Rights of Way

No rights of way traverse the sites proposed for the wind turbine, or the remainder of the area required for sub-surface cabling. This area is not registered as open access land under the CROW Act 2005.

6 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.

6.1 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.*

6.2 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.

7 Results of desk-based assessment

The prehistoric remains in this area are concentrated into a series of hilltop enclosures rather than of a scattering of findspots or a clustering of smaller monuments such as barrows as is more typical within other areas of Cornwall. There are some barrows in elevated locations such those at Carnwinnick (1020751), Bodrugan (1004470) and on the Dodman (1020865). These hilltop sites are variously described as 'camps,' 'enclosures,' 'hillforts' or 'cliff castles.' All are located on hill crests, the majority taking advantage of positions overlooking the multiple river and stream valleys throughout this area. Castle Hill is one of the most typical of these, sited at a confluence of three valleys and overlooking a small cove, it also commands good views inland. Resugga (1017685), Carvossa (1016890) and Golden Camp (1016889) all overlook, from west to east, the upper reaches of the Fal River, thought in the past to be navigable as far as Grampound (Figures 18 and 20). Dodman Point (1020865) is the most impressive of the sites of this type within this area (Figures 22 and 29); at 34ha it dwarfs the other promontory fort of Black Head close by to the northeast. Apart from the large ramparts that utilise and modify the naturally precipitous cliffs, it has a long history of use physically represented by Bronze Age barrows, an Iron Age enclosure and occupation and Medieval field systems. There are also two phases of signal stations, the surviving hut dated to 1794, and a large granite cross erected as a navigational aid.

The Medieval field system on the Dodman is illustrative of the characteristic agricultural features still surviving within the wider landscape. Many local place-names have a Medieval origin. The earliest recording of Levalsa and its meaning are problematic. It is suggested that it is a compound of the Cornish elements 'aval' and 'ti' meaning 'apple house.' However other Cornish elements 'le' meaning place, 'leven' meaning smooth or even and 'als' or its derivative 'alsa' meaning cliff or slope could also apply given the topographic location of Levalsa Farm (Padel, 1985; 4, 13, 145, 148, 217, 278). It is notable that Levalsa Down and Levalsa Meor, to the northeast, are similarly located on sloping ground. Levalsa is directly referred to in the Domesday Book, which may be the earliest known record of the name. It documents that Erchenbald held the manor of Levalsa although Doda held it before 1066 and paid tax for 1f of land despite there being 1v there. Also registered were one plough, three slaves, two villagers and the smallholder as well as one cow, twelve sheep and a pig. The pasture was recorded as being of 60 acres and there was woodland 3f long and 1f wide. The value was previously 20s; at the time of the Domesday Survey it was 10s (Thorn and Thorn, 1979).

Levalsa was not shown on Norden's Map of Powder Hundred, but was depicted by Gascoyne on his map of 1699 as Levassa (Figures 3 and 4). On the St Ewe Parish Tithe Map of 1839 the field patterns can be seen to have changed little immediately surrounding Levalsa, although the farm buildings had become more developed (Figure 5). However to the southeast, around Kestle, the fields still retained their Medieval form on the Tithe Map; they are now large, approximately rectangular blocks. These are a

product of the Enclosure Acts in place from the 17th Century, here shown to have been enacted post 1839. On the Tithe Apportionment Levalsa Farm was indicated as being owned by Richard, Earl of Mount Edgcumbe. The land was occupied by Ezekiel Gaved and Thomas Stephens, although they are described as the executors of Thomas Stephens, deceased. The poor surviving quality of the numbering on the Tithe map meant that it was impossible to identify the details of the proposed turbine field with any certainty, but all the Levalsa land was arable farmland. The Tithe Apportionment also records a series of 'Tenements in Levalsa' of which the majority were owned by the Earl of Mount Edgcumbe or the executors of Thomas Stephens, these small farms having various tenants, some of which were lessees for life. These tenements usually consisted of a cottage and one or more arable fields, or occasionally furze and orchards.

The Post Medieval period in Cornwall and elsewhere saw the development of large estates with country houses, designed landscapes and significant collections of plants. Heligan (1000538) and Caerhays (1000448) are two of the most well known in the vicinity (Figures 27 and 28). Heligan was part of the Arundell estate during the 12th century and was sold to Sampson Tremayne in the late 16th century. The house was developed from the 17th century with the garden undergoing several remodelling phases in the 17th-18th Centuries. In the 19th century there was extensive planting of exotic species including rhododendron and bamboo. These have now been restored after they became derelict following World War II.

Caerhays (1000448) was also part of the Early Medieval estate of the Arundell family, passing by marriage into the Trevanion family c1379. Improvements to the house and garden were made in 1703 and successively throughout the 18th and 19th centuries with input from John Nash and possibly Humphry Repton. The estate was sold to the Williams family in 1853, and in c1885 John Charles Williams began the woodland garden that features the camellias and rhododendrons that Caerhays is now noted for.

The wider landscape to the north has been significantly altered by china clay extraction. The resultant pits and spoil dumps are still visible and the ports and coastal villages around St Austell Bay have many related industrial features. Charlestown, a component of the World Heritage Site, being the prime example (Figures 24 and 33). In the modern period few changes have been made to the immediate surroundings of Levalsa; the small farming settlements and fields remain, many structures being protected by Listed Building status; the estates remain largely intact and maritime activities are still pursued from the coastal settlements.

8 Results of viewshed analysis

See Figures 13-15

Given the topography of the site, its surroundings and the height of the turbine, the viewshed analysis suggests that it is likely to be visible over a fairly large proportion of the surrounding countryside. In line with the requirements of English Heritage guidance, a Zone of Theoretical Visibility has been mapped to a distance of 10km from the proposed site, though the ZTV mapping was extended out to 15km in view of the height of the proposed wind turbine. The visibility of the turbine will diminish with distance, and will at many local sites, be blocked by the local terrain, by intervening buildings within settlements or farmsteads, or by high hedgerows and mature groups of trees. However the seasonal changes to deciduous trees and their susceptibility to being cut back or completely removed has the potential to significantly change the degree of intervisibility between a historic asset and the proposed turbine site.

8.1 1 km radius ZTV

See Figures 13-17

The ZTV suggests that the turbine mast or blades could potentially be visible from almost the whole of this zone, with the exception of a narrow strip to the north, south and west. The zone includes the base of a Medieval cross at Lanhadron, a Scheduled Monument.

The only other heritage assets within this zone are the 20 undesignated sites listed in the HBSMR, of which the majority are known from documentary records only.

8.2 1km to 5km radius ZTV

See Figures 13-19

Parts of the wind turbine could potentially be visible from all of the ridge-tops that encircle the proposed site within the 1-5km radius area. The area extends northeast to St. Austell, southeast to Mevagissey, and west to Grampound. It is characterised by a series of steep-sided valleys and broader ridge-tops which will considerably influence the theoretical intervisibility of the wind turbine.

The wind turbine is likely to be intervisible with only parts of some heritage sites, including the Conservation Areas and associated Listed Buildings within Mevagissey and Pentewan due to their coastal inlet topography. There will be greater potential intervisibility with the proposed wind turbine from features on ridge tops, in particular the prehistoric camp and Scheduled Monument at Sticker (Figure 31).

This zone contains a number of potentially intervisible Scheduled Monuments and Listed Buildings, including Levalsa Farmhouse and Holy Trinity Church in St Austell. Notably, there will be partial intervisibility with the Registered Park and Garden of Heligan (Figures 27 and 28).

8.3 5km to 10km radius ZTV

See Figure 15

The wind turbine would potentially be visible from a small proportion of the 5km to 10km radius area around it, visibility again being significantly constrained by the local topography of ridges and valleys. Equally significantly, approximately 30% of this zone is located over the sea, specifically St Austell, Mevagissey and Veryan Bays. Whilst the sea does not feature any historic assets, its maritime activities and seaward approaches are significant to the landscape setting and history of the area. They are likely to have a high degree of intervisibility with the proposed site.

Within the ZTV for this radius are a number of notable heritage sites including the Registered Parks and Gardens of Trewarthenick, Trewithen, Tregehan and Caerhays and the World Heritage Site Area at Charlestown. Scheduled Monuments within this zone include the Prehistoric sites of Resugga, Carvossa, Castlezens and Golden Hill, together with the promontory forts at Black Head and Dodman Point (Figure 27). All will be potentially intervisible to some extent with the proposed turbine site.

8.4 10km to 15km radius

See Figure 15

This radius extends to beyond the A30 road in the north, Polruan in the east, and Truro to the west. The southern extent is approximately 5km out to sea from the coastline. The visibility of the proposed wind turbine site within this zone is likely to be minimal, probably confined to ridge-tops, and will be moderated by the relatively considerable distance of heritage assets from the proposed wind turbine site. The zone contains a high number of Grade I and II* Listed Buildings and Scheduled Monuments and two Registered Parks and Gardens.

8.5 Scheduled Monuments within the 10km radius ZTV

See Figure 15

There are a total of 27 Scheduled Monuments within 10km of the proposed wind turbine, 24 of these falling within the ZTV, as follows:

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

Reference	Name
1010843	Fair Cross, 420m west-northwest of Tregidgeo Farm
1006647	Corran Cross 350yds (320m) E of Lanuah
1016889	Golden Camp Hillfort
1007288	South Polgooth mine complex
1007952	Medieval wayside cross base 550m west-northwest of Lanhadron Farm
1011994	Sticker Camp, later Prehistoric-Roman round
1016284	Nancor Cross, 400m northwest of Nancor
1016369	Wayside Cross, 6m south of St Mary's Church, Par
1003269	Longstone at Mount Charles
1007291	Round Southwest of St Stephen's Beacon
1014897	Wayside Cross in Holy Trinity Churchyard
1006663	Prideaux Camp
1016890	Prehistoric and Roman settlement at Carvossa
1018694	Wayside Cross and cross base in St Stephen's Churchyard, 6m south of the Church
1004470	Round barrow 950yds (870m) SE of Bodrugan
1018695	Churchyard Cross shaft and base in St Stephen's Churchyard, 3m south of the Church
1003091	St Stephen's Beacon hillfort
1020865	Later Prehistoric cliff castle, two Prehistoric round barrows, Medieval field system and associated remains on Dodman Point
1019163	Menacuddle Well
1010849	Medieval Cross base at St Ewe
1017685	Resugga Castle later Prehistoric univallate hillfort
1019743	Castlezens multiple enclosure fort
1020751	Round barrow 530m northwest of Carnwinnick
1016368	The Biscovey Stone, early Christian memorial stone and wayside cross shaft 1m south of St Mary's Church, Par

Table 2 Scheduled Monuments within the 10km radius ZTV

Some of these potentially intervisible Scheduled Monuments consist of structures such as wayside crosses, churchyard crosses and chapels whose settings are inherently very local. The majority are not close to the site proposed for the wind turbine and in line with English Heritage guidance, no assessment of impacts on their settings therefore needs to be made. The Medieval wayside cross at Lanhadron is within a kilometre of the proposed wind turbine site and therefore setting impacts on it have been considered (Figure 19).

Hillforts, barrows, standing stones and stone circles, in contrast, were intended, when constructed, to have far-ranging settings. Many 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 turbine, where substantial intervisibility was likely,

where they were judged to have sensitive settings, or where impacts on or intrusion into key views of such sites appeared likely to occur.

8.6 Registered Parks and Gardens within the 15km radius

See Figure 20

There are seven Registered Parks and Gardens (RPGs) within the 15km radius of the proposed site:

Reference	Name	Grade
1000545	Tregrehan	II*
1000510	Trewithen	II*
1000655	Tregothnan	II*
1000448	Caerhays Castle	II*
1000658	Trewarthenick	II
1000538	Heligan	II
1000651	Menabilly	II

Table 3 Registered Parks and Gardens within the 15km radius.

The Grade II (RPG) at Heligan is within 5km of the proposed turbine site (Figures 27 and 28). It is positioned within a number of valleys, and as such the potential intervisibility with the turbine will be sporadic across the designated area. Menabilly and Tregothnan are more than 10km away and intervisibility between them and the proposed wind turbine is likely to be minimal. The density of vegetation recorded within all the parks reduces the likelihood of intervisibility; however all are designed landscapes with natural or agricultural contexts.

8.7 Areas of the Cornish Mining World Heritage Site within the 10km radius ZTV

See Figures 21 and 30

The northern edge of the Charlestown Area of the Cornish Mining World Heritage Site is approximately 7km from the proposed turbine site (Figure 30). The majority of the area, along with its associated leat, is within a valley and is unlikely to be intervisible with the turbine site at all, significantly limiting the potential for impacts.

8.8 Grade 1 and II* Listed Buildings within the 15km radius

See Figures 19, 20 and 22

There are 114 Grade I or II* Listed Buildings within 15km of the proposed wind turbine site, 20 of these falling within the ZTV.

Reference	Name	Grade
1211925	Holy Trinity Church	I
1137082	Church of All Saints	I
1137033	Church of St Stephen	I
1328913	Pavilion approximately 15m northwest of Trewithen House	I
1141100	Trewithen House	I
1327073	Church of St Michael	I
1160827	Pavilion approximately 15m northeast of Trewithen House	I

1138159	Higher Lodge	I
1289697	Market House	II*
1211944	St John's Methodist Church and attached schoolrooms	II*
1327444	Garlenick	II*
1141079	Barn and two adjoining engine houses approximately 10m north of Trewithen Farmhouse	II*
1212080	Long Stone	II*
1212091	Tregrehan House and attached steps and parterre walls with urn	II*
1327463	Meledor Farmhouse	II*
1327442	Church of St Mewan	II*
1136796	Levalsa Farmhouse	II*
1212089	Church of St Mary	II*
1212189	The Old Manor House	II*
1386524	Leek Seed Chapel	II*

Table 4 Grade I and II Listed Buildings within the 15km radius*

The Grade II* Listed Levalsa Farmhouse is just over 1km from the proposed site (Figure 19). Eight Grade I or II* Listed Buildings within the ZTV fall within the 5km radius; the remaining heritage assets are all outside the 5km radius from the proposed turbine site (Figure 19). The churches, in particular, are potentially significant landmarks in addition to their inherent historical importance; however many of the sites listed above, such as the barns and farmhouses are more locally important and have much more limited settings.

8.9 Grade II Listed Buildings within the 5km radius ZTV

See Figures 18 and 19

Within the 5km zone there are 318 Grade II Listed Buildings. Of these, 102 are within the ZTV:

Reference	**Name**	**Grade**
1327448	Garden walls about 100m east of Pennans Farmhouse	II
1211823	Northeast gateway at Penrice	II
1144802	Signpost at SW 982 461	II
1327445	Pair of gate piers about 50m southwest of Garlenick	II
1136891	Barn about 50m west of Luney Barton Farmhouse	II
1144031	Guidestone at SW 957 473	II
1327441	Engine house at South Polgooth tin mine	II
1323705	St Austell branch library	II
1327077	Outbuilding about 10m southeast of the Crown Inn	II
1312541	Pair of gate piers about 100m southeast of Tregonan Farmhouse	II
1327076	Cross	II
1136777	The Old Rectory	II

1379471	Well house and pump at rear of number 5 Church Row	II
1327047	Guidestone at SW 991 471	II
1212076	15 High Cross Street	II
1327446	House about 60m east of Trecaine Farmhouse with attached front garden walls and gateway	II
1289911	Engine house at Polgooth mine	II
1136760	Richard's Monument in the Churchyard about 10m south of the south aisle of the Church of St Mewan	II
1211827	72 and 74 Bodmin Road	II
1144773	The Crown Inn	II
1144029	Garden walls and gazebo about 30m south of Garlenick	II
1144028	Cross shaft at SW 955 473	II
1289467	Elm Terrace	II
1327053	Tregear Farmhouse	II
1136745	Vian Monument in the Churchyard about 2m south of the tower of the Church of St Mewan	II
1211653	Little Trevissick	II
1312647	Thomas Monument in the Churchyard about 9m north of the north transept of the Church of St Mewan	II
1212219	6-12 Victoria Place	II
1136921	Tregain Farmhouse with attached front garden wall	II
1289695	30 and 32 Eastbourne Road	II
1136713	Manor Farmhouse (marked on OS map as Bungullow Manor Farmhouse)	II
1212072	12a and 12b Fore Street	II
1144030	Guidestone at SW 954 473	II
1144794	Guidestone at SW 984 471	II
1212569	Elm Terrace	II
1212077	Friends' Meeting House	II
1136764	Richard Monument in the Churchyard about 17m northeast of the chancel of the Church of St Mewan	II
1211829	6 and 7 Church Street	II
1143989	House at Newgate at SW 977531	II
1212074	5 High Cross Street	II
1144016	Retanning Farmhouse	II
1289699	3 Vicarage Hill	II
1144771	1 and 2 St Ewe	II
1144801	Stable about 20m south of Luney Barton Farmhouse	II
1212075	Commercial Hotel	II

1211746	Church of All Saints	II
1144767	Unidentified Monument in the Churchyard about 12m north of the nave of the Church of All Saints	II
1268442	St Austell railway station and footbridge	II
1211656	Church Row	II
1212677	17 North Street	II
1289908	Outbuilding immediately northeast of Trevissick Farmhouse	II
1144020	Nicholl's Monument in the Churchyard about 12m north of the north transept of the Church of St Mewan	II
1212079	1 Market Street	II
1396216	Milestone approximately 137m southeast of The Meadows	II
1289644	The Stag Inn	II
1327075	K6 Telephone kiosk outside St Ewe Institute	II
1327446	House about 60m east of Trecaine Farmhouse with attached front garden walls and gateway	II
1144018	Crew's Monument in the Churchyard about 3m south of the south aisle of the Church of St Mewan	II
1144804	Trelewack Farmhouse	II
1212172	Queen's Head Hotel	II
1144029	Garden walls and gazebo about 30m south of Garlenick	II
1136784	Kestle Farmhouse	II
1144792	Corran Cross at SW 985 457	II
1144023	St Mewan Sunday School	II
1312581	Stables about 15m north of Levalsa Farmhouse	II
1136769	Base of a cross in the Churchyard about 10m west of the tower of the Church of St Mewan	II
1212069	White Hart Hotel	II
1144770	Lychgate at the north entrance to the Churchyard of the Church of St Mewan	II
1289422	21 North Street	II
1144022	Gateway at the southwest entrance to the Churchyard of the Church of St Mewan	II
1246626	Lobbs Shop Cottage	II
1407574	Milestone at SX 01840 52396 on Alexandra Road	II
1144021	Gaved Monument in the Churchyard about 18m northeast of the chancel of the Church of St Mewan	II
1289840	Stone cross in the Churchyard	II
1327046	Cross base at SW 989 478	II
1212575	Elm Terrace	II
1144805	Trudgian Farmhouse	II

1212187	Drinking Fountain	II
1137241	Churchtown Farmhouse	II
1144019	Edward's Monument and railings in the Churchyard about 10m east of the south aisle of the Church of St Mewan	II
1212497	19 North Street	II
1327052	Rose Cottage	II
1312473	Harris Monument in the Churchyard about 9m north of the nave of the Church of All Saints	II
1212083	1 and 3 Victoria Place	II
1388282	The Red Bank	II
1289696	3-7 Fore Street	II
1312636	Trelowth Methodist Church	II
1136246	Milestone at SW 965 498	II
1212493	Elm Terrace	II
1211927	Churchyard wall and railings	II
1289511	Elm Terrace	II
1379454	The General Wolfe Public House	II
1327050	Lodge with attached walls and piers at the northwest entrance to Heligan House	II
1212496	15 North Street	II
1137125	Scobell Monument in the Churchyard about 1m north of the north transept of the Church of All Saints	II
1327051	Pair of gate piers about 10m south of Levalsa Farmhouse	II
1327448	Garden walls about 100m east of Pennans Farmhouse	II
1327440	Hembal Manor	II
1312514	Bridge over the River Luney	II
1144772	Nantuat	II
1136264	Stable about 20m south of Pennans Farmhouse	II
1211651	Trevissick Farmhouse	II

Table 5 Grade II Listed Buildings within the 5km radius ZTV

Impacts on the settings of all of these feature types are very unlikely unless they are in very close proximity to the proposed wind turbine. The list includes structures such as guideposts, milestones, stiles, churchyard walls, lych gates, headstones or chest tombs, crosses, bridges and village halls, all of which have very localised settings. Others such as houses, farmhouses and manors have somewhat more extensive settings; however in terms of their designation as heritage assets these are still likely to be limited in extent. Few if any of these structures are likely to have been constructed with the aim of being dominant in the landscape, with the intention to be viewed from a distance, or with designed vistas. On the other hand, several of the assets were probably designed to be 'ornaments' to the adjacent area, often to be viewed from an adjacent approach.

8.10 Conservation Areas within the 5km radius ZTV

See Figures 18 and 19

All three of the Conservation Areas within 5km of the proposed turbine site are within the Zone of Theoretical Visibility. Pentewan and Mevagissey are set within narrow coastal valleys and only restricted upslope areas of them fall within the ZTV, potentially exposing them to some visual and setting impacts from the wind turbine. The St. Austell Conservation Area is spread across the centre of the town, including those parts within a valley and its east and west facing slopes. Only the upper parts of the area occupying the west facing slope are likely to be intervisible with the proposed turbine. Intervisibility within this part of the Conservation Area will be determined by the density of the local built environment.

8.11 Undesignated historic assets within the 1km ZTV

See Figure 17

The ZTV mapping suggests that the majority of the landscape within a 1km radius of the site will be intervisible with all or part of the proposed wind turbine. Within this zone, the Cornwall and Scilly Historic Environment Record (HER) records 20 potentially intervisible sites:

Reference	Name	Period
MCO12387	PENGELLY - Post Medieval mine	Post Medieval
MCO11395	TREGENNA - Early Medieval settlement, Medieval settlement	Early Medieval
MCO12878	WHEAL COMMERCE - Modern mine	Modern
MCO10006	LANHADRON - Medieval chapel	Medieval
MCO10379	LANHADRON - Medieval nunnery	Medieval
MCO16554	RESCORLA - Medieval settlement	Medieval
MCO20773	CARTREFLE - Prehistoric field system, Romano British field system	Prehistoric
MCO21776	RESCORLA - Iron Age enclosure, Romano British enclosure	Prehistoric
MCO26252	TREGENNA - Post Medieval crazing mill, Post Medieval blowing house, Post Medieval stamping mill	Post Medieval
MCO26258	POLGOOTH - Post Medieval blowing house	Post Medieval
MCO29693	LANHADRON - Medieval trackway	Medieval
MCO39865	LOWER WOOD CLOSE - Prehistoric lithic scatter	Prehistoric
MCO5480	LEVALSA - Medieval cross	Medieval
MCO8346	PENSTRASSOE - Iron Age round, Romano British round	Prehistoric
MCO5434	LANHADRON - Early Medieval cross	Early Medieval
MCO9474	TREGENNA - Post Medieval farmhouse	Post Medieval
MCO8619	TREGENNA - Iron Age round, Romano British round	Prehistoric
MCO11282	PENSTRASSOE - Medieval manor house, Post Medieval manor house	Medieval
MCO16241	PENSTRASSOE - Medieval settlement	Medieval
MCO21856	TREGENNA - Undated enclosure	Undated

Table 6 Undesignated historic assets within the 1km radius ZTV

The severity of impacts on undesignated assets will depend on the degree of their survival, the types of monument and the nature and extent of their settings. Many are undesignated because they are no longer upstanding, and have only documented records and therefore no settings. Others such as crosses and signposts have very immediate settings, whilst workshops or chapels have specific settlement-related settings, likely to be less sensitive to the visual impacts implied by the ZTV.

9 Results of site walkover

See Figures 23 and 24

A site walkover was undertaken on 26th February 2014. The weather was dry and sunny. The proposed turbine field is currently quite waterlogged grass pasture. The field is approximately flat, sloping down gently to the west and southwest (Figure 23). Its boundaries are Cornish hedges with some granite facing, though much of this has been removed and their underlying structures have become eroded, probably by animal activity. The hedges are approximately 1m high with a further metre of topping vegetation consisting primarily of brambles but also gorse, young trees and grasses. The ground level views from the site were generally very open and extensive with very little vegetation or buildings to screen the proposed turbine from the surroundings. To the north the view was extensive over the undulating rural landscape to the china clay spoil heaps (Figure 24). The views to the east was dominated by Tregenna Farm, but extended out towards the sea through an apparently narrow valley. The farmland immediately adjacent to the south and west was not visible due to the slope of the land and the blocking boundary hedges, but within 500m the steep slope up to another ridge was clearly visible. The proposed site is immediately adjacent to the working farm of Tregenna. No existing turbines are visible from the site.

10 Field verification of ZTV

See Figures 13-15 and Figures 23-33

Sites of archaeological significance identified using ZTV analysis and within the 15km radius from the proposed site are located in the fieldwork table (Table 10), and were numbered from 1-19 working from those sites closest to the turbine site outwards in an approximately clockwise order.

The significance of each site is graded as follows:

WHS- World Heritage Site
S Scheduled Monument
L Listed Building
A Site of National Importance
B Site of Regional Importance
C Site of Local Importance
D Natural feature or non-antiquity

The condition of each site was assessed where possible during the walkover survey and is graded from 1-4:

1 No surviving remains evident above ground
2 Poor preservation
3 Fair preservation
4 Good preservation

The sites have been given one of five Overall Impact grades; from Very Large which approximates to damage and loss of the site's integrity and which represents a key factor in the decision-making process, to neutral which equates to no perceptible effects. The full scale is:

Impact Category	Typical Descriptors of Effect
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but may be important in influencing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 7 Overall Impact descriptors

In addition to the above descriptors the Overall Impact is determined using the combined result of a Sensitivity rating and Magnitude of Impact rating (DMRB Vol.11; 2/1-5).

The Sensitivity ratings are:

Sensitivity Rating	Typical Descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 8 Sensitivity Rating descriptors

The Magnitude of Impact ratings are:

Magnitude of Impact rating	Typical Descriptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
Negligible	Very minor loss or detrimental alteration to 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 9 Magnitude of Impact Rating descriptors

The viewshed mapping and potential impacts were, where possible (given constraints on public access and the general topography of the area), ground checked from a number of locations. The fieldwork results and impact assessment are detailed in the table below.

10.1 Fieldwork results and impact assessment

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
1	Levalsa Farmhouse 1136796 (Figure 25)	SW 99969 48580	The house is situated on higher ground overlooking its working farm buildings in a very agricultural and rural setting. The main aspect of the house is to the south though there are viewpoints looking east and west. The land slopes uphill towards the turbine site where there are extensive areas of mature trees and Tregenna Farm, all of which provide substantial screening. It is therefore unlikely that much of the turbine will be visible from the farmhouse itself.	17th Century	L II*	4	High	Minor	Minor
2	Tregenna MCO9474 (Figure 25)	SW 99450 48620	The farmhouse is on the site of an earlier barton. It is located on an elevated position above the associated farm buildings in a very agricultural and rural setting. Although there are mature trees, hedgerows and farm buildings interrupting the view to the proposed turbine site it is likely that a large proportion of the turbine will be visible from at least some aspects.	Late 18th or early 19th Century	C	4	Low	Moderate	Minor
3	Rescorla MCO5434	SW 98705 48574	The HER records this Prehistoric enclosure as surviving as a low earth bank on aerial photographs. From the nearest publicly accessible viewpoint these banks are not discernible. It is set in a very agricultural environment with few buildings or modern intrusions. The field in which the remains are located is surrounded by 1-	Iron Age to Romano-British	B	2	Medium	Moderate	Moderate

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			2m high Cornish hedges which provide some screening from the proposed turbine. However the proposed turbine site is in very close proximity and the majority of the turbine will be visible at all stages of use.						
4	Lanhadron 1007952 (Figure 26)	SW 98950 47850	An inscribed cross base which is not currently visible in the overgrown hedging or roadside verges. It is in an elevated position with a good view over the landscape, although this is partially obscured to the northeast by a small area of woodland. The site has a rural setting with the industrial landscape to the north contributing to its wider setting and views. The whole of the turbine field is visible so the turbine, its infrastructure and the construction/ decommissioning activities will also be visible.	Early Medieval	S	2	High	Moderate	Moderate
5	Pentewan DCO108 including Church of All Saints 1211746	SX 02027 47232	A well preserved fishing village designated as a Conservation Area. The main square has a southwest aspect towards the harbour/sea and Penare Point. The village is low-lying and surrounded by steep valley sides. Pentewan is set in a maritime coastal environment surrounded by a rural landscape. Although the settlement extends along a valley and up the sloping sides the view northwest towards the turbine site is very restricted by the topography, vegetation and buildings. Intervisibility	Post Medieval	B	3	Medium	No change	Neutral

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			is very unlikely given the distance and quantity of screening but this has the potential to change.						
6	Heligan 1000538	SX 00316 45854	The gardens of Heligan predominantly occupy a valley and south facing slope however there are upland areas to the north and northwest, including the main visitor entrance. Heligan is a designed landscape set within a wider agricultural and rural environment with few modern incursions nearby. It is a significant visitor attraction in the area. From the upland areas there are extensive views to the northwest, with little intervening vegetation, and it is probable that some of the turbine will be visible. Two small existing turbines are visible to the south.	Post Medieval	A Grade II	4	High	Minor	Minor
7	St Ewe MCO53100 / MCO53099 / 1144773 / 1137082	SW 98205 46129/ SW 98177 46128	The village includes the Grade I Listed Church of All Saints, the Grade II Crown Inn, the undesignated Schoolmaster's House and adjacent School and multiple Grade II Listed houses. The village is located in a slight hollow facing in towards the church. The small church spire is not a significant landmark. The village is set in a rural environment and retains its historic character with few overtly modern intrusions. Some mature trees surround the village restricting the view north from the centre. The proposed turbine is unlikely to be visible from much of the village. However the	Medieval or Post Medieval	L Grades I and II	4	High	Negligible	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			northern extent of the village is on a small crest and may have more open views towards the site.						
8	Caerhays Castle and Estate 1000448 / 1138159 / 1327073	SW 97160 41109	The grounds of Caerhays are a Registered Park and Garden whilst St Michael's Church and Higher Lodge are Listed Buildings. The main aspect of the castle is out to sea with lawns in front of it, however the majority of the garden, and protected landscape extends north behind the house. This designed landscape is set within a wider agricultural environment with roads cut into the bedrock or surrounded by woodland, controlling views of the estate. Although the church is small, it is in a prominent hilltop location and, significantly, is intervisible with Gorran Church tower. The park and Listed Buildings are on high ground with good views inland towards the turbine site, though this is quite a distance away and the undulating topography will probably obscure much of the turbine.	Medieval or Post Medieval	A Grade II* L Grade I	4	High	Minor	Minor
9	Dodman Point 1020865 (Figure 33)	SX 00150 39562	The archaeological remains on Dodman Point include a Prehistoric cliff castle, probable Bronze Age barrows, a Medieval field system, Napoleonic signal station and Victorian navigational cross. These are located at a significant elevation above sea level providing clear views in all directions with the most important vistas extending out to	Prehistoric -Post Medieval	S	3	High	Minor	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			sea and also back inland as far as the china clay industrial remains north of St Austell. It is highly likely that the proposed turbine will be visible from various points on the peninsula; several turbines already exist within views from the site.						
10	Trewithen 1000510 / 1141079 / 1141100 (Figure 27)	SW 91172 47510	Trewithen is a Registered Park and Garden and includes Listed barns, farmhouses and other buildings. The majority of the garden is located in a hollow and the perimeter is quite densely wooded. Although a modern visitor attraction, Trewithen is a designed landscape in a highly rural setting. It is unlikely that much, if any, of the turbine would be visible from the majority of the protected area.	Post Medieval	A Grade II* L Grades I and II	4	High	Negligible	Minor
11	Golden Camp 1016889 (Figure 27)	SW 92454 46853	The hillfort is situated on high ground close to the Fal river valley in a rural setting. Its ridge-top location affords it potentially good landscape views however the intervening space to the proposed turbine site includes areas of woodland which may obscure views. It is possible that part of the turbine may be visible.	Prehistoric	S	3	High	Minor	Minor
12	Carvossa 1016890 (Figure 27)	SW 91879 48266	The prehistoric settlement is located in quite open farmland with some hedgerows and wooded valleys between it and the turbine site. Carvossa is on a hilltop overlooking the Fal river in a rural setting with sporadic farm settlements. Views from it to the	Prehistoric	S	2	High	Minor	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			east are quite extensive and it is possible that at least the top of the turbine will be visible. This will be dependent on weather conditions and vegetation density, and the turbine will be at quite a distance from it.						
13	Resugga 1017685	SW 93961 51064	Resugga is a later prehistoric univallate hillfort located on the crest of a small ridge which is covered in scrub vegetation and mature trees. It is adjacent to the village of Coombe in a rural setting. To the south of Coombe is a larger ridge developed by the railway with bridges and nearby viaduct. It is possible some upper parts of the turbine will be visible at a distance and any views would include the railway infrastructure.	Later prehistoric	S	3	High	Negligible	Negligible/ neutral
14	Church of St Stephen 1137033 (Figure 28)	SW 94499 53326	The Listed Church is centrally located in the village of St Stephen. The church tower is prominent but the church is itself is quite a low building that is not very visible. The church is set within the historic core of the village but the surroundings include a busy road and significant modern housing and amenities. The wider setting also features the substantial remains of the china clay and mineral extraction industries. There are some deciduous trees surrounding the church though they do not provide a substantial screen. It is very unlikely that the turbine will be visible from ground level	Medieval, 12th Century origin	L Grade I	3	High	Negligible	Negligible/ neutral

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			but it is possible that the tower will have some degree of intervisibility.						
15	St Stephen's Beacon Hillfort 1003091	SW 96009 54490	The hillfort is located on top of a substantial hill with only grass and scrub vegetation and has good landscape views. It has a mixed setting of past and present mineral extraction activity, agricultural and semi-urban landscapes. At least one turbine is visible from the Beacon and it is likely the proposed turbine will also be visible, though at quite a distance away.	Prehistoric	S	2	High	Minor	Minor
16	Church of St Mewan 1327442	SW 99838 51849	The Grade II* Listed Church is quite a small low building with a small tower largely hidden from view from most approaches. It is located on a west facing slope within a rural setting though close to the A390, the busy main road to St Austell. It is possible that the turbine may be visible although any view will be obscured by the vegetation and undulating topography.	12th Century origin	L Grade II*	3	High	Negligible	Minor
17	St Austell 1211925 / 1289697 / 1212189 (Figure 29)	SX 01419 52452/ SX 01392 52504/ SX 01362 52480	The centre of St Austell includes the Listed Buildings of Holy Trinity Church, Market House and the Old Manor House and is a Conservation Area. These are located on slightly higher ground overlooking a busy urban environment with much modern development obscuring all views out to the surrounding landscape. It is very unlikely any part of the proposed	Medieval or Post Medieval	Grades I and II*	3	High	No change	Neutral

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			turbine will be visible.						
18	Charlestown 17 (Figure 30)	SX 03760 51785	The internationally important area of Charlestown is located in a valley leading to the sea. Within the settlement the eye is directed down the main street with a view of the sea to the south. To the west, in the intervening space between Charlestown and the proposed turbine site is occupied by a significant hill obscuring the view completely. Charlestown has a maritime and coastal setting within the conurbation of St Austell. It includes many modern amenities, tourist features and a high proportion of new houses which are not particularly sympathetic to the preserved cottages in the centre of the settlement. The density of housing, garden vegetation and topography taken together obscure any views of the turbine site.	Post Medieval	WHS	3	Very High	No change	Neutral
19	Tregrehan 1000545	SX 05192 53547	The Registered Park and Garden of Tregrehan is located in a hollow and on a west facing slope between St Austell and St Blazey Gate. It is set in the urbanised area of St Austell, close to busy roads and housing, although to the north the generally rural environment is partly occupied by features associated with the china clay industry and mineral extraction. The garden has a mix of open areas and mature trees potentially allowing some views towards the proposed turbine	Post Medieval	A Grade II*	4	High	No change	Neutral

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			site.						
20	Church of St Mary and Leek Seed Chapel 1212089 / 1386524	SX 05816 53592	Both sites have a suburban setting within St Blazey Gate and are adjacent to a very busy road. St Mary's Church spire is highly visible from the road approaches whilst the chapel is quite inconspicuous amongst the houses. Both have relatively good landscape views but it is unlikely that much, if any, of the turbine will be visible over the intervening ridge-tops, vegetation and buildings.	19th Century	L Grade II*	4	High	Negligible	Neutral
21	Menabilly 1000651	SX 09638 51904	Menabilly, a Registered Park and Garden, is on a west facing slope facing Dodman Point across St Austell and Mevagissey Bays. Although few landscape details could be seen from this distance it is possible that the proposed turbine would be visible, depending on weather conditions and the density of vegetation throughout the garden. Menabilly has a designed landscape setting within a wider rural, agricultural and maritime environment. The view to the bay highlighted the rural setting on the Dodman peninsula.	Post Medieval	A Grade II	4	High	Negligible	Neutral
22	Sticker Camp 1011994	SW 98579 50327	The later prehistoric-Roman round at Sticker is on a hilltop with good views of the surrounding landscape although is adjacent to the village and a busy road. The setting is generally rural though industrial remains of mineral extraction to the north and an engine house to the south are included. There	Prehistoric -Roman	S	3	High	Minor	Moderate

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact	Overall Impact
			is little substantial screening provided by vegetation and it is likely that the majority of the turbine will be visible.						
23	Wheal Commerce MCO12878	SW 98700 48600	This copper mine was operational in the 19th and 20th centuries, though little now remains of it, and its setting is entirely rural. There is very little intervening vegetation, apart from Cornish hedges, providing a screen from the proposed turbine, which is in very close proximity. It is probable the majority of the turbine will be visible.	19th and 20th Century	C	2	Low	Minor	Minor
24	South Polgooth Mine Complex 1007288 (Figure 31; Figure 32)	SW 98982 49880	The mine complex dates from at least 1593 and by the 1880s extracted tin, copper, arsenic and wolfram from three lodes. The remains of the mine engine house in particular are very visible in the landscape as they are on relatively high ground. Although once industrial, the setting is now predominantly rural and agricultural with some the spoil heaps of the china clay industry within the wider setting to the north. Some small trees and Cornish hedges provide minimal screening from the proposed turbine site, but it is probable that the majority of the turbine will be visible.	Post Medieval	S	3	High	Moderate	Moderate

Table 10 Fieldwork Impact Assessment Results

At each accessible designated heritage asset listed in the table above, the potential visibility of the proposed wind turbine was considered and views out from the proposed turbine site towards key heritage assets were checked. Though true levels of intervisibility were impossible to determine from ground level given that the proposed turbine has not yet been constructed, the general degree of openness of the views out from the sites could be assessed.

Where possible, photographs were taken from the proposed site towards the filtered list of heritage assets and from the assets back to the proposed site. In practice, this process was somewhat hampered in terms of capturing the historic asset and a view towards the proposed turbine site in the same photograph due to difficulties of access. The practicality of finding both a suitable viewpoint and a safe place to stop for photographs further constrained attempts to capture ideal viewpoints. However every effort was made to get as close as possible to the historic assets and to take photographs at least representative of the view when the asset itself could not be included. Within settlements, groups of buildings, 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 several areas of suggested intervisibility were closed off by woods and hedgerows as well as by topography.

Field verification tended to confirm the viewshed mapping; the turbine will be visible to some extent from many ridge-tops, but to a lesser extent as the viewer descends into the valleys. At distances from around 5km from the proposed site, visual impact may occur but will become weaker. Given the increasing number of proposed wind turbines in this area it will also become harder to distinguish individual turbines and cumulative impact will become increasingly relevant.

11 Geophysical Survey Results

The detailed magnetic gradiometer survey has identified a number of anomalies that have been characterised as being either of a probable or possible archaeological origin.

The difference between probable and possible archaeological origin is based on a confidence rating. Features identified within the dataset that form recognisable archaeological patterns or seem to be related to a deliberate historical act have been interpreted as being of a probable archaeological origin.

Features of possible archaeological origin tend to be more amorphous anomalies which may have similar magnetic attributes in terms of strength or polarity but are difficult to classify as being archaeological or natural.

The following list of numbered anomalies refers to numerical labels on the interpretation plots (Figures 34 and 35).

Probable Archaeology

1 A large number of positive anomalies including curvilinear, linear and several discrete anomalies, indicative of cut features of archaeological origin. These form a concentrated area of archaeological activity including ring ditches, boundaries, enclosures and pitting.

2 Widely spaced parallel anomalies, probably related to ridge-and-furrow cultivation.

Possible Archaeology

3 Several positive linear features with an associated discrete anomaly are possibly cut features of archaeological origin.

4 A number of negative linear anomalies, possibly indicative of ploughed out banks or earthworks.

Other Anomalies

5 Parallel linear anomalies probably related to agricultural activity such as ploughing.

6 Areas of magnetic disturbance are the result of substantial nearby ferrous metal objects such as fences and underground services. These effects can mask weaker archaeological anomalies, but on this site have not affected a significant proportion of the area.

7 A number of magnetic 'spikes' (strong focussed values with associated antipolar response) indicate ferrous metal objects. These are likely to have been produced by modern rubbish.

The survey identified a large number and variety of archaeological features. These include two large ring ditch features of prehistoric dates, these being visible across the north of the survey area. Both features are likely broken, indicating an access route, and have associated inner and outer ditches and enclosures. The larger eastern feature contains an area of pitting. A large number of linear features indicative of boundaries and enclosures are also visible in the vicinity, along with smaller linear and discrete features. These features likely form part of a concentrated area of multi-phase settlement activity.

Several weaker positive and negative linear and discrete features are visible in the west of the survey area, although their sporadic appearance and varying orientations makes further interpretation difficult

A small section of ridge-and-furrow is apparent in the south of the site. The western margin contains some agricultural marks adjacent to the field boundary, with a small number of magnetic spikes caused by modern metallic debris also visible throughout the survey area.

12 Statements of Significance

Many of the sites have already had their significance assessed by Scheduling or Listing. Where sites are Scheduled or Listed they have not been considered under the Sites and Monuments Records category below, even though they usually feature on that list, to avoid duplication. Some subsurface and associated remains are likely to be of equal significance to the sites identified below.

12.1 World Heritage Site (Site 18)

These sites are designated and defined by UNESCO (UNESCO website):

The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity and are thus of international importance. This is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972.

Sites inscribed on the World Heritage List benefit from the elaboration and implementation of a comprehensive management plan that sets out adequate preservation measures and monitoring mechanisms. In support of these, experts offer technical training to the local site management team.

The inscription of a site on the World Heritage List brings an increase in public awareness of the site and of its outstanding values, thus also potentially increasing tourist activities at the site. When these are well planned for and organized respecting sustainable tourism principles, they can bring important funds to the site and to the local economy.

12.2 Scheduled Monuments (Sites 4, 9, 11, 12, 13, 15, 22, 24)

Scheduled Monuments have Statutory Protection under the Ancient Monuments and Archaeological Areas Act 1979. These are sites that have been identified by English Heritage, the Government's archaeological advisory body, as being of national importance, and are included in the County Lists maintained by the Secretary of State for Culture, Media and Sport. A schedule has been kept since 1882 of monuments whose preservation is given priority over other land uses. The current legislation, the Ancient

Monuments and Archaeological Areas Act 1979, supports a formal system of Scheduled Monument Consent for any work to a designated monument (English Heritage Website).

12.3 Registered Parks and Gardens (Sites 6, 8, 10, 19, 21)

Registered Parks and Gardens, which are of national importance, are described and defined by English Heritage as (English Heritage Website):

The English Heritage 'Register of Historic Parks and Gardens of special historic interest in England', established in 1983, currently identifies over 1,600 sites assessed to be of national importance The emphasis of the Register is … *on 'designed' landscapes; … gardens, grounds and other planned open spaces, such as town squares … rather than on planting or botanical importance.*

Historic parks and gardens are a fragile and finite resource: they can easily be damaged beyond repair or lost forever … The main purpose of this Register is to celebrate designed landscapes of note, and encourage appropriate protection. It is hoped that, by drawing attention to sites in this way, English Heritage will increase awareness of their value and encourage those who own them, or who otherwise have a role in their protection and their future, to treat these special places with due care.

Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.

12.4 Listed Buildings (Sites1, 5, 7, 14, 16, 17, 20)

Sites are Listed to mark their special architectural and historical interest; they are protected by law, and Listed Building Consent must be granted for any alterations to a designated building. Some sites, such as the Church of St Mary, have been given Grade II* status, which means they are considered 'particularly important...of more than special interest.' The remaining sites are designated as Grade II listed and are therefore considered 'nationally important and of special interest' (English Heritage Website).

12.5 Conservation Areas (Site 5, 17)

Conservation areas are designated for their special architectural and historic interest. They are designated by the local planning authority and comply with national standards. Designations of Conservation Areas were first made in 1967 and typically include town or city centres, fishing and mining villages, historic estates, housing and transport links (English Heritage Website).

12.6 Local or Regional Significance (Sites 2, 3, 23)

These remains are considered of local or regional significance because of their comparative rarity, setting and upstanding evidence, but are otherwise undesignated assets.

13 Likely impacts of the proposed development

13.1 Construction Phase Impacts

The construction of the wind turbine at Levalsa will create some minor visual and audible disturbance, though as these will be temporary and reversible they are considered as negligible impacts only. An assessment of the likely noise impact due to the construction phase of the proposed turbine has been undertaken by an appropriate specialist. The predicted noise levels have been found to be insignificant and unlikely to result in audible impacts on surrounding designated heritage assets.

The construction of the turbine, specifically the excavations for the foundations and cable run has the potential to cause major direct, physical and irreversible impacts upon any archaeology in these locations. The geophysical survey results indicate The geophysical survey results indicate a series of anomalies which comprise an apparently coherent

enclosed feature, sub-circular groups and linear features, likely to be of late prehistoric date and relating to an enclosed farm settlement of the type known as a 'round'. Further small, ephemeral or artefactual remains are likely to be associated with the geophysical anomalies which are of a size or nature which cannot be detected at the resolution utilised for the geophysical survey (see Figures 34 and 35 for detected anomalies). Direct impacts on such archaeology would mean at least partial loss or alteration resulting in at least a moderately negative impact if this scenario occurred.

The passage of exceptionally large, heavy or tracked vehicles is likely to have a moderately negative impact through extensive rutting or compression on the sub-surface archaeology which it is likely to have to pass over. The locations of the turbine base, route of the cable trench and access tracks have been designed to avoid where possible areas shown on the geophysical survey results to have high quantities of anomalies (Figures 34 and 35). Provision of a works compound and additional access requirements have also been sympathetically sited where possible but are likely to have scales of impact similar to those identified above. Whilst this may reduce the likelihood of direct impacts, where these do occur, the severity is likely to remain moderately negative.

The impacts of the construction of the wind turbine are considered as moderate negative.

13.2 Operational Phase Impacts

During the operational phase only the setting and visual impacts will apply. These will vary according to the weather, season, distance from, and intervisibility with the proposed turbine and according to the sensitivity of individual heritage assets. Such impacts are temporary and potentially reversible (when the turbine is eventually dismantled, as required by the planning conditions applying to such installations) and will vary in overall magnitude according to receptor distance from the turbine, degree of intervisibility or intrusion of the turbine within key views of them and the sensitivities of their settings.

An assessment of the likely noise impact during the operational phase of the proposed turbine has been undertaken by an appropriate specialist. The assessment demonstrates that the turbine will operate within the relevant ETSU-R-97 noise limits and the noise emission level experienced at the receptor sites used in the study is unlikely to cause a disturbance. The residual noise impacts are considered to be insignificant.

13.3 End of Use Phase Impacts

Assuming the proposed turbine is not re-powered or replaced, the end of use impacts will be as a result of excavation activity to remove the turbine components. It is anticipated that foundations will be removed to a depth of 1m below grade and the soil profile restored. Access tracks will either be removed or retained, depending on the landowner's preference. The associated noise impacts are considered by the specialist's assessment as likely to be insignificant and there will be negligible but temporary visual impacts resulting from the use of machinery during this phase. The partial removal of the foundations and possibly also the access track and cabling, may result in further physical, irreversible impacts on surrounding subsurface archaeology but this is considered likely to be a minor negative impact and should be capable of mitigation.

13.4 Impacts on the Cornish Mining World Heritage Site

The Charlestown World Heritage Site is located to a very minimal extent within the viewshed (Figures 21 and 30). The area will not be physically impacted upon and there will not be visual and audible impacts resulting from construction, operation and end of use activities. This is because the potentially intervisible areas are substantially obscured by housing and associated vegetation. Current distractions from the significance of the area originate from the conurbation of St Austell. The addition of the proposed turbine will alter the setting of the World Heritage Site area, though at a distance of approximately 12km this will only be to a very negligible extent and will only be

perceived from a viewpoint out to sea from which the turbine and Charlestown could potentially be seen in the same view. The overall impact is rated as neutral.

13.5 Impacts on Scheduled Monuments

No Scheduled Monuments will be physically impacted upon by the proposal. The settings of all those within the viewshed will be visually impacted to some extent, dependant on how much of the proposed turbine will be visible, their prominence and vulnerability to intrusion of their settings. Sticker Camp and Polgooth Mine Complex will experience moderate visual and setting impacts during all three phases due to their proximity. In addition Polgooth retains an engine house with a tall chimney with which the rotating blades of the turbine may compete visually, leading to some degree of detraction from the current prominence of the engine house within the historic landscape (Figures 31 and 32).

Lanhadron Medieval Cross is assessed to be impacted overall to a moderate extent, specific negative though reversible impacts affecting its setting in particular with impacts occurring at all three stages. Although located close to the proposed turbine site, an assessment by a qualified specialist has determined that as Lanhadron is further from the proposed site than the noise receptors which measured noise at below the acceptable maximum the heritage asset is very unlikely to experience any noise impact. Ordinarily crosses are deemed to have limited and localised settings, particularly where they only partially survive, as at Lanhadron. However in this instance, the views from the cross site are deliberately extensive and include the turbine field in its entirety (Figure 26); there is also documentary and physical association with a Medieval chapel, nunnery or other religious structure which contribute to its setting; finally, the setting is definitively rural and isolated from any overtly modern developments. The collective magnitude of impacts upon the setting of this particular cross is considered to be greater than would be usual for a Scheduled Monument of this type.

Further afield, St Stephen's Beacon is partially within the viewshed, and as a prehistoric hillfort has an intentionally large setting. This setting is only likely to be negatively impacted upon during the operational stage and has been assessed as minor for a variety of reasons, principally its distance from the turbine site and the impacts on the hillfort's setting which have arisen through activities associated with china clay extraction activities.

Similarly, the promontory fort on Dodman Fort occupies a commanding position over the adjacent land and seascape, the site having significant open views in all directions (Figure 33). There will be minor visual and wider setting impacts, particularly during the operational phase. Overall however the impacts on Scheduled Monuments can be rated as minor.

13.6 Impacts on Listed Buildings – Grade I and II*

The wind turbine will have a neutral impact on those Listed Buildings which do not fall within its viewshed with the exception of those for which key viewpoints will also include the proposed wind turbine. There may be a minor or negligible visual impact for all Listed sites around or within 5km from the proposed site during all three phases; this will diminish with increasing distance from the site. The Grade II* Levalsa Farmhouse is just over a kilometre distant from the proposed turbine site, but as it faces south and is significantly screened by trees and other farm buildings, setting impacts will be negligible, or minor from some viewpoints (Figure 25). From others, however, negative setting impacts and audible impacts are likely to be greater, but will be moderated by intervening features such as tree cover. Although located close to the proposed turbine site, an assessment by a qualified specialist has determined that as Levalsa Farmhouse is further from the proposed site than the noise receptors which measured noise at below the acceptable maximum the heritage asset is very unlikely to experience any noise impact. Despite its high grade Listing, the overall impact on Levalsa Farmhouse is therefore assessed as minor.

The majority of Listed Buildings within St Austell are very unlikely to experience any negative impacts as their locations in the centre of the town will obscure any views outwards and their setting is already a modern environment. The majority within the centre of St Ewe, a relatively unspoilt and quiet village, are unlikely to experience significant visual impacts during the construction, operational and end of use phases. However, in individual cases the degree of impact may vary, dependent on the extent of intervisibility and degree of screening afforded by vegetation. The Grade I Church of All Saints in St Ewe has the most extensive setting of the Listed Buildings in the village. Although it has a very small spire which is not a landmark feature, the church is well preserved, with a secluded churchyard to its east and south. The slight crest located to the north of the village restricts some views towards the turbine site from its centre and particularly from the church.

St Michael's Church and Higher Lodge at Caerhays approximately 8km to the south-southwest of the proposed site are Grade I Listed, with extensive views northwards. Their settings are mainly related to the formal grounds of Caerhays but they also interact with the wider rural landscape, as the estate farms much of this land and the church is intervisible with the church at Gorran to the east. Visual and setting impacts on the designed landscape will be significant but are rated as minor. The overall impact on the Grade I and II* Listed Buildings at Caerhays is assessed as minor.

13.7 Impacts on Listed Buildings – Grade II

No Grade II Listed Buildings will be physically impacted upon and only those within the viewshed or those for which key views will also include the proposed wind turbine will experience a visual impact during all three phases (Figure 18). The South Polgooth Mine Complex includes some grade II Listed Buildings which will be impacted to a moderate extent and are discussed in greater detail within the section covering Scheduled Monuments above (Section 11.5; Figure 31). The Crown Inn, St Ewe and the Grade II Listed Buildings within St Austell such as the Red Bank are set within village and urban environments which will have very minimal views of the proposed turbine and therefore will be impacted to a minor or neutral extent respectively (Figure 29). The overall impact for Grade II Listed Buildings is assessed as neutral.

13.8 Impacts on Conservation Areas

All three surrounding Conservation Areas will be potentially intervisible with the turbine site though only to a minimal or partial extent (Figure 18). The modern urban environment of St Austell blocks views out from the centre of the Conservation Area. As Mevagissey and Pentewan have coastal locations there may be a minor impact to their setting when considered from a maritime viewpoint, as a modern turbine will be juxtaposed with these historically maritime related settlements. The topography and aspect of the Pentewan Conservation Area greatly restricts intervisibility to its upslope parts only where it is possible but unlikely that the turbine will be visible. As it is highly unlikely that the turbine will be visible or audible during any of the three use phases, setting impacts are assessed as neutral. The overall impact is therefore assessed as neutral.

13.9 Impacts on Registered Parks and Gardens

Visual impacts may be limited by the density of vegetation making up these designated landscapes, however many views from the parks were specifically designed and many may in the future include the proposed turbine. The settings of these parks are simultaneously formal, deliberately natural, within related or unrelated surrounding agricultural land and they often interact with the seascape. The proposed turbine will theoretically be intervisible to some extent from all seven parks, though distance will diminish any impacts occurring during the construction, operational and end of use phases.

At 3km from the proposed site, Heligan will experience the greatest impacts. Heligan is mostly located in a valley facing away from the proposed turbine site but the park entrances and woodland are on the crest of a ridge exposing it to visual and possibly audible impacts. The planted gardens, particularly the upslope areas, have extensive settings including their agricultural and coastal surroundings, which will be impacted to a minor degree by the installation of this turbine.

Beyond 5km from the proposed turbine site the effect on Registered Parks and Gardens decreases and consists of setting and visual impacts only. Caerhays has extensive views and its setting extends to the north towards the turbine location, though the principal aspect of Caerhays Castle is southwards to the sea and the formal gardens which surround it. The parkland, woodland and agricultural land, including the church and lodge discussed above will be intervisible with the turbine, though at a distance of 8km. There is likely to be a minor impact on many views of them and on the setting of the park as a whole. Any views of the turbine from the parks at Trewithen, Trewarthenick, Tregrehan and Tregothnan will be marginal as intervening vegetation will provide screening and the turbine will be a very small and distant component within views from and of them. The turbine will intrude to a limited degree on the wider setting of these sites, but due to distance this will result in very minor or negligible impacts. Menabilly, in contrast, is on a west facing slope with generally extensive views across St Austell Bay and has a setting which includes the maritime environment to a greater extent than the other designated parks, though is almost 15km from the proposed site. The rural environment of the Dodman Point is also very clear from viewpoints within this Registered Garden. The turbine will intrude into these settings, though this will result in at most a minor impact. The overall impact on Registered Parks and Gardens is assessed as minor.

13.10 Impacts on Undesignated Historic Assets

All of the sites within the viewshed (Figure 17) and those which survive as upstanding sites will be visually impacted upon to some extent during all three phases, though at worst this is considered as being likely to be minor for the more prominently positioned or closest sites such as Rescorla prehistoric enclosure (Figure 26). Due to their proximity, Rescorla and Tregenna are potentially susceptible to noise impacts from the proposed turbine. However assessment by a qualified specialist with measurements taken very close to these heritage assets has shown that the predicted worst case scenario noise levels will be less than 35dB(A), within the ETSU-R-97 limits and therefore are not considered to cause a disturbance. The majority of the undesignated sites are known from documentary sources only or are signposts and crosses with very limited settings. The overall impacts on such sites are therefore assessed as minor to neutral.

13.11 Impacts on Historic Landscape Character

The landscape surrounding the proposed wind turbine site is dominated by extensive areas of farmland of medieval origin interspersed with tracts of land enclosed during later periods (Figure 10). Much of the land has been farmed since at least the medieval period, in some places long before, as alluded to by the surviving place names and by prehistoric remains. From the 17th Century onwards parts of this area were subjected to enclosure under the Enclosure Acts with the imposition of larger, more regularly shaped fields and intensive farming methods that reduced some archaeological sites to below ground remains only. In places this is highlighted by the use of block work walls as field boundaries instead of the more traditional Cornish hedges. The development of the two Registered Parks and Gardens in the vicinity of the proposed turbine site also influenced the layout and character of the land. However the Post Medieval enclosures still preserve much of the original open character of the landscape, with small farming settlements scattered throughout it.

With the exception of the growth of the St Austell conurbation some distance away, the overall character of this landscape has changed little. The elevated nature of the area is clearly ideal for locating the proposed wind turbine and is likely therefore to become

increasingly popular for generating electricity from wind power as has been the case in other areas of Cornwall. The construction of wind turbines will inevitably erode the coherency and legibility of the former and surviving historic landscape character of this area to some degree. The construction of the proposed wind turbine at Levalsa will materially change the character of the surrounding landscape, given the relatively small number of wind turbines already operational within it and the lack of similarly modern and intrusive infrastructure, resulting in a moderate impact.

14 Cumulative impacts

Recent English Heritage guidance requires assessments of applications for renewable energy installations to consider the cumulative impacts of such developments in addition to specific impacts. The area surrounding Levalsa is not currently populated with multiple wind turbines but there are currently proposals for a number to be constructed, and the elevated landscape is ideal for generating energy from wind. This suggests a high potential for cumulative impacts.

From the proposed turbine site at Levalsa Farm, no operational turbines are currently visible, and from the majority of the archaeological and historic sites visited, either no turbines, or only one or two small installations could be seen. Few of the archaeological sites highlighted in this assessment are significant landmarks although many have extensive and sensitive settings, these including the multiple Registered Parks and Gardens and the Scheduled Monuments. The prehistoric Scheduled Monuments occupy prominent hilltop locations, command significant landscape views and have a degree of intervisibility with other approximately contemporary sites. From the sea, a wider viewpoint of multiple heritage assets and their relationships would be appreciated, and views will incorporate both existing and proposed turbines. The distraction created by the rotating blades of the proposed wind turbine at Levalsa could be, or at least could become, detrimental to the appreciation and understanding of the setting of these monuments and of the wider landscape, especially within areas which could theoretically site a number of operational wind turbines in the future.

The majority of the remaining heritage assets considered consist of Listed Buildings within settlements, and although their settings are quite localised, many of these settlements have landscape views, and a degree of visual prominence within the surrounding agricultural landscape. The settings of some of these, such as those relating to sites within St Ewe, Gorran and Caerhays in particular, may be adversely affected to at least a minor degree by the visual distraction of the cumulative effects of multiple turbines within the landscape surrounding them.

It should be noted that assessments of setting refer to the heritage significance and surroundings of historic assets. Individuals' perceptions of setting, the associated aesthetics and appreciation and their perception of the impacts of one or multiple wind turbines will differ.

Wind farms, where multiple turbines are installed in close proximity, can have a visual coherency which, despite their size and quantity, may limit the negative impacts they might otherwise impose. The placement of individual wind turbines sporadically across the landscape, as may become the case around Levalsa, is unlikely to achieve any such coherency and therefore is likely to be potentially more distracting in relation to perceptions of the historic landscape or in the appreciation of the settings of individual heritage assets.

Such adverse visual impacts are, given the 25 year lifetime of any specific wind turbine, judged to be temporary in nature (though long-lived) and would be reversed on the dismantling of a turbine. Therefore, any unmitigated impacts associated with their construction and operation would not be permanent, but would impact on the settings of designated sites and in the ways in which these sites and this historic landscape would be perceived and appreciated for substantial periods. For those sites with local or limited settings having small-scale and/or limited numbers of turbines within the landscape surrounding them, impacts are likely to be minor in most cases. For those sites with

sensitive settings, where the construction of additional wind turbines is considered likely to result in a significant alteration to the historic character of the surrounding landscape, cumulative impacts may well be significantly greater, and assessment of them should form an important part of the planning process.

15 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.

15.1 Micro-relocation of the turbine and cabling

Mitigating any potential impacts on heritage assets might be possible through the relocation of the wind turbine in particular sub-surface archaeology, elements of which have been revealed through geophysical survey within the immediate area surrounding the proposed development at Levalsa. In addition to careful siting of the turbine base and cabling trench, consideration of the access route, and its construction, could prevent or avoid direct physical impacts from rutting or compression from heavy vehicles during construction and decommissioning. In relation to indirect (setting) impacts, given the topography, the substantial height of the turbine and the minimal nature of the surrounding vegetation screens, micro-relocation would seem unlikely to be able to result in any substantial diminution of impact (Figure 11). English Heritage may require the production of photomontages demonstrating that any submitted proposal could achieve an aim of minimising setting impacts.

15.2 Archaeological recording

In a case where the finalised site design would seem likely to result in unavoidable physical impacts on likely sub-surface features, a brief for work to mitigate these impacts would be prepared by Cornwall Council's Senior Development Officer (Archaeology), 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.

The Senior Development Officer (Historic Environment) may require further archaeological evaluation or recording to provide a level of information sufficient to determine the potential and scale of sub-surface impacts on archaeological features identified by the geophysics before a recommendation for the granting of planning permission could be made.

Subsequent archaeological recording works could include controlled soil stripping and a watching brief (control of and observation of mechanical ground reduction activities by an archaeologist) or excavation and recording prior to construction works. This could target areas where significant features had been identified through geophysical survey, or where the balance of probability suggests that sub-surface archaeology might survive. This approach provides for preservation by record of buried archaeological features or artefacts and reduces any impacts on the archaeology of the sites to minor with some benefits in the form of increased knowledge and awareness of the heritage assets.

It should be noted that the form of any mitigation applied to the site would be determined by the Senior Development Officer (Archaeology), who might require studies additional to those identified within this assessment in order to determine his recommendations.

16 Conclusion

Significant archaeological sites and heritage assets have been identified within a 15km radius of the proposed wind turbine. These include Scheduled Monuments, such as at St Stephen's Beacon, Resugga and Carvossa, for which the overall impacts have been rated as minor, due to their distance from the site and the reversible effects on their settings.

Impacts on Registered Parks and Gardens will vary from neutral to minor according to distance, intervisibility with the proposed site and extent and sensitivities of their settings. Impacts on the settings of at least the closest parks at Heligan and Caerhays are likely given the particular sensitivities of such deliberately designed landscapes. Upon the Listed Buildings, Conservation Areas and the World Heritage Site and especially those with more limited settings, the effects will be limited to minor visual and audible impacts. The exceptions will be the Scheduled Monuments at Lanhadron and South Polgooth Mine Complex where close proximity and very extensive landscape views to the proposed site will result in greater visual and setting impacts, these having been assessed as moderate in severity.

Although wind turbines within this area are currently few in number, the cumulative impact of the construction of this and future turbines will become increasingly negative as they erode the well-preserved historic character of the landscape within which they will be constructed. The viewshed mapping includes large areas out to sea with considerable views of the landscape that combine the World Heritage Site, Conservation Areas, Scheduled Monuments and Registered Parks and Gardens and their rural settings. The high volume of maritime leisure and economic pursuits in this area past and present mean that the potential negative impacts of one or more turbines appearing within this view should be an important consideration in determining planning applications for such developments.

Due to the topography and location of the heritage assets, the adoption of a micro-relocation mitigation strategy (as suggested above) is unlikely to achieve any positive change on the setting impacts which have been identified. In relation to direct impacts, the geophysical survey identified multiple linear, curvilinear and point anomalies forming an apparently coherent enclosure and associated features within the turbine base area and cable route; these are likely to represent evidence for significant prehistoric activity of potentially national importance. Further archaeological investigation into the existence and nature of the subsurface archaeology in the proposed turbine field and along the cable connection route would enhance our understanding of the archaeology of this site and the surrounding area and help to mitigate the at least moderately severe, direct impacts on archaeology which would otherwise result from the construction of the turbine at Levalsa.

The impacts of the wind turbine are all reversible, with the exception of those identified through the findings of the geophysical survey which may prove to be incapable of mitigation by micro-relocation, and there are considerable environmental benefits associated with this proposal. The high level of significance already placed on designated heritage assets with sensitive settings surrounding the proposed turbine site and the potential impacts on their settings should be taken into consideration when considering this and similar applications within this part of Cornwall.

17 References

17.1 Primary sources

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Martyn's 1748 Map of Cornwall

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Sharpe, A. 2013, *Levalsa Farm, St Ewe, proposed wind turbine: Written Scheme of Investigation for archaeological assessment*. Unpublished report for Historic Environment Projects, Cornwall Council

17.3 Websites

http://www.bgsgeologyviewer.ac.uk British Geological Survey

http://www.cornish-mining.org.uk Cornish World Heritage Site

http://www.english-heritage.org.uk/caring/listing/ English Heritage designation information

http://www.english-heritage.org.uk/publications English Heritage guidance

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

http://www.legislation.gov.uk Government documents, Acts and legislation

http://whc.unesco.org/ World Heritage Site information

18 Project archive

The CAU project number is **146340**

The project's documentary, photographic and drawn archive is housed at the offices of CAU, Cornwall Council, Fal Building, New County Hall, 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.I-L\Levalsa_Farm
3. English Heritage/ADS OASIS online reference: cornwall2-173265
4. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites L\Levalsa_Farm

Figure 3: The proposed turbine site at Levalsa Farm and its surroundings as shown on John Norden's 17th Century Map of Cornwall.

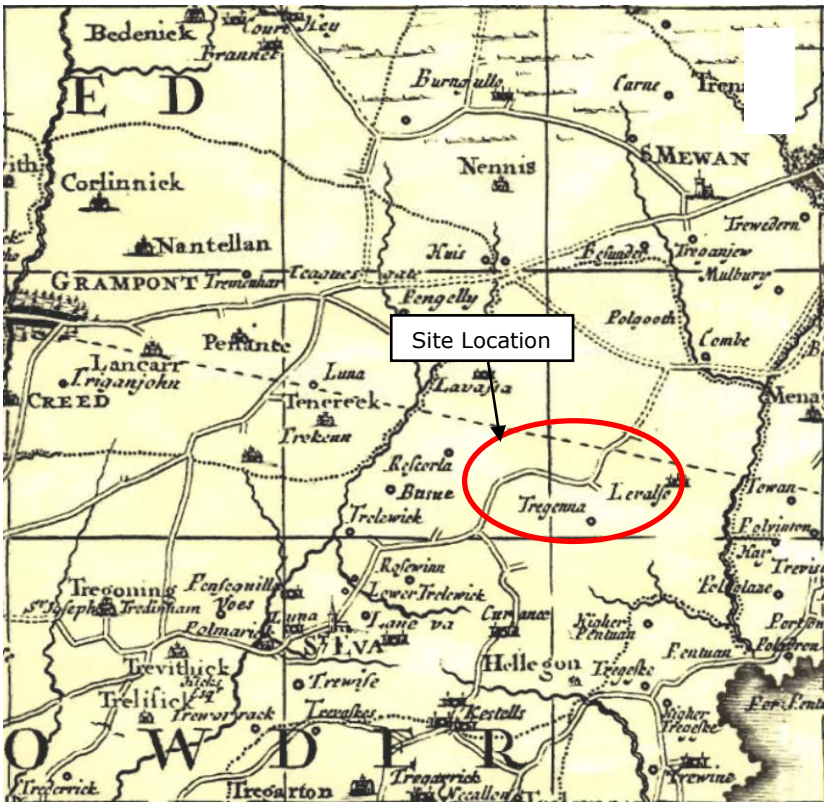

Figure 4: The proposed turbine site and Levalsa Farm and its surroundings as shown on Joel Gascoyne's 1699 Map of Cornwall.

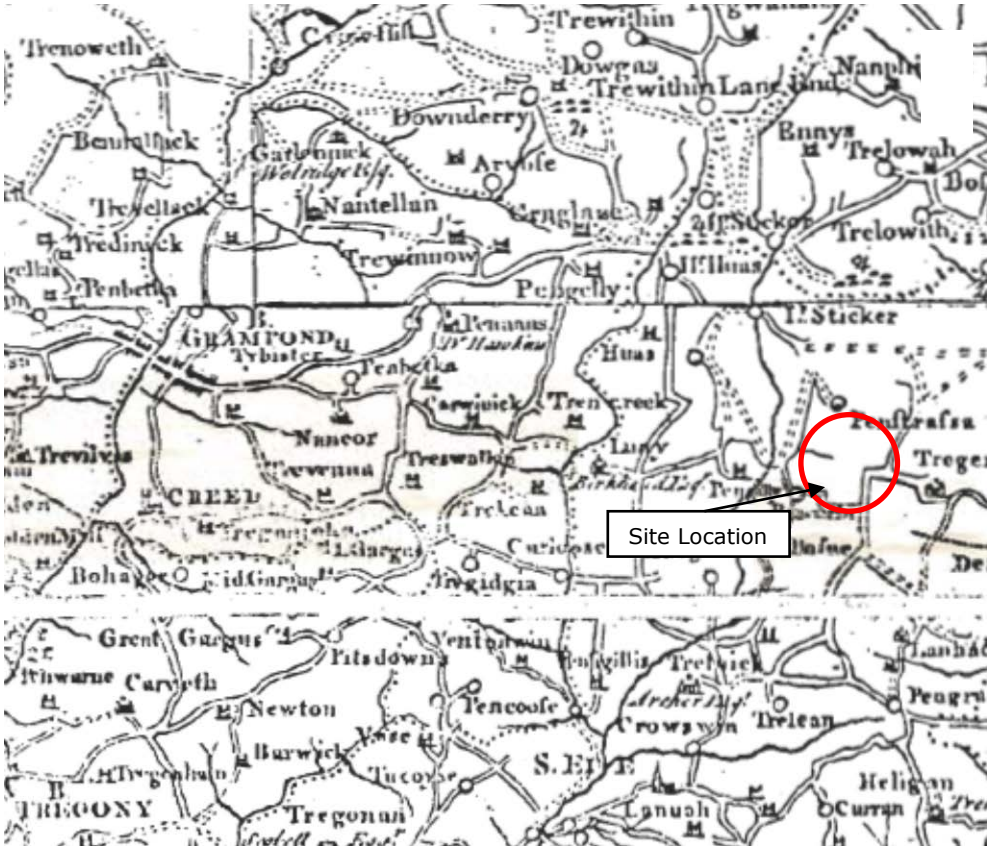

Figure 5: The proposed turbine site and its surroundings as depicted on Martyn's Map of Cornwall 1748.

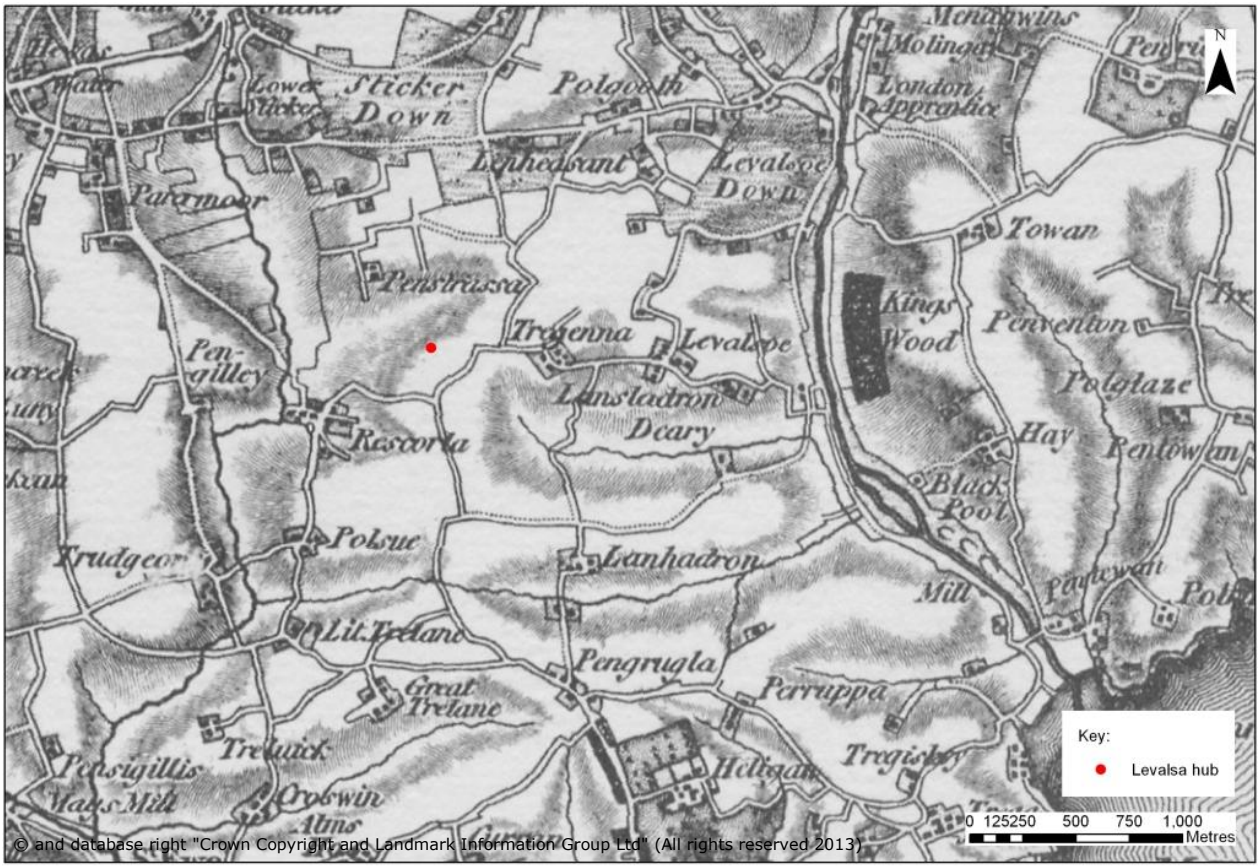

Figure 6: The proposed turbine site as depicted on the 1807 OS 1 inch Map.

Figure 7: The proposed wind turbine location superimposed on the c1839 Tithe Map for the parish of St Ewe.

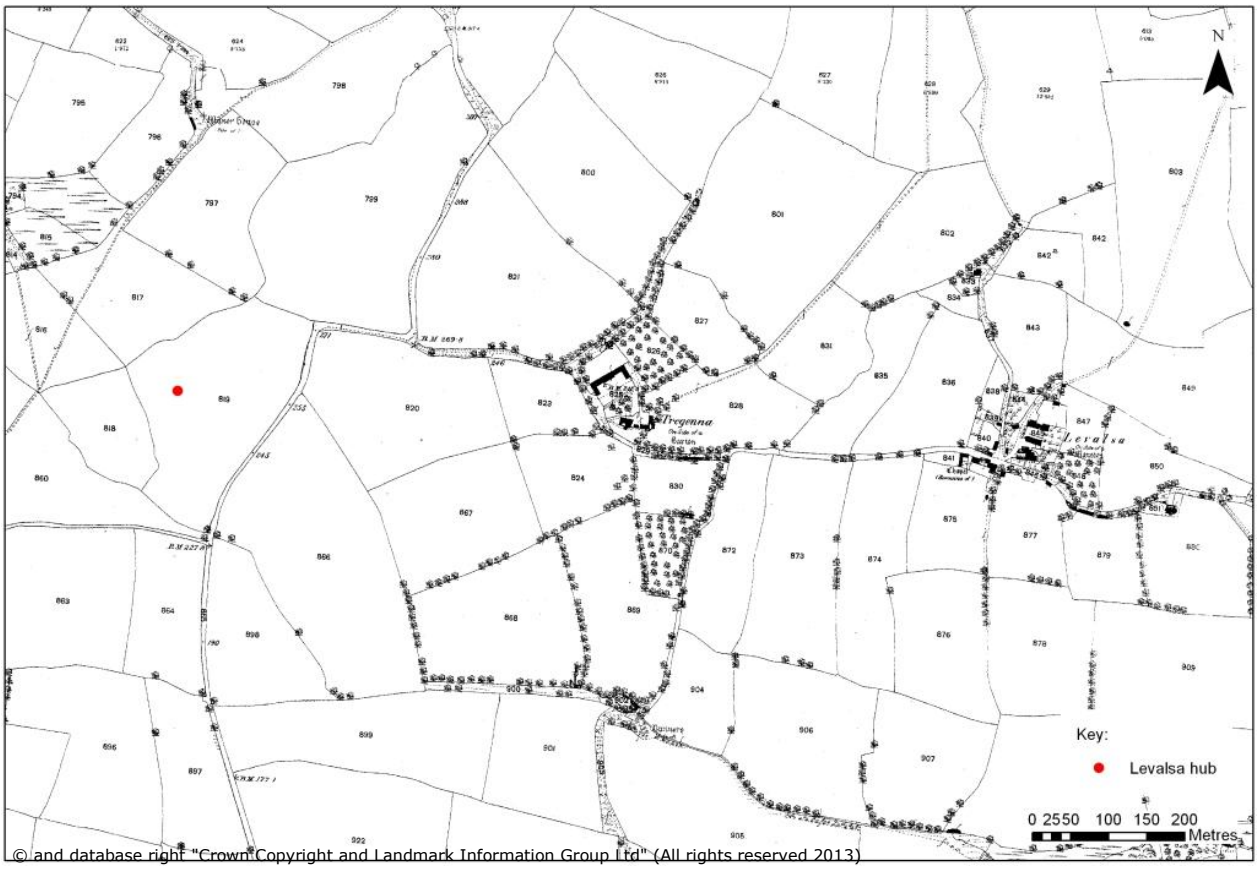

Figure 8: The proposed turbine site superimposed on the OS c1875 25" map.

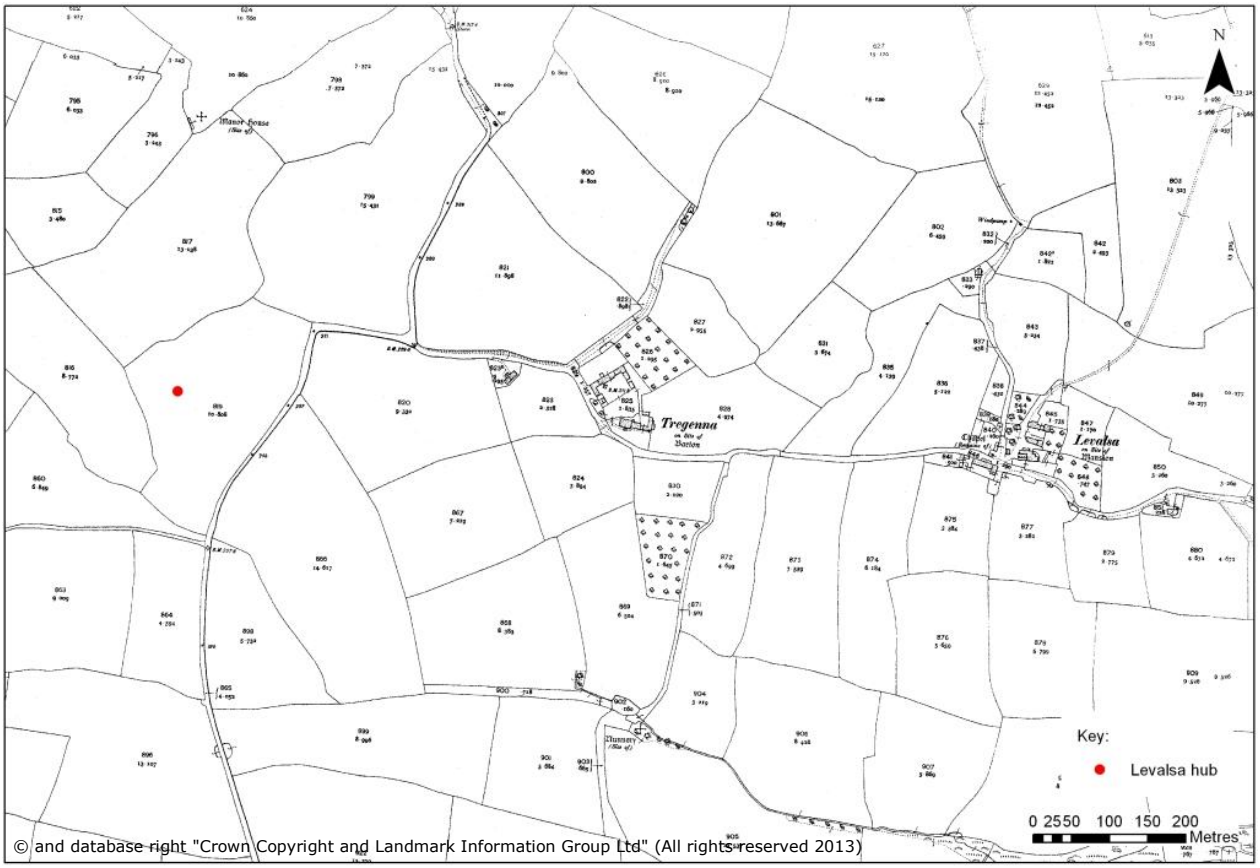

Figure 9: The proposed turbine site located over the OS c1908 25" map.

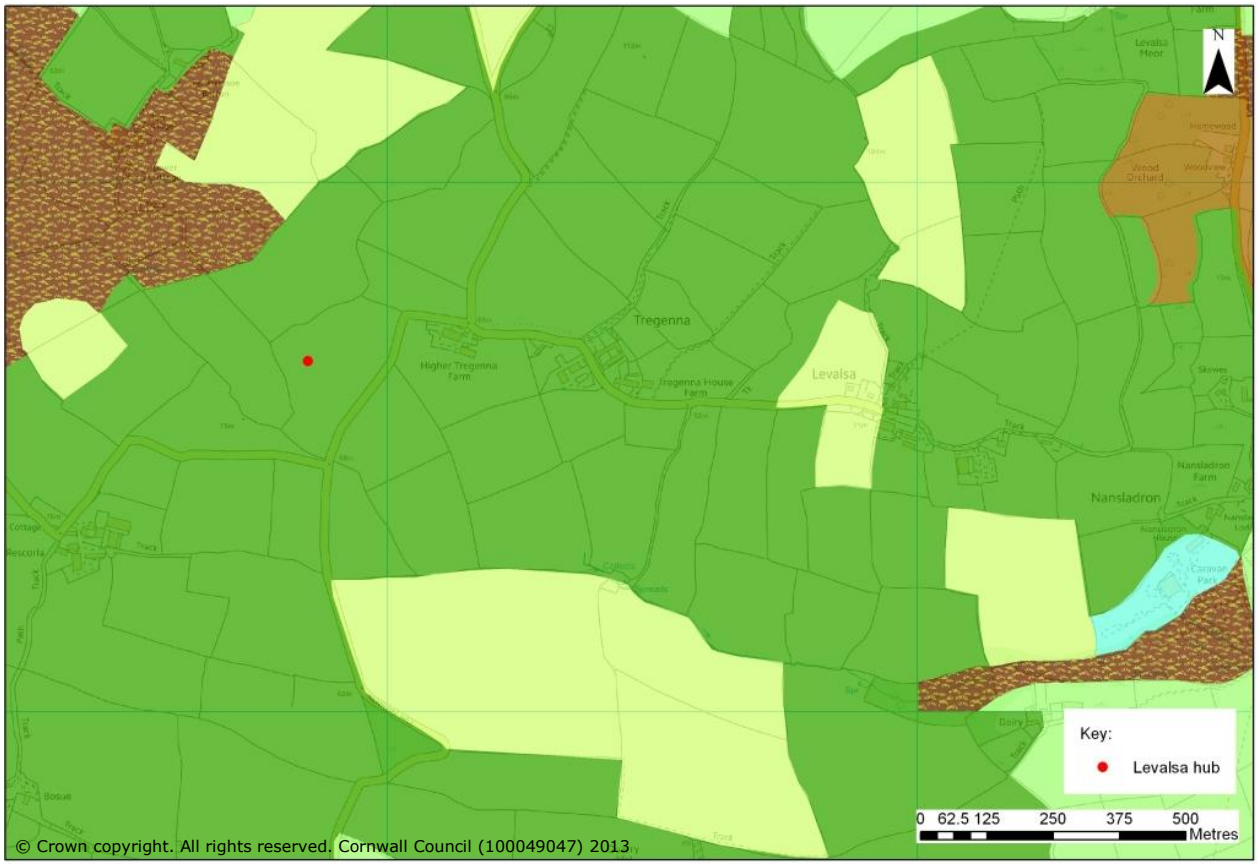

Figure 10: Historic Landscape Characterisation of the area surrounding the proposed turbine site. The dark green represents the Medieval farmland and the light green the Post Medieval farmland.

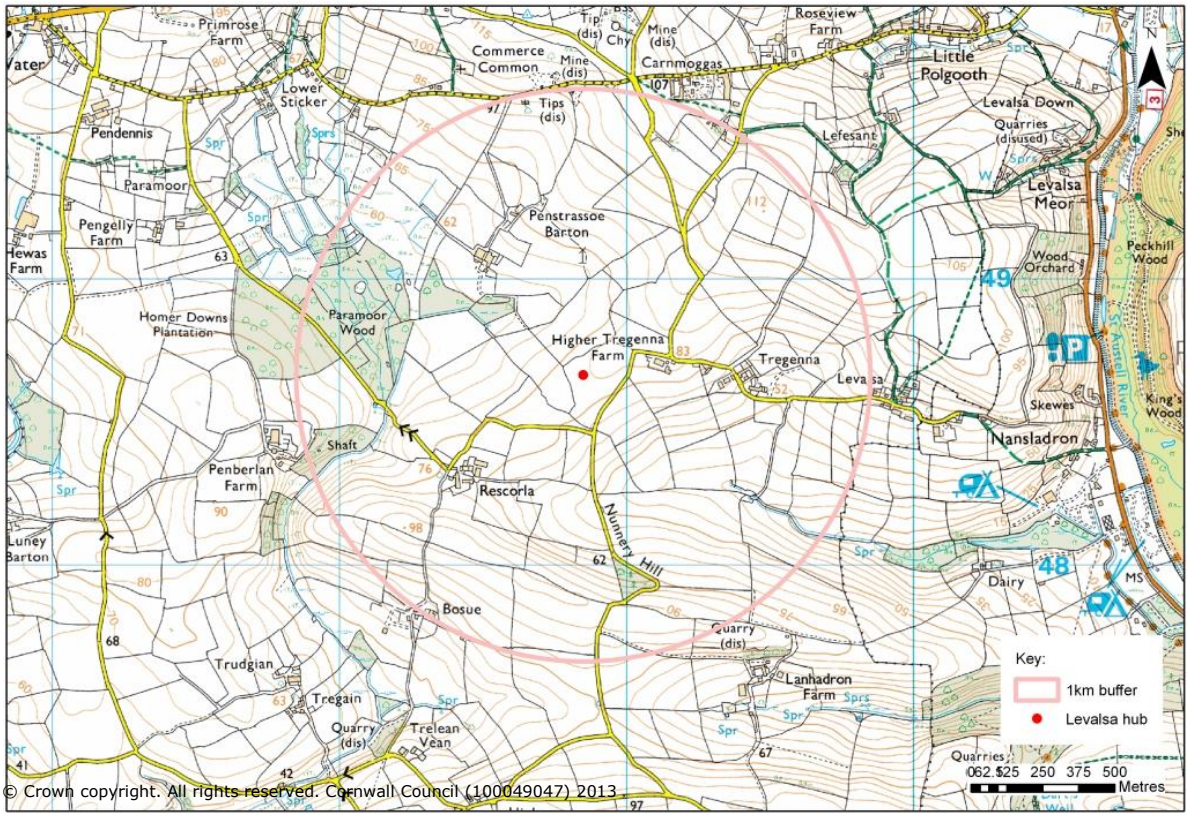

Figure 11: Contour map of the area surrounding the proposed site, note the ridges and steep slopes.

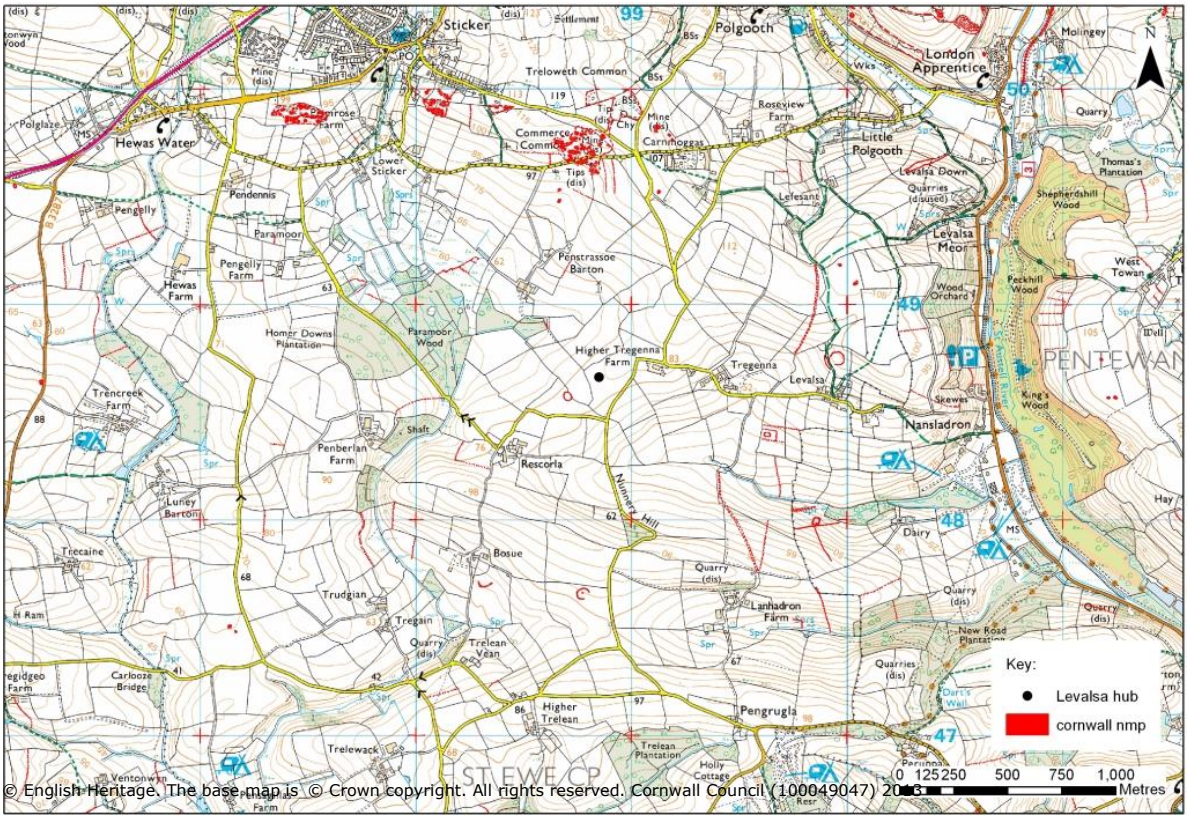

Figure 12: NMP data for the proposed site and surrounding area. Note the scatter of prehistoric enclosures within the vicinity of the proposed site and the density of mining remains around Sticker.

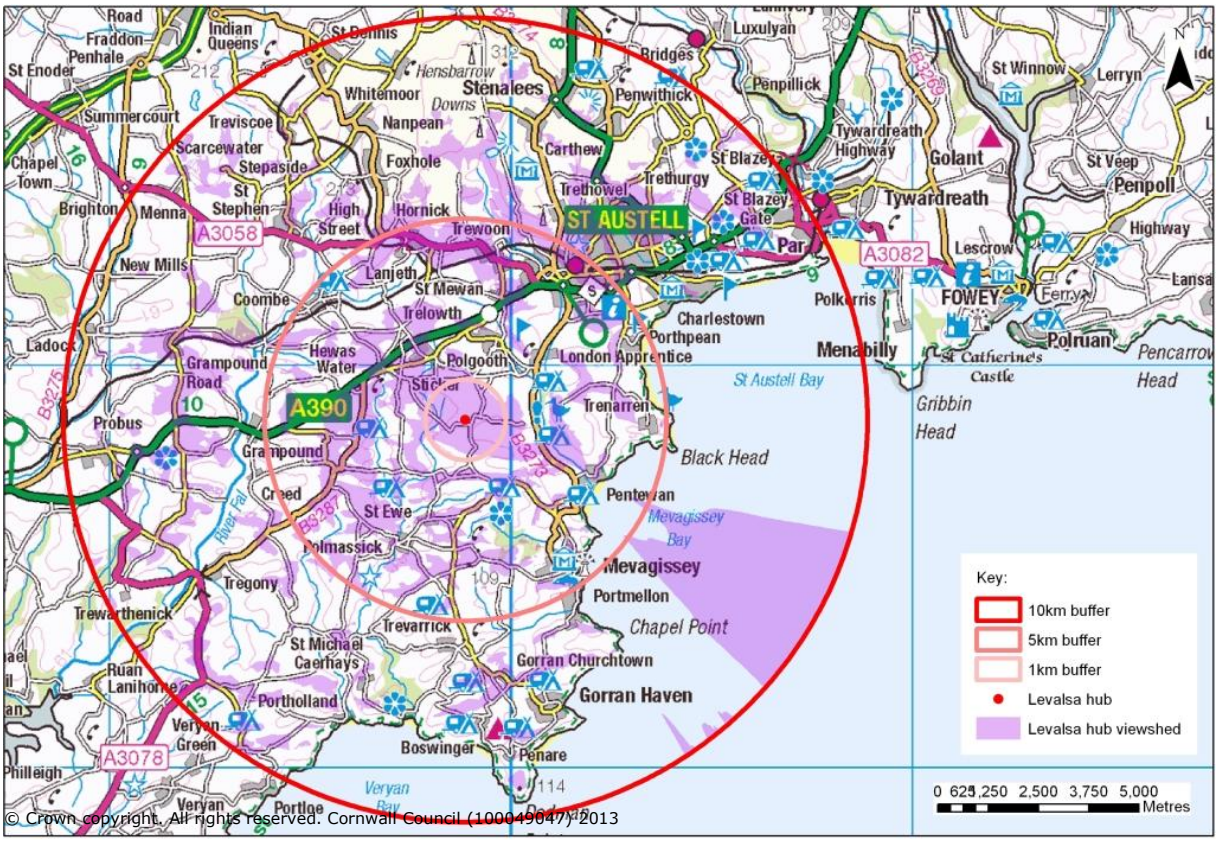

Figure 13: Viewshed for the turbine hub.

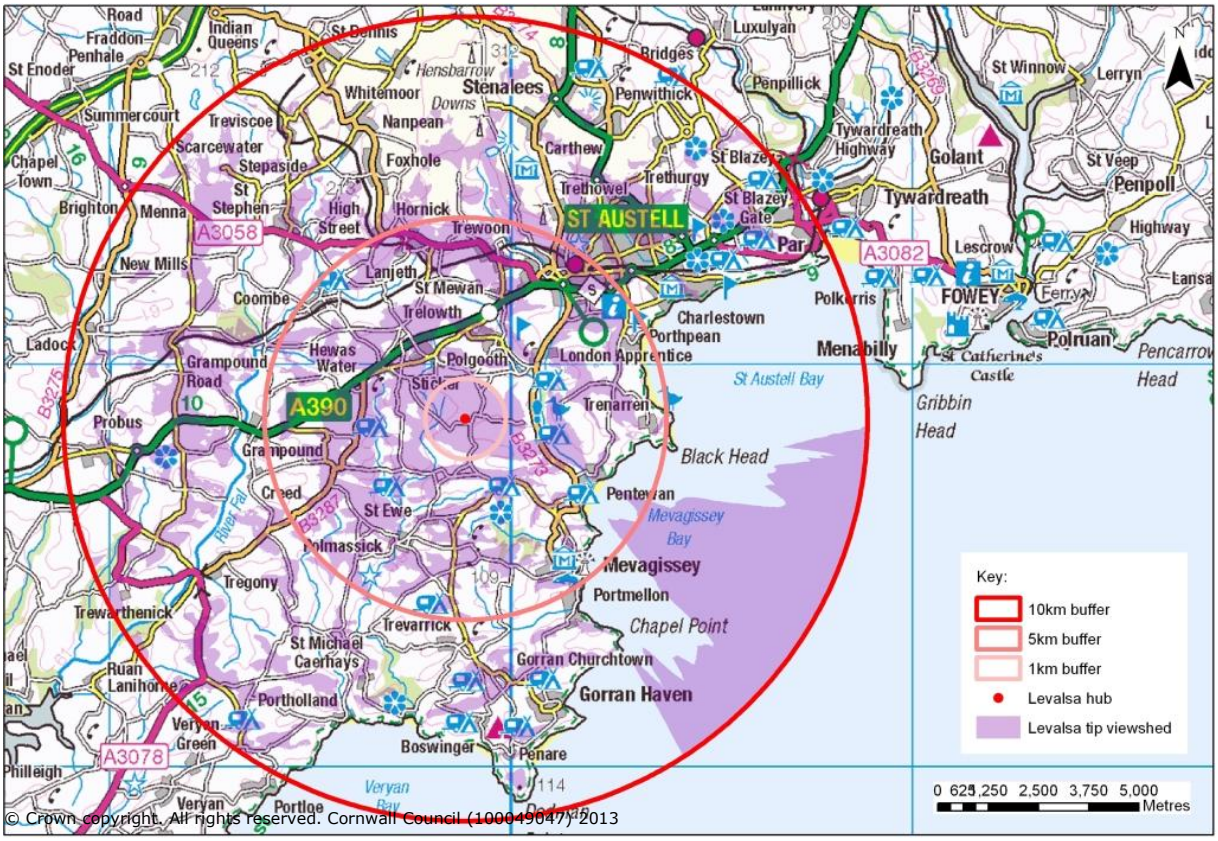

Figure 14: Viewshed for the turbine tip.

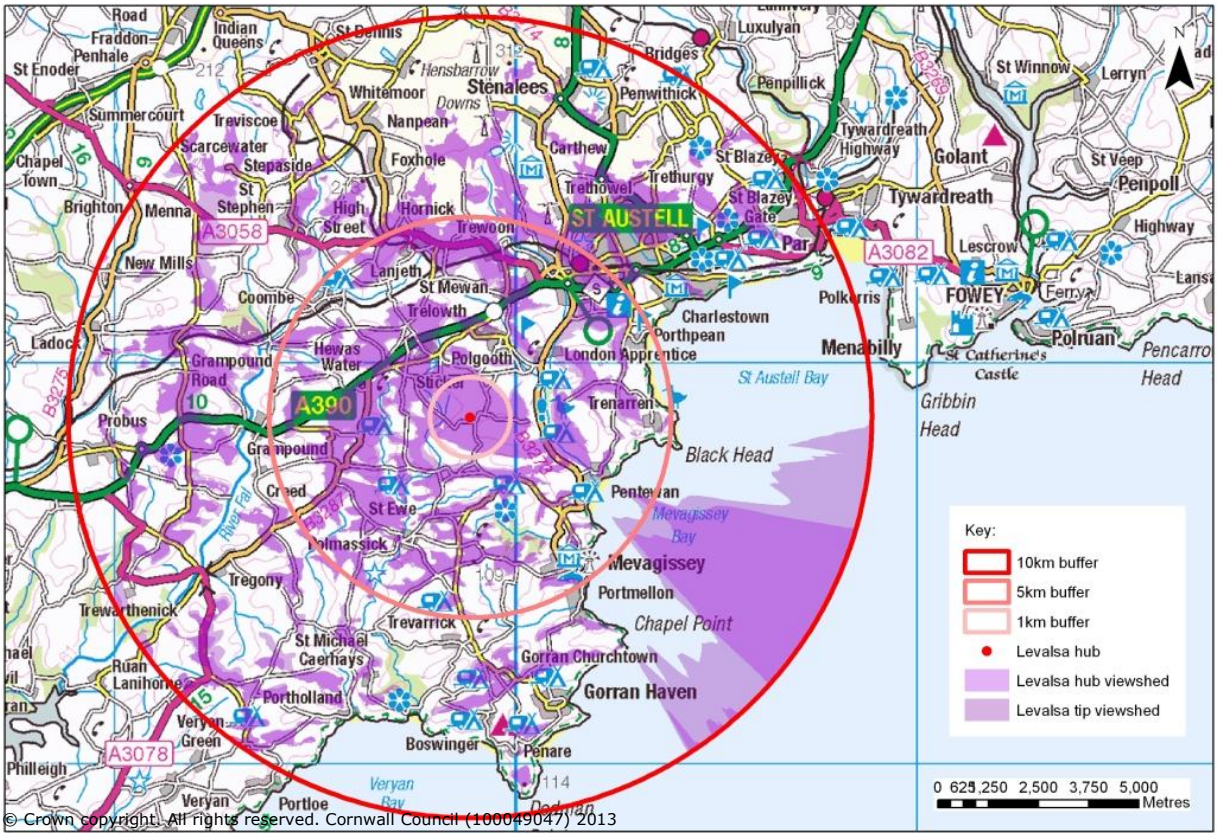

Figure 15: Combined hub and tip viewshed from the proposed turbine.

Figure 16: Map showing the radial zones within which each category of heritage asset has been considered.

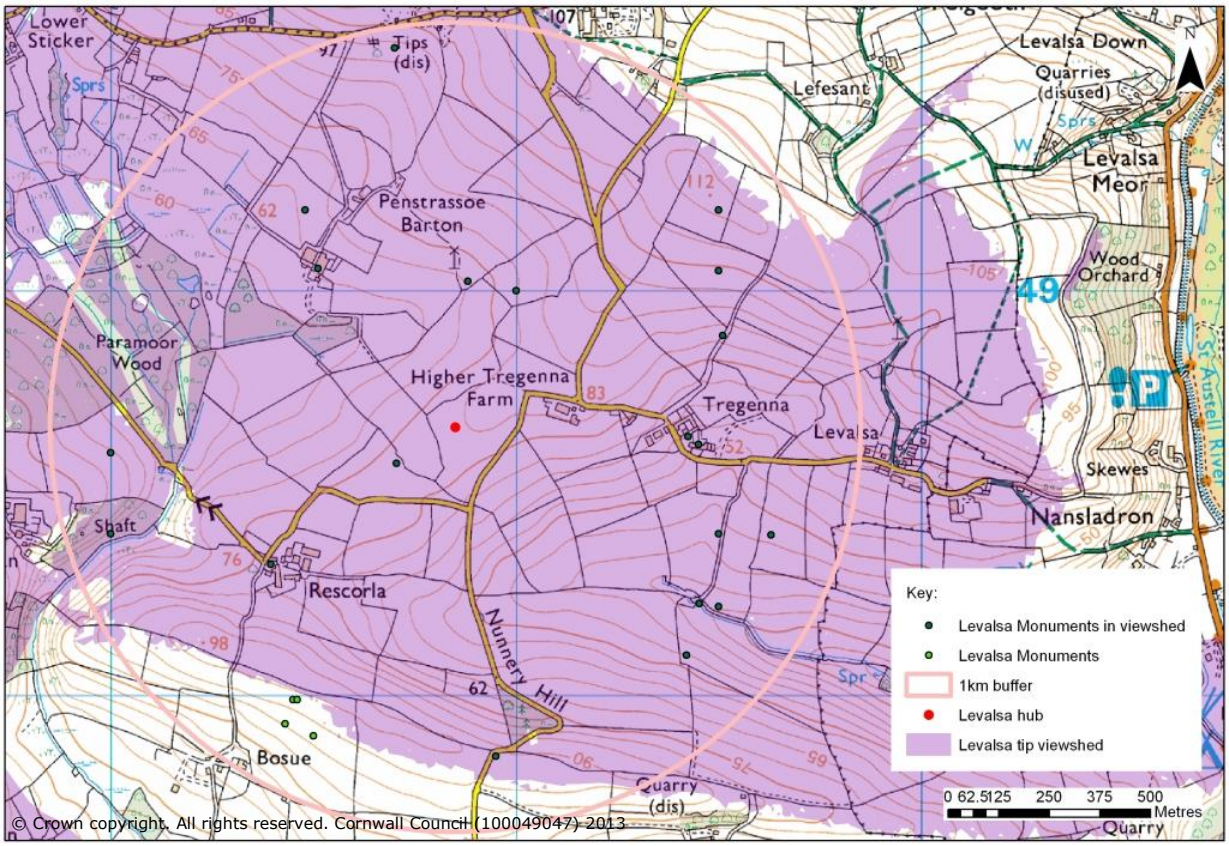

Figure 17: The 1km radius around the proposed site showing undesignated assets within the viewshed.

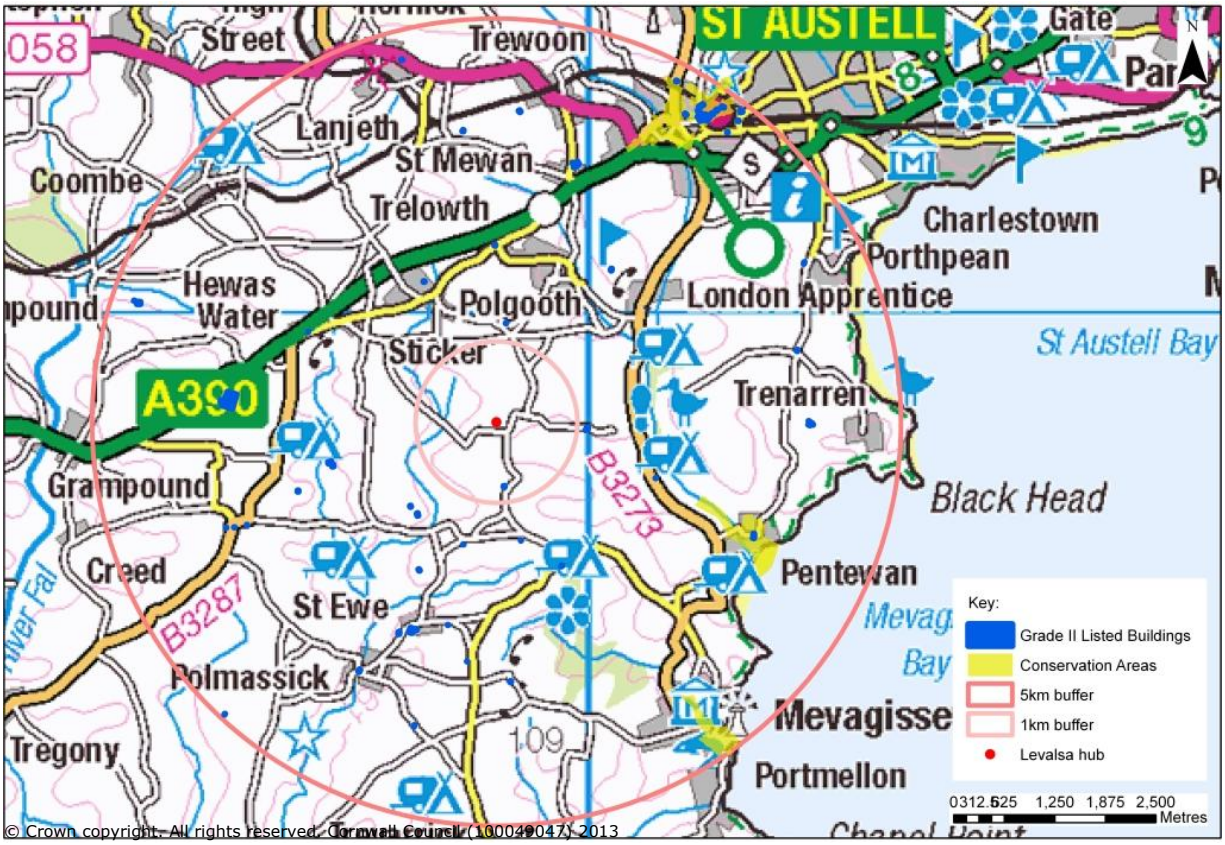

Figure 18: Map illustrating the Grade II Listed Buildings and Conservation areas within a 5km radius from the proposed turbine site.

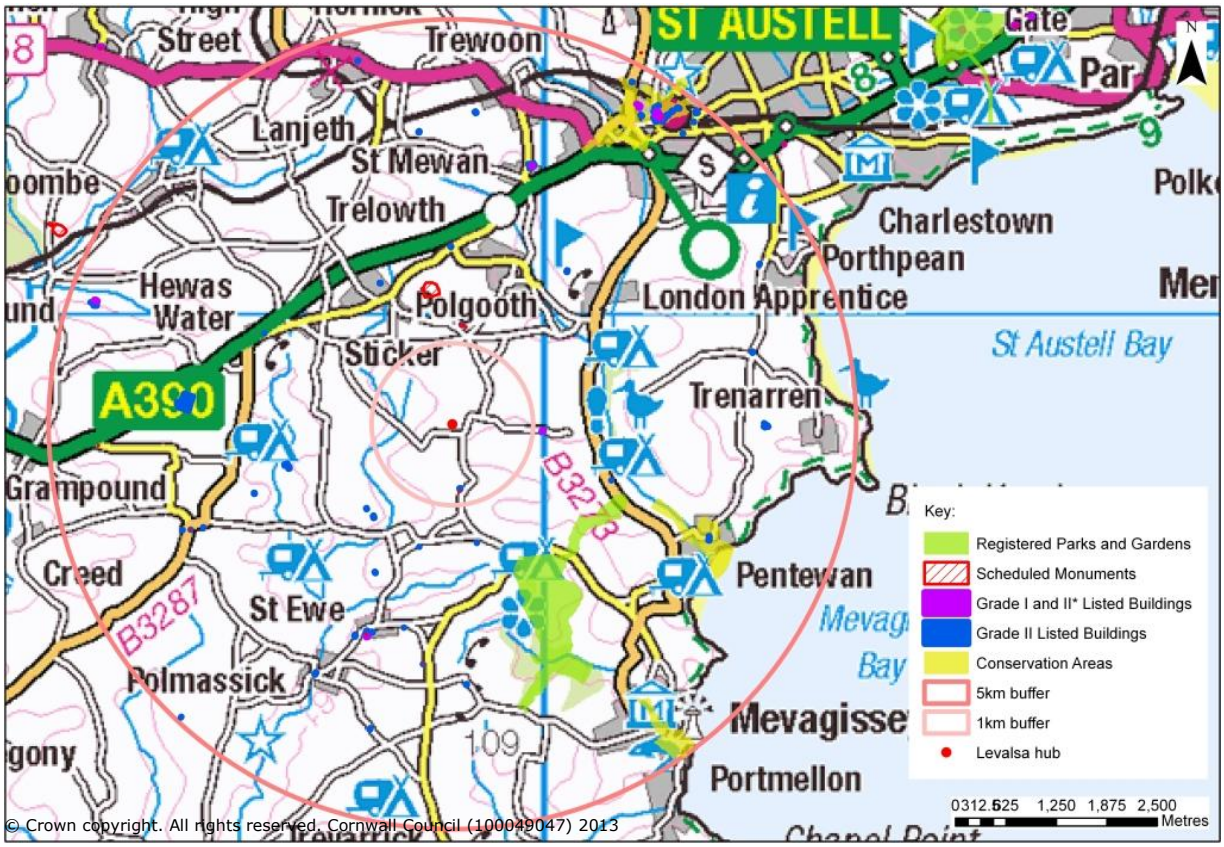

Figure 19: The 5km radius showing all designated assets within the viewshed.

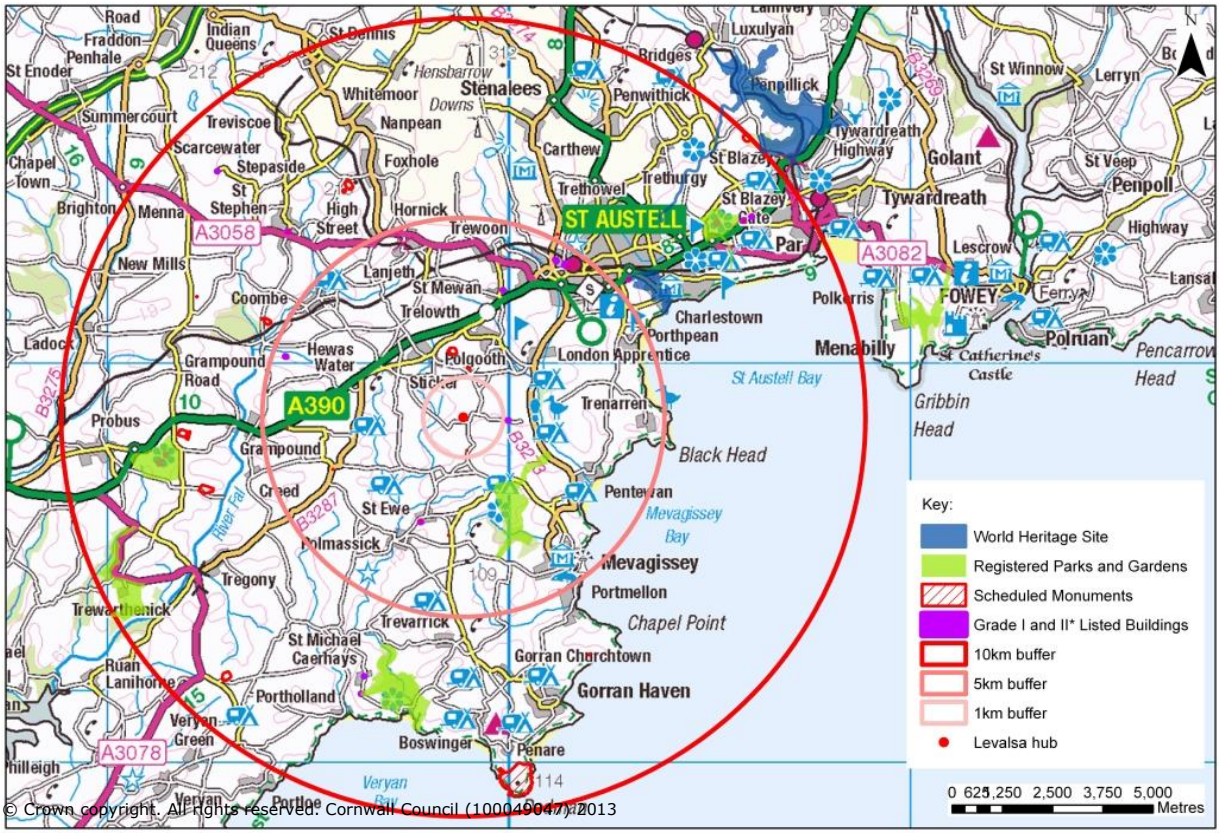

Figure 20: The 10km radius showing the Grade I and II Listed Buildings, Scheduled Monuments and Registered Parks and Gardens within the viewshed.*

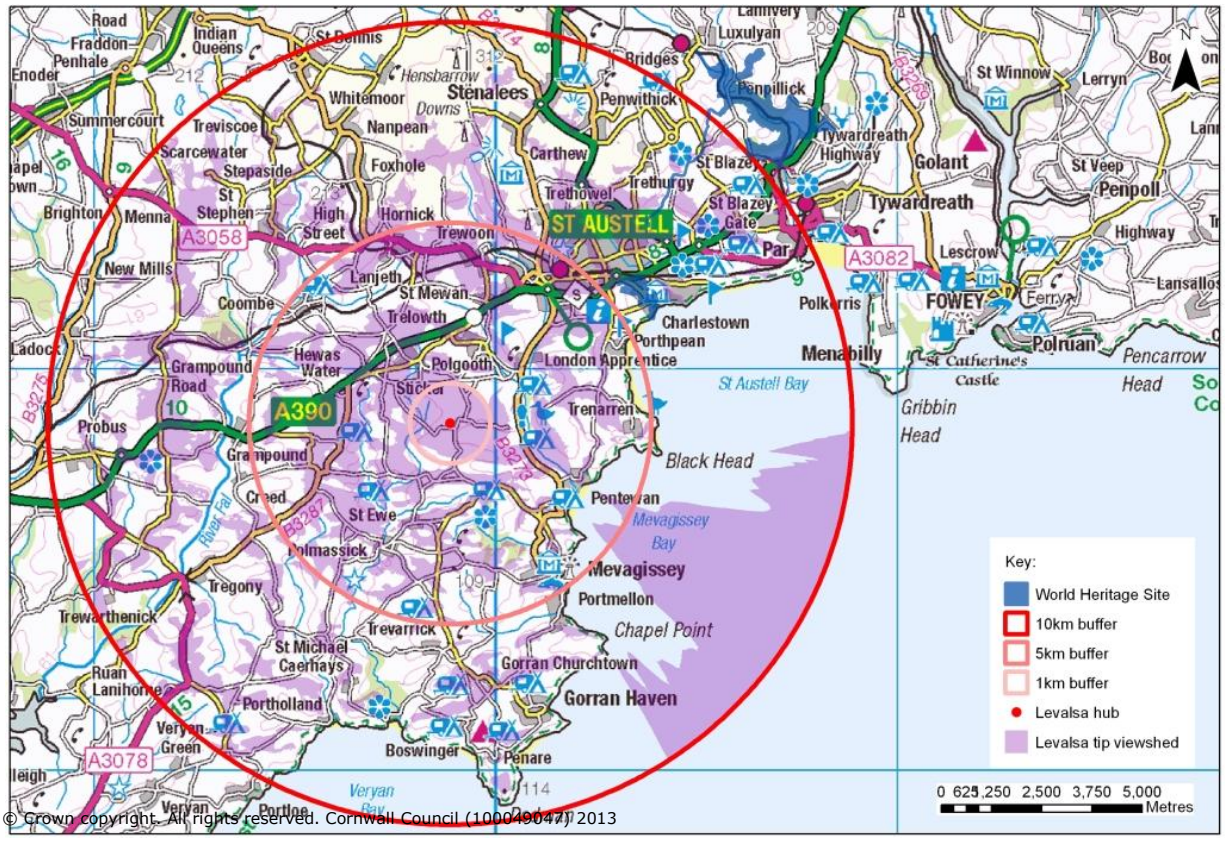

Figure 21: The 10km radius indicating the proximity of the Charlestown Area of the Cornish Mining World Heritage Site to the proposed turbine site.

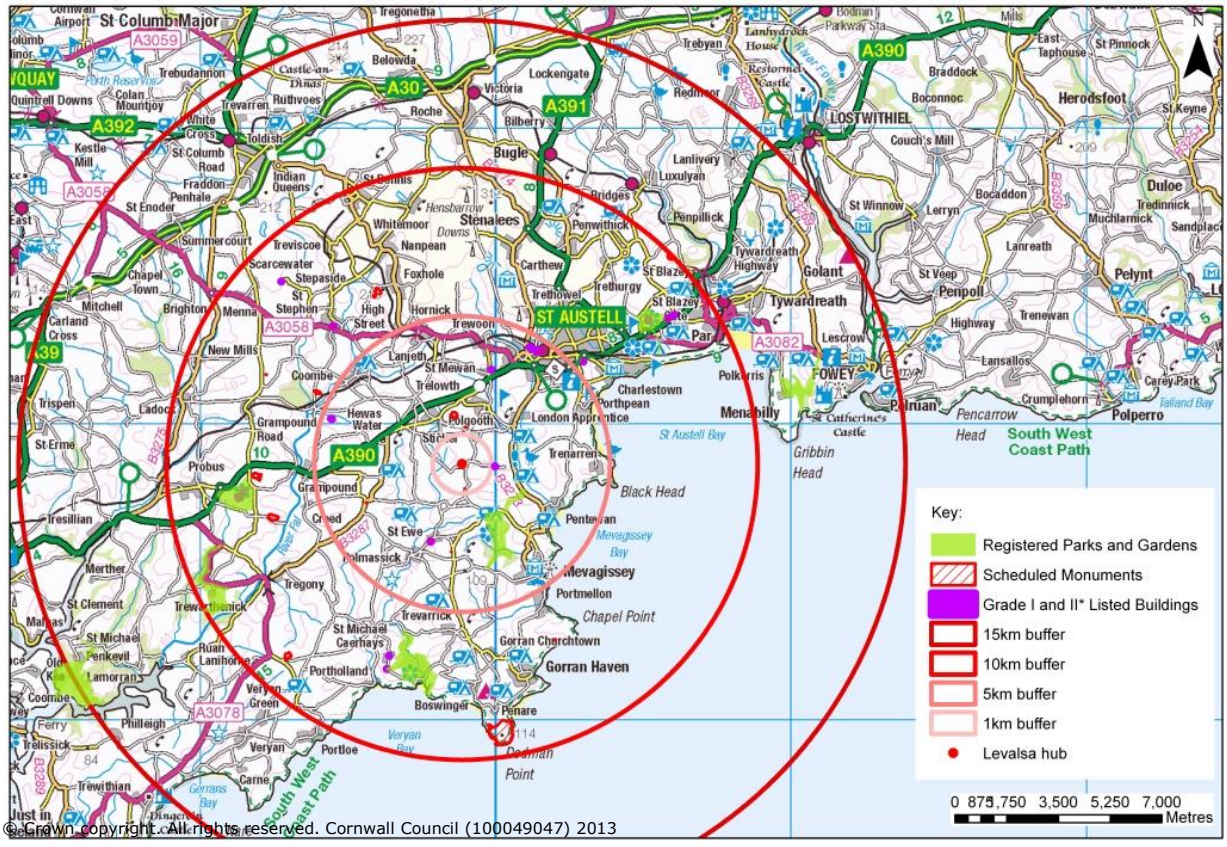

Figure 22: The Registered Parks and Gardens, Scheduled Monuments and Grade I and II Listed Buildings within a 15km radius of the proposed turbine site.*

Figure 23: The proposed wind turbine field looking west.

Figure 24: The view northwest from the proposed turbine field towards Penstrassoe Barton farm in the middle ground and the Scheduled mining remains south of the village of Sticker; both elements that characterise the area.

Figure 25: The view west towards the proposed turbine site from a location adjacent to the Grade II Listed Levalsa Farmhouse, including Tregenna Farmhouse in the background.*

Figure 26: The extensive landscape view from the Scheduled Lanhadron Medieval Cross, the proposed turbine field being clearly intervisible in the centre of the image.

Figure 27: The view east from adjacent to the sites of Trewithen Garden, Golden Camp and Carvossa prehistoric hillfort. The proposed wind turbine would be on the far horizon.

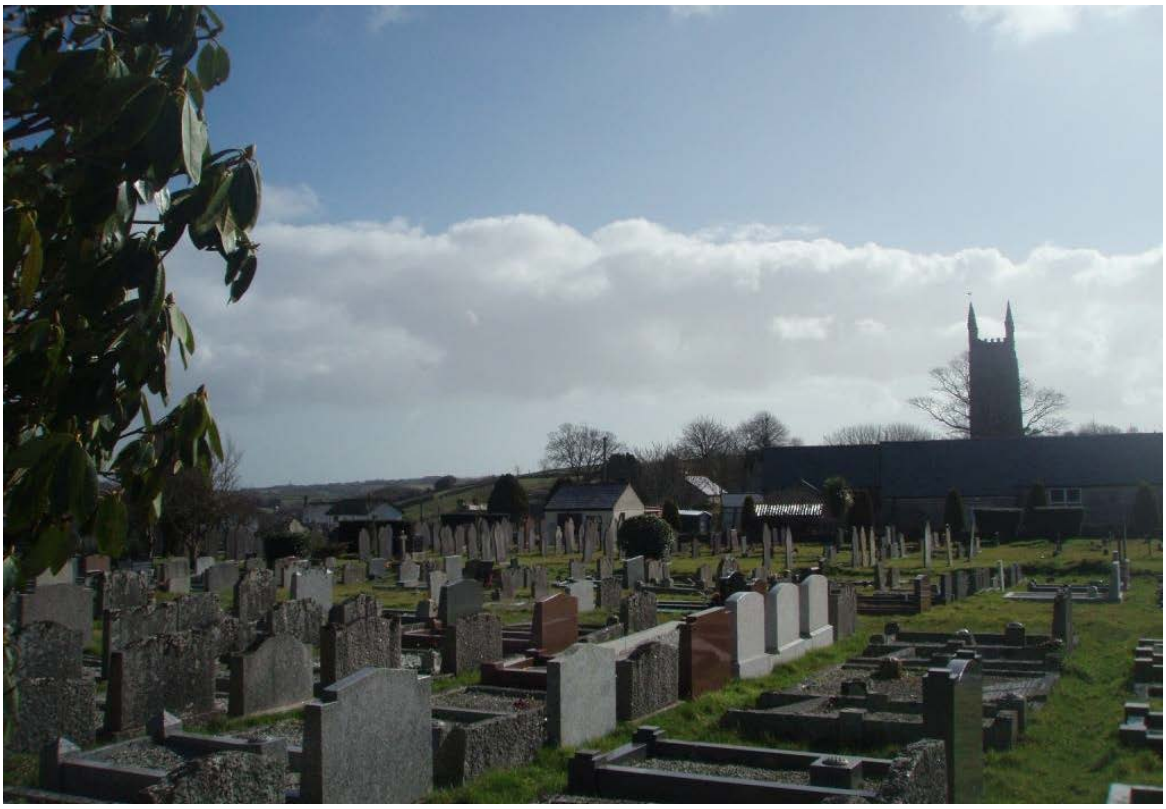

Figure 28: The view southeast incorporating the village, churchyard and Church of St Stephen. The proposed turbine may be visible left of centre in this image.

Figure 29: The view west from behind Holy Trinity Church, incorporating the Listed Red Bank on the right of the image. Note the built up nature and closed views of St Austell town centre.

Figure 30: The centre of Charlestown where key views are south out to sea rather than west towards the proposed turbine site.

Figure 31: Looking south towards the proposed turbine site from close to the Scheduled South Polgooth Mine complex. Note the open nature of the landscape and the lack of potential vegetation screening.

Figure 32: The Scheduled engine house at South Polgooth Mine. This view to the northeast also includes the infrastructure of the modern china clay extraction industry. Note the prominence of the chimney within this landscape. See also Fig 24.

Figure 33: The view north from the Dodman Point towards the china clay spoil heaps inland. The proposed turbine would be right of centre in this view.

Figure 34: The geophysical survey plot of the raw data.

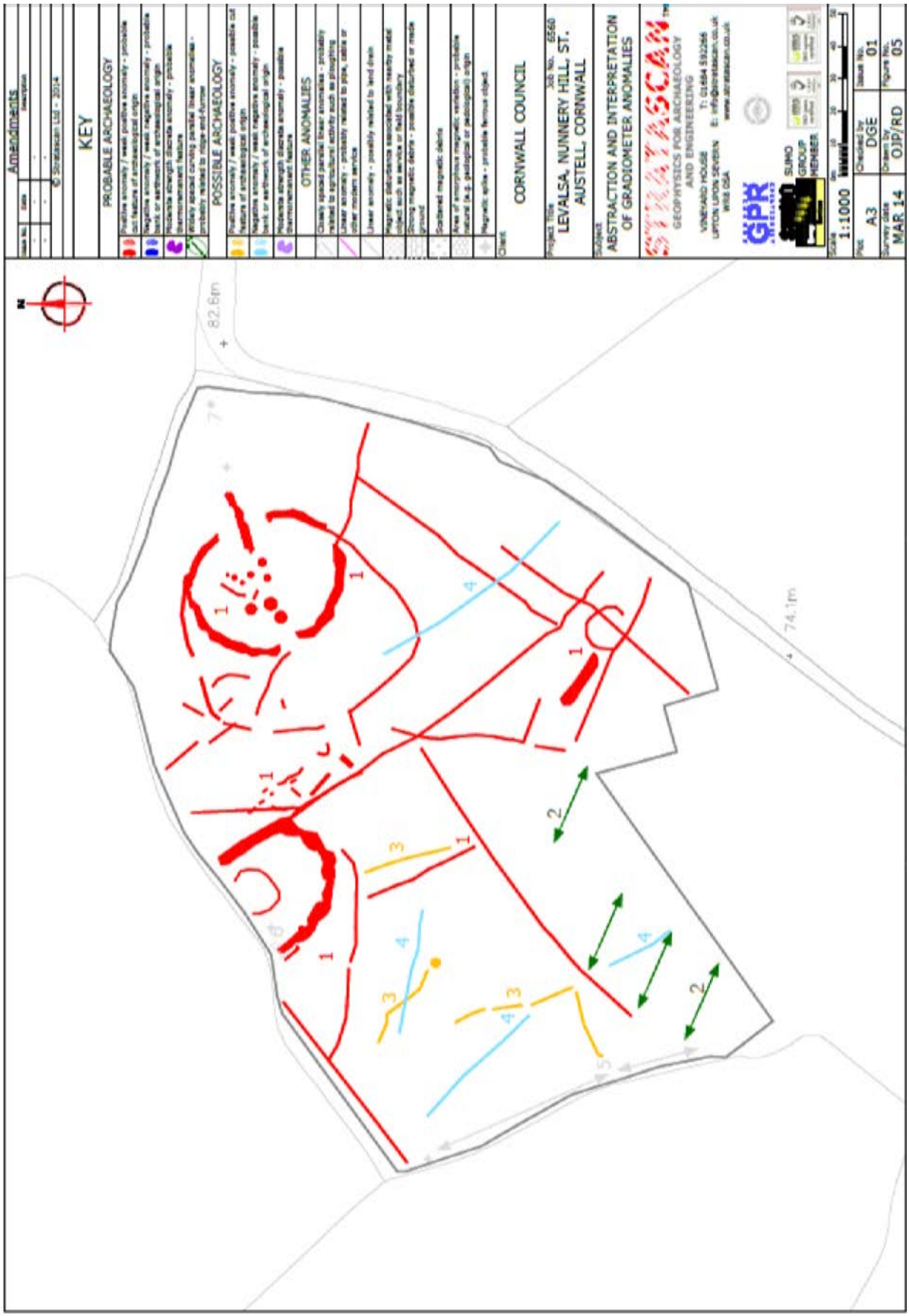

Figure 35: The interpretation of the geophysical survey results derived from the raw data plot shown above. Note the two apparently-well preserved enclosures, the isolated round house and the density of apparently related features.

9.0 ARCHAEOLOGY AND THE HISTORIC ENVIRONMENT ASSESSMENT

Introduction

9.1 Cornwall Archaeological Unit (formerly Historic Environment Projects, Cornwall Council) was commissioned to provide an assessment of the potential impacts of a proposed development for a single wind turbine on land at Levalsa in respect of archaeology and the historic environment. The assessment considers designated and undesignated heritage assets within a 15km radius of the application site together with sub-surface archaeology within the application area.

9.2 This statement provides a baseline description of heritage assets and assesses the potential impacts of the proposed development during construction and operation. Cumulative impacts of the proposed development are assessed together with mitigation measures to reduce the magnitude of any adverse direct and indirect impacts on heritage assets.

9.3 Direct impacts are considered to constitute physical damage or removal of the asset. Indirect impacts are those that affect its setting (the area within which the asset is experienced or within which it influences the character of its surrounding landscape) including the visual, audible or contextual appreciation of the asset.

Planning Policy Context

9.4 The section provides an overview of the statutory and non-statutory planning legislation and policies relevant to the archaeology and historic environment.

National Planning Policy Framework

9.5 Paragraph 128 of the NPPF states that; '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.'

9.6 Paragraph 129 of the NPPF states that; '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.'

9.7 Paragraph 132 of the NPPF states that; '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.'

9.8 Paragraph 133 of the NPPF states that; '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.'

9.9 Paragraph 134 of the NPPF states that; '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.'

9.10 Paragraph 135 of the NPPF states that; '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.'

9.11 Paragraph 139 of the NPPF states that; '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.'

Planning Practice Guidance – Covering the Historic Environment (March 2014)

9.12 Relevant guidance in Policy Practice Guidance (PPG) considered relevant to the proposed development is provided as follows:-

In Section 3, paragraph 2, of the PPG Decision Taking – Historic Environment it asks the question:-

- Why is 'significance' important in decision-taking?

9.13 Heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset, and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals.

In section 3, paragraph 6, of the PPG it asks the question:-

- What is the setting of a heritage asset and how should it be taken into account?

9.14 A thorough assessment of the impact on setting needs to take into account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

9.15 Setting is the surroundings in which an asset is experienced, and may therefore be more extensive than its curtilage. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not.

9.16 The extent and importance of setting is often expressed by reference to visual considerations. Although views of or from an asset will play an important part, the way in which we experience an asset in its setting is also influenced by other environmental factors such as noise, dust and vibration from other land uses in the vicinity, and by our understanding of the historic relationship between places. For example, buildings that are in close proximity but are not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each.

9.17 The contribution that setting makes to the significance of the heritage asset does not depend on there being public rights or an ability to access or experience that setting. This will vary over time and according to circumstance.

9.18 When assessing any application for development which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative change. They may also need to consider the fact that developments which materially detract from the asset's significance may also damage its economic viability now, or in the future, thereby threatening its ongoing conservation. In section 3, paragraph 12, of the PPG it asks the question:-

- How can proposals avoid or minimise harm to the significance of a heritage asset?

9.19 A clear understanding of the significance of a heritage asset and its setting is necessary to develop proposals which avoid or minimise harm. Early appraisals, a conservation plan or targeted specialist investigation can help to identify constraints and opportunities arising from the asset at an early stage. Such studies can reveal alternative development options, for example more sensitive designs or different orientations, that will deliver public benefits in a more sustainable and appropriate way.

Hedgerow Regulations

9.20 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.

9.21 Cornwall Council Historic Environment Planning Advice Officer's further advice dated late May 2013 states the current guidance for medium-sized wind turbines (61- 99m) is:-

- All proposals will require an archaeological assessment. Those in 'Anciently Enclosed Land' with HER sites within 500m will also require a geophysical survey.

- An assessment of the settings of designated heritage assets will be required when Scheduled Monuments, Listed Buildings, Conservation Areas, the World Heritage Site, Registered Battlefields or Registered Parks and Gardens lie within 10km (for wind turbines measuring 60m to tip) or 15km (for turbines measuring 100m to tip).

Designations and Their Significance

World Heritage Site

These sites are designated and defined by UNESCO (UNESCO website)

9.22 The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation

of cultural and natural heritage around the world considered to be of outstanding value to humanity. This is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972.

9.23 Sites inscribed on the World Heritage List benefit from the elaboration and implementation of a comprehensive management plan that sets out adequate preservation measures and monitoring mechanisms. In support of these, experts offer technical training to the local site management team.

9.24 The inscription of a site on the World Heritage List brings an increase in public awareness of the site and of its outstanding values, thus also potentially increasing tourist activities at the site. When these are well planned for and organized respecting sustainable tourism principles, they can bring important funds to the site and to the local economy.

Scheduled Monuments

9.25 Scheduled Monuments have Statutory Protection under the Ancient Monuments and Archaeological Areas Act 1979. These are sites that have been identified by English Heritage, the Government's archaeological advisory body, as being of national importance, and are included in the County Lists maintained by the Secretary of State for Culture, Media and Sport. A schedule has been kept since 1882 of monuments whose preservation is given priority over other land uses. The current legislation, the Ancient Monuments and Archaeological Areas Act 1979, supports a formal system of Scheduled Monument Consent for any work to a designated monument (English Heritage Website).

Registered Parks and Gardens

9.26 Registered Parks and Gardens are described and defined by English Heritage (English Heritage Website). The English Heritage 'Register of Historic Parks and Gardens of special historic interest in England', established in 1983, currently identifies over 1,600 sites assessed to be of national importance The emphasis of the Register is … on 'designed' landscapes; … gardens, grounds and other planned open spaces, such as town squares … rather than on planting or botanical importance.

9.27 Historic parks and gardens are a fragile and finite resource: they can easily be damaged beyond repair or lost forever … The main purpose of this Register is to celebrate designed landscapes of note, and encourage appropriate protection. It is hoped that, by drawing attention to sites in this way, English Heritage will increase awareness of their value and encourage those who own them, or who otherwise have a role in their protection and their future, to treat these special places with due care.

9.28 Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.

Listed Buildings

9.29 Sites are Listed to mark their special architectural and historical interest; they are protected by law, and Listed Building Consent must be granted for any alterations to a designated building. Some sites, such as the Church of All Saints, have been given Grade I status which means they are considered 'of exceptional interest…and sometimes considered to be internationally important' whilst other sites, including Levalsa Farmhouse, are Grade II* Listed, which means they are considered 'particularly important...of more than special interest.' The remaining sites are designated as Grade II listed and are therefore considered 'nationally important and of special interest' (English Heritage Website).

Conservation Areas

9.30 Conservation areas are designated for their special architectural and historic interest. They are designated by the local planning authority and comply with national standards. Designations of Conservation Areas were first made in 1967 and typically include town or city centres, fishing and mining villages, historic estates, housing and transport links (English Heritage Website).

Regional and Local Significance

9.31 These remains are considered of regional significance because of their rarity, setting and upstanding evidence but are otherwise undesignated assets.

Consultation

9.32 To inform the Environmental Statement a pre-application consultation process has been undertaken. This included:-

- Pre application screening in spring 2014 determined that this application is not considered an EIA development within the meaning of the EIA regulations.

- An archaeological assessment was undertaken by Historic Environment Projects, Cornwall Council in February 2014 of the proposed development site and surrounding area (Appendix 1). The impacts identified from the results of the assessment are described below.

- A geophysical survey of the development area was undertaken by Stratascan Ltd. in April 2014. The results are included in the Archaeological Assessment (Appendix 1) and the impacts identified from the results are discussed below.

- Further consultation with other specialists contributing to the Planning Statement was undertaken on a formal and informal basis.

Methodology

9.33 A detailed methodology for the Archaeological Assessment and Geophysical Survey can be found in Appendix 9.1. In summary the Assessment included:-

- Desk-based assessment – a consultation of historical databases, published sources, archives, maps and databases to obtain information about the history of the site, its surroundings and any features or structures of historical or archaeological interest within the assessment area boundaries.

- The historical and landscape context of the site were also considered during the desk-based stage in order to establish the nature of the heritage assets, the Historic Landscape Character of the area and the nature of any existing or planned power generation infrastructure within the landscape in which the development is proposed.

- Viewshed analysis – Using ArcGIS software and a Digital Terrain Model, a surface model of potential intervisibility between the proposed wind turbine and key heritage assets within the surrounding landscape was created. This provided the baseline 3D mapping from which setting impacts which might result from the construction of the proposed wind turbine could be quantified. Viewsheds or Zones of Theoretical Visibility were generated for an 'observer point' based on the location of the proposed wind turbine (Figure 9.1).

- Heritage assets were identified using intersections between this digital model and Historic Environment Record GIS layers; these were filtered to produce data sub-sets based on likely sensitivity, setting, intervisibility between heritage assets and the proposed turbine and other factors. This filtered group of sites was assessed to determine the nature and extent of any potential impacts (Figures 9.2 and 9.3).

- Fieldwork – In order to check the validity of the Zone of Theoretical Visibility and to field check the extent and nature of potential impacts on the identified heritage assets, site visits were made to selected key locations and heritage assets within the landscape surrounding the proposed development (Table 9.4). A visual check and photographic record were made.

- A walkover survey of the proposed wind turbine site and cabling route was 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.

- Geophysical Survey – A magnetometer survey was carried out using a dual sensor Bartington Grad601-2 Magnetic Gradiometer. Readings were taken at 0.25m centres along traverses 1m apart to identify potential sub-surface archaeological features.

Assessment of Significance

9.34 Two general types of archaeological impact associated with development are relevant during both the construction and operational phase of the development. The impacts of a development on archaeology and the historic environment may be either positive or negative. For the purposes of this assessment the significance of the impacts is set out in Tables 9.1, 9.2 and 9.3.

9.35 The assessment also distinguishes where possible between “permanent” or “temporary” and between “reversible” or “irreversible” as appropriate, in the determination of the scale of impacts. From the data collected above, the potential impacts and significance of effects upon the identified heritage assets were assessed taking into account the nature and significance of each asset. Significance and impact were determined using the following criteria:

The significance of each historic asset is graded as follows:

WHS - World Heritage Site
S - Scheduled Monument
L - Listed Building
A - Site of National Importance
B - Site of Regional Importance
C - Site of Local Importance
D - Natural Feature or non-antiquity

The condition of each historic asset was assessed where possible during the walkover survey and was graded from 1-4:

1 - No surviving remains evident above ground
2 - Poor preservation
3 - Fair preservation
4 - Good preservation

The sites have been given one of four Overall Impact grades; from Major, which (where negative) approximates to damage and loss of the site’s integrity and which represents a key factor in the decision-making process, to negligible, which equates to no perceptible effects. The full scale is:

Impact Category	**Typical Descriptors of Effect**
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are

	not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but may be important in influencing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 9.1: Overall Impact descriptors

In addition to the above descriptors the Overall Impact is determined using the combined result of the Sensitivity rating and the Magnitude of Impact rating (DMRB Vol.11; 2/1-5).

The Sensitivity ratings are:

Sensitivity Rating	**Typical Descriptors**
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 9.2: Sensitivity Rating descriptors

The Magnitude of Impact ratings are:

Magnitude of Impact rating	**Typical Descriptors**
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
Negligible	Very minor loss or detrimental alteration to 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 9.3: Magnitude of Impact Rating descriptors

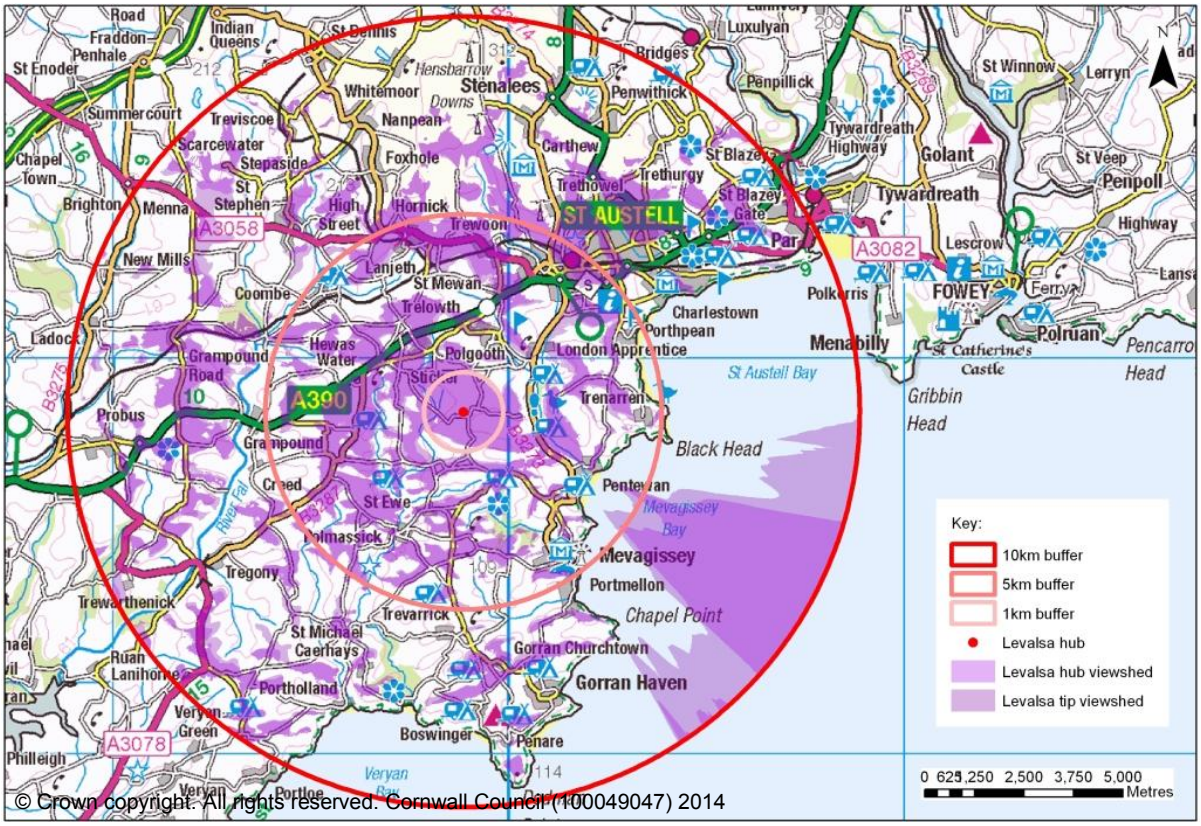

Figure 9.1: Combined tip and hub viewshed for the proposed wind turbine.

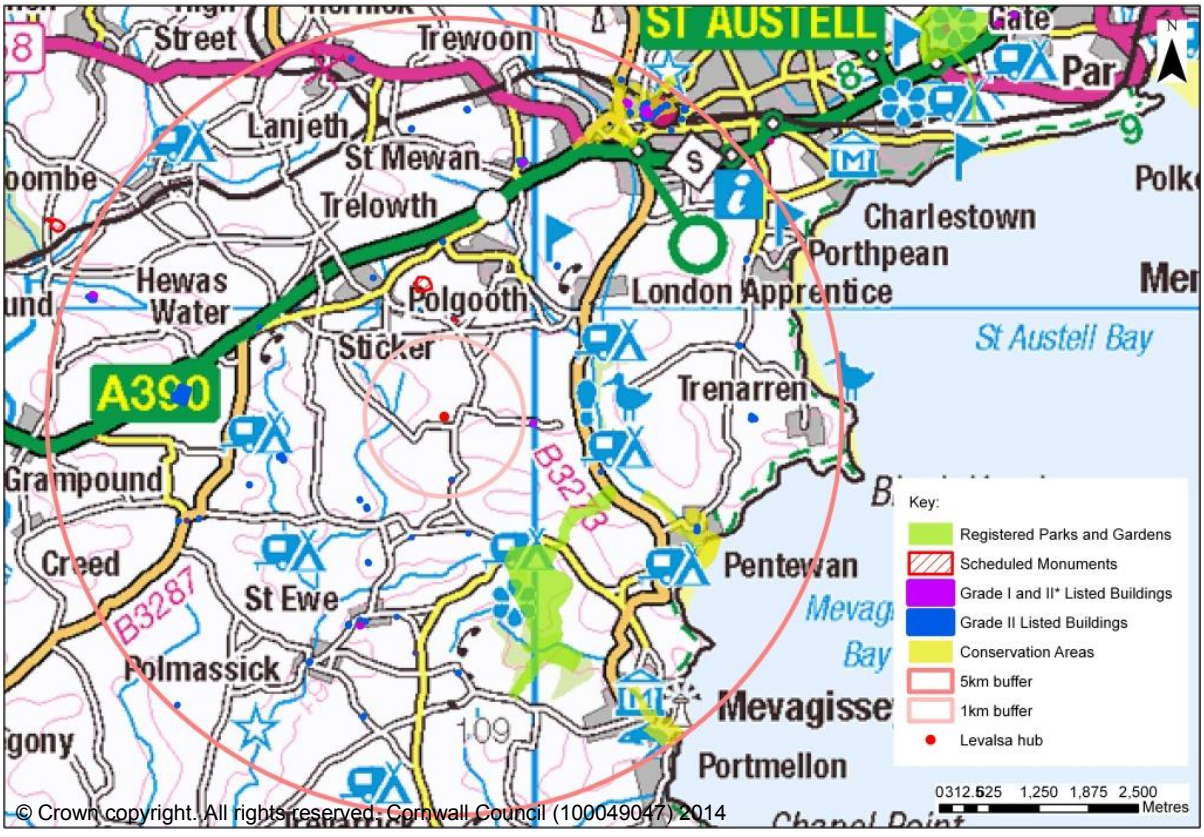

Figure 9.2: Heritage assets within the viewshed and within 5km of the proposed turbine site.

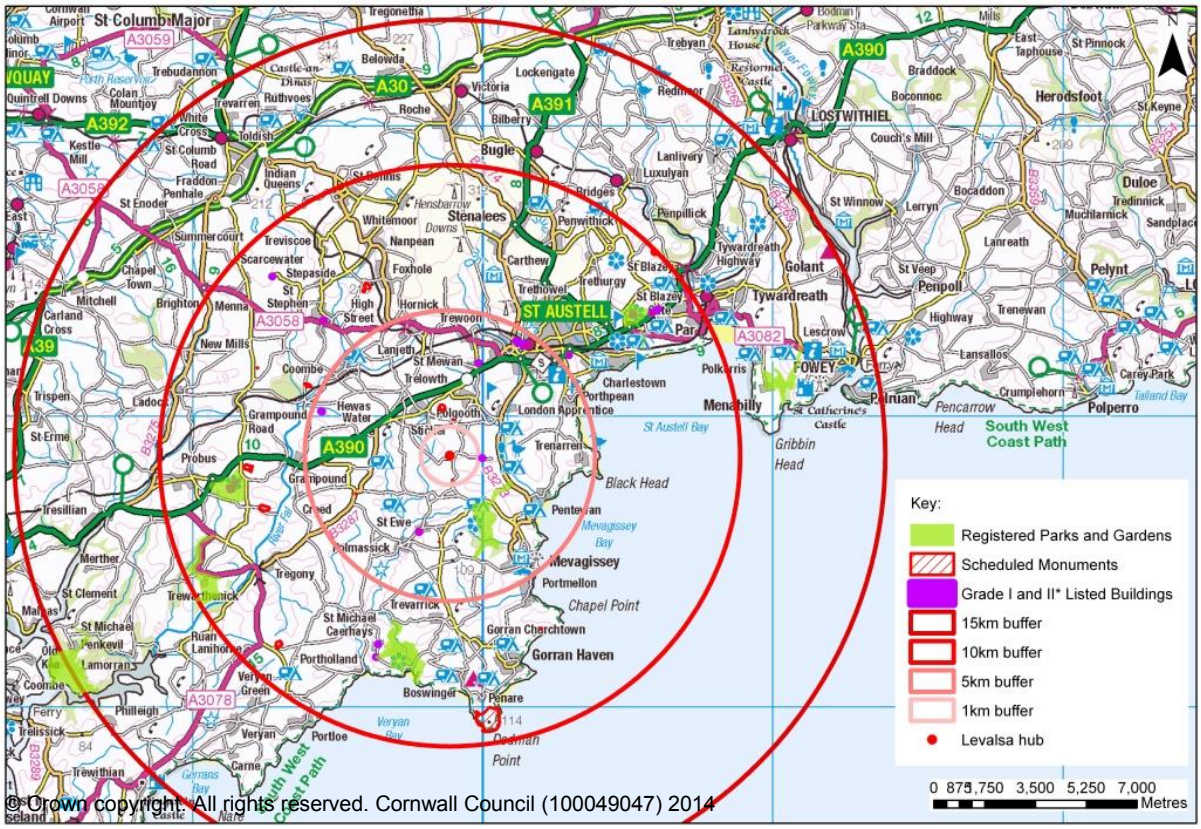

Figure 9.3: Designated heritage assets within the viewshed and within 15km of the proposed turbine site.

Baseline Conditions

Location and Topography

9.36 The proposed wind turbine is located at approximately 82m above Ordnance Datum (OD) at SW 98833 48677 (NGR). The application site is approximately 15km east of Truro and 5km southwest of St Austell. Topographically the site is on the northern end of a northeast-southwest orientated ridge-top plateau. Given the height of the wind turbine, this development is likely to be visible from a considerable distance away in the surrounding landscape.

Geology

9.37 The bedrock geology in this location consists of sandstone and mudstone of the Gramscatho Formation. This is a sedimentary bedrock formed approximately 375-398 million years ago in the Devonian Period in a deep sea environment. No superficial deposits are recorded (British Geological Survey website). This bedrock type is judged to be favourable to archaeological magnetometer surveys.

Historic Landscape Characterisation

9.38 The Historic Landscape Characterisation (HLC) of the turbine site is recorded as Farmland; Medieval (Anciently Enclosed Land). This HLC Type forms Cornwall's agricultural heartlands, and contains farming settlements

documented before the 17th century set within morphologically distinct field patterns of medieval or prehistoric origins, and is likely to contain archaeological evidence for early settlements and associated features.

Site Description

9.39 The field is an irregular shape and generally flat, sloping down gently to the west and southwest. Its boundaries are 1m high Cornish hedges with some granite facing, though much of this has been removed and their underlying structures have become eroded, probably by animal activity. They are topped by vegetation consisting primarily of brambles but also gorse, young trees and grasses. The ground level views from the site were generally very open and extensive with very little vegetation or buildings to screen the proposed turbine from the surroundings. To the north the view was extensive over the undulating rural landscape to the china clay spoil heaps. The view to the east was dominated by Tregenna Farm, but extended out towards the sea through an apparently narrow valley. The farmland immediately adjacent to the south and west was not visible due to the slope of the land and the blocking boundary hedges, but within 500m the steep slope up to another ridge was clearly visible. The proposed site is immediately adjacent to the working farm of Tregenna. No existing turbines are visible from the site.

Archaeological and Historical Context

Prehistoric

9.40 The prehistoric remains in this area are concentrated into a series of hilltop enclosures with occasional barrows. Barrows in elevated locations include those at Carnwinnick, Bodrugan and on the Dodman.

9.41 Castle Hill is one of the most typical of the hilltop enclosures, sited at a confluence of three valleys and overlooking a small cove, it also commands good views inland. Resugga, Carvossa and Golden Camp all overlook, from west to east, the upper reaches of the Fal River, thought in the past to be navigable as far as Grampound. Dodman Point is the most impressive of the sites of this type within this area; at 34ha it dwarfs the other promontory fort of Black Head close by to the northeast. It has a long history of use physically represented by Bronze Age barrows, an Iron Age enclosure and occupation and medieval field systems.

Medieval

9.42 The medieval field system on the Dodman is illustrative of the characteristic agricultural features still surviving within the wider landscape whilst many local place-names have a medieval origin, including Levalsa.

9.43 Levalsa is directly referred to in the Domesday Book, which may be the earliest known record of the name. It documents that Erchenbald held the manor of Levalsa which included 1v of land, a small number of livestock, 60 acres of pasture and woodland. It was valued at 10s (Thorn and Thorn 1979).

Post Medieval

9.44 Levalsa was depicted by Gascoyne on his map of 1699 as 'Levassa.'

9.45 The St Ewe Parish Tithe Map of 1839 shows that the field patterns immediately surrounding Levalsa are strikingly similar to today, although the farm buildings have become more developed. However to the southeast, around Kestle, the fields still retained their medieval form on the Tithe Map and had not been subject to the Enclosure Acts. On the accompanying Tithe Apportionment Levalsa Farm was owned by Richard, Earl of Mount Edgcumbe. The arable land was occupied by Ezekiel Gaved and Thomas Stephens, described as the executors of Thomas Stephens, deceased.

9.46 The post medieval period in Cornwall and elsewhere saw the development of large estates with country houses, designed landscapes and significant collections of plants. Heligan was part of the Arundell estate during the 12th century and was sold to Sampson Tremayne in the late 16th century. The house and garden were developed from the 17th century. In the 19th century there was extensive planting of exotic species including rhododendron and bamboo, which have now been restored after they became derelict following World War II.

9.47 Caerhays was also part of the early medieval estate of the Arundell family, passing by marriage into the Trevanion family c1379. Improvements to the house and garden were made in 1703 and successively throughout the 18th and 19th centuries with input from John Nash and possibly Humphry Repton. The estate was sold to the Williams family in 1853, and in c1885 John Charles Williams began the woodland garden that features the camellias and rhododendrons that Caerhays is now noted for.

9.48 The wider landscape to the north has been significantly altered by china clay extraction. The resultant pits and spoil dumps are still visible and the ports and coastal villages around St Austell Bay have many related industrial features. Charlestown, a component of the World Heritage Site, is a prime example.

Modern

9.49 In the modern period few changes have been made to the immediate surroundings of Levalsa; the small farming settlements and fields remain, many structures being protected by Listed Building status; the estates remain largely intact and maritime activities are still pursued from the coastal settlements.

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
1	Levalsa Farmhouse 1136796	SW 99969 48580	The house is situated on higher ground overlooking its working farm buildings in a very agricultural and rural setting. The main aspect of the house is to the south though there are viewpoints looking east and west. The land slopes uphill towards the turbine site where there are extensive areas of mature trees and Tregenna Farm, all of which provide substantial screening. It is therefore unlikely that much of the turbine will be visible from the farmhouse itself.	17th Century	L II*	4	High	Minor
2	Tregenna MCO9474	SW 99450 48620	The farmhouse is on the site of an earlier barton. It is located on an elevated position above the associated farm buildings in a very agricultural and rural setting. Although there are mature trees, hedgerows and farm buildings interrupting the view to the proposed turbine site it is likely that a large proportion of the turbine will be visible from at least some aspects.	Late 18th or early 19th Century	C	4	Low	Moderate
3	Rescorla MCO5434	SW 98705 48574	The HER records this Prehistoric enclosure as surviving as a low earth bank on aerial photographs. From the nearest publicly accessible viewpoint these banks are not discernible. It is set in a very agricultural environment with few buildings or modern intrusions. The field in which the remains are located is surrounded by 1-2m high Cornish hedges which provide some screening from the proposed	Iron Age to Romano-British	B	2	Medium	Moderate

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			turbine. However the proposed turbine site is in very close proximity and the majority of the turbine will be visible at all stages of use.					
4	Lanhadron 1007952	SW 98950 47850	An inscribed cross base which is not currently visible in the overgrown hedging or roadside verges. It is in an elevated position with a good view over the landscape, although this is partially obscured to the northeast by a small area of woodland. The site has a rural setting with the industrial landscape to the north contributing to its wider setting and views. The whole of the turbine field is visible so the turbine, its infrastructure and the construction and decommissioning activities will also be clearly visible.	Early Medieval	S	2	High	Moderate
5	Pentewan DCO108 including Church of All Saints 1211746	SX 02027 47232	A well preserved fishing village designated as a Conservation Area. The main square has a southwest aspect towards the harbour/sea and Penare Point. The village is low-lying and surrounded by steep valley sides. Pentewan is set in a maritime coastal environment surrounded by a rural landscape. Although the settlement extends along a valley and up the sloping sides the view northwest towards the turbine site is very restricted by the topography, vegetation and buildings. Intervisibility is very unlikely given the distance and quantity of screening but this has the	Post Medieval	B	3	Medium	Negligible

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			potential to change.					
6	Heligan 1000538	SX 00316 45854	The gardens of Heligan predominantly occupy a valley and south facing slope however there are upland areas to the north and northwest, including the main visitor entrance. Heligan is a designed landscape set within a wider agricultural and rural environment with few modern incursions nearby. It is a significant visitor attraction in the area. From the upland areas there are extensive views to the northwest, with little intervening vegetation, and it is probable that some of the turbine will be visible. Two small existing turbines are already visible to the south.	Post Medieval	A Grade II	4	High	Minor
7	St Ewe MCO53100 / MCO53099 / 1144773 / 1137082	SW 98205 46129/ SW 98177 46128	The village includes the Grade I Listed Church of All Saints, the Grade II Crown Inn, the undesignated Schoolmaster's House and adjacent School and multiple Grade II Listed houses. The village is located in a slight hollow facing in towards the church. The small church spire is not a significant landmark. The village is set in a rural environment and retains its historic character with few overtly modern intrusions. Some mature trees surround the village restricting the view north from the centre. The proposed turbine is unlikely to be visible from much of the village. However the northern extent of the village is on a small crest and may have more open	Medieval or Post Medieval	L Grades I and II	4	High	Negligible

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			views towards the site.					
8	Caerhays Castle and Estate 1000448 / 1138159 / 1327073	SW 97160 41109	The grounds of Caerhays are a Registered Park and Garden whilst St Michael's Church and Higher Lodge are Listed Buildings. The main aspect of the castle is out to sea with lawns in front of it, however the majority of the garden, and protected landscape extends north behind the house. This designed landscape is set within a wider agricultural environment with roads cut into the bedrock or surrounded by woodland, controlling views of the estate. Although the church is small, it is in a prominent hilltop location and, significantly, is intervisible with Gorran Church tower. The park and Listed Buildings are on high ground with good views inland towards the turbine site, though this is quite a distance away and the undulating topography will probably obscure much of the turbine.	Medieval or Post Medieval	A Grade II* L Grade I	4	High	Minor
9	Dodman Point 1020865	SX 00150 39562	The archaeological remains on Dodman Point include a Prehistoric cliff castle, probable Bronze Age barrows, a Medieval field system, Napoleonic signal station and Victorian navigational cross. These are located at a significant elevation above sea level providing clear views in all directions with the most important vistas extending out to sea and also back inland as far as the china clay industrial remains north of St	Prehistoric -Post Medieval	S	3	High	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			Austell. It is highly likely that the proposed turbine will be visible from various points on the peninsula; several turbines already exist within views from the site.					
10	Trewithen 1000510 / 1141079 / 1141100	SW 91172 47510	Trewithen is a Registered Park and Garden and includes Listed barns, farmhouses and other buildings. The majority of the garden is located in a hollow and the perimeter is quite densely wooded. Although a modern visitor attraction, Trewithen is a designed landscape in a highly rural setting. It is unlikely that much, if any, of the turbine would be visible from the majority of the protected area.	Post Medieval	A Grade II* L Grades I and II	4	High	Negligible
11	Golden Camp 1016889	SW 92454 46853	The hillfort is situated on high ground close to the Fal river valley in a rural setting. Its ridge-top location affords it potentially good landscape views however the intervening space to the proposed turbine site includes areas of woodland which may obscure views. It is possible that part of the turbine may be visible.	Prehistoric	S	3	High	Minor
12	Carvossa 1016890	SW 91879 48266	The prehistoric settlement is located in quite open farmland with some hedgerows and wooded valleys between it and the turbine site. Carvossa is on a hilltop overlooking the Fal river in a rural setting with sporadic farm settlements. Views from it to the east are quite extensive and it is possible that at least the top of the	Prehistoric	S	2	High	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			turbine will be visible. This will be dependent on weather conditions and vegetation density, and the turbine will be at quite a distance from it.					
13	Resugga 1017685	SW 93961 51064	Resugga is a later prehistoric univallate hillfort located on the crest of a small ridge which is covered in scrub vegetation and mature trees. It is adjacent to the village of Coombe in a rural setting. To the south of Coombe is a larger ridge developed by the railway with bridges and nearby viaduct. It is possible some upper parts of the turbine will be visible at a distance and any views would include the railway infrastructure.	Later prehistoric	S	3	High	Negligible
14	Church of St Stephen 1137033	SW 94499 53326	The Listed church is centrally located in the village of St Stephen. The church tower is prominent but the church is itself is quite a low building that is not very visible. The church is set within the historic core of the village but the surroundings include a busy road and significant modern housing and amenities. The wider setting also features the substantial remains of the china clay and mineral extraction industries. There are some deciduous trees surrounding the church though they do not provide a substantial screen. It is very unlikely that the turbine will be visible from ground level but it is possible that the tower will have some degree of intervisibility.	Medieval, 12th Century origin	L Grade I	3	High	Negligible

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
15	St Stephen's Beacon Hillfort 1003091	SW 96009 54490	The hillfort is located on top of a substantial hill with only grass and scrub vegetation and has good landscape views. It has a mixed setting of past and present mineral extraction activity, agricultural and semi-urban landscapes. At least one turbine is visible from the Beacon and it is likely the proposed turbine will also be visible, though at quite a distance away.	Prehistoric	S	2	High	Minor
16	Church of St Mewan 1327442	SW 99838 51849	The Grade II* Listed church is quite a small low building with a small tower largely hidden from view from most approaches. It is located on a west facing slope within a rural setting though close to the A390, the busy main road to St Austell. It is possible that the turbine may be visible although any view will be largely obscured by the vegetation and undulating topography.	12th Century origin	L Grade II*	3	High	Negligible
17	St Austell 1211925 / 1289697 / 1212189	SX 01419 52452/ SX 01392 52504/ SX 01362 52480	The centre of St Austell includes the Listed Buildings of Holy Trinity Church, Market House and the Old Manor House and is a Conservation Area. These are located on slightly higher ground overlooking a busy urban environment with much modern development obscuring all views out to the surrounding landscape. It is very unlikely any part of the proposed turbine will be visible.	Medieval or Post Medieval	Grades I and II*	3	High	No change

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
18	Charlestown 17	SX 03760 51785	The internationally important area of Charlestown is located in a valley leading to the sea. Within the settlement the eye is directed down the main street with a view of the sea to the south. To the west, in the intervening space between Charlestown and the proposed turbine site is occupied by a significant hill obscuring the view completely. Charlestown has a maritime and coastal setting within the conurbation of St Austell. It includes many modern amenities, tourist features and a high proportion of new houses which are not particularly sympathetic to the preserved cottages in the centre of the settlement. The density of housing, garden vegetation and topography taken together obscure any views of the turbine site.	Post Medieval	WHS	3	Very High	Negligible
19	Tregrehan 1000545	SX 05192 53547	The Registered Park and Garden of Tregrehan is located in a hollow and on a west facing slope between St Austell and St Blazey Gate. It is set in the urbanised area of St Austell, close to busy roads and housing, although to the north the generally rural environment is partly occupied by features associated with the china clay industry and mineral extraction. The garden has a mix of open areas and mature trees potentially allowing some views towards the proposed turbine site.	Post Medieval	A Grade II*	4	High	Negligible

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
20	Church of St Mary and Leek Seed Chapel 1212089 / 1386524	SX 05816 53592	Both sites have a suburban setting within St Blazey Gate and are adjacent to a very busy road. St Mary's Church spire is highly visible from the road approaches whilst the chapel is quite inconspicuous amongst the houses. Both have relatively good landscape views but it is unlikely that much, if any, of the turbine will be visible over the intervening ridge-tops, vegetation and buildings.	19th Century	L Grade II*	4	High	Negligible
21	Menabilly 1000651	SX 09638 51904	Menabilly, a Registered Park and Garden, is on a west facing slope facing Dodman Point across St Austell and Mevagissey Bays. Although few landscape details could be seen from this distance it is possible that the proposed turbine would be visible, depending on weather conditions and the density of vegetation throughout the garden. Menabilly has a designed landscape setting within a wider rural, agricultural and maritime environment. The view to the bay highlights the rural setting on the Dodman peninsula.	Post Medieval	A Grade II	4	High	Negligible
22	Sticker Camp 1011994	SW 98579 50327	The later prehistoric-Roman round at Sticker is on a hilltop with good views of the surrounding landscape although is adjacent to the village and a busy road. The setting is generally rural though industrial remains of mineral extraction to the north and an engine house to the south are included. There is little substantial screening provided	Prehistoric -Roman	S	3	High	Minor

No	Site Name & Reference	Grid Ref. SW/SX	Description	Probable Date	Significance	Condition	Sensitivity	Magnitude of Impact
			by vegetation and it is likely that the majority of the turbine will be visible.					
23	Wheal Commerce MCO12878	SW 98700 48600	This copper mine was operational in the 19th and 20th centuries, though little now remains of it, and its setting is entirely rural. There is very little intervening vegetation, apart from Cornish hedges, providing a screen from the proposed turbine, which is in very close proximity. It is probable the majority of the turbine will be visible.	19th and 20th Century	C	2	Low	Minor
24	South Polgooth Mine Complex 1007288	SW 98982 49880	The mine complex dates from at least 1593 and by the 1880s extracted tin, copper, arsenic and wolfram from three lodes. The remains of the mine engine house in particular are very visible in the landscape as they are on relatively high ground. Although once industrial, the setting is now predominantly rural and agricultural with some of the spoil heaps of the china clay industry within the wider setting to the north. Some small trees and Cornish hedges provide minimal screening from the proposed turbine site, but it is probable that the majority of the turbine will be visible.	Post Medieval	S	3	High	Moderate

Table 9.4: Fieldwork Impact Assessment Results

Impact Assessment during construction

Indirect Impacts

9.50 The construction of the wind turbine at Levalsa will create some minor setting impacts to surrounding heritage assets, though as these impacts will be temporary and reversible they are assessed as **negligible negative** in scale.

9.51 An assessment of the likely noise impact due to the construction phase of the proposed turbine has been undertaken by an appropriate specialist. The predicted noise levels have been found to be insignificant and unlikely to result in audible impacts on surrounding designated heritage assets.

Direct Impacts

9.52 The construction of the wind turbine, specifically the excavations for the foundations and the cable route, has the potential to cause irreversible physical impacts upon any upstanding or sub-surface archaeology in these locations.

9.53 It is difficult to assess the significance or sensitivity on unknown or potential archaeology. The geophysical survey results indicate a series of anomalies which comprise an apparently coherent enclosed feature, sub-circular groups and linear features, likely to be of late prehistoric date and relating to an enclosed farm settlement of the type known as a 'round'. Further small, ephemeral or artefactual remains are likely to be associated with the geophysical anomalies but are of a size and nature which cannot be detected at the resolution utilised for the survey. If such archaeology as indicated by the survey is found it is likely to be considered as having at least regional importance though national or greater significance remains a possibility due to the strong probability that these are extensive prehistoric remains. Direct impacts on such archaeology would mean at least partial loss or alteration resulting in at least a moderately negative impact if this scenario occurred. Although dependent on the extent, survival and significance of any archaeological remains, given the geophysical survey results, the overall direct and irreversible impacts are most likely to be **moderate negative**.

9.54 The passage of exceptionally large, heavy or tracked vehicles is likely to have a moderately negative impact through extensive rutting or compression on the sub-surface archaeology which it is likely to have to pass over. The location of the turbine base, route of the cable trench and access tracks have been designed to avoid where possible areas shown on the geophysical survey results to have high quantities of anomalies. Provision of a works compound and additional access requirements have also been sympathetically sited where possible but are likely to have scales of impact similar to those identified above. Whilst this may reduce

the likelihood of direct impacts, where these do occur, the severity is likely to remain **moderately negative**.

9.55 The widening of existing gateways and the removal of existing hedgerows has the potential to expose archaeological remains which maybe of at least local significance. The alteration of a historic hedgerow will also result in a change to attributes which contribute to its sensitivity as a locally important historic asset. The upstanding preservation of the hedgerow and the likely low sensitivity of remains and the localised though direct impacts from widening or removal would result in a **minor negative** impact.

Figure 9.4: The extensive landscape view from the Scheduled Lanhadron Medieval Cross, the proposed turbine field being clearly intervisible in the centre of the image with the site of Rescorla prehistoric remains located to the left edge.

Impact Assessment during operation

9.56 During the operational phase setting impacts will arise. These will vary in scale of impact according to weather, season, distance from the turbine, intervisibility between the proposed wind turbine site and key heritage assets, the degree to which the wind turbine intrudes into views of them and the sensitivity and significance of the heritage assets. Such impacts will be temporary, though long-lasting and would cease when the turbine is eventually dismantled, as required by the planning conditions applying to such installations.

9.57 An assessment of the likely noise impact during the operational phase of the proposed turbine has been undertaken by an appropriate specialist. The assessment demonstrates that the turbine will operate within the relevant ETSU-R-97 noise limits and the noise emission level experienced at the receptor sites used in the study is unlikely to cause a disturbance. The residual noise impacts are considered to be insignificant.

Impacts on the Cornish Mining World Heritage Site

9.58 The Charlestown World Heritage Site is located to a very minimal extent within the viewshed (Figures 9.3 and 9.5). The area will not be physically impacted upon and there will not be visual and audible impacts resulting from construction, operation and end of use activities. The addition of the proposed turbine will alter the setting of the World Heritage Site area, though at a distance of approximately 12km this will only be to a very negligible extent and will only be perceived from a viewpoint out to sea from which the turbine and Charlestown could potentially be seen in the same view. The overall impact is rated as **negligible**.

Figure 9.5: The centre of Charlestown where key views are south out to sea rather than west towards the proposed turbine site.

Impacts on Scheduled Monuments

9.59 No Scheduled Monuments will be physically impacted upon by the proposal.

9.60 Sticker Camp and Polgooth Mine Complex (Figure 9.6) will experience setting impacts during all three phases due to their close proximity. In addition Polgooth retains an engine house with a tall chimney with which the turbine may compete visually, leading to a degree of detraction from the current prominence of the engine house within the historic landscape. The impacts for these sites are therefore rated as **moderate negative**.

9.61 Negative reversible setting impacts affect the setting of Lanhadron Medieval Cross in particular (Figure 9.4). Although located close to the proposed turbine site, an assessment by a qualified specialist has determined that as Lanhadron is further from the proposed site than the noise receptors which measured noise at below the acceptable maximum the heritage asset is very unlikely to experience any noise impact. Ordinarily crosses are deemed to have limited and localised settings, particularly where they only partially survive, as at Lanhadron. In this instance, the views from the cross site are deliberately extensive and include the turbine field in its entirety; there is also documentary and physical association with a medieval chapel, nunnery or other religious structure which contributes to its setting; finally, the setting is definitively rural and isolated from any overtly modern developments. The collective magnitude of impacts upon the setting of this particular cross is considered to be greater than would be usual for a Scheduled Monument of this type. Lanhadron Medieval Cross is assessed as likely to be impacted to a **moderate negative** extent.

9.62 Further afield, the promontory fort on Dodman Point and St Stephen's Beacon are partially within the viewshed, and as prehistoric forts have an intentionally large setting and open views. These settings are only likely to be negatively impacted upon during the operational stage and experience existing impacts which have arisen through activities associated with china clay extraction activities. The impacts on these sites is considered minor negative. Overall however the impacts on Scheduled Monuments can be rated as **minor negative**.

Figure 9.6: The Scheduled engine house at South Polgooth Mine. This view to the northeast also includes the infrastructure of the modern china clay extraction industry. Note the prominence of the chimney within this landscape.

Impacts on Listed Buildings – Grade I and II*

9.63 The wind turbine will almost certainly have no impact on the settings of those Listed Buildings which do not fall within the viewshed, though there may be exceptional cases where key views of Listed Buildings not in the viewshed will also prominently feature the proposed wind turbine. Any such negative visual impact will attenuate with distance.

9.64 The Grade II* Levalsa Farmhouse is just over a kilometre distant from the proposed turbine site, though as it has a south facing aspect and is significantly screened by trees and other farm buildings, setting impacts will be at worst minor negative (Figure 9.7). Although located close to the proposed turbine site, an assessment by a qualified specialist has determined that as Levalsa Farmhouse is further from the proposed site than the noise receptors which measured noise at below the acceptable maximum the heritage asset is very unlikely to experience any noise impact. The impact on Levalsa Farmhouse is therefore assessed as **minor negative**.

9.65 The majority of Listed Buildings within the centre of St Ewe are unlikely to experience significant visual impacts during the three phases. In individual cases the degree of impact may vary, dependent on the extent of

intervisibility and degree of screening afforded by vegetation. The Grade I Church of All Saints, although not a prominent landscape feature, has the most extensive setting of the Listed Buildings in the village is will experience the most significant impacts. The slight crest located to the north of the village restricts some views towards the turbine site from its centre and particularly from the church and therefore the impacts for the Grade I Listed Buildings in St Ewe is rated as **negligible negative**.

9.66 St Michael's Church and Higher Lodge at Caerhays approximately 8km to the south-southwest of the proposed site have extensive views northwards. Their settings are mainly related to the formal grounds of Caerhays but they also interact with the wider rural landscape and the impacts upon this will be significant. The impact on the Grade I and II* Listed Buildings at Caerhays is assessed as minor negative. The overall impact on Grade I and II* Listed Buildings is assessed as **minor negative**.

Figure 9.7: The view west towards the proposed turbine site from a location adjacent to the Grade II Listed Levalsa Farmhouse, including Tregenna Farmhouse in the background.*

Impacts on Listed Buildings – Grade II

9.67 No Grade II Listed Buildings will be physically impacted upon and only those within the viewshed are likely to experience a setting impact during all three phases.

9.68 The South Polgooth Mine Complex includes some Grade II Listed Buildings which are in close proximity and includes tall buildings that may visually compete with the tall wind turbine (Figure 9.6). The impact to the complex is considered to be **moderate negative**.

9.69 The Crown Inn, St Ewe and the Grade II Listed Buildings within St Austell such as the Red Bank are set within village and urban environments which will have very minimal views of the proposed turbine and therefore will be impacted to, at worst, a minor negative extent. The overall impact for Grade II Listed Buildings is assessed as **negligible negative**.

Impacts on Conservation Areas

9.70 All three Conservation Areas will be potentially intervisible with the turbine site though only to a minimal or partial extent. The modern urban environment of St Austell blocks views out from the centre of the Conservation Area.

9.71 The coastal location of Mevagissey and Pentewan is likely to mean that a modern turbine will be juxtaposed with these historically maritime related settlements and the setting will be impacted, particularly when considered from a maritime viewpoint The topography and aspect of the Pentewan Conservation Area greatly restricts intervisibility to its upslope parts only where it is possible, but unlikely, that the turbine will be visible. As the setting impacts to three Conservation Areas are limited, the overall impact is assessed as **negligible negative**.

Impacts on Registered Parks and Gardens

9.72 The settings of these parks are simultaneously formal and deliberately natural and include historically related and unrelated surrounding agricultural land. Setting impacts are likely to be limited by the density of vegetation making up these designated landscapes; however many views across the parks from the Listed houses or from features within the parks were specifically designed. Trewithen and Trewarthenick feature eastward views from rides and walks across the formal gardens and from parkland extending out on east facing slopes. The Grade II Listed Trewarthenick House faces eastward with extensive views beyond the park. These views have the potential to include the proposed turbine. The RPGs of Tregothnan and Tregrehan appear not to have specifically designed features or views towards the wind turbine but do have slopes in their wider parkland from which intervisibility remains a possibility. The west facing aspect and greater maritime setting of Menabilly means that the RPG has a good view of the rural environment on the Dodman peninsular which is likely to include the proposed turbine. Any such impacts on these four RPGs are likely to be minor to negligible as their distances from the proposed site will significantly diminish the prominence of the turbine within views from them. However they are within the 15km radius study

area and therefore the potential for setting impacts has been considered in line with English heritage and Cornwall Council guidance.

9.73 At 3km from the proposed development site, Heligan is likely to experience the greatest setting impacts. The formal areas of the RPG and Listed house are located in a valley facing south-east and away from the proposed turbine site. However the former and current entrances to the RPG are located on higher ground to the north-west adjacent to the wider parkland that is predominantly wooded. Whilst there seems to be few walks through the woodland and none with a clear focus on westward views, intervisibility is possible. The RPG has an extensive setting including the surrounding agricultural and coastal environments. The impact on Heligan is therefore considered to be **minor negative**.

9.74 Caerhays is more than 5km from the proposed site though its northern extents include the main entrance drive and a network of walks and drives through the woodland that make up the parkland. These are on north-facing slopes with extensive views north and it is very likely that the proposed turbine will be a component within these views when operational. The main aspect of the Listed house and formal gardens is to the south and east and less likely to experience setting impacts although the higher ground on the headlands will experience similar views and setting impacts as the northern parts of the RPG. The impact on Caerhays is therefore **minor negative**.

Impacts on Undesignated Historic Assets

9.75 The settings of all sites within the viewshed will be visually impacted to some degree during all three phases, though at worst this is assessed as minor negative for the more prominently positioned, extant or closest sites such as Rescorla prehistoric enclosure. Due to their proximity, Rescorla and Tregenna are potentially susceptible to noise impacts from the proposed turbine. However assessment by a qualified specialist with measurements taken very close to these heritage assets has shown that the predicted worst case scenario noise levels will be less than 35dB(A), within the ETSU-R-97 limits and therefore are not considered to cause a disturbance. The majority of the undesignated sites are known from documentary sources are cropmark sites or consist of signposts, crosses, milestones or find-spots with very limited settings and therefore little or no potential for setting impacts.

9.76 The overall impact on such sites is assessed as **minor negative**.

Impacts on Historic Landscape Character

9.77 The landscape surrounding the proposed wind turbine site is dominated by extensive areas characterised as Farmland; Medieval, interspersed with tracts of land enclosed during later periods. Much of the land has been

farmed since at least the medieval period, in some places long before, as alluded to by the surviving place names and by prehistoric remains.

9.78 From the 17th century onwards parts of this area were subjected to enclosure under the Enclosure Acts with the imposition of larger, more regularly shaped fields and intensive farming methods that reduced some archaeological sites to below ground remains only. The development of the two Registered Parks and Gardens in the vicinity also influenced the layout and character of the land. In places these changes are highlighted by the use of blockwork walls as field boundaries instead of the more traditional Cornish hedges. The survival of the post medieval enclosures still preserves much of the original open character of the landscape, with small farming settlements scattered throughout it.

9.79 With the exception of the growth of the St Austell conurbation some distance away, the overall character of this landscape has changed little. The elevated nature of the area is clearly ideal for generating electricity from wind power. The construction of the proposed wind turbine will inevitably begin to erode the coherency and legibility of the surviving historic landscape character of this area. The presence of a wind turbine at Levalsa will materially change the character of the surrounding landscape, as there are relatively few wind turbines already operational in the surrounding landscape and there is a lack of similarly modern and intrusive infrastructure. The impact on the HLC is therefore considered to be **moderate negative**.

Mitigation Measures

9.80 A range of means to mitigate the impacts of this wind turbine are proposed within the environmental assessment. The mitigation measures are aimed at reducing any adverse impacts of the proposal during the construction and operation stages. A summary of likely mitigation measures is provided below.

Micrositing

9.81 Mitigating any potential impacts on heritage assets is sometimes possible through the micrositing of the wind turbine and the redirecting of cabling routes to reduce direct physical impacts on sub-surface archaeological remains within the proposal site, demonstrated through geophysical survey, this approach can also sometimes reduce setting impacts on sensitive assets within the landscape surrounding the proposed turbine site. However given the nature of the local topography at Levalsa, the substantial height of the turbine and the minimal nature of the surrounding vegetation screens, such an approach would seem unlikely to be able to achieve any substantial diminution of any setting impacts in this instance.

9.82 In addition to careful siting of the turbine base and cabling trench, consideration of the access route, and its construction, could prevent or

avoid direct physical impacts from rutting or compression from heavy vehicles during construction and decommissioning.

Archaeological recording

9.83 In a case where the finalised site design would seem likely to result in unavoidable physical impacts on sub-surface archaeology, a brief for work to mitigate these impacts would need to be produced. 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 as part of the planning decision-making process.

9.84 Further archaeological evaluation to provide a level of information sufficient to determine the potential and scale of sub-surface impacts on archaeological features identified by the geophysical survey might be required in advance of a recommendation for a grant of planning permission.

9.85 Further archaeological recording works could comprise a watching brief (observation by an archaeologist during mechanical ground reduction activities) or full excavation and recording of some areas of the site prior to construction works. This would be likely to target areas where significant features had been identified through geophysical survey, or where the balance of probability suggests that sub-surface archaeology might survive. This approach provides for preservation by record of buried archaeological features or artefacts, reduces any impacts on the archaeology of the sites to minor, and provides positive benefits from the development in the form of increased knowledge and understanding of Cornwall's archaeological heritage.

9.86 It should be noted that the form of any mitigation applied to the site would be determined by the Senior Development Officer (archaeology), who might require studies additional to those identified within this assessment in order to determine appropriate recommendations.

Cumulative Impacts

9.87 The brief for this Impact Assessment requires the inclusion of an assessment of cumulative impacts of the development proposal.

9.88 Three operational wind turbines are located in the vicinity of Levalsa though are not visible from the proposed site. From the majority of the historic assets visited either no turbines, or only one or two installations can be seen. Additional wind turbines proposed or granted planning permission within a 10km radius of Levalsa creates the potential for cumulative impacts to be experienced by individual heritage assets and the historic landscape character.

9.89 Wind farms, where multiple turbines of similar sizes are installed in close proximity, can have a visual coherency which, despite the size and quantity of the wind turbines making them up, may limit the negative impacts they might otherwise impose on their surroundings. Conversely the placement of individual wind turbines, such as at Levalsa, of varying heights and designs sporadically across the landscape is unlikely to result in any degree of coherency, and will therefore have a potentially greater impact on the appreciation of the historic landscape or of the settings of heritage assets.

9.90 Few of the heritage assets highlighted in this assessment are significant landmarks although many have extensive and sensitive settings, most specifically the multiple Registered Parks and Gardens and the Scheduled Monuments. The prehistoric Scheduled Monuments deliberately occupy prominent hilltop or ridge-top locations, command significant landscape views and have a degree of intervisibility with other approximately contemporary sites. They are important features that are often still discernible within the landscape. From the sea, a wider viewpoint of multiple heritage assets and their relationships would be appreciated, and views will incorporate the existing and proposed turbines.

9.91 The Listed Buildings within settlements have relatively localised settings, though many of the settlements have landscape views and a degree of visual prominence with the surrounding agricultural countryside. The settings of some individual or grouped buildings may well be adversely affected to some degree by the visual and setting impacts resulting from the construction of one or more wind turbines in the surrounding landscape.

9.92 Such adverse visual impacts are, given the 25 year lifetime of any specific wind turbines, judged to be temporary in nature, though long-lived, and would be reversed on their decommissioning removing any visual or setting impacts. Although 25 years is a fraction of the lifetime of a heritage asset, it makes up a far greater part of an individual's lifetime. For sites with limited settings, alterations to historic landscape character will not be particularly noticeable to the observer; from sites with extensive or sensitive settings the changes resulting from cumulative impacts are likely to be greater. As a result, the overall cumulative impact on historic landscape character is assessed as **moderate negative**.

Residual Effects

9.93 The residual effects of the proposal on archaeology are summarised in Table 9.5 below. The potential impacts and significances are based on those identified in the assessment and summarised in the results table above. It should be noted that the form of any mitigation applied to the site would be determined by the Senior Development Officer (archaeology), who may choose to recommend one or more of the options or impose other measures.

Feature	Potential Impacts	Significance before mitigation	Mitigation	Significance of residual impact	Overall impact
Sub-surface archaeology (construction)	Loss of buried archaeology on application site (including anomalies identified by geophysical survey and unknown remains)	At least moderate negative Permanent.	Evaluation to assess archaeological potential and/or watching brief to preserve archaeology by record. Micro-siting of the turbine base and cable route to avoid potential archaeology highlighted by the geophysical survey. Protection of sensitive areas of sub-surface archaeology through the use of load-spreading ground mats along access trackway.	Moderate to minor negative dependent on archaeology identified and the degree to which is capable being recorded. Permanent	Moderate negative.
Identified heritage assets (construction and end of life)	Setting, visual and audible impacts from machinery and infrastructure	Minor negative though this is dependent on the distance from and intervisibility with the turbine site and the significance and sensitivity of each asset. Temporary	None possible given location and height of turbine	Minor negative. Temporary	Negligible to moderate negative.
Sub-surface archaeology (operational)	None unless additional infrastructure or maintenance is required	Negligible though potentially major negative if infrastructure or maintenance required. Permanent	None unless additional infrastructure or maintenance required in which case a watching brief may be required.	Negligible or minor negative if further work is required. Permanent	Negligible to minor negative.
Identified heritage assets (operational)	Setting, visual and audible impacts	Negligible to moderate negative though this is dependent on the distance from and intervisibility with the turbine site and the significance and	Micro relocation to minimise visual and audible impacts, if this can be demonstrated to reduce the impact.	Negligible to moderate negative though this will be dependent on the distance from and intervisibility with the turbine site and the significance and	Negligible to moderate negative.

		sensitivity of each asset. Temporary		sensitivity of each asset. Temporary	
Identified heritage assets (operational)	Cumulative impacts	Minor to moderate negative though this is dependent on the distance from and intervisibility with the turbine site and the significance and sensitivity of each asset. Temporary	None available.	Minor to moderate negative though this will be dependent on the distance from and intervisibility with the turbine site and the significance and sensitivity of each asset. Temporary	Moderate negative.
Historic Landscape Character	Erosion of the setting, coherency and legibility of surviving prehistoric, medieval and designed landscape features	Moderate negative. Temporary	Retention of historic hedgerows	Moderate negative. Temporary	Moderate negative.
Sub-surface archaeology (end of life)	Loss of buried archaeology if there are sub-surface works to remove infrastructure. Permanent	Minor to major negative dependent on archaeology identified.	Avoidance of sub-surface works. Watching brief to record any archaeology.	Minor to moderate negative dependent on archaeology identified and the degree to which this is archaeologically recorded. Permanent	Minor to moderate negative.

Table 9.5: Residual impacts upon archaeology and identified heritage assets.

9.94 The implementation of the mitigation measures detailed above should ensure the preservation by record of any sub-surface archaeology. However as archaeology is a finite resource and cannot be replaced, a residual moderate negative direct impact will remain. For the linear, curvilinear and point anomalies, suggested by the geophysical survey to be complex and substantial, this is likely to be of at least moderate significance if, as has been predicted, they represent evidence for prehistoric activity. The residual moderate negative impact is dependent on the degree of preservation and survival, and the degree to which this archaeological potential can be successfully mitigated through micrositing and archaeological investigation. Some mitigation of setting impacts may be possible, though the height, prominent location and high degree of visibility of the wind turbine make this unlikely.

9.95 Assuming the proposed turbine is not re-powered or replaced, the end of life impacts will be as a result of excavation activity to remove the turbine components. It is anticipated that foundations will be removed to a depth of 1m below grade and the soil profile restored. Access tracks will either be removed or retained, depending on the landowner's preference. The associated noise impacts are considered by the specialist's assessment to as likely to be insignificant and there will be negligible but temporary visual impacts resulting from the use of machinery during this phase. The partial removal of the foundations and possibly also the access track and cabling, may result in further physical, irreversible impacts on surrounding subsurface archaeology but this is considered likely to be a **minor negative** impact and should be capable of mitigation.

Summary

9.96 An assessment of archaeological sites and heritage assets has been undertaken within a 15km radius of the proposed wind turbine for which the overall impacts vary from negligible to moderate according to distance from and likely intervisibility with the turbine and the degree of impact on their settings. The overall impact on Scheduled Monuments is considered to be minor negative. A similar range of impacts will affect Registered Parks and Gardens as Heligan and Caerhays, the closest, will be impacted to a minor negative extent whilst those beyond 10km will experience negligible negative impacts. For the World Heritage Site and Conservation Areas setting impacts could potentially occur though the collective impact is considered negligible negative. The range and severity of impacts to the Listed Buildings varies though few are in very close proximity and as a result the impact upon them is minor negative. However the combination of proximity, prominence and intervisibility between the turbine and the Scheduled Monuments at Lanhadron and the South Polgooth Mine Complex will increase the impact rating to moderate negative for these designated assets.

9.97 There will be high potential for cumulative impacts to arise on Historic Landscape Character from the construction of this proposed turbine. The

historic landscape character of this area is still clearly apparent. The effect of this proposal combined with the lack of modern infrastructure and the cumulative effect of future similar proposals will become an increasingly negative impact as the historic character of the landscape is increasingly eroded.

9.98 Due to the topography and the locations of the heritage assets considered in this assessment, the adoption of a micrositing mitigation strategy is unlikely to achieve any positive change in the impacts which have been identified. The geophysical survey identified multiple linear, curvilinear and point anomalies within the development area, direct impacts to some of which could be avoided by careful micrositing of the turbine and cable route. Further archaeological investigation into the existence and nature of the probable subsurface archaeology in the development area and its recording could enhance our understanding of the archaeology of this site and surrounding area and help to mitigate direct impacts on archaeology.

9.99 Residual effects will occur despite any imposed mitigation measures. These include the potential for the permanent loss of any subsurface archaeology at the application site during the construction and decommissioning phases. This can be mitigated to an extent by archaeological recording options but a potential minor or moderate negative impact will remain due to the possible loss of the resource and degree of the success of the mitigation measures. Impacts to the heritage assets and the HLC such as setting and cumulative effects are considered temporary and generally minor negative in severity but they will remain throughout the operation of the turbine.

9.100 The impacts of the construction, operation and decommissioning activities of the wind turbine are all reversible, with the exception of those on any sub-surface archaeology; it is likely that these can be mitigated through a planning condition requiring some degree of archaeological recording either prior to or during the construction phase, and possibly also during decommissioning activities.

Appendices

9.1. Levalsa Farm, St Ewe, Cornwall. Archaeological assessment of proposed wind turbine

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