



Kessel Downs, Mabe, Cornwall

Archaeological assessment of proposed solar farm



Historic Environment Projects

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The viewshed mapping was carried out by Francis Shepherd.

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

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Cover illustration

Looking north across the upper western fields proposed for the solar farm

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Abbreviations

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

1 Summary

Historic Environment Projects, Cornwall Council, were approached by Adrian French for AGRenewables in May 2013 with a request to provide costs for the provision of an archaeological assessment of a proposed solar farm at a site adjoining Kessel Downs, Longdowns, in the parish of Mabe in preparation for an application for planning consent. A cost schedule for this work was approved on 05 July 2013.

The current proposal is for a solar farm extending to 11.11 Ha, though HE Projects were also requested to undertake the assessment of an additional area of 7.17Ha immediately to the west of the area on which the solar farm is proposed to be sited. The site chosen for the solar farm lies within an area of former downland dominated by the evidence for granite quarrying and associated industrial smallholdings near Longdowns, Mabe.

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

Despite the elevated site selected for this development the specific topography of the local landscape greatly restricted the ZTV for the site. In addition, the local landscape contains very few designated sites or landscapes. No significant setting impacts are expected from this development, whilst the site walkover revealed no predictable physical impacts on archaeological sites from the construction of the solar farm.

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

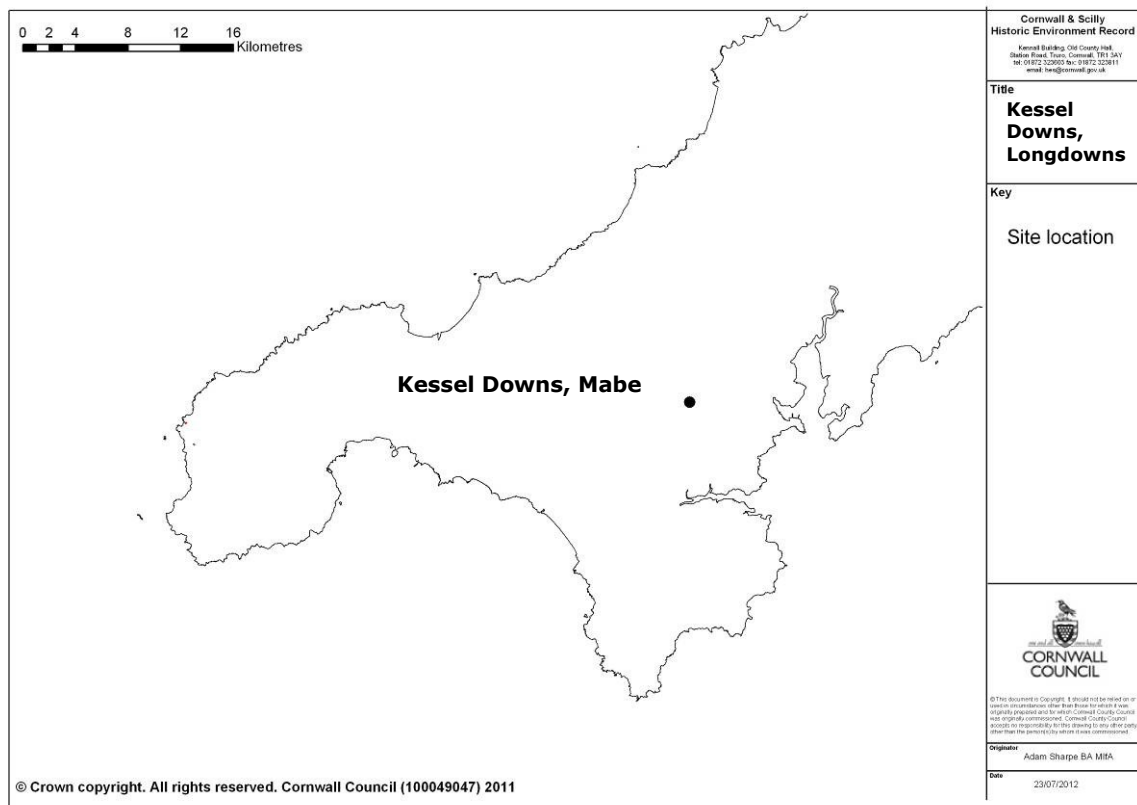


Fig 1. The location of Kessel Downs, Mabe.

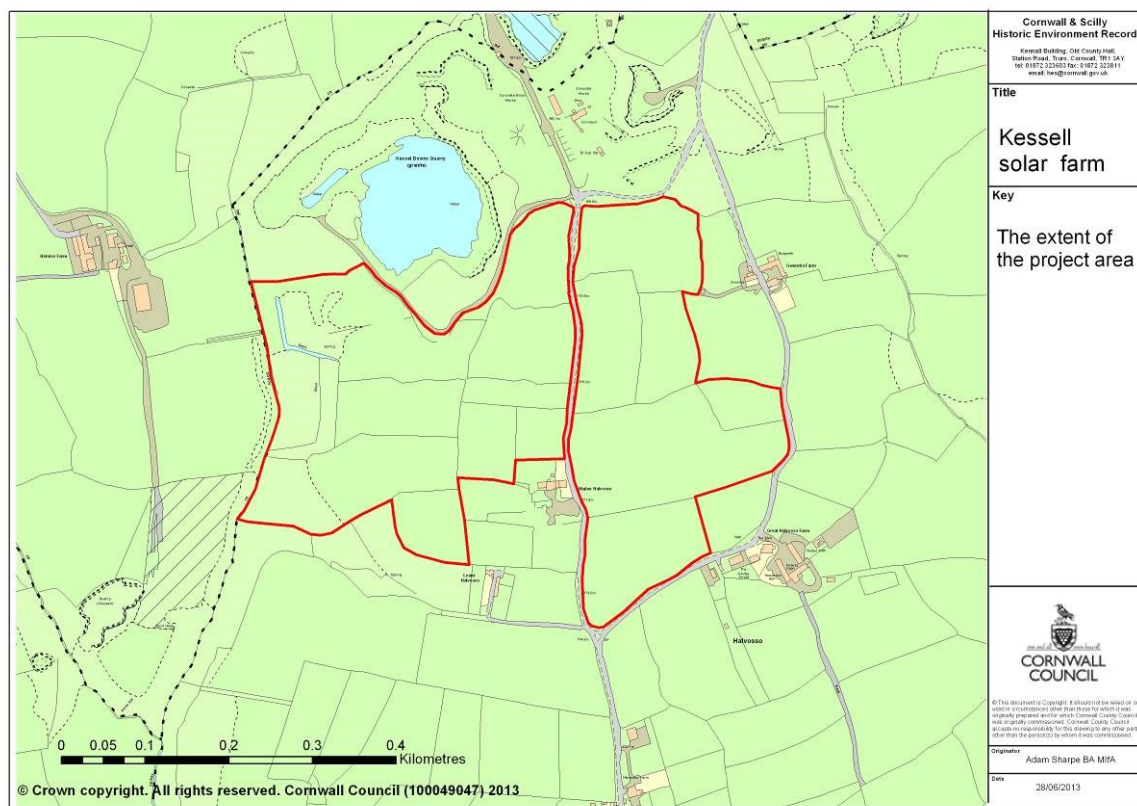


Fig 2. The extent of the project area. The Kessel Downs solar farm is proposed for the eastern two thirds of this block of land.

2 Introduction

2.1 Project background

Historic Environment Projects, Cornwall Council, were approached by Adrian French for AGRenewables in May 2013 with a request to provide costs for the provision of an archaeological assessment of a proposed solar farm at a site to the south of Kessel Downs, Longdowns, in the parish of Mabe in preparation for an application for planning consent. A cost schedule for this work was approved on 05 July 2013.

The proposal is for a solar farm extending over an area of 11.26 Ha. This consists of an area to the west of a public highway consisting of five fields totalling 3.3Ha, and an area immediately to the east of the highway which is made up of six fields with an area of 7.96Ha, though the project area considered within this report includes additional fields to the west of that proposed for the arrays. The site is centred at SW 74076 33511.

Given that the proposal (PA13/04927) was at the time of writing this report at a screening stage, no specific brief for the work was available. In this instance a brief prepared by Phil Markham, Historic Environment Planning Advice Officer (West Cornwall) was used as a model, whilst advice on assessing the impacts of such developments on the settings of designated sites provided by English Heritage in 2012 was also taken into consideration.

The walkover survey and viewshed check were undertaken on 02 August 2013.

2.2 Aims and objectives

The principal aim of the study is to gain a better understanding of the impacts which would result from the construction of a solar farm at Kessel Downs in the parish of Mabe, Cornwall.

The overall project aims are to:

- Draw together historical and archaeological information about the development site and its surroundings, including relevant information held within the Cornwall Historic Environment Record.
- Review and analyse historic map evidence for the site.
- Follow the approach outlined in Section 3 of the English Heritage guidance on setting.
- Identify the construction, use and 'end of life' impacts of the current proposals on the significance of the setting of these assets and on the proposal site.

The site specific project aims are to:

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

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

2.3 Methods

2.3.1 Desk-based assessment

As part of the desk-based assessment (DBA), historical databases and archives were consulted in order to obtain information about the history of the site and its

surroundings, and the structures and features recorded within the site boundaries. The main sources consulted were as follows:

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

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

2.3.2 Viewshed analysis

An assessment of the impacts of the proposals was made from the surrounding area using the guidelines and methodological approaches set out in English Heritage's recent consultation draft guidance on the setting of heritage assets. This was based on GIS-based viewshed mapping produced using a model of theoretical inter-visibility between the solar arrays proposed for the site and significant heritage assets within the surrounding landscape; the viewshed (ZTV or Zone of Theoretical Visibility) was generated using ArcGIS software. The methodology employs a Digital Terrain Model (DTM), which ignores potentially temporary surface features such as buildings, woodland, vegetation, etc. to provide a surface model of potential intervisibility between the proposed solar farm and key heritage assets within the surrounding landscape. A viewshed was generated for a multiple 'observer points' based on the high centroids of each of the fields proposed to site solar arrays.

When performing a viewshed analysis, 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 solar farm at Kessel Downs, 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 an additional offset of 2.0m to represent the heights of the solar arrays. This viewshed was checked on the ground, given that vegetation and other factors may currently block views to key sites, whilst significant heritage assets within the theoretical viewshed were visited (where access was possible) to determine intervisibility with the proposed development site, and hence the scale and type of any visual impacts which may affect their settings, as required by English Heritage (2011). A viewshed radius of either 10Km or 5Km was used to determine potential impacts on designated heritage assets and a radius of 1Km for undesignated heritage assets (see Figs 17 to 20).

Sites identified through intersection of the ZTV modelling with GIS layers containing designated and undesignated heritage assets produced data sub-sets which were further filtered according to their intersection with ZTV zones representing 1Km, 5Km and 10Km radii from the site, as required by model HEPAO briefs 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. Designated sites with limited settings (most Grade II Listed Buildings) and those with local settings such as associated urban development which were more than 2Km from the application site tended to be excluded from assessment at this stage unless specific reasons were identified for their retention.

The resultant site list consisted of a very small number of designated sites with potential intervisibility with the proposal site. This filtered group of sites was assessed to determine impact (see below).

2.3.3 Fieldwork

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

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

2.3.4 Post-fieldwork

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

An archive report (this report) has been produced and supplied to the Client. This report will be lodged with the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation once a planning application for the site has been made. A copy of the report will be supplied to the National Monuments Record (NMR) 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 proposed for the solar farm is centred at SW 74076 33511 on upland farmland to the south of a disused granite quarry at Kessel Downs, Longdowns (Figs 1 to 3). The solar farm is proposed for land ranging from 186m OD at its upper, northern end, and 150m OD at its lowest south western corner. The location has limited views out, these being constrained by ridges less than 1km away to the north, east and west. To the south there are very limited views towards the coast, but the majority of these are blocked by local hedgeline vegetation (for example Fig 23).

The development area is characterised in the Cornwall and Scilly Historic Environment Record (HER) as a mixture of former Medieval farmland (Anciently Enclosed Land) to the west of the road bisecting the site, former downland (Upland Rough Ground), and farmland enclosed within the post-medieval and modern periods (Recently Enclosed Land, see Fig 13). Much of the surrounding landscape is elevated, underlain by granite which outcrops in places and has been quarried since at least the early 19th century. The more elevated parts of this landscape would have, by virtue of their elevation and exposure, been unenclosed downland since prehistory.

The parent bedrock underlying the application site is recorded as granite (BGS data) whilst the local soils are recorded as Moretonhamstead loams over granite.

4 Project extent

The archaeological assessment was focussed on those heritage assets (whether designated or not) which might be physically impacted upon through activities associated with the erection of the solar farm, including cable trenching, siting of permanent infrastructure such as transformer buildings or inverter cabins and with temporary compounds, cranes or other equipment and any associated semi-permanent infrastructure.

The assessment takes into account and quantifies impacts on the settings of heritage assets (both designated and undesignated) within the viewshed of the proposed turbine site in line with current planning policies, 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), namely:

- Non-designated heritage assets – 1Km radius.
- Grade II Listed Buildings, World Heritage Site Areas and Conservation Areas – 5Km radius.
- Scheduled Monuments, Grade I and II* Listed Buildings, Registered Battlefields and Registered Parks and Gardens – 10Km radius.

5 Designations

5.1 International

The 5Km radius viewshed includes a very small part of the Carnmenellis and Wendron Area of the Cornish Mining World Heritage Site to the east.

5.2 National

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

The 10Km radius viewshed zone includes one Scheduled Monument (Fig 21).

The 10Km radius viewshed includes no parts of any Registered Parks and Gardens or Registered Battlefields.

The 10Km radius viewshed also includes one Grade I Listed Building at Pendennis Castle to the east (see Fig 20), but no Grade II* Listed Buildings.

The 5Km radius viewshed mapping indicates that the proposed solar farm would not be intervisible with any Conservation Areas within this zone.

Within the 5Km radius viewshed, the solar farm would be theoretically intervisible with eight Grade II Listed Buildings (or groups of Grade II Listed Buildings) see Fig 19.

5.3 Regional/county

No regional or county designations relate to the site proposed for the solar farm.

5.4 Local

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

5.5 Rights of Way

One right of way traverses the site proposed for the solar farm (see Fig 16). This area is not registered as open access land under the CROW Act 2005.

6 Results of desk-based assessment

The site lies just to the south of the centre and highest point of a very extensive area of elevated, exposed, upland, underlain by granite, which extends southwards to the Helford, to Mabe Burnthouse on the outskirts of Penryn to the east, to Wendron to the south west, Crowan to the west, Four Lanes to the north and Stithians to the north east.

Given its poor soils and exposure, this area has probably always been sparsely settled. The Cornwall and Scilly Historic Environment Record shows that the surrounding landscape during the Bronze age was characterised by barrows and burial sites, over a dozen being recorded within a 2Km radius of the Kessel Downs site, together with a pair of early Bronze Age standing stones, clearly indicating that this land was unenclosed upland, used as important summer grazing by transhumant farmers living off the edges of the moors, as sources of fuel in the form of gorse and heather and animal bedding (heather and bracken) and as the sites for communal ceremonial activities. Nevertheless, by late prehistory, settlement had begun to creep up onto the edges of the uplands, there being eight Iron Age/Romano-British rounds or defended farmsteads in the lower-lying areas of the landscape surrounding the Kessel Downs site at Higher Spargo, Turnermere, Carnsew, Carveth, Carnkie, Trewince, Herniss and New Lestraynes.

Those late prehistoric settlements on the more elevated areas of the upland do not seem, in the main, to have been succeeded by early Medieval farmsteads, perhaps a reflection of the poor soils and extreme exposure of the higher land.

Nevertheless, some farms were established during this period, as at Halvasso, Hantertavis, Trenow, Gwendra and Nancrossa, though it may be significant that the majority of these pre-conquest farms were located on the warmer, sunnier land falling to the south from the highest ground. In the more elevated or exposed areas, a substantial number of the place names are in English – Edgcumbe, Longdowns, Rame, Bay View, Greenacre and Cliftures – reflecting the post-Medieval enclosure and settlement of the downs by smallholdings occupied by those working in the quarrying industry or in nearby mines, or by recently-established speculative new farms. Not all were successful, and the survival of smallholdings, in particular, was subject to the vagaries of the mining and quarrying industries. The vast majority in this immediate area have now disappeared, incorporated into modern farmland.

The first mapping depicting this area dates to the 17th century, when John Norden produced his map of Cornwall (Fig 5). This late 17th century mapping, published in 1728 depicting the Hundred of Kirrier, showed this landscape as being sparsely populated and dominated by a significant area of upland - Longdowns.

In the early 18th century Gascoyne (Fig 6) depicted the surrounding landscape as containing very few settlements or farmsteads, the closest being Halvasso to the south, within whose lands this site probably lay. Tracks and roadways traversed these uplands, one more or less following the boundary between the parishes of Mabe and Stithians. Thomas Martyn's map drawn up a few decades later showed little change in this landscape (Fig 7).

The 1st Edition of the Ordnance Survey 1" to a mile mapping (Fig 8), dating to the first decade of the 19th century, again shows this landscape as a sparsely-occupied upland area traversed by roads and lanes, with farms established during the medieval period being off the flanks of the downs to the south. The mapping seems to suggest that all of the landscape surrounding the application site was predominantly exposed downland at the beginning of the 19th century, though the better and more sheltered land had been enclosed as farmland.

The *circa* 1840 Mabe Tithe Map (Fig 9) provides a little more detail of this upland landscape at the northern edge of the parish. The area within which the solar farm is proposed was, at that date, occupied by fields, some of which represent modified medieval farmland, others representing fields associated with recently-created farms or smallholdings, three cottages or groups of cottages recorded on the mapping probably represent quarrymen's housing with attached groups of small fields.

Six occupiers were noted within the project area, the land being held by three landowners: Samuel Stephens Esq., Joseph Matthew Esq. and Henry Trebilcock, as follows. All are named as parts of Halvosso.

Henry Trebilcock owner, Thomas Morcomb occupier, 15 acres 9 poles and 15 perches.

1085	Cottage and garden	
1086	No name	Arable
1087	No name	Furze
1088	Moor	Pasture
1090	No name	Pasture
1091	No name	Arable
1092	No name	Arable
1097	No name	Arable

Joseph Matthews Esq. owner, Thomas Morcomb occupier, 7 acres, 0 poles and 10 perches.

1042	Great Laddis	Arable
1043	Sprys Close	Arable
1044	Outer Laddis	Arable
1045	Inner Laddis	Waste
1046	Lane Close	Arable
1047	Morcomb's Field	Arable
1089	No name	Arable

Samuel Stephens Esq. owner, John Nicholls occupier, 31 Acres, 3 poles, 30 perches

1053	No name	Arable
1054	Eddy's Field	Arable
1055	Joan's Field	Arable
1056	Middle Field	Arable
1064	Higher Croft	Furze
1074a	Part of Lower Moor	Pasture

Samuel Stephens Esq. owner, Thomas Dunstan occupier

1074b	Part of Lower Moor	Pasture
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Samuel Stephens Esq. occupier, Thomas Dunstan occupier

1081	Middle Close	Furze
1082	Cottage and garden	
1083	South Close	Arable
1084	Part of Highway	

Samuel Stephens Esq. owner, John Francis occupier, 4 acres, 2 poles, 4 perches

1074c	Part of Lower Moor	Pasture
1075	No name	Arable
1076	No name	Arable
1077	No name	Arable
1078	No name	Arable
1079a	Cottage and garden	Waste

The fact that many of these fields are un-named is indicative of their recent creation as parts of smallholdings or new farms created from former downland.

By the late 19th century (Fig 10) it can be seen from the 1st Edition of the Ordnance Survey 25" to a mile mapping that this area to the south west of Longdowns had become a focus for small-scale granite quarrying, there being 13 individual quarries within the immediate area of Kessel Downs. None were marked as disused at this date, whilst the relatively small-scale of the associated spoil dumps suggests that activity within this area had commenced relatively recently.

In 1907/8 (Fig 11) the 2nd Edition of the Ordnance Survey 25" mapping showed that many of these quarries must have had very short lives. Of the eleven quarries shown, six were shown as disused. However, during the 20th century, the 2005 Cornwall County Council aerial photograph (Fig 12) indicates that many of these smaller quarries must have been taken up and amalgamated into a single, larger scale working represented by two now-disused and flooded quarries and their adjacent re-worked spoil dumps just to the north of the application area. An operational concrete batching plant occupies a site immediately to the east of the minor road just to the north of the site proposed for the solar farm.

7 Results of site walkover

A site walkover was undertaken on 02 August 2013. The weather was warm, with variable cloud cover. Clear visibility was possible out to in excess of 10Km of the site.

The site proposed for the solar farm lies immediately to the south of a disused and partially reworked granite quarry on upland grassland comprising eleven fields, some of these being aggregations of formerly smaller fields, the 1877 OS 25" mapping showing 13 fields within this block of land. Most boundaries are likely to be between 200 and 300 years old, taking the form of Cornish Hedges between 1.0m and 1.5m high and between 1.6m and 2.0m high (Fig 30), most being topped with deliberate hawthorn plantings to provide windbreaks (Fig 23). These thorn bushes increase the hedge heights by between 1.5m and 4.0m, restricting both intervisibility between adjacent fields and views out of the proposal site. Some field corners and edges also support mature trees (Figs 24 and 26), whilst blackthorn, bramble and gorse also grow on the hedges, some of which have been made stockproof by the addition of electric fencing. Some granite gateposts survive, but most gateways have been widened from their original sizes to allow the passage of modern farm machinery.

The majority of the fields had recently been cut for hay or silage, and were in a regenerating grass crop. The northern three of the eastern block of fields were in notably lower grade rough pasture (Fig 28) and were being grazed by a small herd of cows at the time of survey. The eastern block of fields was also in a regenerating grass crop following a hay or silage cut.

Historic Environment Projects were also asked to assess an additional five fields immediately to the west of the area proposed for the solar farm (Fig 3). One of these (the small enclosure to the south east) was a closely-grazed horse paddock adjacent to Higher Halvosso. The field immediately to its north had, again, recently been cut for hay or silage – a comparison with the OS 1877 mapping shows that this enclosure was originally three fields, the westernmost of which was depicted as rough grazing. The lowest section of this field adjoining the stream course merges into an area of marshland and willow carr (Fig 35).

The remaining two large fields to the north were, in 1877, one large enclosure, two large areas of rough grassland and a pair of smallholdings (probably held by quarry workers) made up of nine small fields, two garden plots, cottages and small outbuildings. One of these smallholdings predates 1840 (TA map evidence), the other was laid out between 1840 and 1877. These smallholdings survived in recognisable form until at least 1907 (OS map evidence), but the potential southward expansion of the quarry probably forced their abandonment. The large area containing the smallholdings, rough land and enclosure have, as a result, been left to revert to bramble, bracken, coarse grass, scrub and occasional willow, and is currently unsurveyable by virtue of its vegetation cover (Fig 36). It is not known whether any remains of the smallholding buildings adjacent to the quarry tip survive as a result.

Views out into the landscape surrounding the area proposed for the solar farm are notably closed in by the rising ground to the north, views terminating along the ridgeline followed by the A394 between Longdowns and Edgcumbe. To the east, views from the site are closed off by a ridgeline running southwards from Longdowns through Hantertavis and Bay View Farm to Trevone Farm (Fig 32), whilst to the west, a pair of ridges running southwards from Herniss through Herniss Farm to Lower Halvosso and from Rame southwards through Nancrossa, through the sites of New Lestraynes, and Lestraynes to Callevan (Fig 33 and 34) form the effective limits of visibility of the site. In practice, visibility out from the site in all three of these directions is even more constrained, given the abundant hedge-top vegetation around all local fields and the substantial vegetated Kessel Downs Quarry tip to the north.

The views to the south are theoretically more open, the DTM viewshed suggesting some degree of intervisibility with the landscape stretching down to the banks of the Helford. In practice, although glimpses of the sea could be seen from one location within the

southern part of the proposed development area, most views were blocked in by mature trees less than 0.5km away (Figs 23 and 24). The transmitter on Carnmenellis was just visible from a few locations (Figs 25 and 31).

With the exception of a few quite substantial lynchets marking the sites of documented post-medieval boundaries which were removed during the 20th century, no upstanding archaeological features or earthworks were recorded. The general character of the boundaries suggests that this area of former downland was probably enclosed during the early 19th century or shortly before.

8 Results of viewshed analysis

See Figs 17 to 20.

Given the combination of the elevated location of the site and the low level nature of the solar arrays, the viewshed analysis suggests that the Zone of Theoretical Visibility (ZTV) will be very restricted, the majority of intervisible areas lying within 1km of the site proposed for the solar farm. The theoretical ZTV does extend further to the south, extending to the Helford, though very patchily (Fig 20). The visibility of the solar arrays will diminish rapidly away from the site, and will, at no great distance, be locally blocked by buildings within settlements, hedgeline vegetation or mature groups of trees. Even if some of these trees are felled in the future, local hedges and the vegetation they support will effectively block the visibility of the proposed solar farm from most areas over a few hundred metres from it, the exceptions being the east-facing slopes of the two ridges up to 0.5km to the west and the west-facing slope of the ridge 0.5km to the east.

8.1 1 km radius ZTV

See Fig 17.

Given the nature of the topography of the landscape surrounding the site proposed for the solar farm at Kessel Downs, the development would theoretically be visible from about 60% of this area, the hilltop to the north of the site, the lower ground to the south of the site between Halvosso Farm and Potter's and the valley bases to the east and west being outside the ZTV. In practice, visibility of the site is only likely from the ridge slope to the west between New Lestraynes and Lestraynes and around Herniss Farm and around Hantertavis to the east.

8.2 1Km to 5Km radius ZTV

See Figs 18 and 19.

This zone largely covers the central part of the granite upland area centred on Longdowns, extending to Ponsanooth to the north east, Constantine to the south, Budock Water to the south east and Porkellis to the south west.

The ZTV within this zone is very limited indeed, small patches of theoretical intervisibility being suggested to the south of the site around Halvosso and Treverva between 1km and 2km away. Between 2km and 5km away from the site, small patches of theoretical intervisibility are suggested around Seworgan and Penjerrick to the south west and south east respectively.

In practice, views of the site from these areas are unlikely to occur, given the abundant local hedge vegetation.

8.3 5Km to 10Km radius ZTV

See Fig 20.

This zone extends to Camborne-Redruth to the north west, Praze-an-Beeble to the west, Helston to the south west, St. Martin to the south, St. Anthony-in-Meneage to the

south east, St. Mawes and Carrick Roads to the east, Kea to the north east and Scorrier to the north.

The ZTV mapping suggests a small patch of intervisibility on the southern slopes of Carnmenellis 5.5km to the north west, and around Helford Passage and Flushing between 8.5km and 10km to the south of Kessel Downs.

In practice, no views of the solar farm are likely from any designated or undesignated sites or landscapes within these areas.

8.4 Scheduled Monuments within the 10Km radius ZTV

See Fig 20.

Five Scheduled Monuments falls within the 10km radius ZTV around the proposed solar farm.

1012134 – Pendennis Castle

1004431 – Little Dennis fortifications

1006665 - Three crosses at Bosvathick

Cairn on Carnmenellis - 1001727

1004428 – Earthwork 270m south east of Carplight

This site are all at a sufficient distance from Kessel Downs that no impacts will occur on their settings.

No other Scheduled Monuments lie close enough to the site proposed for the solar farm for impacts on their settings to occur as a result of shared inclusion within key views.

8.5 Registered Parks and Gardens within the 10Km radius ZTV

No Registered Parks and Gardens fall within the ZTV within 10Km of the proposed solar farm at Kessel Downs, and none are close enough to the proposed solar farm for setting impacts to occur as a result of shared inclusion within key views.

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

One Grade I Listed Building falls within the 10Km radius ZTV – Pendennis Castle. This is sited 8.8km from Kessel Downs and no impacts on its setting are likely from the construction of the solar farm to the west north west.

There are no Grade II* Listed Buildings within the 10km radius viewshed of the solar farm.

No Grade I or II* Listed Buildings are sited sufficiently close to the proposed solar farm for inclusion within shared views of it to result in impacts on their settings.

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

The only part of any area of the Cornish Mining World Heritage Site falling within the 10Km radius ZTV is the summit of Carnmenellis, part of Area A4 – the Wendron Mining District. The area within the ZTV is so small and the distance so considerable that no impacts on the setting of the WHS will result.

8.8 Conservation Areas within the 5Km radius ZTV

No intervisibility is suggested between the solar farm proposed at Kessel Downs and any Conservation Area within a 5Km radius of the site, nor are key views of any Conservations Areas likely to be impacted upon by the inclusion of the Kessel Downs solar farm.

8.9 Grade II Listed Buildings within the 5Km radius ZTV

See Fig 19.

Nineteen Grade II Listed Buildings (or groups of buildings) intersect the 10Km radius ZTV, of which eight intersect its 5km radius zone. These are:

- 1158763 – Callevan farmhouse
- 1158710 – Gate piers at Bosvathick Lodge
- 1142066 – Gate piers at Penwarne House
- 1328405 – Kitchen garden wall at Trewardreva House
- 1142134 – Trecombe farmhouse
- 1328739 – Bosvathick Lodge
- 1311233 – Trecombe Farm cottage
- 1142135 – Outbuildings south west of Trecombe Farm

Within 2Km of the Kessel Downs site, the only grade II Listed Building is:

- 1158763 – Callevan farmhouse

Impacts on the settings of Listed Buildings within the 5km and 2km zones is considered very unlikely unless they are in very close proximity to and clearly intervisible with the solar farm. The gate piers and kitchen garden walls have only immediate settings, whilst the domestic buildings have inherently local settings. Callevan farmhouse is 1.43km from the nearest point of the proposed solar farm.

8.10 Undesignated sites within the 1Km ZTV

See Fig 17.

Around half of the landscape within a 1km radius of the proposed Kessel Downs solar farm will be theoretically intervisible with all or part of it.

Ten sites are listed in the Cornwall and Scilly Historic Environment Record within this zone, these being mostly a mixture of possible prehistoric sites identified from place names, farms of medieval origin and granite quarries or associated sites.

Prehistoric

- MCO8044 Herniss 'round' field name.
- MCO8280 New Lestraynes 'round' field name.

Medieval

- MCO14725 Halvasso medieval settlement
- MCO34196 Little Lestraynes medieval field boundary.
- MCO34194 Longdowns medieval field system
- MCO34176 Lower Halvasso medieval field system
- MCO34170 Hantertavis medieval field system

Post-medieval/modern

- MCO34177 New Lestraynes quarry
- MCO34174 Herniss quarry
- MCO34163 Hantertavis quarry

Given the nature of the majority of these sites, the proposal for a solar farm at Kessel Downs would have no significant impact on their settings. Some possible impacts on

settings might occur, however, on farms with medieval origins which are close to the Kessel Downs site.

9 Field verification of ZTV

The viewshed mapping and potential impacts were, wherever possible (given constraints on public access) ground checked from a number of locations, including at or near settlements of medieval or post-medieval origin within the 1Km viewshed. These included Higher Halvosso, Halvosso, Boundis Farm and Potter's to its south and Great Halvosso and Gwendra Farm to its east. Potential intervisibility was also checked from Longdowns, Pokanuggo, Herniss, Rame and Edgcumbe to the north.

There was no ready public access to sites at or near Nancrossa, Herniss Farm, New Lestraynes or Lestraynes to the west of the site or Hantertavis and Bay View Farm to its east. Herniss Farm is the site of a very visible waste recycling business. New Lestraynes and Lestraynes were noted as being intervisible with many areas of the solar farm, as was Hantertavis.

At each accessible designated heritage site the potential visibility (and proportional visibility) of the proposed solar farm was considered. Views out from the site towards key heritage assets were checked from locations within the area proposed for the solar farm. The general degree of openness of the views out from the site was assessed.

Given the substantial constraints on intervisibility, no photographs were taken from locations within the surrounding landscape, though they were taken from Kessel Downs of intervisible areas of the local landscape (Figs 21 to 36). In practice, field hedges and trees blocked potential views of the site from most of the surrounding area. The visibility cut-off imposed by the local topography which was suggested by the viewshed mapping was confirmed.

10 Cumulative impacts

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

There are a number of active proposals for solar farms within the immediate locality, those currently being screened being at Herniss Farm (PA13/03572, 11Mw) immediately to the east, Herniss not far away (PA10/08528, 5Mw currently being reconsidered as PA13/04112), Nancrossa (PA13/03360, 6Mw) and Butteriss (PA13/03053, 3Mw). Two proposals have been withdrawn by the applicants (Yew Tree Cottage PA12/09032, 2.75Mw, which is being re-presented as PA12/07878, 5Mw and Little Trevease PA10/05012, 5Mw). A 2.75Mw solar farm has been approved at Halvasso (PA12/09502). All lie within 1.9km of the application site adjacent to Kessel Downs Quarry, and over half are within 1km of it.

Within 2.75Km of the proposed site of the solar farm near Kessel Quarry there have been a substantial number of applications for wind turbines of various sizes in view of the elevated character of the topography and the suitability of this landscape for such generating capacity given the direction of the prevailing wind. A number of small, domestic examples have been approved, or are already operational (as at Goodagrane Adventure Centre, Chyan Farm, Trevone, Halvasso, Higher Carvedras and Lower Rame Farm, as have two small to medium examples at Little Viscar and another adjacent to the Roseline Estate). Several schemes for single or multiple small to medium sized turbines have been withdrawn by applicants (at Little Viscar, Wendron Cricket Club, Little Butteriss, Halvasso), together with one at Tregantellen for a medium sized wind turbine. A scheme for 10 small wind turbines to the south of Butteriss has also been withdrawn, and the status of a proposal for 20 small to medium wind turbines at Little Trevease cannot be determined from the available information. Additional proposals are

recorded for Little Trevease (one application for five turbines and another for two turbines), Lower Nancrossa (3), Rame (1), Kessel Downs Quarry (1) and a small example at Vicarage Farm (1).

Other wind turbines are proposed to the north of the ridge, and to the east around Mabe Burnthouse. This is, therefore, a part of the Cornish landscape within which small, medium and occasional large wind turbines already have a visible presence and within which more are likely to be applied for, some of which are likely to be constructed.

High voltage power lines carried on tall pylons also cross the landscape from two directions to the north of Rame, one line running in from the north west, the other from the north. These converge at a prominent hilltop transformer site just to the south of Rame 1.4Km to the south west of Kessel Downs.

The television aerial mast on Carnmenellis 4.5Km to the north is a skyline feature from much of the surrounding landscape, as are the tall concrete batching plant in the eastern part of the Kessel Downs Quarry site, a number of mobile phone and communications masts (as, for example, at RNAS Culdrose) and the remaining Goonhilly Downs Satellite dishes to the south.

In summary, therefore, the landscape surrounding the proposed solar farm already contains a number of often visually-prominent 21st century features, though remains essentially open and agricultural in character. However, given the restricted visibility of the proposed Kessel Downs solar farm, no cumulative effects are likely to result from its construction.

11 Synthesis

Neither the desk based assessment nor the walkover survey indicated the presence of any significant upstanding archaeology which might be impacted upon by the proposed solar farm at Kessel Downs.

Impacts on both heritage assets within the local landscape resulting from the construction of the solar farm on land on Kessel Downs will be very limited and restricted to the landscape within 1km of its site. Factors influencing this include distance from the development site, state of preservation, nature, and the substantial effects of reduced or blocked intervisibility due to local topography, vegetation (including hedge plantings), the presence of other buildings or the proximity of modern features in the landscape. Local topography significantly restricts views of the solar farm from archaeological sites in the local landscape to a very constrained area immediately around it.

12 Policies and guidance

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

12.1 National Planning Policy Framework 2012

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

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

has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

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

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

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

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

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

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

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

12.2 Former Cornwall Structure Plan

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

12.2.1 Policy 1

'Development should be compatible with:

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

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

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

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

12.2.2 Policy 2

'Throughout Cornwall, development must respect local character and:

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

12.3 Former Kerrier Local Plan

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

Policy B.EN1: Historic Heritage – Archaeology

Development that would significantly harm sites, buildings and other remains of archaeological and historic importance, or their setting, will not be permitted unless there is a need for the development and the benefits for the community outweigh the archaeological importance. Where it affects archaeology that is found to be of national importance, development will only be permitted if the remains can be preserved in-situ without significant harm to them and to their setting; where it affects other sites and on-site preservation is impracticable or unnecessary, the development should include excavation and recording of significant remains and a planning obligation to secure this will be sought.

Policy B.EN2: Historic Heritage – Scheduled Ancient Monuments

Development that would significantly harm a Scheduled Ancient Monument, its setting or archaeological interest will not be permitted.

Policy B.En3: Historic Heritage - Areas of Great Historic Value

Development within the Areas of Great Historic Value that would significantly harm their historic character or the preservation of archaeological or historic remains and their setting will not be permitted.

Policy B.En7: Historic Heritage – Registered Parks and Gardens of Special Historic Interest

Development that would significantly harm the form or character of important historic features of the buildings, structures or gardens of a registered park and garden of special historic interest or its setting in the landscape will not be permitted.

Policy B.En8: Historic Heritage – Houses and Gardens of Local Historic Interest

Development within or adjoining houses and gardens of local historic interest will be permitted where there is no significant harm to:

- (I) The preservation of the significant historic and architectural features of interest, layout and ornamentation of the house and grounds;*
- (II) The conservation of the historic character of the house within its parkland or garden setting; and*
- (III) The conservation of the historic character, landscape and setting of the parkland, including its trees and woodland.*

B.En9: Listed Buildings – Preservation, Alteration, Extension and Change of Use

Development involving the alteration, extension or the change of use of a listed building will be permitted where it has special regard to the desirability of its preservation, the preservation of its appearance, character, setting and any features of special architectural or historic interest which contribute to its listing and it is compatible with the fabric and interior of the building. Development which would not preserve the listed building, its setting or any features of special or historic interest will not be permitted unless it can be demonstrated to be the only way in which the building can be retained.

12.4 Hedgerow Regulations

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

13 Likely impacts of the proposed development

13.1 Types and scale of impact

Two general types of archaeological impact associated with solar farm developments have been identified as follows.

13.1.1 Types of impact, construction phase

Construction of the solar farm could have direct, physical impacts on the buried archaeology of the site through the creation of foundations for inverter or transformer buildings, through the undergrounding of cables, as a result of the installation of ground anchors to support array panels, and through the provision of any works compound, together with any permanent or temporary vehicle access ways into and within the site. Such impacts would be **permanent** and **irreversible**.

13.1.2 Types of impact, operational phase

This solar farm might be expected to have a visual impact on the settings of some heritage assets within its viewshed during the operational phase, given its potential high visibility as a large modern feature within the landscape, the elevation of the site and the open nature of the local landscape. Such factors also make it likely that the development would have an impact on Historic Landscape Character. These impacts would be temporary and reversible should the solar farm subsequently be dismantled and not re-powered or replaced.

13.1.3 Scale and duration of impact

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

positive/substantial

positive/moderate

positive/minor

neutral

negative/minor

negative/moderate

negative/ substantial

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

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

13.1.4 Potential and residual impacts

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

13.2 Assessment of impact

Overall, the impacts of the proposed solar farm on the archaeological resource are assessed as having a potential scored as **neutral**.

Impacts on the settings of the designated heritage sites within 10Km of the proposed solar farm has been assessed as **neutral**.

Impacts on potential sub-surface archaeology within the development site are unquantifiable on currently-available information, but are likely to be limited.

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

13.2.1 Impacts on archaeological sites within the development area

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

Scales of impact will vary with the degree of significance of individual sites, and with the proportion of the whole site which would be affected. On the basis of the documented history of the site, no such impacts are likely to take place.

13.2.2 Impacts on the settings of surrounding key heritage assets

The proposed solar farm is considered likely to have no appreciable negative impact on the setting of key surrounding heritage assets, the impact therefore being summarised as **neutral** and temporary/reversible overall should the solar farm be dismantled at the end of its consented life.

- Two Scheduled barrows are sited just over 1Km from the site proposed for the solar farm. These would have been intended, when constructed, to be highly visible focal points within the local landscape. There will be no intervisibility between these sites and the proposed solar farm. Herniss Farm lying between these Scheduled sites and the site proposed for the solar farm sites a prominent, recently created open-air recycling facility, whilst a nearby small-scale landfill site just to its south has already impacted on their setting as seen from the north east. Wind turbines are visible from the barrow sites, whilst less than 1.5Km to the north west is a highly visible electricity transformer station with its associated high voltage pylon lines.
- The other Scheduled Monuments within the 10Km viewshed are either of types which have only limited settings or are at distances from the proposed solar farm where their settings are unlikely to be impacted upon.
- Additionally, as a result of the process of enclosure within the surrounding countryside during the medieval period, together with granite quarrying in the 19th and 20th centuries, the character and appearance of the landscape within which these prehistoric monuments now sit has changed considerably from those within which they were originally designed to be seen and understood.
- A number of highly visible wind turbines can be seen at a number of locations within the surrounding landscape. There are also existing solar farms within the surrounding landscape.
- During the operational phase the solar farm is unlikely to impact to any significant degree on the setting of the majority of the Listed Buildings within its viewshed, given the relatively large distances between the solar farm and these designated structures and the constraints on intervisibility.
- There are no Registered Parks and Gardens or Registered Battlefields within the 10Km radius viewshed of the proposed solar farm.
- There are no Conservation Areas within the 5Km radius viewshed of the proposed solar farm.
- The only identifiable impacts will be on undesignated farmsteads of probable medieval origin within 1Km of the proposed Kessel Downs site which will have uninterrupted views of it.
- Any impacts on heritage assets within the landscape surrounding the proposed solar farm would be **temporary** and **reversible** should it be dismantled at the end of its consented lifespan.

13.2.3 Designated heritage assets within the 10Km radius viewshed

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

Scheduled Monuments (SM) – see Fig 20.

No Scheduled Monuments within 10km of the proposed solar farm were considered as requiring an assessment of impact.

Registered Parks and Gardens.

No Registered Parks and Gardens within 10km of the proposed solar farm were considered as requiring an assessment of impact.

Grade I and II* Listed Buildings (LBs).

No Grade I or Grade II* Listed Buildings within 10km of the proposed solar farm were considered as requiring an assessment of impact.

13.2.4 Designated heritage assets within the 5Km radius viewshed.

Grade II Listed Buildings – see Fig 19.

Identifier	Site	NGR	Impact
1158763	Callevan Farm	SW 73770 31892	Neutral

World Heritage Site Areas.

No Areas of the Cornwall and West Devon Mining Landscapes World Heritage Site were considered as requiring an assessment of impact.

13.2.5 Undesignated heritage assets within the 1Km radius viewshed

See Fig 20.

Identifier	Site	NGR	Impact
MCO14872	Herniss	SW 73446 34333	Neutral
MCO14723	Hantertavis	SW 74289 33709	Negative minor

13.2.6 Impacts on Historic Landscape Character

A solar farm erected on the elevated land at Kessel Downs can be predicted to have an impact on the historic character of the landscape to some degree. The expected effect on HLC has been assessed as **negative/moderate** to **negative/minor**. Factors contributing to this assessment are as follows;

- The land-take for the proposed development is relatively substantial.
- There would be no impacts in terms of physical loss during the construction phase of features which form the visible components of this type of HLC.
- Some visual impact throughout the operational phase would occur, affecting the integrity of this area as mostly former downland which had largely been enclosed through the practice of the creation of industrial smallholdings and small farms, in particular through the introduction of a highly visible modern feature into this open landscape.
- However, this area has had a history of industrial activity from the 19th century to the present day, including quarrying, which introduced usually temporary highly visible features such as cranes and waste dumps into the landscape. In addition, the site lies close to Rosemanowas Quarry, which was the site for the pilot Hot Rocks project, which, whilst operational, sited a pair of prominent (but now dismantled) drill towers.
- There are already a number of wind turbines and other tall modern features such as pylons and aials within the landscape to the north of this site.
- Any impacts on the legibility of HLC would be temporary and reversible should the solar farm be dismantled at the end of its consented lifespan.

14 Mitigation Strategy

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

14.1 Geophysical survey

Whilst the present assessment has allowed the determination of impacts on the settings of both designated and undesignated sites and landscapes to be determined, as also the potential for impacts on upstanding archaeology, the information currently available is insufficient to determine whether groundworks or other activities involved in the construction of the solar farm would impact on any significant below ground archaeology.

It may be, therefore, that the HEPAO may recommend that all or part of the area proposed for the solar farm is subjected to a geophysical (magnetometer) survey. Whilst such an approach would not be capable of detecting all sub-surface archaeological features, it would be capable of informing the extent, nature and character of any significant underlying features.

14.2 Site redesign

In the case where a geophysical survey were to reveal the existence of archaeological sites within the development area which are judged by the HEPAO to be of significance and vulnerable to disruption or damage, it may be recommended that the areas with which they lie are excluded from development, or alternatively that methods are employed which can be proven to prevent any damage to them during both the construction and operational phases of the solar farm (for instance ground-mounted concrete pads on which solar arrays may be sited within sensitive areas of the site). Such a proposed site redesign would be discussed in detail between the HEPAO and the developer as part of the pre-application process in the light of available information.

14.3 Archaeological evaluation

Where geophysical survey indicates the presence of potentially significant sub-surface archaeology, the HEPAO might require the evaluation of such features through evaluation trenching by suitably qualified archaeologists to confirm the identification of such features and to determine their susceptibility to the impacts likely to result from the construction of the solar farm. The scope for this work would be determined by the HEPAO in the form of a brief following discussion with the developer. An approved WSI would be required before such work could take place, and the results of the investigation would have to be set out in a written report, which would form the basis for any further discussions regarding potential mitigation of the development.

14.4 Archaeological recording

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

Archaeological recording in the form of the recording of upstanding elements of the site which might be negatively impacted upon by the works, or a watching brief (observation by an archaeologist during mechanical ground reduction activities) might be required either where any significant features or areas of ground are to be disturbed (for instance by the foundations for permanent buildings, during cable trenching, where ground reduction activities are proposed for temporary infrastructure), in areas where significant features had been identified through the site walkover or a 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 reduce any impacts on the archaeology of the site to **negative/minor**. Any resultant impacts produced by the development of the site would be reduced to **permanent** and **irreversible**.

15 References

15.1 Primary sources

Cornwall County Council 2005 aerial mapping of Cornwall.

Joel Gascoyne's 1699 Map of Cornwall

Martyn's 1748 Map of Cornwall

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

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

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

Ordnance Survey, 2007. *Mastermap Digital Mapping*

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

15.2 Publications

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

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

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

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

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

15.3 Websites

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

16 Project archive

The HE project number is **PR146280**

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

1. A project file containing site records and notes, project correspondence and administration.
2. Digital photographs stored in the directory R:\Historic Environment (Images)\SITES.I-L\Kessel Downs solar farm assessment 2013
3. English Heritage/ADS OASIS online reference: cornwall2-156948
4. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites K \Kessel Downs solar farm assessment 2013\Kessel Downs solar farm assessment.doc

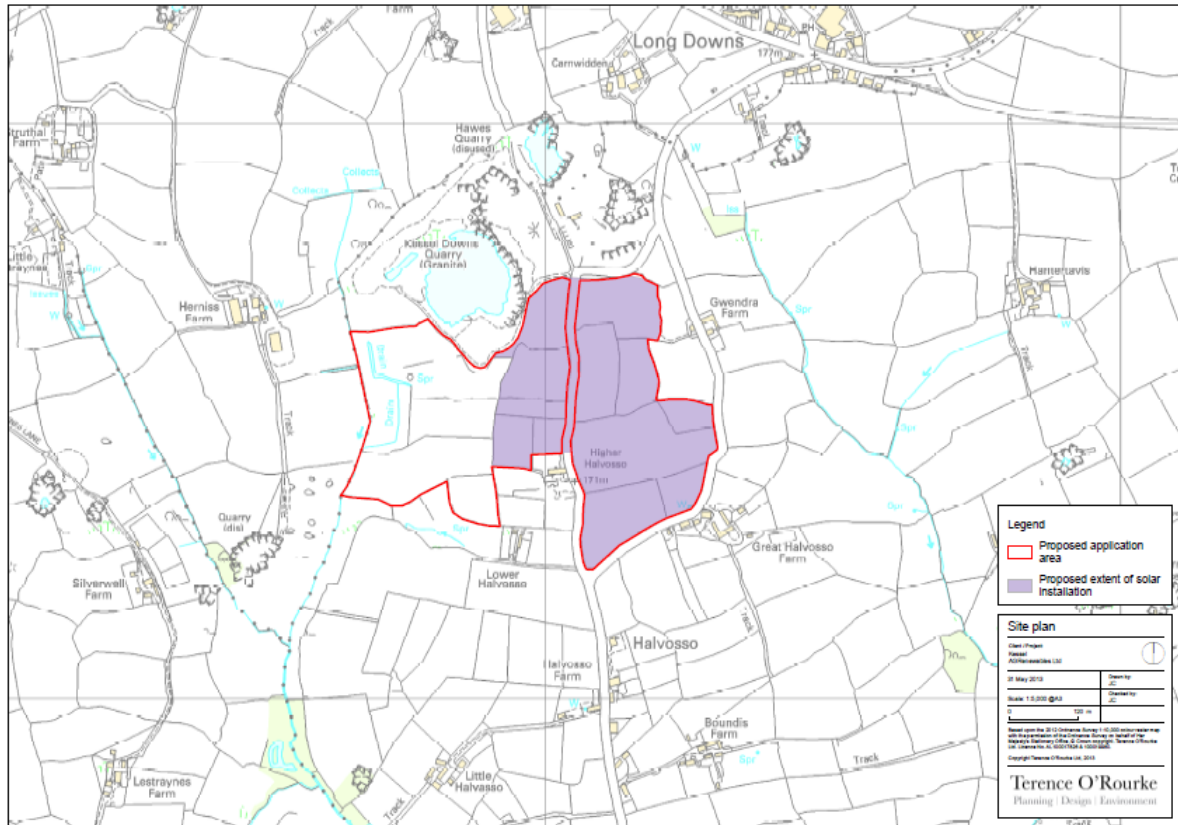


Fig 3. The extent of the project area proposed for the current application for a solar farm (shaded purple).

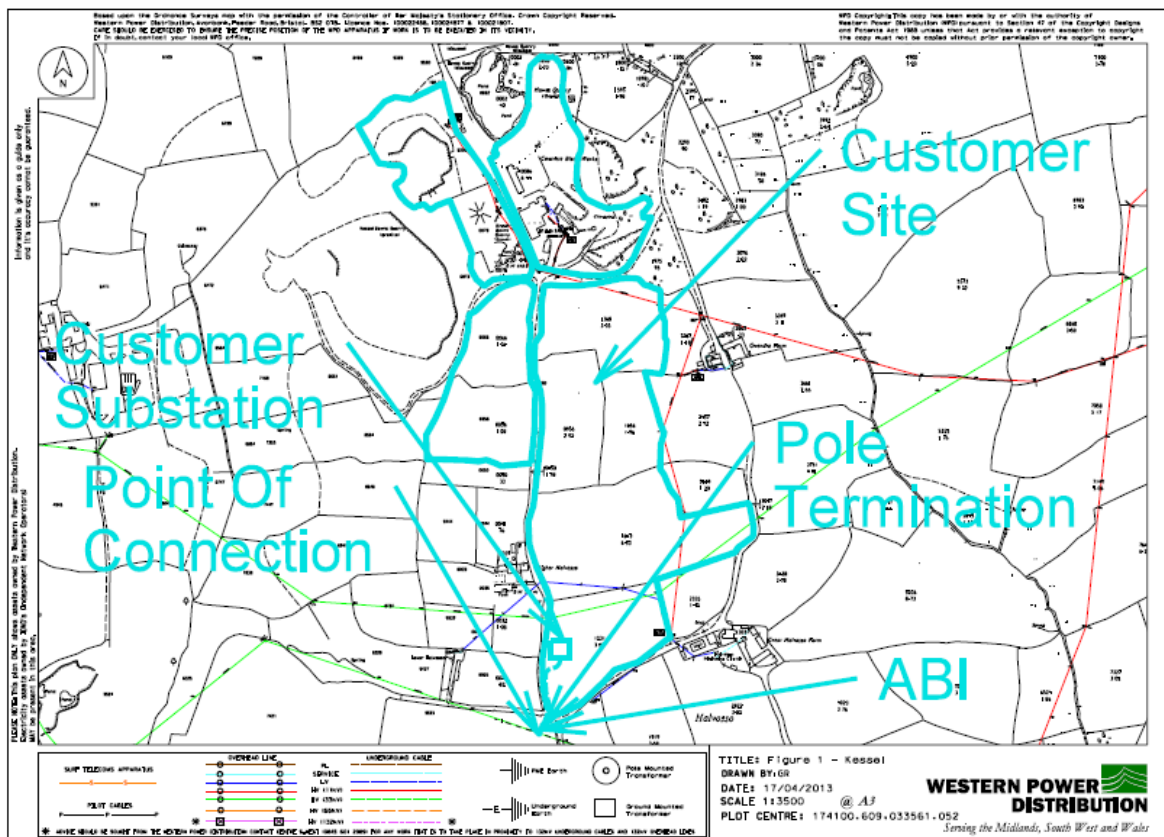


Fig 4. Proposed National Grid connection for the proposed Kessel solar farm.



Fig 5. The proposed solar farm site and its surroundings, as shown on John Norden's 17th century Map of Cornwall, published in 1742. The project area is circled in red.

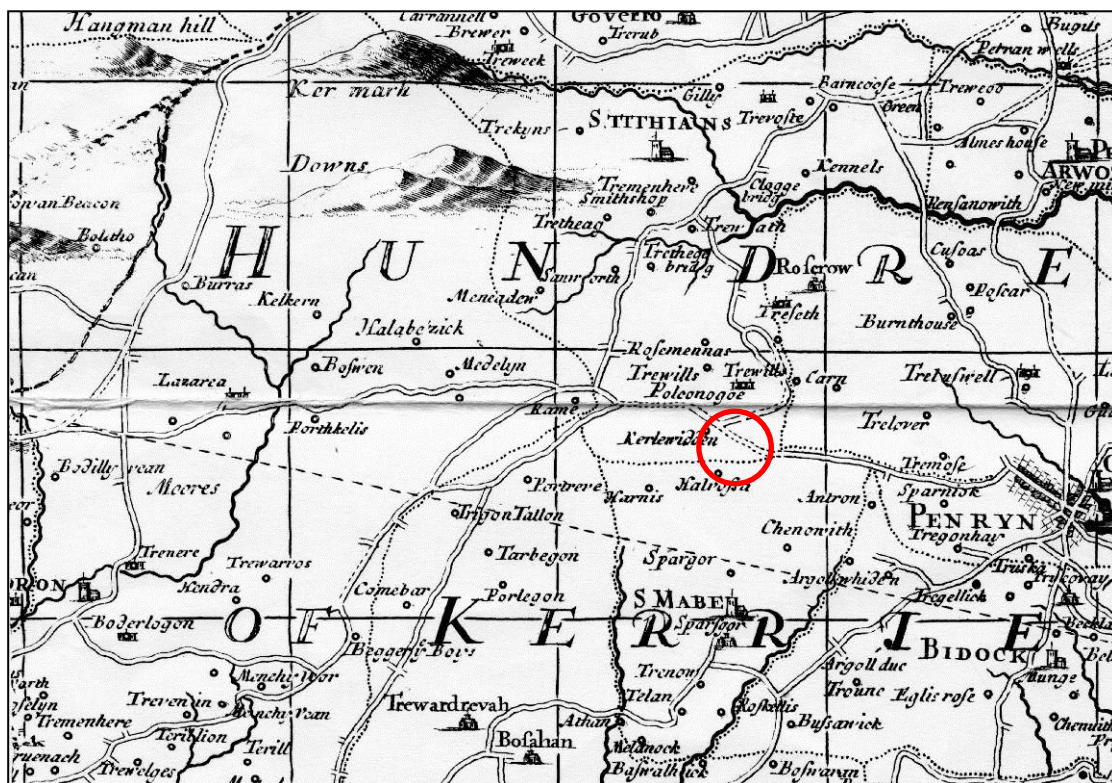


Fig 6. The project area and its surroundings, shown on Joel Gascoyne's 1699 Map of Cornwall. The project area is circled in red.

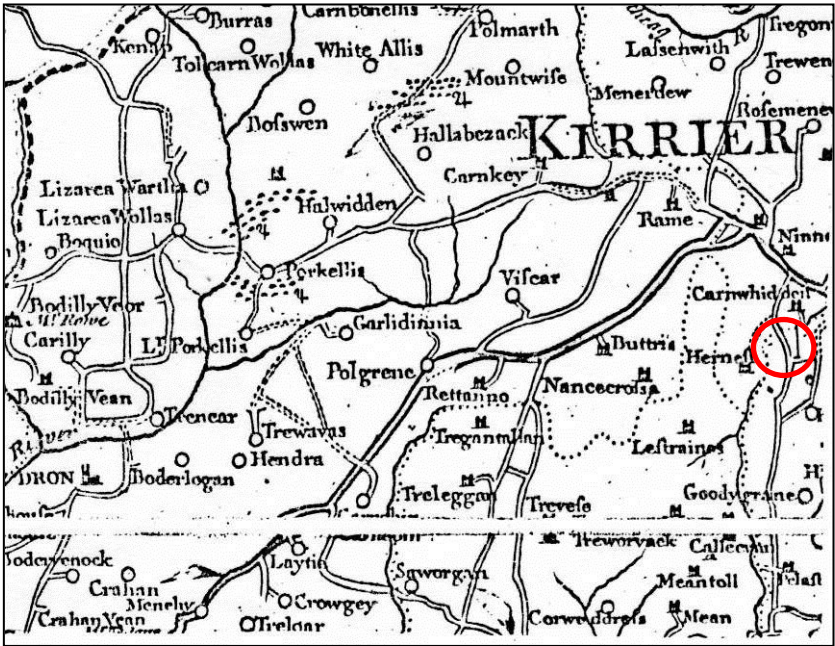


Fig 7. The proposed solar farm site and its surroundings, as shown on Martyn's 1748 Map of Cornwall. The project area is circled in red.

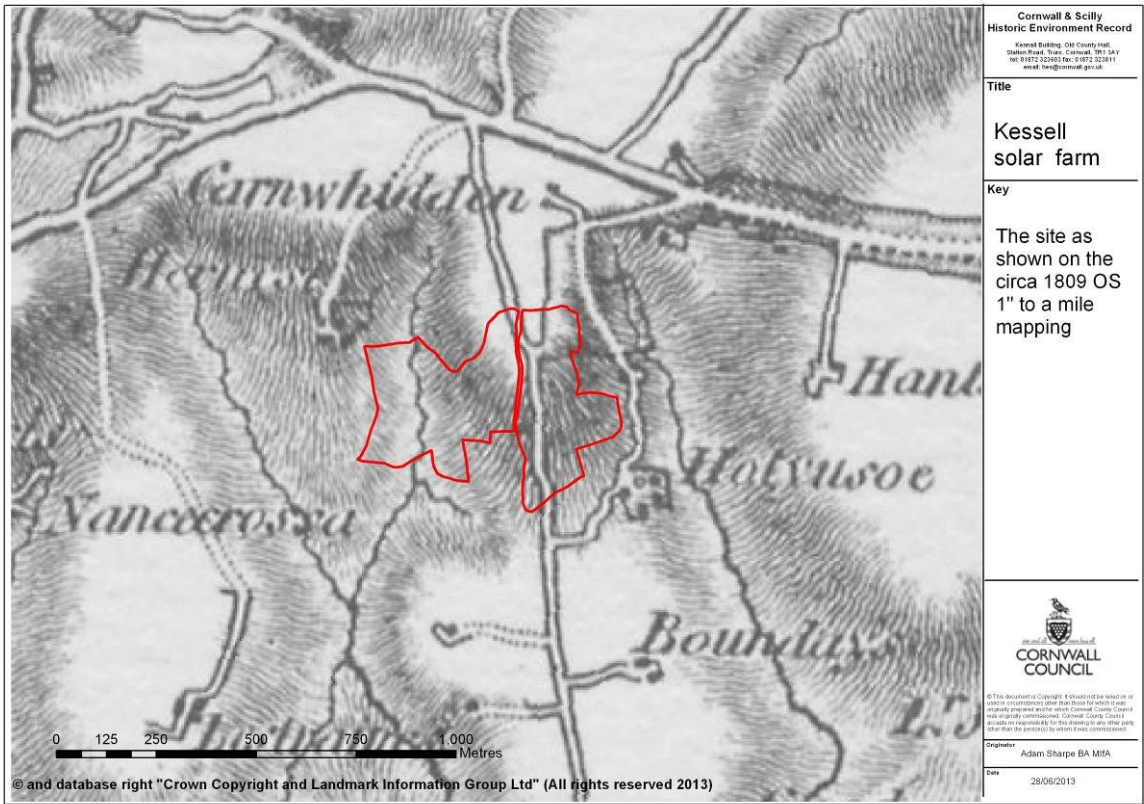


Fig 8. The project area and its surroundings as shown on the circa 1809 1st Edition OS mapping. The solar farm project area is slightly offset because of the differing projections used by the 19th century OS surveyors and modern mapping.

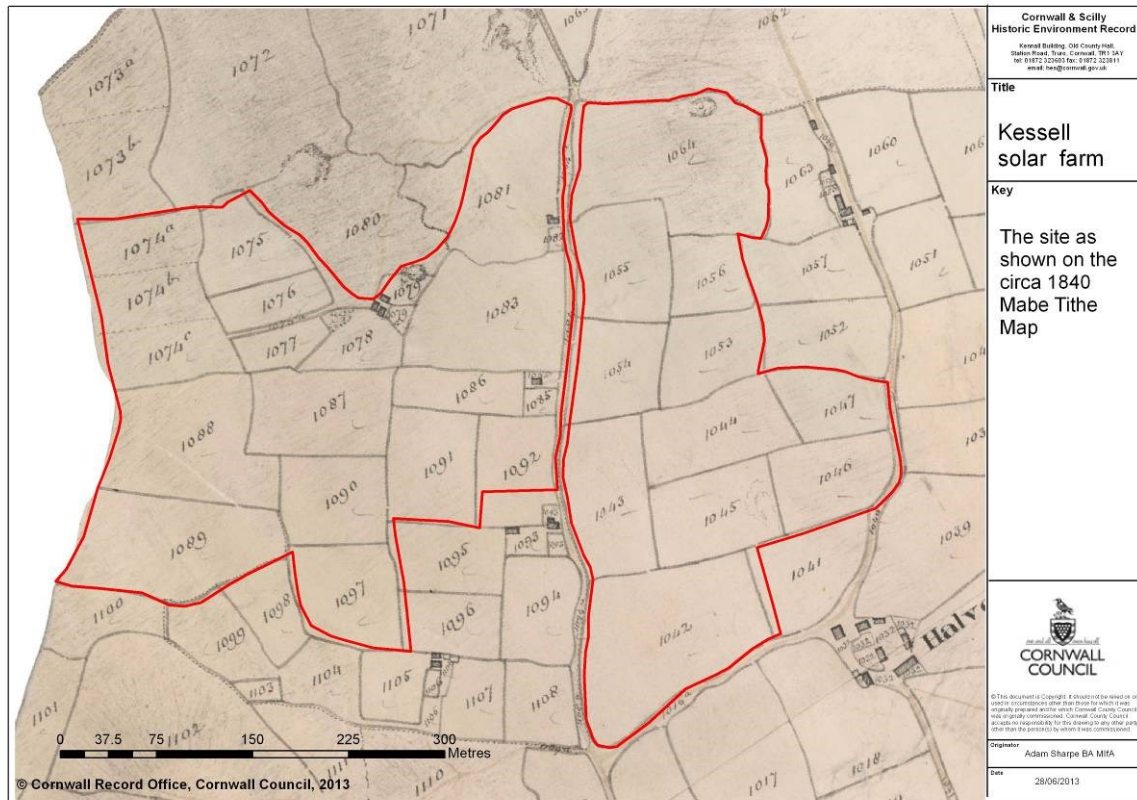


Fig 9. The project area as shown on the circa 1840 Mabe Tithe Map.

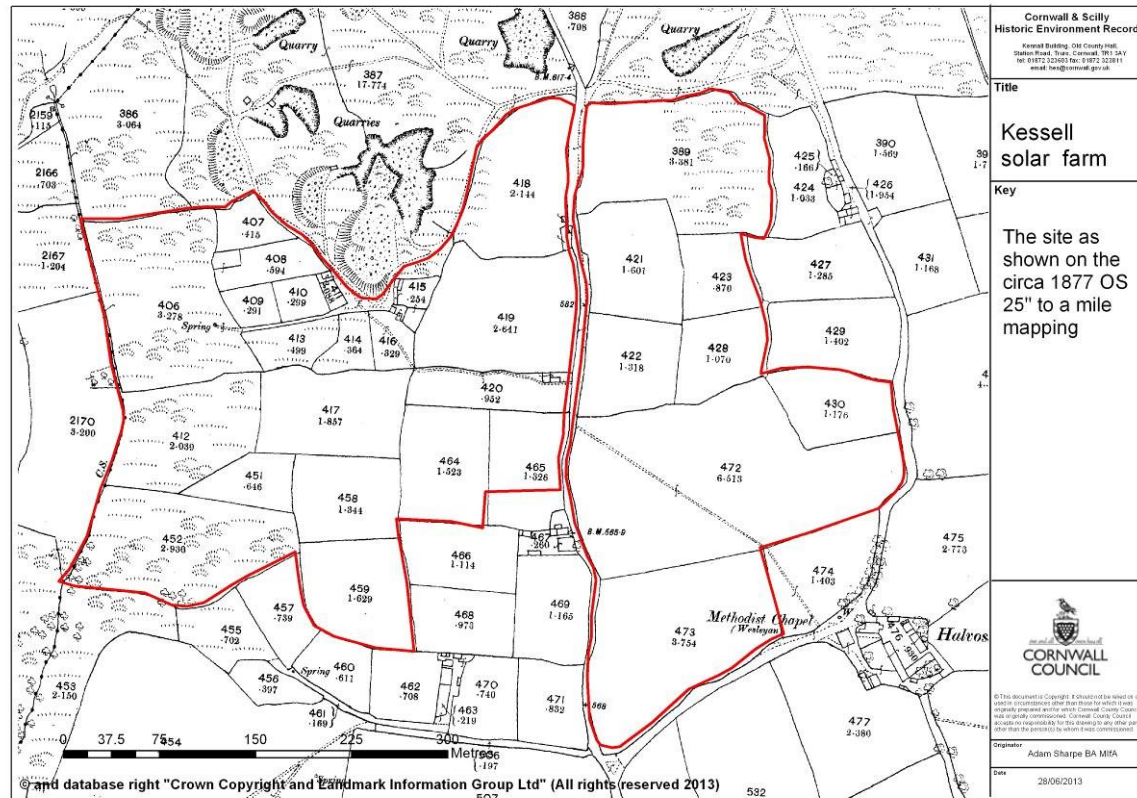


Fig 10. The project area as shown on the circa 1877 1st Edition OS 25" to the mile mapping.

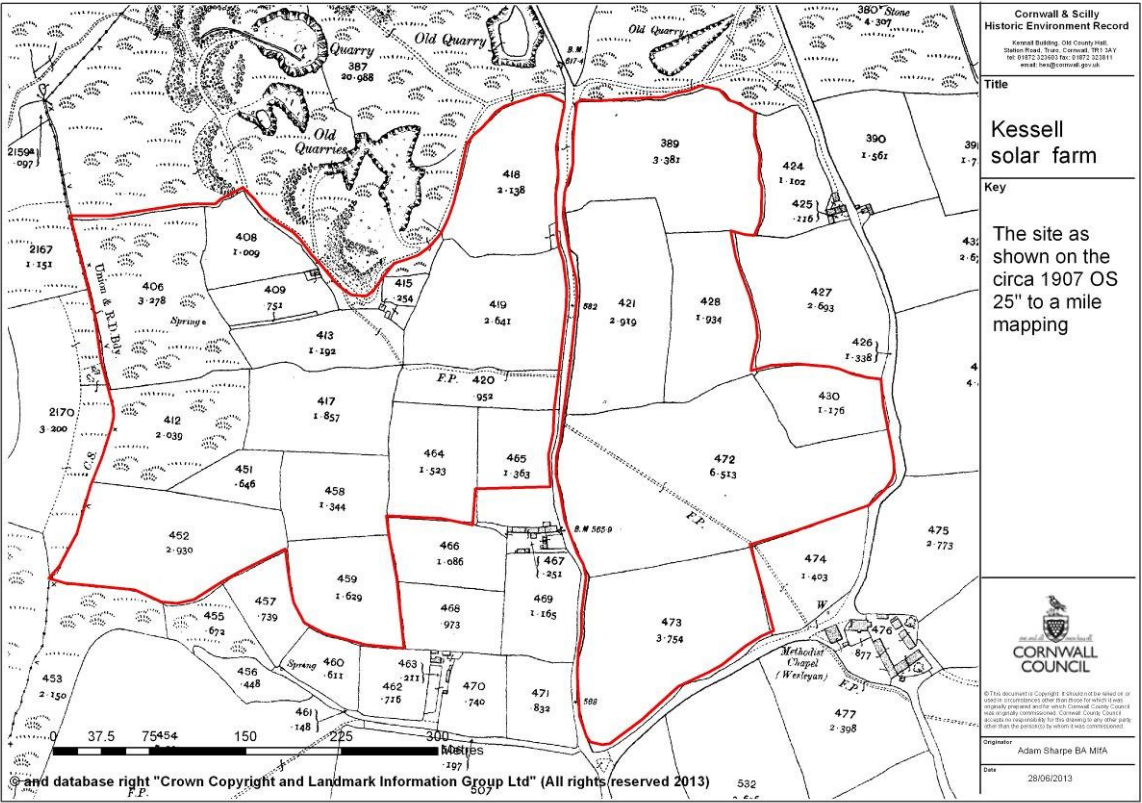


Fig 11. The project area as shown on the circa 1908 OS 25" to the mile mapping.

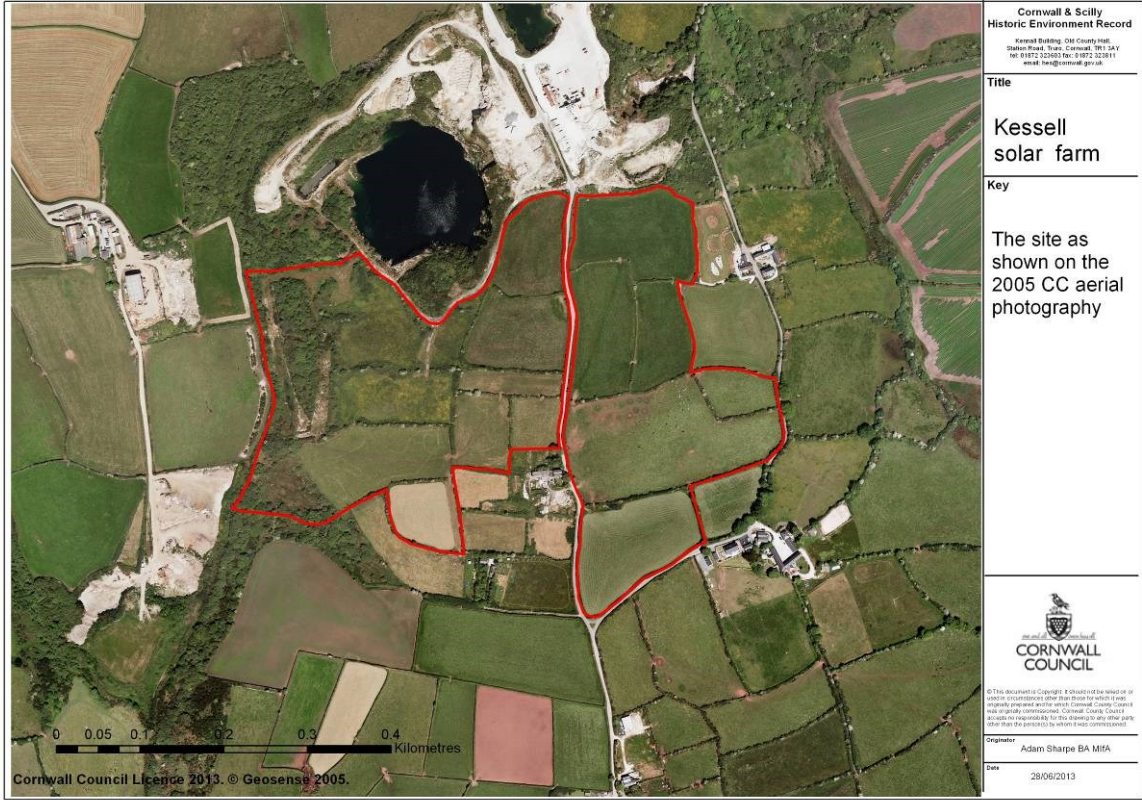


Fig 12. The project area as shown on a 2005 CCC aerial photograph.

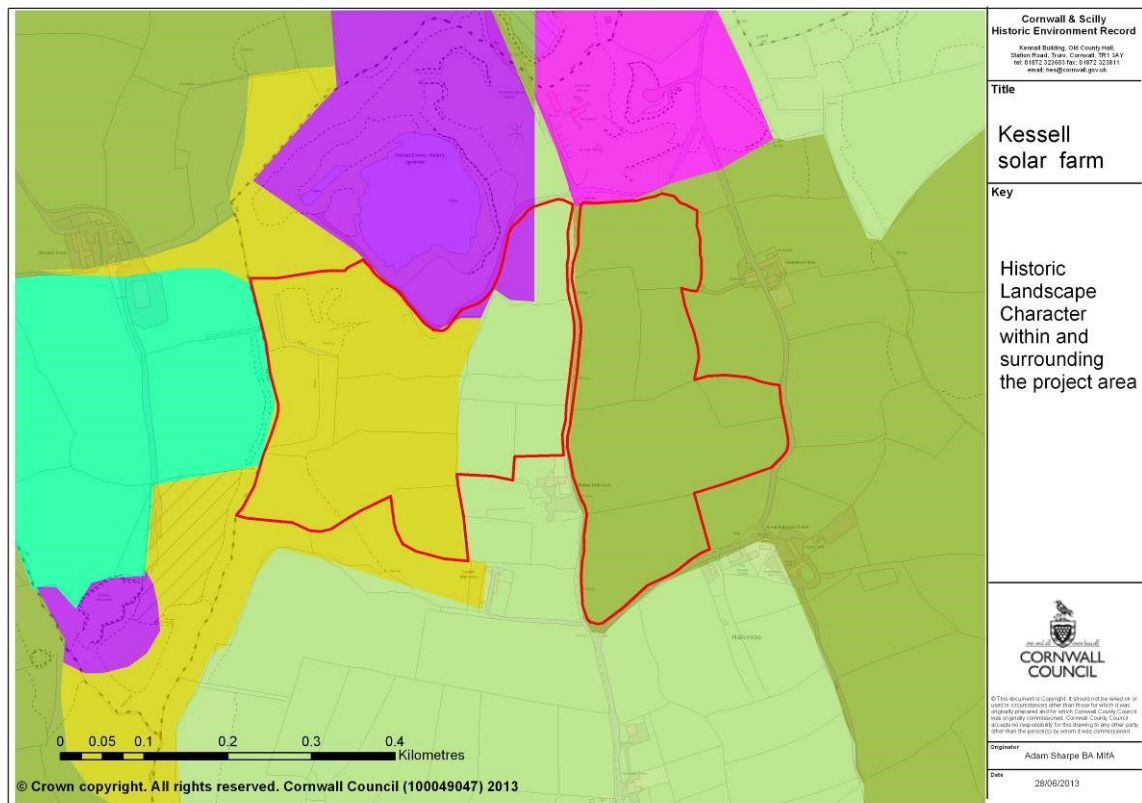


Fig 13. Historic Landscape Character mapping showing how this area of countryside is derived from a patchwork of upland rough ground (yellow), Medieval farmland (khaki) and post-medieval farmland (pale green and turquoise).

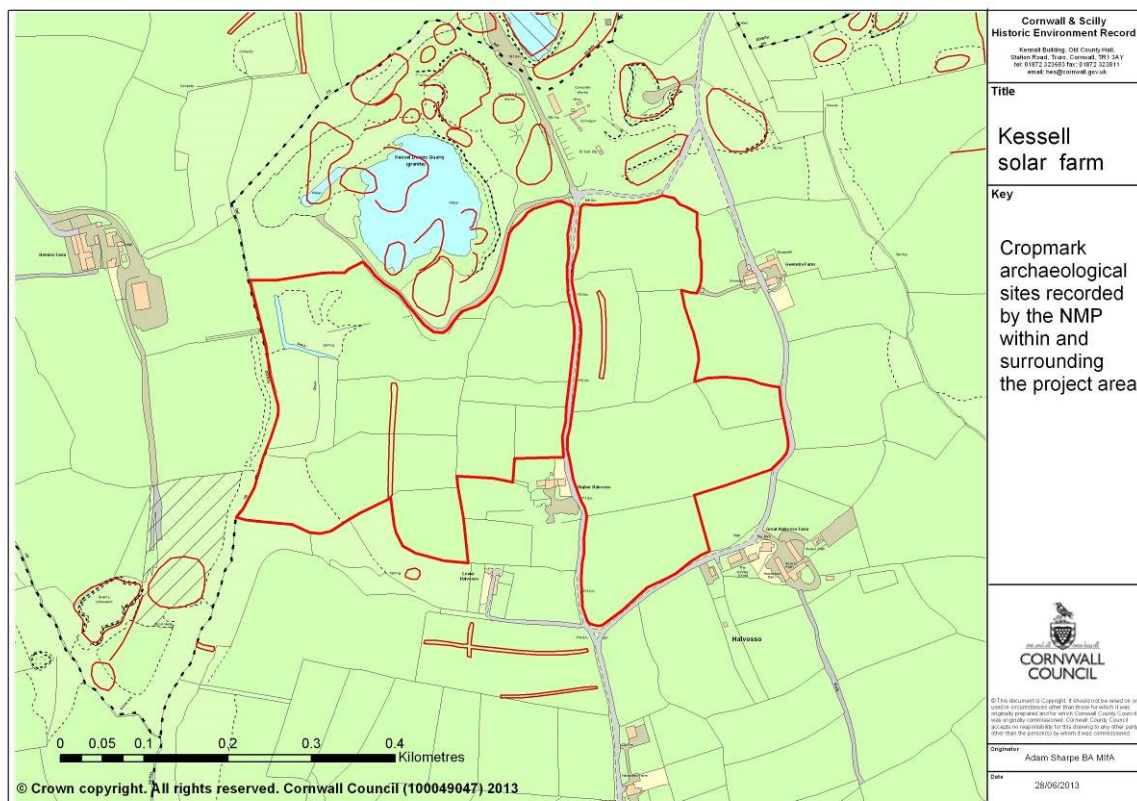


Fig 14. Archaeological sites recorded from aerial photographs by the National Mapping Programme consist largely of features related to former quarrying, though Medieval derived boundaries were also recorded.

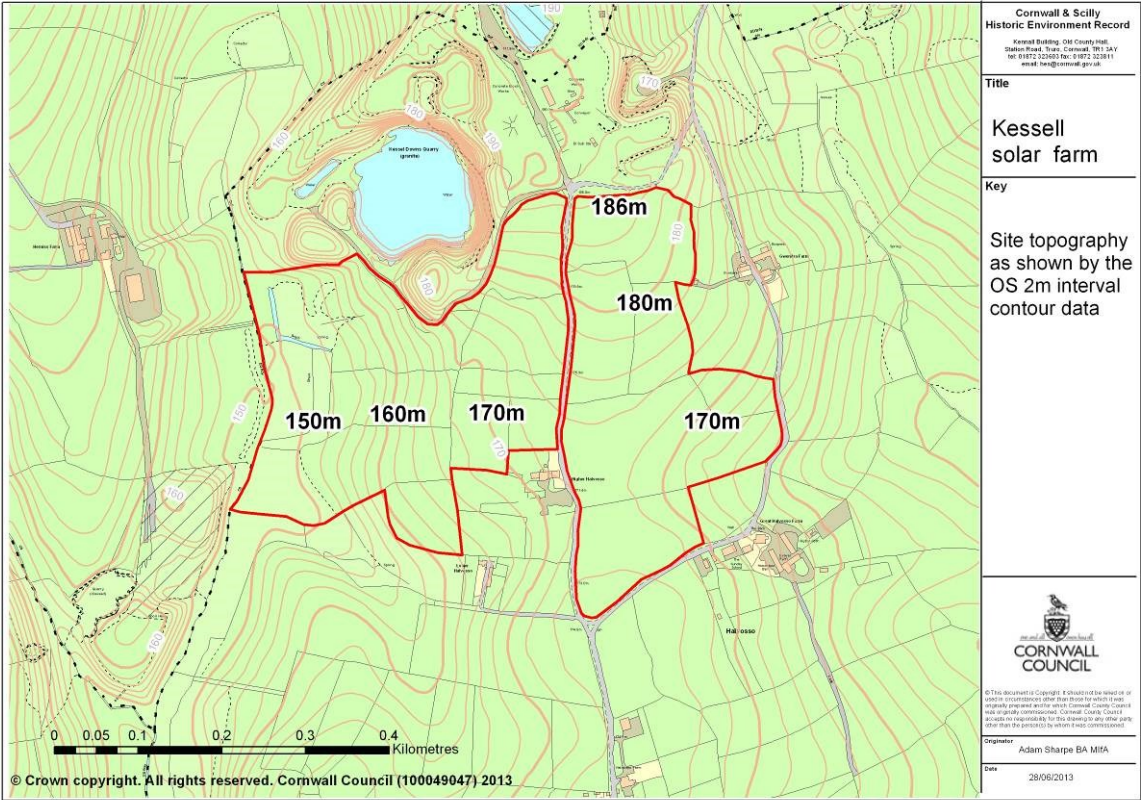


Fig 15. OS contour data for the area immediately surrounding the proposed solar farm shows the site located near a hilltop on land primarily falling to the west and south.

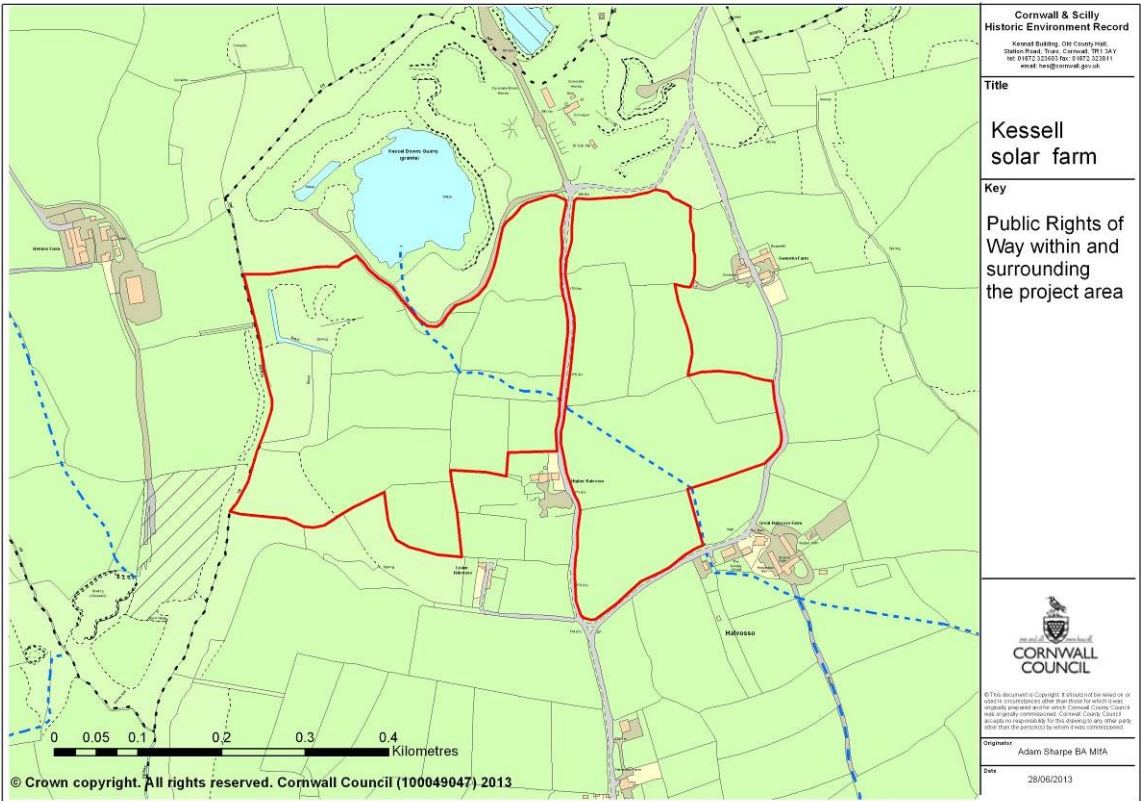


Fig 16. Public access routes in the vicinity of the proposed solar farm (blue dash) consists of a footpath which traverses its proposed site.

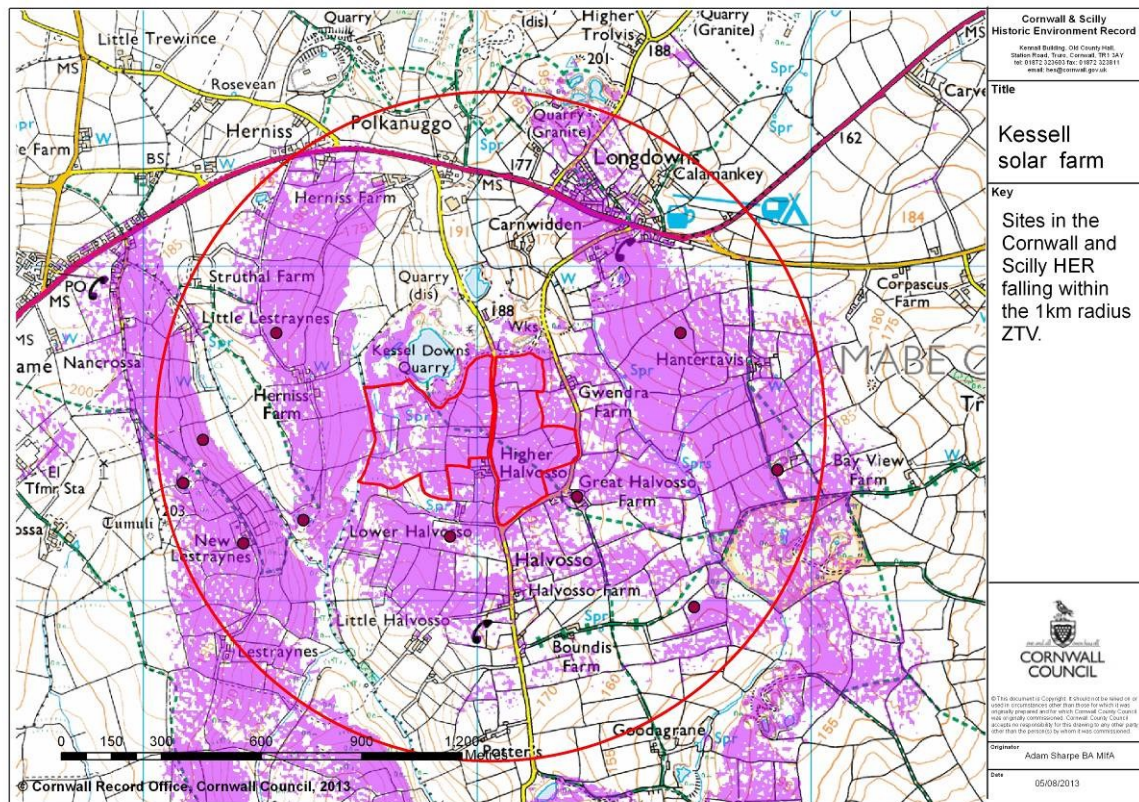


Fig 17. Mapping showing the ZTV within a 1Km radius of the site proposed for the solar farm, showing potentially intervisible sites recorded in the HER.

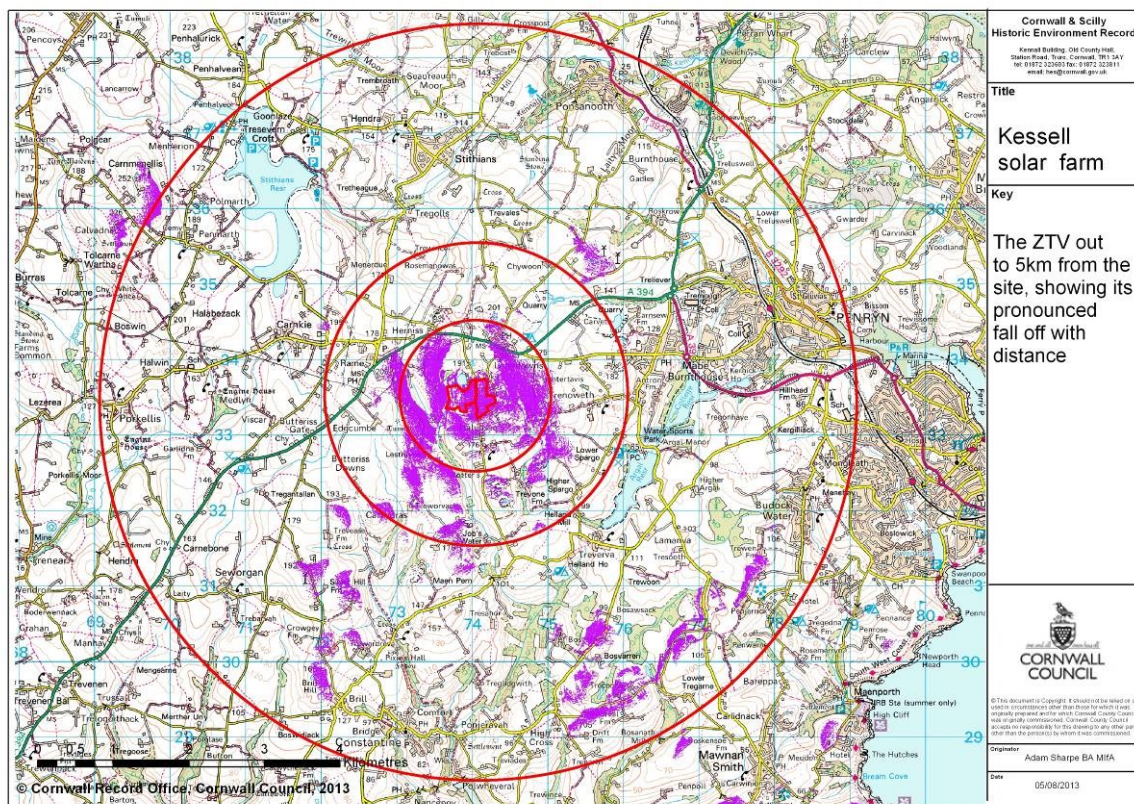


Fig 18. The ZTV with 1km, 2km and 5km radius circles drawn around it, showing how intervisibility will fall off dramatically over 1.5km away from the proposed solar farm.

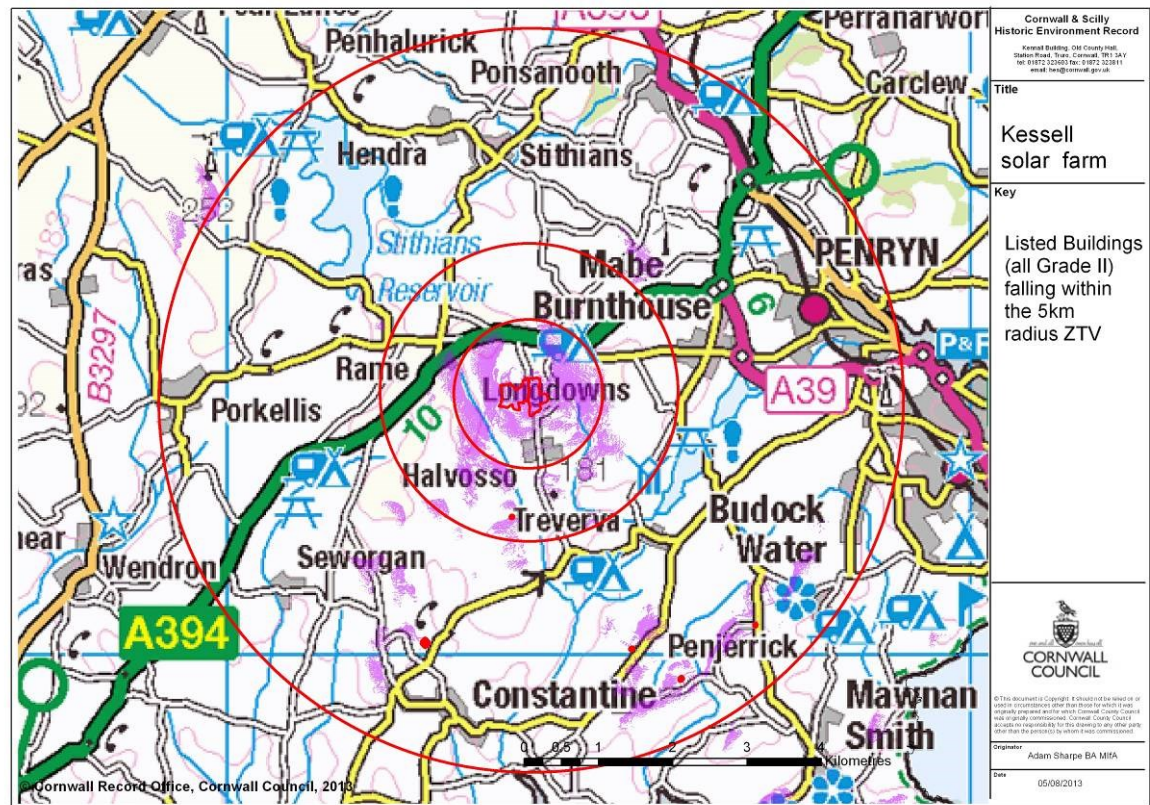


Fig 19. Mapping showing Listed Buildings (in red) falling within the ZTV out to 5km from the proposed solar farm.

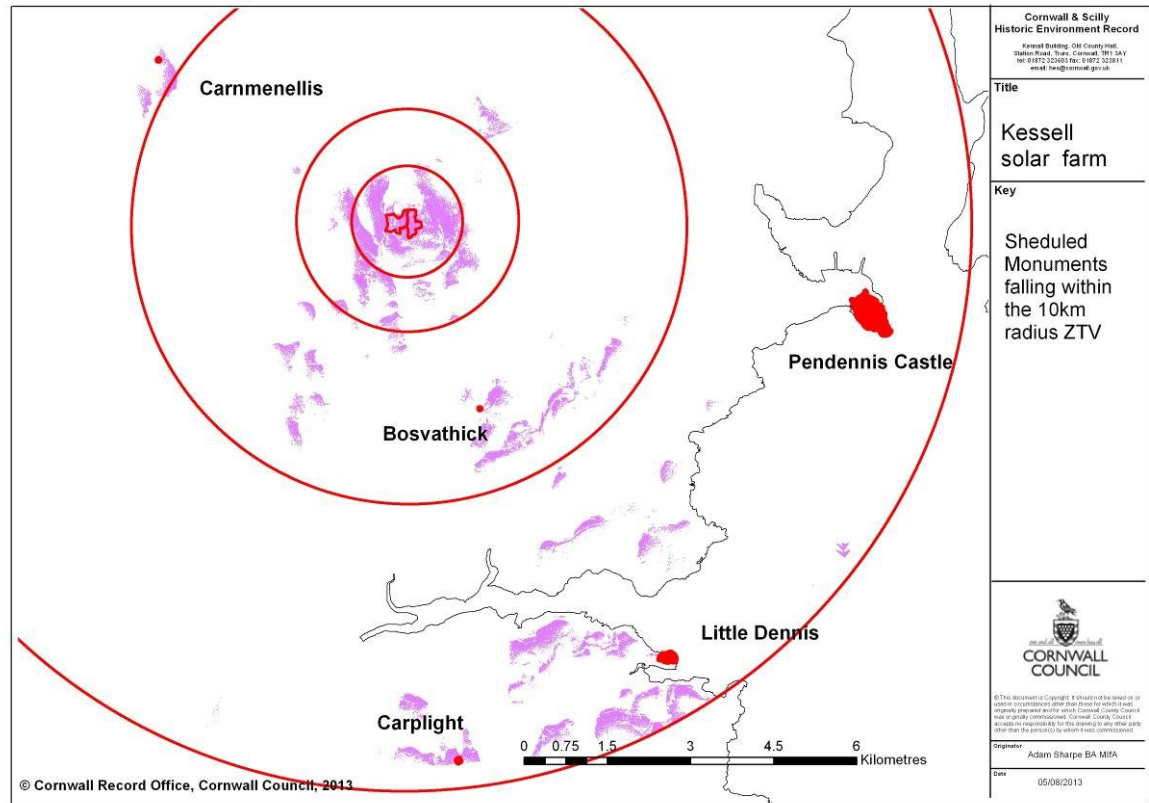


Fig 20. Mapping showing Scheduled Monuments within the 10km radius ZTV around the proposed solar farm.



Fig 21. Looking north across the eastern block of fields proposed for the solar farm towards the concrete batching plant at Kessel Quarry on the skyline.



Fig 22. Looking north west towards Herniss Farm (left) and Little Halvasso (right) from the southernmost of the eastern block of fields.



Fig 23. Looking south from the central eastern field, showing how visibility of the solar farm in this direction would be blocked by the rising ground topped by the skylining hedge.



Fig 24. Looking south from the upper fields to the east of the dividing road towards the converted Great Halvasso Sunday School.



Fig 25. The view south westwards from the upper eastern fields towards Carnmenellis, whose aerial can just be made out on the skyline at centre.



Fig 26. Tree screening around Great Halvasso, as seen from the adjacent field proposed for the solar farm.



Fig 27. The converted Sunday School at Great Halvasso Farm.



Fig 28. The upper northern boundary of the eastern block of fields with the Kessel Quarry concrete plant showing above the hedgeline.



Fig 29. Little Halvasso from the southern part of the western group of fields.



Fig 30. The view northwards across the western group of fields.



Fig 31. Looking towards Carnmenellis (aerial skylining at centre) from the southern part of the western group of fields.



Fig 32. The view east from the central part of the eastern block of fields, closed off by the ridgeline, beyond which can be seen the blades of a pair of large wind turbines.



Fig 33. Looking east from the western block of fields towards New Lestraynes. Two Scheduled barrows are sited just over the ridgeline in this direction.



Fig 34. Looking just north of west from the western fields towards the Herniss recycling facility.



Fig 35. Marshland and willow carr forming the western edge of the extension to the western block of fields.



Fig 36. The scrubbed in upper section of the western extension of the project area. The former smallholdings were sited at the foot of the overgrown quarry dumps on the skyline.