

Proposed Quoit Solar Farm, St. Columb Major, Cornwall

Archaeological Assessment



Historic Environment Projects

Proposed Quoit Solar Farm, St. Columb Major, Cornwall

Archaeological Assessment

Client	Wardell Armstrong International
Report Number	2010R150
Date	December 2010
Status	Final
Report author(s)	Jo Sturgess
Checked by	Adam Sharpe BA MIFA
Approved by	Peter Rose

Historic Environment, Cornwall Council
Kennall Building, Old County Hall, Station Road, Truro, Cornwall, TR1 3AY
tel (01872) 323603 fax (01872) 323811 E-mail hes@cornwall.gov.uk
www.cornwall.gov.uk

Acknowledgements

This study was commissioned by Paul Evans of Wardell Armstrong International, Cornwall, and carried out by Historic Environment Projects, Cornwall Council.

Within Historic Environment, the Project Manager was Adam Sharpe.

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.

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.



Historic Environment, Cornwall Council is a Registered Organisation with the
Institute for Archaeologists

Cover illustration: Photograph taken 22/11/10 from the eastern side of the site looking towards Castle-an-Dinas to the east.

© **Cornwall Council 2010**

No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without the prior permission of the publisher.

Contents

7.1 Archaeological Summary	8
7.2 Introduction	9
7.2.1 Project background	9
7.2.2 Aims	9
7.2.3 Methods	9
7.2.3.1 Desk-based assessment	9
7.2.3.2 Study of viewshed	10
7.2.3.3 Fieldwork	11
7.2.3.4 Post-fieldwork	11
7.3 Site location	11
7.3.1 Geology and soils	12
7.3.2 Landuse	12
7.3.3 Access	12
7.3.4 Viewshed	12
7.3.5 Historic Landscape Characterisation	14
7.3.6 Designations	14
7.4 Policies and Guidance	16
7.4.1 Planning Policy Statement 5 (PPS5), ‘Planning for the Historic Environment’	16
7.4.1.1 Policy HE9.6	16
7.4.1.2 Extracts from Policies HE9.1 to HE9.4 and HE10	16
7.4.2 Cornwall Structure Plan	17
7.4.2.1 Policy 1	17
7.4.2.2 Policy 2	18
7.4.3 Former Restormel Local Plan	18
7.4.3.1 Policy 11	18
7.4.3.2 Policy 12	18
7.4.3.3 Policy 26	19
7.4.3.4 Policy 27	19
7.4.4 Hedgerow Regulations	20
7.5 Archaeological results	20
7.5.1 Chronological summary of the site and its landscape	20
7.5.2 Inventory of sites within the proposed development area	22
7.5.3 Further archaeological potential	24
7.6 Significance	24
7.7 Archaeological Impact	25
7.7.1 Types and scale of impact	25
7.7.1.1 Types of impact; construction phase	25
7.7.1.2 Types of impact; operational phase	26
7.7.1.3 Scale and duration of impact	26
7.7.1.4 Potential and residual impacts	26
7.7.2 Assessment of impact	26
7.7.2.1 Impact on known individual archaeological sites within the project area	27

7.7.2.2 Impact on the project area as the setting of surrounding key heritage assets	27
7.7.2.3 Impact on Historic Landscape Character	28
7.7.2.4 Other archaeological impact	28
7.7.2.5 Impact on historic field boundaries	28
7.8 Mitigation Strategy	29
7.8.1 Development of pre-construction recording; geophysical survey	29
7.8.2 Close design of proposed works to reduce impact	29
7.8.3 Controlled soil stripping	29
7.8.4 Excavation	29
7.8.5 Boundary recording and reconstruction	29
7.8.6 Analysis and presentation of findings	30
7.9 References	30
7.9.1 Primary sources	30
7.9.2 Publications	30
7.9.3 Project archive	30

List of Figures

Fig 1 View from roughly the centre of the eastern half of the site looking east to Castle-an-Dinas
Fig 2 View from the west side of Castle-an-Dinas hillfort looking towards the site approximately 2.5km away
Fig 3 View from roughly the centre of the eastern half of the site looking north to the ridge of high ground at Trelow and Rosenannon Downs and Scheduled Monument 32983 (two Bronze Age barrows) 5km away
Fig 4 Surface feature of the Royal Observer Corps monitoring post HER No MCO42712
Fig 5 Location map
Fig 6 Plan of the proposed solar farm, showing solar arrays (in blue)
Fig 7 Thomas Martyn's map of 1748
Fig 8 The area on the c1809 OS Surveyors' drawing, showing the farm settlement (site 3)
Fig 9 Extract from the Tithe Map c1840 for the Parish of St Columb Major showing the separate holdings of different individuals at this date (in red)
Fig 10 First edition OS 25" map of c1880
Fig 11 Second edition OS 25" map of c1907
Fig 12 The 1994 HLC mapping, showing the site at the centre of a large tract of 'Medieval farmland'
Fig 13 Distribution of Iron Age/Romano-British rounds/enclosures plotted by the NMP within a 1km radius of the site
Fig 14 Archaeological sites location map
Fig 15 Map showing the computer generated viewshed of the proposed solar farm (in purple), and Scheduled Monuments (red but circled in blue) within a 4km radius

Fig 16 Map showing the computer generated viewshed of the proposed solar farm (in purple), and listed buildings (yellow but circled in blue) potentially visible within a 4km radius

Abbreviations

AEL	Anciently Enclosed Land (HLC Zone)
BA	Bronze Age
AONB	Area of Outstanding Natural Beauty
CC	Cornwall Council
CRO	Cornwall Record Office
EH	English Heritage
HBSMR	Historic Buildings, Sites and Monuments Record
HE	Historic Environment, Cornwall Council
HLC	Historic Landscape Character
LB	Listed building
LPA	Local Planning Authority
NGR	National Grid Reference
NMP	National Mapping Programme (digital plotting from aerial photographs)
OS	Ordnance Survey
PRN	Primary Record Number in Cornwall HBSMR
PPS5	Planning Policy Statement 5 ('Planning for the Historic Environment')
RIC	Royal Institution of Cornwall
SM	Scheduled Monument
WSI	Written Scheme of Investigation

7.1 Archaeological Summary

This archaeological assessment of a proposed solar farm at Quoit, St Columb Major, Cornwall, for Wardell Armstrong International was undertaken by the Projects team of Historic Environment, Cornwall Council (HE Projects, CC). The study was designed to gain a better understanding of the impacts which would result from the solar farm, both within the limits of this site, and in the surrounding historic landscape with its key archaeological sites or 'heritage assets'. It includes desk-based study and fieldwork and follows current planning policies and guidance, relevant extracts from which are provided in the report. Viewshed mapping generated in ArcGIS, showing the theoretical inter-visibility between the proposed solar farm and the surrounding landscape, was used to inform the assessment.

The proposed area does not include any Scheduled Monuments (SMs) or Listed Buildings (LBs). The field boundaries are considered 'important' under Hedgerow Regulations. In the potential viewshed up to 5km from the site (where historic features such as field systems can be discerned) three Scheduled Monuments have possible inter-visibility with the site and one Scheduled Monument (Castle-an-Dinas CO93) is clearly visible. The site is also potentially visible from twelve of the Listed Buildings within the viewshed.

On the basis of current knowledge the proposed site includes or is bordered by eleven archaeological sites of particular significance. Those within the proposed area are the sites of an Observer Corps monitoring post of regional importance (**site 1**), the site of a leat and water channels of local importance (**site 2**), a strip-derived field system of regional importance (**site 3**), a post-medieval lane of local importance (**site 5**) and the site of a former building of local importance (**site 6**). Those sites bordering the area include the site of a Neolithic chambered tomb of national importance immediately to the south-east (**site 7**), a Romano-British enclosure and metalworking site of regional importance (**site 9**), a Bronze Age barrow of regional importance (**site 10**), Tregatillian Iron Age/Romano-British round of regional importance (**site 11**), the medieval settlement of Quoit of regional importance (**site 8**) and a 19th century school house of local importance (**site 4**).

In terms of Historic Landscape Character, the development area at Quoit is significant as a part of a large Unit of the 'Medieval Farmland' HLC Type of 'Anciently Enclosed Land', with fairly clear derivation from medieval cropping-units and in places from strips within these, with some evidence for time-depth, as well as for its former association with the settlements of Quoit, Roserrans and Tregatillian. Buried early remains often occur in land of this HLC Type, and the presence of prehistoric sites in close proximity ranging from the Neolithic through to the Romano-British period indicates prolonged prehistoric use of this area, showing a high potential here for below-ground remains. The proximity of a Neolithic chambered tomb (**site 7**) along with Neolithic activity discovered at the Romano-British metalworking site (**site 9**) indicates the potential within the site for the survival of important Neolithic remains.

The scheme would involve erecting solar arrays up to 2m high, with a control station, and associated cable trenching and anchor points up to 1m deep. Its potential impacts include in the construction phase disturbance or loss of below-ground elements of the medieval fields, and of other buried features as yet unrecorded. In the operational phase it would impact adversely on HLC, and on the settings of designated heritage assets, in particular the high status hillfort at Castle-an-Dinas. Overall, the impact on the archaeological resource (without the results of a geophysical survey) is assessed as potentially negative/moderate without appropriate mitigation; with a negative/minor residual impact provided such mitigation is undertaken.

The recommendations set out further work likely to be required to mitigate for the archaeological impact should the development proceed. This includes a geophysical survey to

identify sensitive areas of the site, and modification of the scheme to avoid the Observer Corps post (**site 1**), field boundaries (**site 3**), lane (**site 5**) and any significant buried features identified as a result of the geophysical survey. Also subject to the results of the geophysical survey, controlled soil stripping may be recommended to allow appropriate recording of buried remains. Disturbance to Cornish hedges should be avoided, but if they are recording of affected sections may be required, and careful reconstruction may be appropriate.

7.2 Introduction

7.2.1 Project background

This archaeological assessment of a proposed solar farm at Quoit, St. Columb, Cornwall, was commissioned by Paul Evans of Wardell Armstrong International's Cornwall Office, and undertaken by the Projects team of Historic Environment, Cornwall Council (HE, CC). The results of the assessment are intended to be included in a wider Environmental Assessment for the proposal. It follows methods of working and reporting developed by HE, CC for similar projects (Parkes, 2010 and Sharpe, 2010), so facilitating cross-reference between project results. The site extends over four fields centred at around SW 9219 6232 just to the east of the town of St. Columb Major, Cornwall (Figs 5 and 6).

7.2.2 Aims

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 the site, both within the limits of the application site, and in the surrounding historic landscape with its key archaeological sites or 'heritage assets'.

The objectives are to identify the archaeological potential and significance of the site and to provide the client with advice on the impacts of the proposed development and any mitigation which would be likely to be required should the development proceed.

A further objective is to satisfy the information requirements of PPS5, the Government's policy statement on 'Planning for the Historic Environment' (see further Section 7.4.1).

7.2.3 Methods

7.2.3.1 Desk-based assessment

For the desk-based study, historical databases and archives were consulted. Information about the history and significance of the sites and the features likely to survive in the proposed development area was recorded, and evidence for the development and present character of the wider historic landscape (HLC) was gathered. The key surrounding heritage assets (those of high archaeological importance) whose settings could be affected by the solar farm project were included in this work. GIS mapping was used to assist identification of the viewshed of the solar farm, to inform the study of impact on the settings of those surrounding assets. (See separate Section 7.2.3.2, below). The main sources studied were as follows:

- Cornwall's HBSMR, the computerised database of the county's archaeological and historical sites maintained by Cornwall Council.
- GIS based computerised mapping showing features plotted from aerial photographs as part of the National Mapping Programme (NMP).
- GIS mapping of Historic Landscape Character (HLC) Types, and related text derived originally from the Cornwall Historic Landscape Assessment, 1994.

- Historic maps and original documents (see Section 7.9.1 for a list of these).
- Archaeological reports, histories and other relevant publications (listed in Section 7.9.2).
- Relevant designation and planning documentation.
- Aerial photographs taken previously as part of the Cornwall Aerial Survey project, HE, CC.

7.2.3.2 Study of viewshed

The viewshed mapping (as used in Figs 15 and 16), showing the theoretical inter-visibility between the site with solar arrays as proposed and the surrounding landscape, was generated in ArcGIS. A viewshed is an area of the landscape that is visible from a specific location based on elevation values of a Digital Elevation Model (DEM). Viewshed analysis uses the elevation value of each cell of the elevation model to determine visibility to or from a particular location - the observer viewpoint. To determine the visibility of a target, each cell between the observer's location and target is examined for line of sight. Where cells of higher value are between the observer viewpoint and the target cells the line of sight is blocked. If the line of sight is blocked then the target cell, and by extension that part of the landscape, is determined to not be part of the viewshed; otherwise it is included in the viewshed.

The methodology used was based on a Digital Surface Model (DSM), which takes account of surface features such as buildings, woodland, vegetation, roads etc, and provides a more accurate representation when compared to a 'bare earth' or DTM elevation model. A viewshed was generated for each of seven 'observer points' based on the centroid of each of the seven fields in which an array is proposed. The seven were combined to produce the *multiple viewshed* for the proposed solar farm area.

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, the viewshed is 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 2m to represent the height of the solar array.

The viewshed mapping is a computer model and whilst it does take into account some surface features that might hinder visibility and lines of sight (e.g. trees) it takes only limited account of visibility quality and the degradation of views over distance. It was therefore verified and qualified through observation as part of the project fieldwork, looking 'outward' or from rather than into the proposed site, due to limits on time and other constraints. Inevitably, atmospheric conditions and other local factors will still have a variable effect on actual visibility, and there are practical limitations to the feasibility of checking potential 'inward' visibility to a site which is currently similar in terms of its ground cover and other features to neighbouring farmland, but which would have a colour and texture more distinguishable than at present at distances of several kilometres if developed as proposed. However in general the areas of landscape visible on the ground proved to conform very well with those generated by the GIS modelling.

The checking of the viewshed on the ground also allowed identification of particular belts, within these areas theoretically visible from the proposed solar farm site, whose historic landscape character can be 'read' *from* the site with varying degrees of clarity through discernible patterns of historic features, primarily field systems, and can be expected to have views *to* the site of similar quality. The belts observed were used to help determine useful distance buffers (at 0.5km, 3km and 5km around the site) for application to the original viewshed mapping, to show zones with inwardly increasing quality of visibility and legibility of

the proposed solar farm's historic landscape (Figs 15 and 16). The GIS was then used to capture for the inner zones the designated key heritage assets; their Scheduled Monuments and Listed Buildings.

(It should be noted that the site viewshed mapping is used in this report to aid assessment and presentation of archaeological impacts. This work is not intended to convey more general impacts on views from dwellings, etc.)

7.2.3.3 Fieldwork

Following completion of the desk-based assessment, a 'walk-over' survey of the site was undertaken using a composite base map generated by that research. This involved walking systematically over the ground, recording the following;

- Any further details of sites identified during the desk-based survey
- Other features visible on the ground
- Areas of ground with particular evidence for potential survival of below-ground remains
- Relevant aspects of Historic Landscape Character
- Associations with the area's key heritage assets, contributing to their setting
- Views over surrounding sites and historic landscape.

The walk-over was carried out across all the fields on the site. There was good visibility across the ground, which was, at the time, newly planted. Castle-an-Dinas was also visited briefly to inform the assessment of impact on settings.

Digital colour photographs were taken as appropriate to record sites and aspects of the historic landscape, or illustrate potential effects on these.

7.2.3.4 Post-fieldwork

The cultural resource of the study area, and potential impacts of the solar farm scheme upon this, were assessed and reported using current standards and methodologies, and professional judgement. The area's individual archaeological features, its specific archaeological potential for further, buried sites, its Historic Landscape Character (HLC), and its significance for the settings of key surrounding heritage assets (in terms of both visual and historic or other aesthetic connections), were all considered. The viewshed study was used to inform the HLC and 'settings' assessments. Finally, notes and images generated by the project were archived, following established HE guidelines (see Section 7.9.3).

7.3 Site location

The proposed solar farm site is located on the top and north and south facing slopes of a hill to the east of St Columb Major centred at NGR SW 9219 6232 (Figs 5 and 6). The site lies in the parish of St. Columb Major and comprises four adjoining fields. The three to the south have a gentle slope down to the south sloping from 120m OD down to 105m OD, whilst the northern field slopes down to the north-east. Altogether the site forms an irregular, roughly trapezoidal block and the total area of the fields is 19.8 hectares. The town of St. Columb Major to the west is approximately 0.5km away at its nearest point.

7.3.1 Geology and soils

The study area lies within the Meadfoot group comprising slate, siltstone and sandstone overlain by fine loamy soils (CC GIS mapping).

7.3.2 Landuse

The site is now arable farmland. At the time of the site visit the southern half of the site had been recently planted with bulbs whilst the northern field contained a young cereal crop.

7.3.3 Access

Public highways border the proposed solar farm fields to the south and east. There is also a footpath running from north-west to south-east across the south-west corner of the site.

7.3.4 Viewshed

The Zone of Theoretical Visibility (ZTV) for the proposed solar farm (that is, the area of the surrounding historic landscape which can be seen from the site and from where the site can be seen) generated for the project is not too extensive, but in summary includes the following (see Figs 15 and 16);

- **In a 0.5km radius**, ground mostly contained within the site and some to the west within neighbouring fields; also around the settlement of Quoit to the south-east.
- **In a 0.5-3km radius**, ground to the north inter-visible with the northern half of the site, ground to the south and south-west inter-visible with the central and some southern parts of the site, and the hill of Castle-an-Dinas to the east inter-visible with the eastern half of the site (Figs 1 and 2). NB. St Columb Major Conservation Area is not inter-visible with the site.



Fig 1 View from roughly the centre of the eastern half of the site looking east to Castle-an-Dinas



Fig 2 View from the west side of Castle-an-Dinas hillfort looking towards the site approximately 2.5km away

- **In a 3-5km radius**, ground mainly to the north, inter-visible with the northern half of the site and ground to the west, inter-visible with most of the site.



Fig 3 View from roughly the centre of the eastern half of the site looking north to the ridge of high ground at Trelow and Rosenannon Downs and Scheduled Monument 32983 (two Bronze Age barrows) 5km away

7.3.5 Historic Landscape Characterisation

Historic Landscape Characterisation, developed for Cornwall from 1994 (Cornwall County Council 1996), captures the varying evidence for change and earlier landscapes existing in the present landscape, identifying extents of landscape with similar essential or distinguishing features, principally field boundary patterns. These extents have been mapped across the county, forming a continuous patchwork of Units of various Historic Landscape Character (HLC) Types (Fig 12). HLC Units of any given Type share a similar distinctive character today, the result of historic processes common to that Type, and tend to contain a predictable range of archaeological sites and historic features.

As shown in Fig 12, the land proposed for the solar farm at Quoit is part of an extensive tract of the 'Medieval farmland' HLC Type of 'Anciently Enclosed Land' (AEL).

The following summary of the area's predominant 'Medieval farmland' Historic Landscape Character Type is adapted from generic HLC texts produced for Cornwall by Peter Herring (Cornwall County Council, 1996).

Much AEL will have been enclosed and farmed since the Middle Bronze Age (c 1500 BC). The 'Medieval farmland' AEL reflects re-organisation in the medieval period into extensive 'open' or sub-divided field systems, associated with hamlets of co-operating families who each worked open strips of land dispersed in different 'cropping units' or stock proof fields making up the systems. Those documented medieval farming settlements in close proximity to the site include Quoit to the south-east, Roserrans to the north-east and Tregatillian to the north.

Overall, on the ground, the proposed solar farm fields show some of the detail of this medieval character, though to the north most of the original boundaries were removed in the 20th century. Comparing the Tithe Map (Fig 9) with the four fields that exist today shows that many early boundaries have been removed across the whole site.

Standing features including field boundaries still in use, such as all those here at Quoit can reveal much about the history of this HLC Type and particular places within it. Ground disturbance in 'Medieval Farmland' may reveal buried artefacts and structures or deposits associated with settlement, agriculture and other activity, both medieval and earlier in date. Across Cornwall as a whole, it contains many 'rounds' or later prehistoric to Roman period enclosed settlements. These may survive as earthworks, or as sub-surface remains, which may be visible as 'crop-marks' on aerial photographs, or detected by geophysical survey.

There may have been as many unenclosed prehistoric and Roman era settlements within this area, and though more vulnerable to loss to ploughing or other change during the long and intensive use for farming characteristic of this HLC Type, remains of such activity are increasingly being discovered through geophysical survey, archaeological watching briefs, and trial excavations. Smaller undetected buried deposits or artefacts could also be present in 'Medieval farmland' as elsewhere in AEL.

Other HLC Types represented in the surrounding area and visible in Fig 12 include 'Farmland post-medieval' immediately south-east of the site; more 'Farmland post-medieval' and 'Farmland 20th century' to the east; 'Twentieth century settlement', expanded from medieval origins, at St Columb Major to the north-west; 'Plantation and scrub' typically on steep-sided valleys and 'Upland rough ground' to the north, south and east.

7.3.6 Designations

There are no Scheduled Monuments, Listed Buildings or designated areas within the site.

Within the potential viewshed in a 5km radius of the site (a distance within which historic features can still be viewed on the ground) there are nine Scheduled Monuments (see Fig 15),

and twenty-one listed buildings (see Fig 16). These designated heritage assets are listed in the following tables along with a description of their inter-visibility with the site.

Scheduled Monuments in potential viewshed, within a 5km radius

Scheduled Monument No.	HBSMR no	Ref Name	Inter-visibility with the site
32983	DCO1109	Two round barrows 150m SW and 180m SE of Prince Parc	Possibly visible
32969	DCO1096	Iron Age/ Romano-British round 340m north of Tresawle Farm.	Possibly visible
30438	DCO969	Cross Putty, medieval wayside cross.	Not visible
28459	DCO852	Cross in St Columb Major churchyard.	Not visible
28460	DCO853	Wayside cross slab and Early Christian memorial stone in St Columb Major churchyard.	Not visible
CO93	DCO1684	Castle-an-Dinas Iron Age/ Romano-British hillfort.	Visible
CO219	DCO1226	Cross and cross head at southern boundary of Tregonetha Downs.	Not visible
30423	DCO954	Early Christian memorial stone in St Francis churchyard, Indian Queens.	Not visible
CO1070	DCO1150	Queen's Pit preaching pit, Indian Queens	Possibly visible

Listed Buildings in potential viewshed, within a 5km radius

LB Ref no [UID]	HBSMR Ref no	Name	Grade	Inter-visibility with the site
71163	DCO13007	Milestone at SW 929 665	II	Not visible
71183	DCO13013	Trewan Hall with attached garden walls.	II*	Possibly visible
71184	DCO13384	Farm buildings associated with Trewan Hall	II	Possibly visible
71185	DCO14093	House about 40m SW of Trewan Hall	II	Possibly visible
71238	DCO12995	Prospect House	II	Possibly visible
71157	DCO13005	Middle Lodge of Carnanton House	II	Possibly visible
71150	DCO14124	East Lodge of Carnanton House	II	Possibly visible
71174	DCO13380	Pair of gate pillars to Carnanton estate	II	Possibly visible
508253	DCO15009	Trevithick milestone	II	Not visible
508254	DCO15008	Tregaswith milestone	II	Not visible
71255	DCO12963	Philiphough, St Columb Major	II	Possibly visible
71259	DCO13421	Mortuary chapels in St Columb Major	II	Possibly visible

71179	DCO14092	Trekenning House	II	Possibly visible
71181	DCO13012	Tresadden farmhouse	II	Not visible
492426	DCO14265	Bosoughan Cottage	II	Not visible
71008	DCO14079	Bosoughan Farmhouse	II	Not visible
508248	DCO15012	Milestone on A392	II	Not visible
507795	DCO14974	Milestone	II	Not visible
71319	DCO12947	Wesley Methodist church	II	Possibly visible
507729	DCO14972	Milestone, Moorland Road, St Enoder	II	Not visible
71280	DCO14147	Church of St Dennis	II*	Possibly visible

The area around Castle-an-Dinas 2km to the east and south-east of the site is an Area of Great Historic Value (AGHV) and an Area of Great Scientific Value (AGSV). At distances of 3.5km to the north-west and 5km to the north-east are Areas of Great Landscape Value (AGLV). 2.5km to the south-east is a Special Area of Conservation (SAC) and there are Sites of Special Scientific Interest (SSSI) 2.5km to the north-east and south-east and also 4km to the north of the site. Within 1km to the north, south and east there are Cornwall Wildlife Sites (CWS) and 3.5km to the SE is Goss Moor National Nature Reserve (NNR). There is also a Regionally Important Geological Site 4km to the south. St Columb Major 1km to the west is a Historic Settlement and contains a Conservation Area.

The ‘Cornish hedges’ or boundary banks of the fields making up the site are considered ‘important’ under the historic criteria of the Hedgerow Regulations. All are recorded on the 1840 Tithe Map.

7.4 Policies and Guidance

The following section brings together policies and guidance, or extracts from these, referred to in this report and/or used in the development of the assessment and its methodology.

7.4.1 Planning Policy Statement 5 (PPS5), ‘Planning for the Historic Environment’

7.4.1.1 Policy HE9.6

HE9.6 ‘There are many heritage assets with archaeological interest that are not currently designated as scheduled monuments, but which are demonstrably of equivalent significance....The absence of designation for such heritage assets does not indicate lower significance and they should be considered subject to the policies in HE9.1 to HE9.4 and HE10.’

7.4.1.2 Extracts from Policies HE9.1 to HE9.4 and HE10

Policies HE9.1 to HE9.4 and HE10, referred to in Policy HE9, include the following;

- HE9.1 ‘There should be a presumption in favour of the conservation of designated heritage assets and the more significant the designated heritage asset, the greater the presumption in favour of its conservation should be. Once lost, heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting.’

- HE9.2 ‘Where the application will lead to substantial harm to or total loss of significance local planning authorities should refuse consent unless it can be demonstrated that: (i) the substantial harm to or loss of significance is necessary in order to deliver substantial public benefits that outweigh that harm or loss....’
- HE10.1; ‘When considering applications for development that affect the setting of a heritage asset, local planning authorities should treat favourably applications that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset. When considering applications that do not do this, local planning authorities should weigh any such harm against the wider benefits of the application....’

7.4.1.3 PPS5 English Heritage guidance

The English Heritage and DCMS (Department for Culture, Media and Sport) document ‘PPS5 Planning for the Historic Environment: Historic Environment Planning Practice Guide’ provides guidance on PPS5 and its application.

This refers to the need, for decision-making in response to an application for change that affects the historic environment, of providing and assessing, at a level appropriate to the relative importance of the asset affected, information on the asset and its extent, on its setting, and on the significance of both of these aspects. Section 5, 54 states that ‘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....’

Section 5 on Policies HE6 to HE 12, 58, notes among appropriate actions (in point 5) ‘Seek[ing] advice on the best means of assessing the nature and extent of any archaeological interest e.g. geophysical survey, physical appraisal of visible structures and/or trial trenching for buried remains.’

The section on Policy HE10 defines setting as follows;

‘113. Setting is the surroundings in which an asset is experienced. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.

114. 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; by spatial associations; and, by our understanding of the historic relationship between places. For example, buildings that are in close proximity but not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each. They would be considered to be within one another’s setting.’

7.4.2 Cornwall Structure Plan

The following policies in the Cornwall Structure Plan relate to the historic environment.

7.4.2.1 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.

7.4.2.2 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 Cornish Mining World Heritage Site, should be given priority in the consideration of development proposals.

7.4.3 Former Restormel Local Plan

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

The Restormel Local Plan contains policies designed to protect the archaeological resource, using the following elements of policy framework:

7.4.3.1 Policy 11

The Council will seek to conserve and enhance the landscapes, features and habitats of heritage importance within the Borough.

7.4.3.2 Policy 12

(1) Proposals for interpretation and educational facilities which support greater awareness and incorporate positive management of landscapes, features and habitats of heritage importance will be permitted. (2) Where appropriate, opportunities will be taken to make conditions and enter into agreements relating to their conservation and proper management.

With particular reference to archaeology are the following extracts and policies:

5.88 The importance of preservation of archaeological sites and monuments is accepted at national level as set out in Government Circular 8/87 and PPG 16 (1990).

5.91 Where application is made for planning permission to carry out development which would affect an ancient monument whether scheduled or unscheduled, the desirability of preserving the monument and its setting is of course a material consideration.

5.92 The Planning Policy Guidance Note on Archaeology (PPG 16) expands on circular 8/87.

para 6 - "Archaeological remains should be seen as a finite, and non-renewable resource, in many cases highly fragile and vulnerable to damage and destruction They are part of our sense of national identity and are valuable for both their own sake and for their role in education, leisure and tourism."

para 14 - "... the key to the future of the great majority of archaeological sites and historic landscapes lies with local authorities, acting within the framework set by central government ... as well as with the owners of the site themselves. Appropriate planning policies in development plans and their implementation through development control will be especially important"

5.95 National guidance is reflected in the Cornwall Structure Plan where policy ENV2 seeks to prevent development which will adversely affect sites of archaeological importance.

7.4.3.3 Policy 25

Development proposals which would damage scheduled ancient monuments or other archaeological remains of national importance or their settings will not be permitted.

7.4.3.4 Policy 26

Development proposals which adversely affect locally important archaeological sites held on the county sites and monuments record or identified as a result of a prior archaeological investigation will only be permitted where: (1) physical preservation in-situ is not feasible and the importance of the development outweighs the case for preservation of the remains; and (2) satisfactory arrangements are made for the excavation and recording of the remains before or during development.

5.112 In addition to the Scheduled Ancient Monuments, a large number of archaeological sites have been identified by the County Sites and Monuments Record (SMR). This record is being continuously updated and enlarged as a result of historical research, fieldwork, aerial photography and substantiated reports from the general public.

7.4.3.5 Policy 27

Where there is evidence to suggest that significant remains may exist on the site of a proposed development the extent and importance of which are unknown, an archaeological assessment will be carried out prior to the granting of planning permission.

5.113 In 1984 the Government acknowledged that the Schedule of Ancient Monuments no longer coincided with the consensus of informed opinion as to the monuments which were of most archaeological and historical interest. The fact that nationally only 2% of known sites and monuments were scheduled was considered to indicate the need for a nation wide review of the archaeological resource. In 1986 the Historic Buildings and Monuments Commission for England began work on the Monuments Protection Programme (MPP) which seeks to review and evaluate existing information (largely drawn from the County Sites and Monuments Records) so that those monuments which are of National Importance can be identified and scheduling or other means of protection can be recommended.

5.116 The Planning Authority supports the Cornwall County Council and its Archaeological Unit in their efforts to record, interpret and preserve the County's historic landscape and has contributed to the costs of providing the new detailed constraint maps.

5.117 Where proposals are submitted affecting a site which has been identified as having archaeological value, the County Archaeological Officer will be involved from the early stages of negotiations with applicants to ensure proper implementation of these policies.

5.118 Policy 27 will enable the Borough Council to make properly informed decisions on proposals which may affect sites of interest. For well researched known sites an assessment will be relatively straightforward and probably based on existing information. For sites with archaeological potential, small scale surveys, trial trenching etc. may be necessary. A geophysical survey can be an important method of evaluating potential sites.

5.122 The preservation in-situ of important archaeological remains is always to be preferred and this should be the primary objective of all negotiations. If preservation in-situ is not feasible an archaeological excavation for the purpose of preservation by record may be an acceptable alternative. This should always be seen as very much a second best option.

5.123 Where the development is permitted on any site considered to be of potential archaeological value, Policy 26(2) requires the developer to make appropriate and satisfactory arrangements for archaeologists to excavate and record the remains before or during development. This could involve investigation and observation prior to and during the work and the recording of any archaeological deposits, features or finds which might be revealed during the course of the development.

5.128 The CAU (HES) has recently reviewed the Historic settlements of Cornwall and suggested additional settlements which although not conforming with the National definition above are worthy of recognition for their historic importance. The CAU (HES) recommends that these settlements should be designated as Conservation areas. In this plan they have been identified as Areas of Local Architectural or Historic Value.

7.4.4 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.

7.5 Archaeological results

7.5.1 Chronological summary of the site and its landscape

The project area is set within a prehistoric landscape. Although there are no known prehistoric sites within the project area there are known monuments immediately adjacent to it. At Quoit, immediately south-east of the area, there is the site of a Neolithic chambered tomb ('Giant's or Devil's Quoit') (**site 7**), a Bronze Age barrow (**site 10**) and a Romano-British enclosure containing a metal working site (**site 9**). Also, two fields to the west of the site is an Iron Age/Romano-British enclosure 'round' (**site 11**). Of particular note is the site of Castle-an-Dinas which lies 2km to the east of the project area and is one of Cornwall's largest and most important Iron Age/Romano-British hillforts.

In this landscape Iron Age and Romano-British enclosed settlement sites known as ‘rounds’ with associated field systems have been identified through the National Mapping Programme (NMP) and can be seen in the surrounding landscape. It has been increasingly noticed in recent years that settlement associated with rounds does not just occur within the enclosure and there is potential for the remains of other unenclosed structures and settlement related features surviving within the site which may not have been detected by the NMP. There is also the potential for the survival of below-ground remains of both Bronze Age and Neolithic sites within the area.

The surrounding medieval landscape is typified by small farming settlements with their associated field systems. The settlements associated with the farmland within the site are Tregatillian which is first recorded in 1327 when it was spelt ‘Tregentulyon’ meaning ‘place of assembly’, Roserrans (first recorded in 1321 when it is spelt ‘Resgerens’) and Quoit which is first recorded in 1450 when it was spelt ‘Coyt’ (Gover, 322). Medieval strip fields can still be easily discerned both in and around the site.

The field system that exists within the development area (**site 3**) shows formation in medieval times. The ground may contain buried traces of abandoned strip field boundaries, and possibly of the old ‘ridge and furrow’ or cultivation ridges within the strips.

A process of map regression helps to understand the recent landscape history of the site. Martyn’s map of 1748 (Fig 7) is not greatly detailed but shows the development area bounded to the south and east by roads which are still in use. It also shows a lane heading into the north of the project area (**site 5**) from Roserrans. The c1809 OS surveyors’ drawing (Fig 8) is not greatly detailed either but it does show the lane (**site 5**) still entering the site from the east.

Field boundaries shown on the St. Columb Major Tithes Map (Fig 9), dating to c1840, show that the project area includes elements of one or more perpetuated Medieval strip field systems, part of a landscape demonstrating this type of arrangement of fields, which are typically parallel, elongated and sinuous. The ownership of the fields was still divided by the long medieval strips in c1840 between the surrounding medieval settlements of Tregatillian, Roserrans and Quoit. At this date the site was divided into six units each farmed by a different man. Many of the fields had been subdivided, and there were 25 individual fields of mixed sizes (see Fig 9) all in either arable or pasture except for the central southern field which was planted at that time with mixed (predominantly deciduous) woodland. The lane (**site 5**) leading into the north of the area is shown. A leat (**site 2**) running south-east to north-west crossed the northern edges of the southern group of fields and water channels (also **site 2**) had been cut along the north-east south-west boundaries of the two south-western strips. Although the leat was clearly supplying these fields with water the mapping shows that it also continued westwards to St Columb Major where it appears to have supplied the waterworks/reservoir for the village. In the central field of the most south-westerly strip a small building was depicted (**site 6**).

By c1880 (Fig 10) some boundaries had been removed, leaving 14 enclosures, most of the smaller fields to the south-west having been amalgamated into one. The central southern field continued in use as a plantation and the lane (**site 5**) leading into the northern end of the site also continued in use. The leat (**site 2**) was still depicted on the OS mapping at this date but the water channels (also **site 2**) leading to the south-west fields had been removed along with the field boundaries and small building (**site 6**). A footpath is shown at this date running from north-west to south-east across the south-west corner of the site; this is still in use today.

The process of boundary removal continued and by c1907 (Fig 11) there were nine fields, these being reduced to four by 2005. The Second Edition OS 25” map of c1907 shows that the leat (**site 2**) was still present at this date along with the lane (**site 5**), plantation and

footpath. At some point during the 20th century the leat was filled in and the plantation removed.

7.5.2 Inventory of sites within the proposed development area

(See Fig 14 for site locations)

Site 1. Royal Observer Corps monitoring post, HER No MCO42712, SW 92326 62322

This is an underground observation post which was opened in 1964 and closed in 1991. It can be seen in the fence between the two fields.

The Cold War structure has been recorded by Subterranea Britannica on The Royal Observer Corps, Observer Corps Post database. The database describes the site as follows:

'OPEN

All surface features remain intact with the grey/green paint in good condition. A metal dome on the ventilation shaft indicates this was a master post although the dome has been removed and the hole filled with hay (perhaps a nest). The hatch is locked but internally the post is in good condition. When visited in 2000 the post was locked it is now (2001) open. Remaining artefacts include the table and shelf (detached), cupboard and copper earth straps around the walls.'



Fig 4 Surface feature of the Royal Observer Corps monitoring post HER No MCO42712

Site 2. Leat and water channels, SW 92110 62343 (centre)

The leat is shown on the Tithe Map c1840, the c1880 OS 25'' map and the c1907 OS 25'' map (Figs 9, 10 and 11). At some point during the 20th century it became disused and was filled in. It ran through the settlement of Quoit where it probably powered a mill, then under the road and through the southern fields of the site on a south-east to north-west alignment. Two water channels once led from the southern side of the leat along the boundaries of the two

south-westernmost arable fields. These channels are shown on the Tithe Map of c1840 but by c1880 they had been filled in. The Tithe Map, c1880 and c1907 OS maps indicate that the leat fed a watermill just to the south-east of St Columb Major and also the waterworks for the village.

Site 3. Field system, SW 92212 62335 (centre)

This is the field system which extends across the site. All the field boundaries that survive within the site pre-date the c1840 Tithe Map. All of the boundaries are stone-faced earth banks (Cornish hedges) mostly overgrown with grass and brambles, gorse and bracken etc. On average they measure 1.3m high by 1.3m wide at the base. The field boundaries are recorded in detail on the c1840 Tithe Map (Fig 9) and subsequent c1880 and c1907 OS 25" maps (Figs 10 and 11). The pattern of the fields shown on this mapping and still visible on the ground indicates derivation from a medieval sub-divided strip field system. All the boundaries are likely to have medieval origins. Remains of removed boundaries and other early elements of the system may survive below ground.

Site 4. 19th century school house, HER No MCO53113, SW 92321 61990

This school house was built at some point between 1840 and 1880. It is first shown on the First Edition OS 25" map of c1880 (Fig 10). The building, which lies at the south-east corner of the site, is still extant, although it has now been converted into a house.

Site 5. Lane, SW 92306 62575

This lane is first shown on Martyn's map of 1748 (Fig 7) and has survived intact since this date. It is located at the northern end of the site, leading into the fields from the road to the east. In 1748 this lane led from the site directly to Roserrans but the continuation of the lane on the east side of the road had been abandoned by c1809 (Fig 8). The surviving lane is approximately 84m long and 4m wide. It is defined to the north and south by stone faced earth banks (Cornish hedges) each measuring approximately 1m high by 1m wide. Both hedges have mature oaks growing from them. At the western end of the lane where it opens into the field there is a granite gatepost on the southern side of the opening.

Site 6. Small building, SW 86653 62806

This small agricultural building is shown on the Tithe Map of c1840 (Fig 9) at the end of a water channel in the south-westernmost field. By c1880 the building had been demolished.

Site 7. Giant's/Devil's Quoit chambered tomb, HER No MCO25816, SW 92327 61940

The Giants Quoit or Devils Coyt was a Neolithic chambered tomb. It consisted of four vertical stones supporting a capstone 2.8m by 2.0m across. The structure collapsed in the 1840s and was finally removed for stone to construct a road in about 1870, having for a long time been used as a pig sty. An excavation in advance of a pipe trench was carried out in 1977, establishing the location of the site and identifying a number of fragments of the original rocks in the field and in adjacent hedges (Cornwall HER).

Site 8. Medieval settlement of Quoit, HER No MCO16515, SW 92325 61960

The settlement of Quoit is first recorded in 1450 when it was spelt 'Coyt' (Gover, 322). The name is derived from Giant's Quoit or Devil's Coyt, a Neolithic chambered tomb (site 7). The settlement of Quoit is still occupied.

Site 9. Romano-British enclosure and metalworking site, HER No MCO16515, SW 92558 61940

A 2nd to 4th century AD enclosure was excavated on behalf of South West Water, where it was cut by the Bears Down to Ruthvoes water main. Excavation has shown that it was a

specialised smithing site rather than a settlement or round. Initial use of the area (phase one) was represented by a small but distinct Neolithic flint assemblage (incorporated within the area of the subsequent round as residual finds). These may well relate to the nearby, destroyed chambered tomb. A second phase was represented by a ditched field system of late Iron Age or early Roman date, which pre-dated the round. At some point, probably during early 2nd century, this field system was overlain by a series of small structures erected within a palisade enclosure (approximately 50m in diameter). These phase three structures were located centrally within the enclosure and were represented by little more than circular hollows. No evidence for domestic activity was found, but clear evidence for a considerable amount of smithing. Metalworking continued in the 3rd century (phase four), with a furnace, fire pit and slag pit. Evidence for metalworking took the form of slags, pit and hearth bases, broken iron objects, hammerscale and fired clay. A small amount of possible tap slag suggests a limited amount of smelting as well as smithing. Oak and gorse were the principal fuels, the oak coming from managed coppiced woodland. Probably contemporary with this activity was the construction of a ditch and rampart circuit, typical of a round, 54m across internally. Occupation of the site, from 2nd century to late 3rd century or perhaps the early 4th century AD, is dated by a small assemblage of diagnostic pottery and radiocarbon dates. Two fragments of Roman tile are unusual finds for Cornwall, perhaps brought onto the site for use in some furnace construction. The decline of the round seems to have taken place in or by the 4th century AD. This period saw the infilling of larger metalworking related features, the gradual silting of other features, and the continuation of rampart collapse into the external ditch. Evidence for a small fire was found in the uppermost fills of the southern enclosure ditch, long after this period of infilling and desertion. The enclosure is visible as traces of an earthwork and as a crop mark bank on air photographs, and was plotted as part of the NMP (Cornwall HER).

Site 10. Bronze Age barrow, HER No MCO43657, SW 92156 61870

A circular ring ditch, 19m in diameter, is visible as a crop mark on air photographs and was plotted as part of the NMP. This feature is likely to be a plough-levelled barrow.

Site 11. Tregatillian Iron Age/Romano-British round, HER No MCO43883, SW 91826 62616

A curvilinear enclosure, 41.5m by 40m, is visible as a cropmark bank on air photographs and was plotted as part of the NMP. It is likely to be an enclosed settlement or round of Iron Age/Romano-British date.

7.5.3 Further archaeological potential

In addition to the known sites (Section 7.5.2) other, buried archaeological remains as yet unrecorded may be expected to survive within the extent of the proposed solar farm.

Areas of ‘Anciently Enclosed Land’, of the ‘Medieval farmland’ HLC Type have been shown through interventions such as watching briefs and excavations elsewhere in Cornwall to have high archaeological potential. Buried traces of both secular and ceremonial prehistoric sites, as well as of medieval settlement and farming-related activity, may remain in land of this Type. There is also high potential for ‘stray’ or even *in-situ* artefacts such as pottery and flint surviving in the soils.

7.6 Significance

Of the known individual archaeological sites adjacent to the proposed solar farm, the Neolithic chambered tomb (**site 7**), Bronze Age barrow (**site 10**), Iron Age/Romano-British metal working site (**site 9**) all to the south-east and round (**site 11**) to the north-west are all

considered to be of high significance. Although these sites are not designated the chambered tomb is considered of national importance and the others of regional importance. Together, these sites indicate the area immediately adjacent to the proposed solar farm was in use from the Neolithic through to the Romano-British period.

The medieval settlement of Quoit (**site 8**) along with the field system of medieval origin (**site 3**) are of moderately high significance, and the field system is important on a regional scale, showing, fairly well, a derivation from a medieval ‘open’ or subdivided strip field system, some early strip boundaries being maintained as Cornish hedges. There is potential for buried evidence of early farming, and datable deposits, in the form of buried traces of other strip divisions, and of cultivation ridges within the strips. Buried remains associated with the settlement of Quoit may be present within the south-eastern part of the site.

Sites of moderate significance include the Observer Corps monitoring post (**site 1**) in the centre of the site (of which few survive intact in Cornwall), the lane (**site 5**) in the north-east part of the site and the school house (**site 4**) just outside the south-east corner of the site. Those of moderate to low significance include the site of the former leat and water channels (**site 2**) cutting through the centre of the site and the site of a small building shown on the Tithe map (Fig 9) (**site 6**) in the south-westernmost field.

In terms of its contribution as the setting of important ‘heritage assets’ *beyond* its limits, the development area has moderate significance. Of most significance, the eastern half of the site is visible from the western half of Castle-an-Dinas (CO93) an Iron Age hillfort open to the public (Figs 1 and 2). Other sites which may be visible include two round barrows (32983) 5km to the north and an Iron Age/Romano-British round (32969) 3.5km to the north-west. However, both of these sites are likely to be located on private farmland and are located at distances where the proposed solar farm would form only a minor component of views from them. None of the other scheduled monuments within the viewshed appear to be visible except possibly Queen’s pit in Indian Queens which lies 4km to the south. Parts of the site may be visible from twelve out of the twenty-one listed buildings within the viewshed.

The development area is significant as part of an area of ‘Anciently Enclosed Land’. Within the site the fields show derivation from early strips in their form. Association with existing settlements of medieval origin including ‘Quoit’, ‘Roserrans’ and ‘Tregatillian’ can be traced from the Tithe Apportionment 1840. The ‘Medieval farmland’ within the area is associated with high potential for a significant resource of prehistoric or medieval features, artefacts or deposits surviving below ground.

Finally, it should be noted that the Cornish hedges still in use, considered important under the historic criteria of current hedgerow regulations, contribute to the significance of the proposed solar farm area in several, related ways. The boundaries may contain early fabric and may seal buried soils with evidence of past environments. They also indicate the time depth of the historic landscape here.

7.7 Archaeological Impact

7.7.1 Types and scale of impact

Two general types of archaeological impact associated with solar farm developments have been identified and summarised by Sharpe (2010) as follows.

7.7.1.1 Types of impact; construction phase

Construction of a solar farm would have direct, physical impacts on the above-ground or buried archaeology of the site: through construction of solar arrays and associated control

plant, with undergrounding of cables, and through provision of any works compound/s, and permanent or temporary vehicle access ways into and within the site.

Current plans indicate that the creation of the solar arrays within the project area will entail the driving of piles or anchors on which to site the individual arrays. In addition, linear trenching will be required to house the conduits carrying the cabling linking up the individual arrays. These various works could involve considerable ground disturbance up to 1m in depth.

Plans of the proposed solar farm at Quoit show arrays running in rows aligned east-west over perhaps around half of the ground area of the site, leaving corners and margins around the fields (Fig 6). A wider margin between the edge of the fields and the arrays is shown along the northern side. To the east of the arrays, a control point with plant in a fenced rectangular compound measuring in the region of 30m by 10m is shown in the proposed site layout plan.

7.7.1.2 Types of impact; operational phase

A solar farm may be expected to have a visual impact during the operational phase, with tightly-packed arrays of dark glass photovoltaic panels, together forming a surface in the region of 2m above ground level, extending across much of the site.

It is understood that the solar farm is regarded as a temporary development, but that its operational phase might extend for some twenty years, which may be regarded in terms of peoples' experiences of it as a generation.

7.7.1.3 Scale and duration of impact

As noted by Sharpe (2010) the impacts of a 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

with the additional **negative/unknown** 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.

7.7.1.4 Potential and residual impacts

Potential adverse impacts may be capable of mitigation through archaeological recording or other interventions. In the assessments forming the following Section 7.7.2, where appropriate, both 'potential' and 'residual' impacts are given; that is, expected impacts 'before' and 'after' such work. A proposed mitigation strategy is outlined below in Section 7.8.

7.7.2 Assessment of impact

Overall, the proposed solar farm on the archaeological resource is assessed as having a potential impact scored as **negative/moderate** without appropriate recording and other

mitigating work, and a **negative/minor** residual impact provided that the recommended mitigation is undertaken.

The assessments supporting this general statement are outlined in the following sub-sections. To comply with current policies and guidance (Section 7.4) these provide assessments of impact in terms of different aspects of the archaeological resource - its individual sites, the settings of sites, HLC, and field boundaries. There are inevitably areas of overlap between these categories of impact (the field pattern of the area forming at once a significant individual site, the setting of adjoining assets, and an intrinsic feature of the historic landscape, while including individual historic boundaries, for example); the assessment is adjusted accordingly to avoid 'double counting' of impacts.

7.7.2.1 Impact on known individual archaeological sites within the project area

Ground disturbance associated with the installation of supports for solar arrays or cables or with ancillary works could result in permanent, irreversible loss of upstanding or below ground remains of the known archaeological sites within the area, or elements of these. The works if up to around a metre deep might affect buried cut features.

The scale of impact will vary with the significance of the individual site, and with the proportion of the whole site which would be affected. Notably, buried features associated with the field system (**site 3**), the leat and water channels (**site 2**) and former small building (**site 6**) could be disturbed, truncated or removed. Any buried remains of early elements of the medieval field system such as strip field boundaries could be affected. (Potential impacts on historic field boundary banks, the upstanding components of **site 3**, are considered separately, in Section 7.7.2.5.) Impacts on the observation post and lane (**sites 1** and **5**) are not likely to occur as these lie at the edges of fields where margins are left between the solar arrays.

Altogether this impact is considered to be potentially **negative/moderate**, with a residual impact of **negative/minor** provided that appropriate recording and other mitigating work is carried out.

7.7.2.2 Impact on the project area as the setting of surrounding key heritage assets

The proposed solar farm is considered to have an impact on the setting of key surrounding heritage assets, summarised as a **negative/moderate** impact overall, as follows (see Figs 15 and 16, for locations of SMs and LBs referred to);

- During the operational phase the solar farm would detract moderately severely from the understanding of its location as ancient farmland, and so adversely affect the setting of the Scheduled hillfort of Castle-an-Dinas (SM CO93) with which it provides a 'historic or aesthetic connection' of the type included in the definition of settings in the English Heritage PPS5 guidance (see Section 7.4.1.3)
- During its operational phase the solar farm would detract from the visibility and understanding of the area as ancient farmland, and so obscure aspects of the significance - as an early farming settlement working this land.
- In operation the solar farm would also possibly have some adverse impact on the settings of three other Scheduled Monuments (SMs 32983, 32969 and CO1070) within the generated viewshed within 5km from the site. Inter-visibility between these SMs and the solar farm site is limited due to distance.
- However the impacts noted above would be limited with regard to site settings because the medieval strip-derived layout evident in the upstanding field boundaries means that the predominant historic character of the solar farm area today is medieval/post-medieval, so it contributes less directly to understanding of the prehistoric landscape.

- The above effects would also be limited because any direct impact on buried remains identified could be avoided or adequately mitigated (see Section 8) and because the visual impact could be reversible.
- During the operational phase the solar farm could also impact on the settings of up to twelve out of the twenty-one listed buildings within the generated viewshed within the 5km radius. The following listed buildings are possibly inter-visible with the site: 71183, 71184, 71185, 71238, 71157, 71150, 71174, 71255, 71259, 71179, 71319 and 71280.

7.7.2.3 Impact on Historic Landscape Character

A solar farm at Quoit can be predicted to degrade the historic character of the landscape. The expected effect on HLC is **negative/moderate**. Factors contributing to this assessment are as follows;

- Land-take for the project would be substantial but relatively small in comparison with the very large area of the HLC Unit of Medieval Farmland of which it forms part.
- Impact in terms of physical loss during the construction phase of the upstanding boundaries which form the visible components of HLC would be **neutral** or **negative/minor**.
- Visual impact throughout the operational phase would mean the loss of visibility of historic open farmland, reduced visibility of semi-natural hedgerows, and low but extensive introduction of modern design and materials.
- Some scope for mitigating measures to reduce or avoid this impact on HLC has been identified. (These relate to treatment of the historic boundary banks which form the major tangible component of HLC here; see Sections 7.8.2 and 7.8.5).
- However the impacts on the legibility of HLC could be largely or wholly reversible should the solar farm installations be removed in the future.

7.7.2.4 Other archaeological impact

Any ground disturbing works here could encounter significant buried prehistoric or medieval remains (see Section 7.5), resulting in permanent, irreversible loss of these, or elements of them. This potential impact is assessed as **negative/unknown** as specific evidence for the nature and extent of any such remains is at present limited to that of aerial photography prospection which by its nature represents only a partial record. It is likely that it could be mitigated satisfactorily though archaeological recording, reducing the residual impact to **neutral** or **negative/minor**.

7.7.2.5 Impact on historic field boundaries

It is understood that it is proposed that the solar farm scheme would not involve removal of the historic field boundaries, which show derivation from a medieval strip-derived field system. However without full details of any proposed undergrounded cable ways, works access routes etc. which might entail disturbance to the hedge banks or their gateways, there remains a potential **negative/minor** impact on these features. It is likely that it could be mitigated satisfactorily though archaeological recording, and if appropriate, careful, guided reconstruction; reducing the residual impact on boundaries to **neutral**.

7.8 Mitigation Strategy

7.8.1 Development of pre-construction recording; geophysical survey

A geophysical (magnetometer) survey is recommended for the whole area. This would allow:

- Identification of any buried sites, not visible on the ground or on the NMP plot from aerial photographs, allowing sensitive ground to be identified as closely as possible in this area of high archaeological potential.

Following the completion of the geophysical survey, a Written Scheme of Investigation (WSI) should be prepared and agreed to establish and direct a programme of mitigating archaeological work. This should follow a Brief set by Cornwall Council's Historic Environment Advice Team, which would set out the scope of any further work required. It is likely to include the elements outlined below.

7.8.2 Close design of proposed works to reduce impact

The archaeological assessment indicates that careful design of the proposed solar farm to avoid or reduce particular impacts should be considered;

- **Field system (Site 3)** Disturbance (through works such as cable laying, gateway opening or widening) of the fabric of the upstanding elements of the medieval strip-derived field system, the hedge banks still in use as field boundaries, should be avoided or minimised to reduce loss of early features and of their contribution to HLC (see also Section 7.7.5).
- **Observer post (Site 1)** This feature should not be disturbed and any proposed works in the area redesigned to avoid it.
- **Lane (Site 5)** Disturbance of the fabric of the upstanding elements of this lane, should be avoided to reduce loss of early features and of their contribution to HLC.
- **Other significant archaeological remains** Should the recommended geophysical survey indicate any other significant archaeological sites or features, measures to avoid impact on these should be considered.

7.8.3 Controlled soil stripping

Controlled soil stripping - that is, direction by an archaeologist of mechanical topsoil and subsoil stripping - is recommended where ground is to be disturbed, for example through trenching or in levelling access ways or works compounds. The scope and extent of this programme of archaeological monitoring should be guided by the results of the geophysical survey, together with a further understanding of the impacts (based on detailed plans for location and depth of trenching, anchoring, etc). Controlled stripping would provide for preservation by record of buried medieval or earlier artefacts or deposits, and would also allow identification of any further recording or other needs such as wider excavation or sampling.

7.8.4 Excavation

Archaeological excavation may be appropriate in advance of any ground disturbance in areas where features of high significance are found during the geophysical survey or controlled soil strip.

7.8.5 Boundary recording and reconstruction

Any of the historic field boundaries or parts of these disturbed by the works should be recorded in advance. Where sections of boundaries are to be taken down to allow access for construction vehicles or for cable routes, sections through them should be drawn at a suitable

scale. Boundaries should also be sampled for buried soils and palaeoenvironmental evidence if considered appropriate by the recording archaeologist. If possible boundaries so disturbed should be re-instated using original or similar local rubble stone, and in the existing style.

7.8.6 Analysis and presentation of findings

The results of the mitigating archaeological recording outlined above should be compiled and analysed, and significant findings should be presented as required, with publication to professional standards as appropriate.

7.9 References

7.9.1 Primary sources

Thomas Martyn, 1748. Map of Cornwall (photocopy at HE)

Ordnance Survey, c1809. *2 Inch Drawing*

Tithe Map and Apportionment, c1840. *Parish of St. Columb Major* (digital and microfiche copies 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*

7.9.2 Publications

Cornwall County Council 1994. *Cornwall Landscape Assessment* Truro

Gover, J E B, 1948. *Placenames of Cornwall*. Typescript held by the Courtney Library, RCM

Lawson Jones A et al, 2003. *Little Quoit Farm, St Columb Major, Cornwall: Excavation of a Romano-British smithing site*, Cornwall Council: Truro

Padel, O, 1985. *Cornish Place-Name Elements*, English Place-name Society: Nottingham

Parkes, C, 2010. *Proposed Brill Solar Farm, Constantine, Cornwall Archaeological Assessment* Cornwall Council: Truro

Sharpe, A, 2010. *Proposed Four Burrows Solar Farm, Cornwall Archaeological Assessment* Cornwall Council: Truro

Stephens, S, 1998, *Geophysical survey report 98/60: Ruthvoes to Bears Down South West Water pipeline, St. Columb Major*. Geophysical Surveys of Bradford

Sturgess, J, 2010. *Proposed Kernow Solar Farm, Newquay, Cornwall, Archaeological Assessment* Cornwall Council: Truro

7.9.3 Project archive

The HE project number is **2010107**

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

1. A project file containing site records and notes, project correspondence and administration.
2. Digital photographs and map drawings stored in the directory R:\Historic Environment (Images)\SITES.Q-T\Quoit solar farm assessment 2010107

3. Viewshed mapping stored in the directory L:\Historic Environment (Data)\HE_Information\Viewsheds\Solar_Panels\quoit_solar_multiple_viewshed.shp
4. This report text is held in digital form as: G:\Historic Environment (Documents)\HE Projects\Sites\Sites Q\Quoit solar farm assessment 2010107\report 2010107\ Quoit solar farm assessment report 2010107
5. English Heritage OASIS database ID: cornwall2-97681

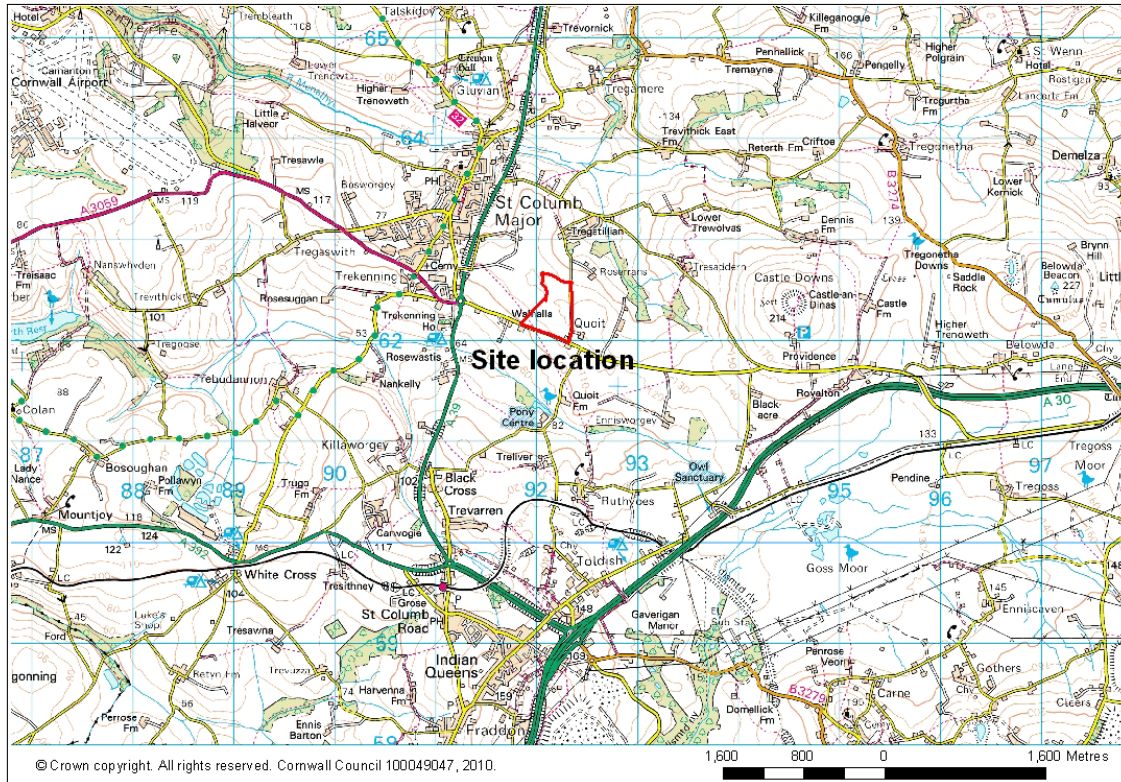


Fig 5 Location map



Fig 6 Plan of the proposed solar farm, showing solar arrays (in blue)

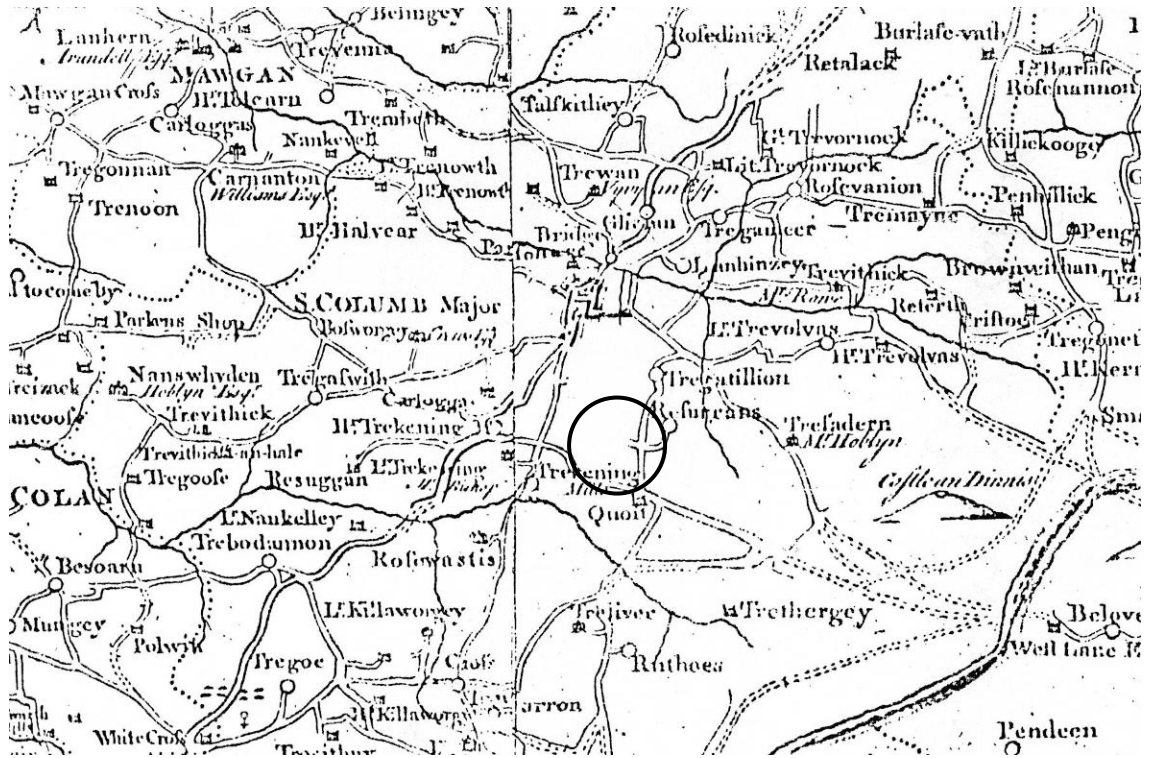


Fig 7 Thomas Martyn's map of 1748

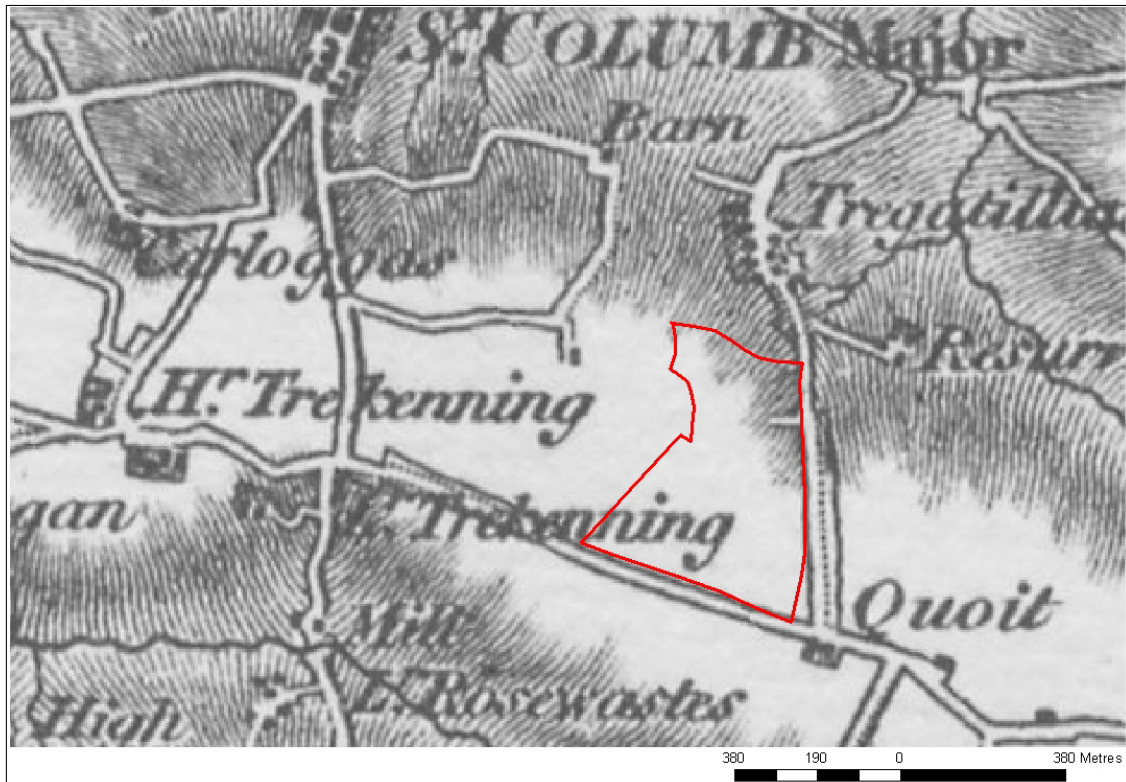


Fig 8 The area on the c1809 OS Surveyors' drawing, showing the farm settlement (site 3)

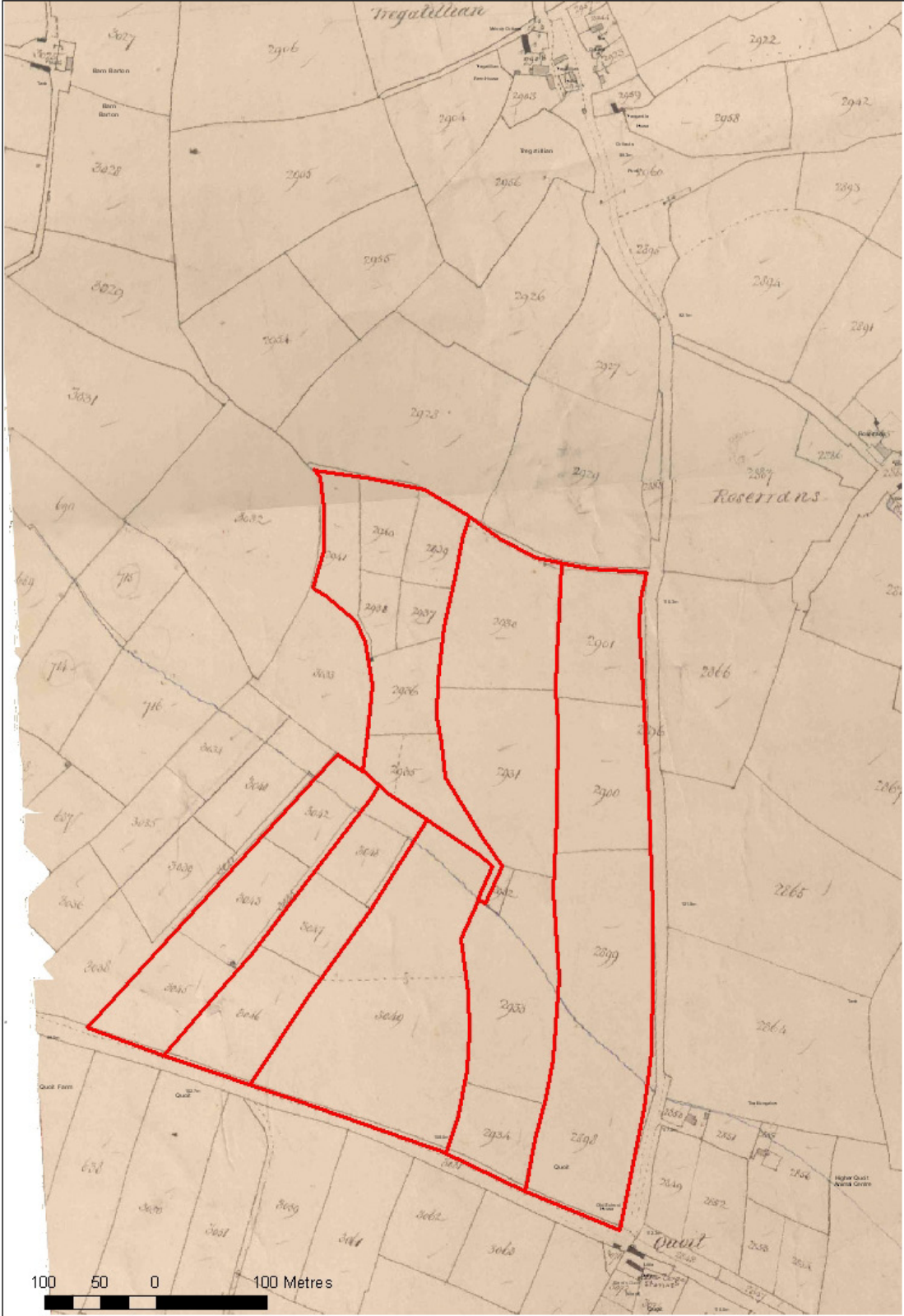


Fig 9 Extract from the Tithe Map c1840 for the Parish of St. Columb Major showing the separate holdings of different individuals at this date (in red)

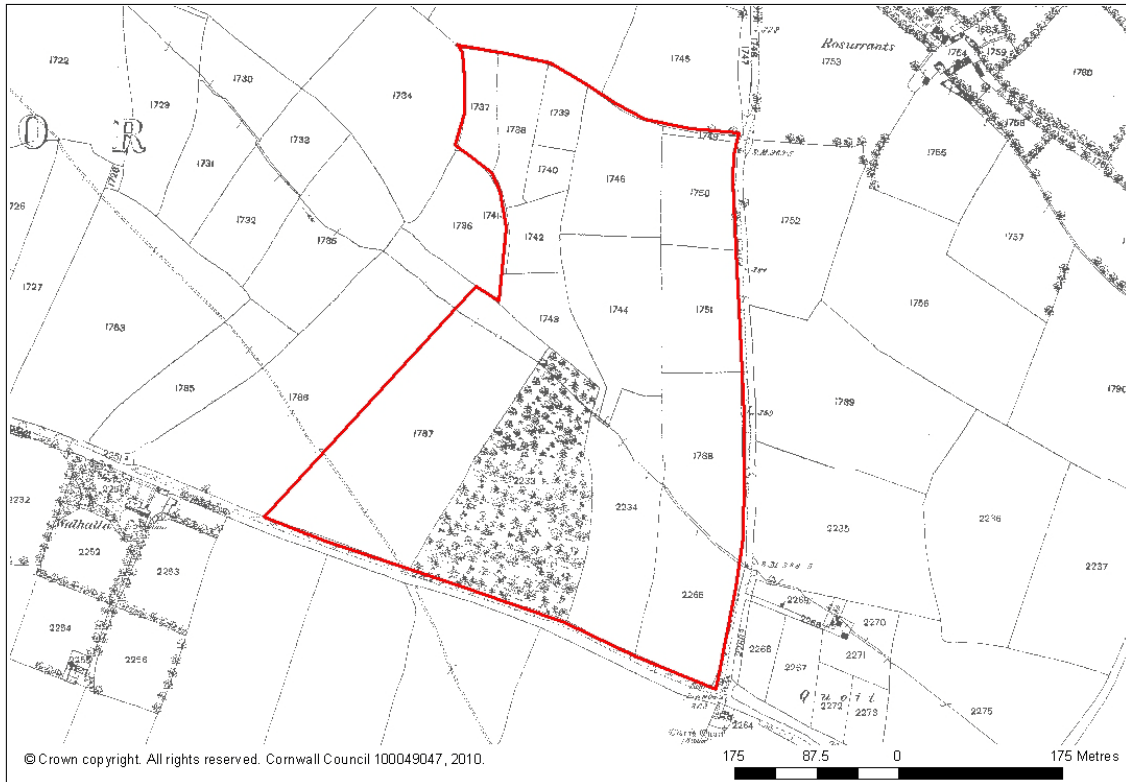


Fig 10 First edition OS 25" map of c1880

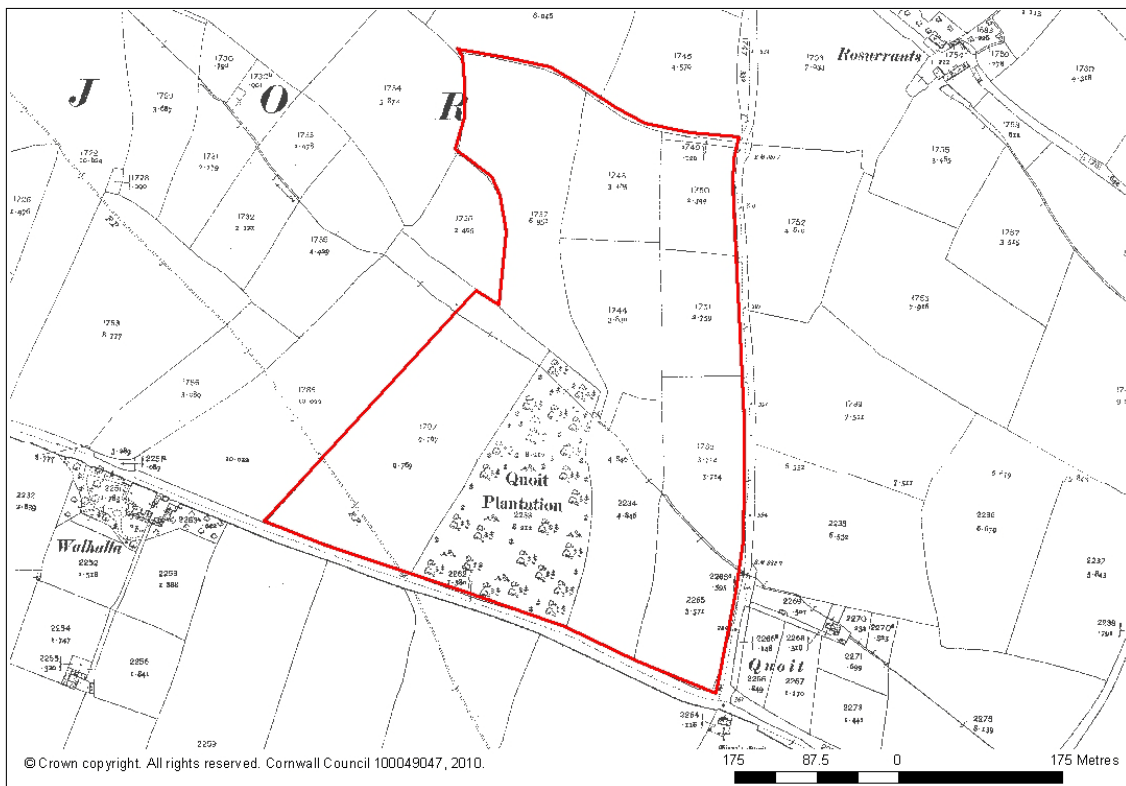


Fig 11 Second edition OS 25" map of c1907

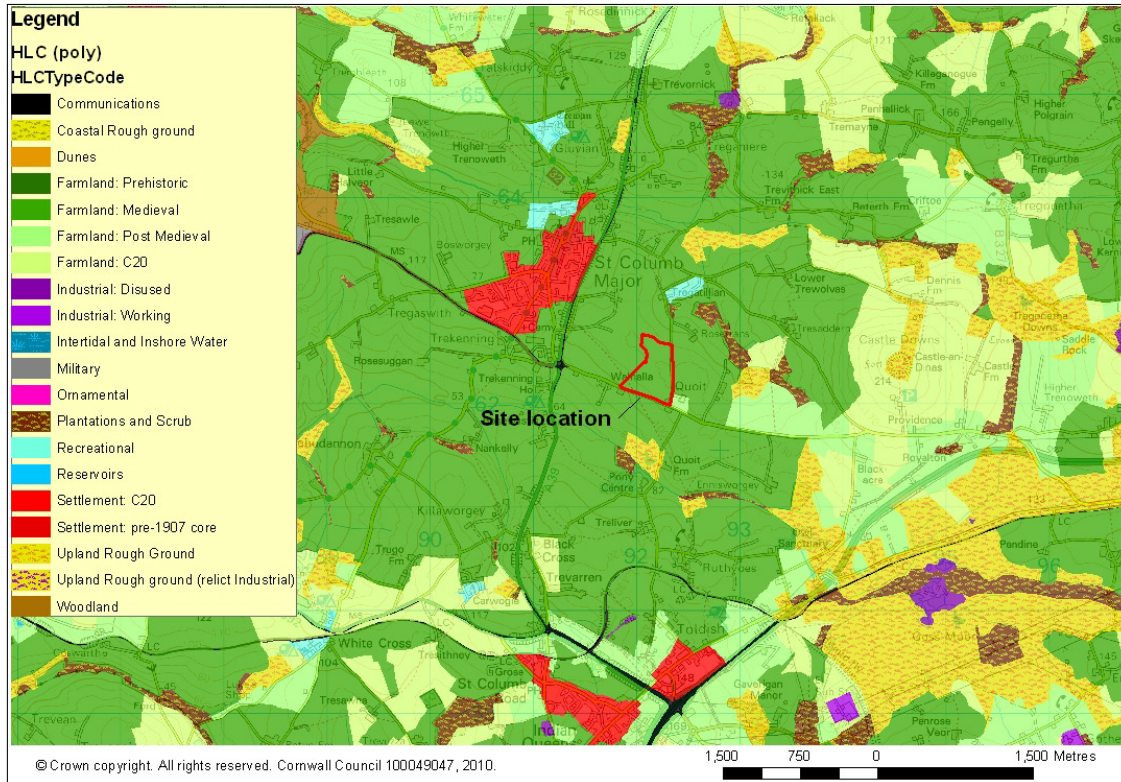


Fig 12 The 1994 HLC mapping, showing the site at the centre of a large tract of 'Medieval farmland'

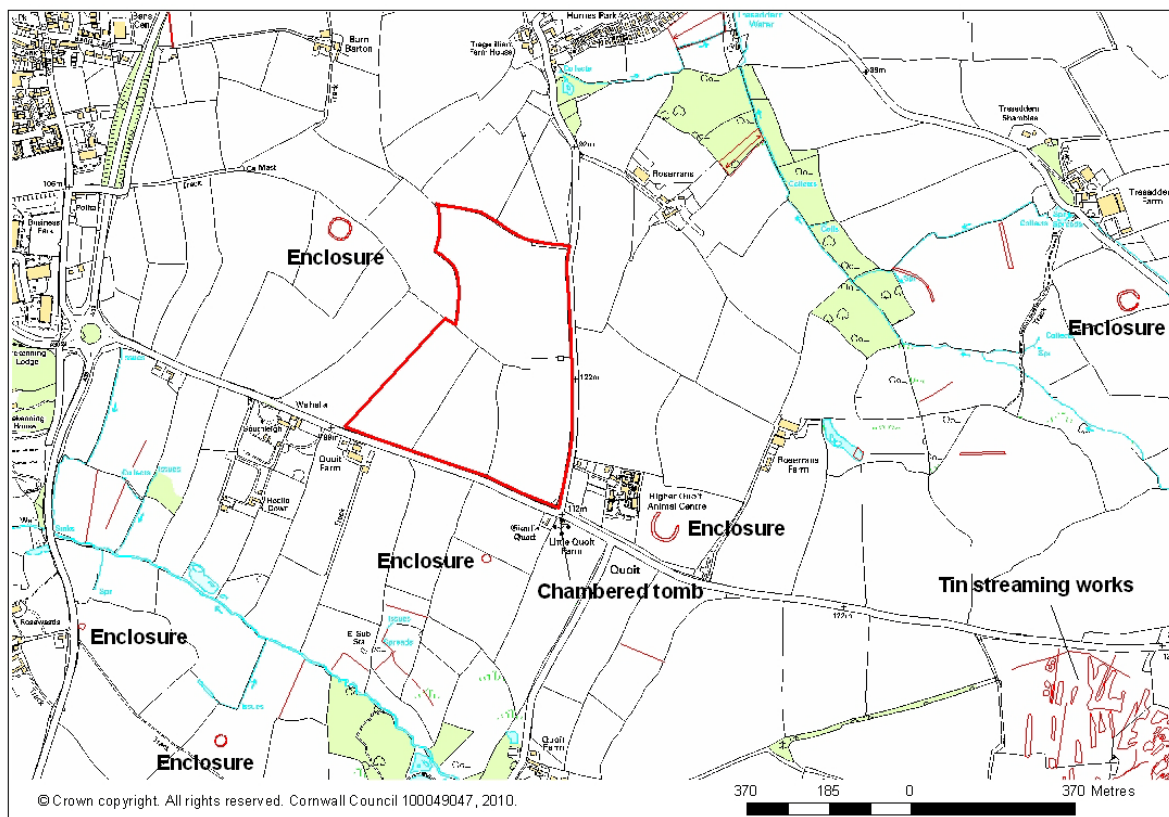


Fig 13 Distribution of Iron Age/Romano-British rounds/enclosures plotted by the NMP within a 1km radius of the site

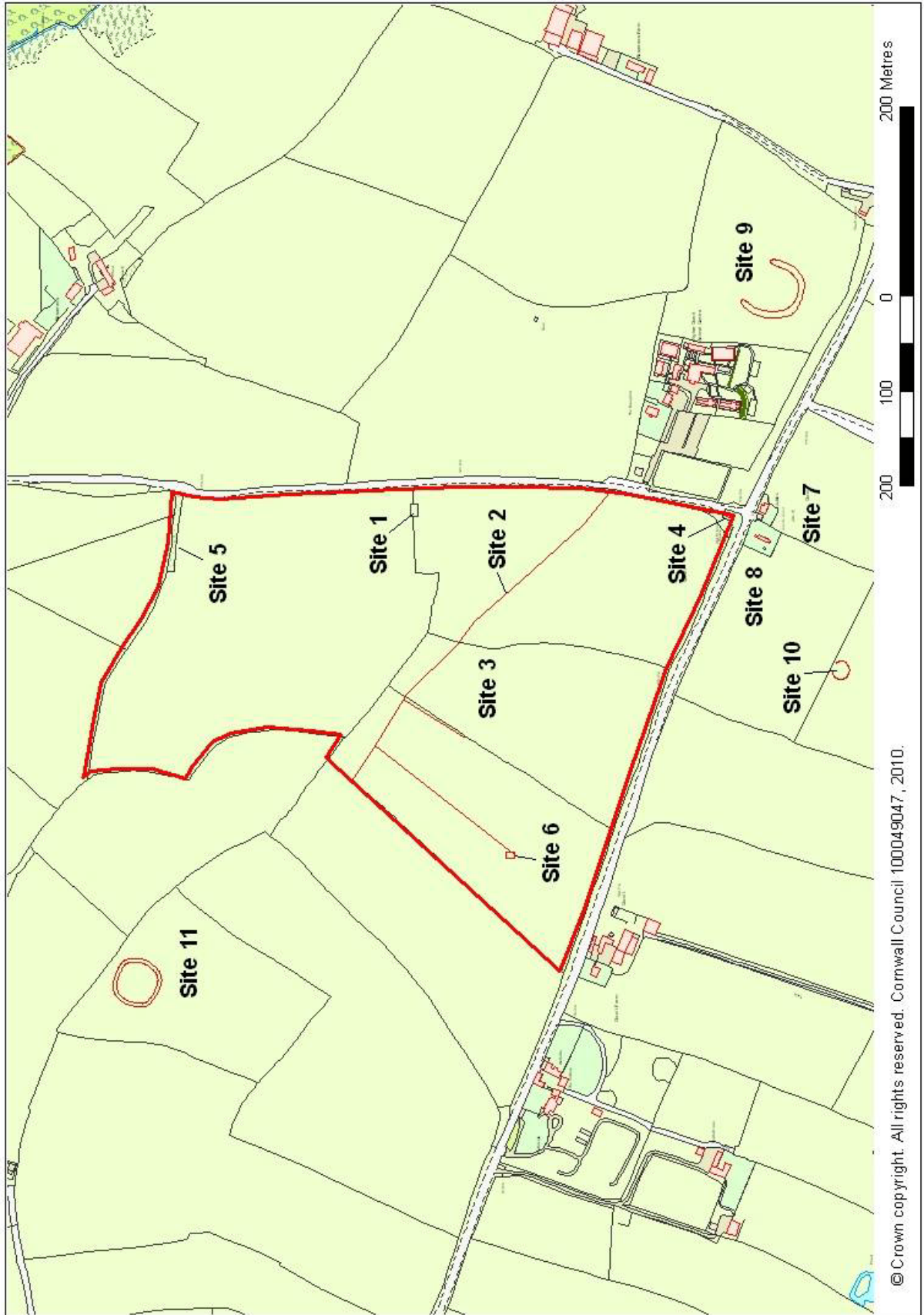


Fig 14 Archaeological sites location map

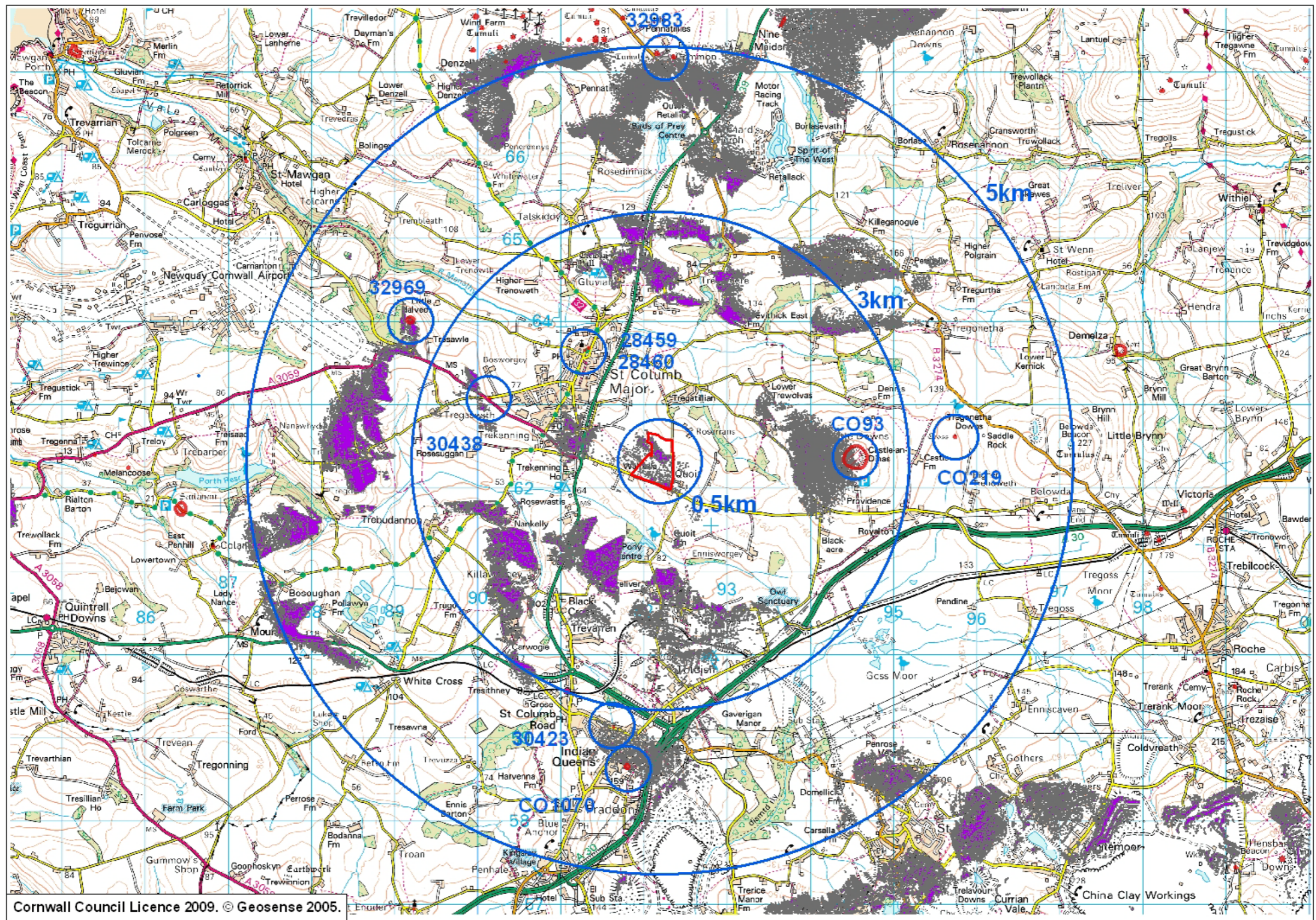


Fig 15 Map showing the computer generated viewshed of the proposed solar farm (in purple), and Scheduled Monuments (red but circled in blue) within a 5km radius

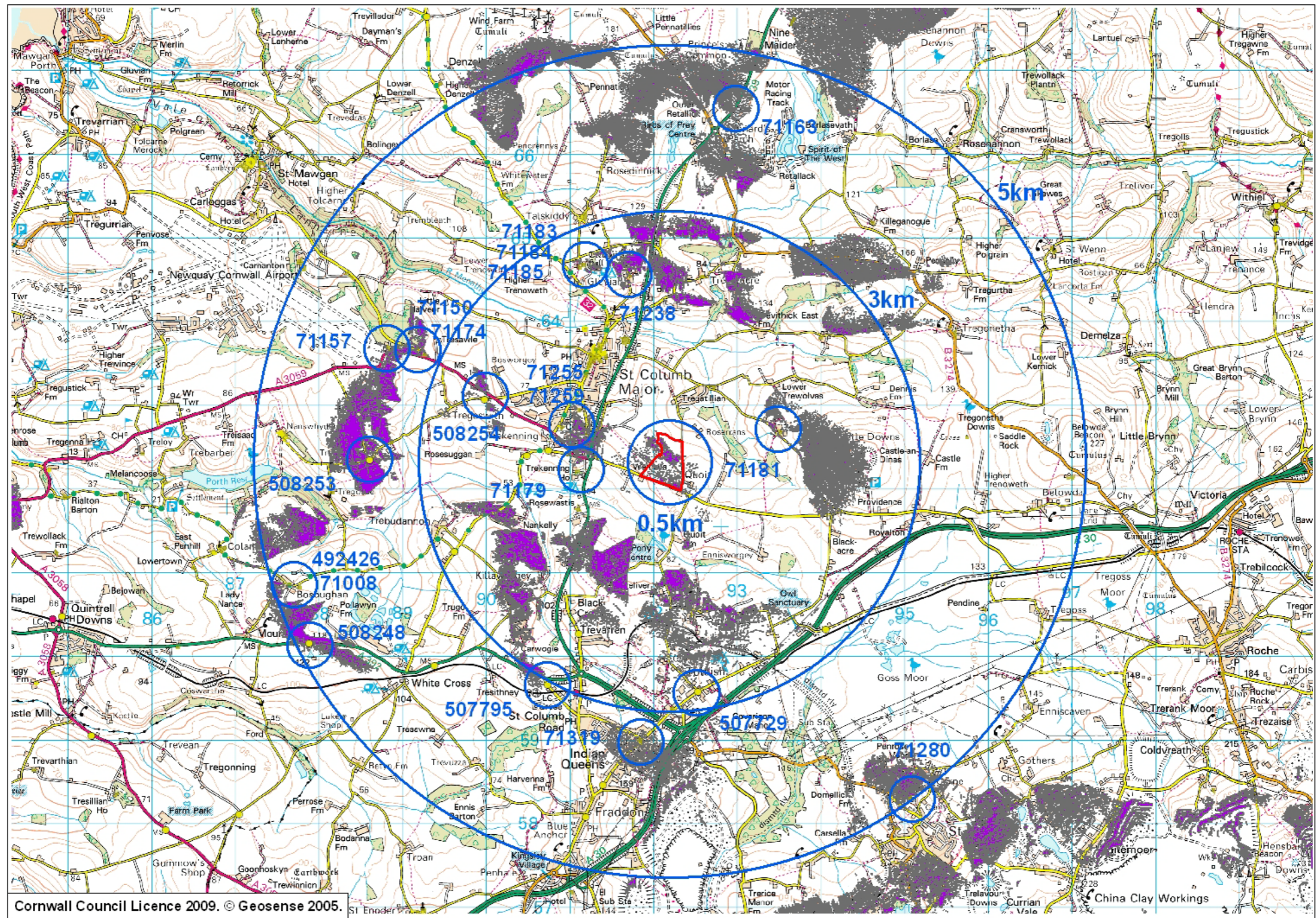


Fig 16 Map showing the computer generated viewshed of the proposed solar farm (in purple), and listed buildings (yellow but circled in blue) potentially visible within a 5km radius

Addendum for proposed Quoit solar farm archaeological assessment

Following the completion of the archaeological assessment of Quoit a geophysical survey was carried out to include the entire proposal area bar the south-westernmost field (Fig 1). The survey (carried out by Stratascan) was requested by Wardell Armstrong International to satisfy mitigation measures for geophysical survey which had been recommended in the archaeological assessment.

The initial results of the gradiometer survey showed that the majority of features identified were located in the northern half of the area (Figs 2 and 4). Here two probable ditched enclosures are visible associated with numerous pits of unknown function. In addition, many of the removed field boundaries shown on the Tithe map of c1840 are also visible. The results from the southern half of the site (Figs 3 and 4) show little in the way of archaeological features besides a post-medieval leat (**site 2**) and a few pits and short banks. Some of the field boundaries shown on the Tithe map are also visible in the eastern half.

In the light of the geophysical survey results Wardell Armstrong International have redesigned the layout of the solar arrays (Fig 5) to avoid disturbance to the area containing the two ditched enclosures in the northern half of the site.

The redesign of the solar array layout to avoid the newly discovered archaeological features has reduced the impact on known archaeological features identified through the assessment or geophysical survey to **negative/minor**.

However, the potential impact of the solar farm on unknown (as yet unidentified) below ground archaeological features remains assessed as **negative/unknown**.

The other mitigation recommendations set out within the archaeological assessment remain unchanged.



Fig 1: Location of geophysical survey (© Stratascan)

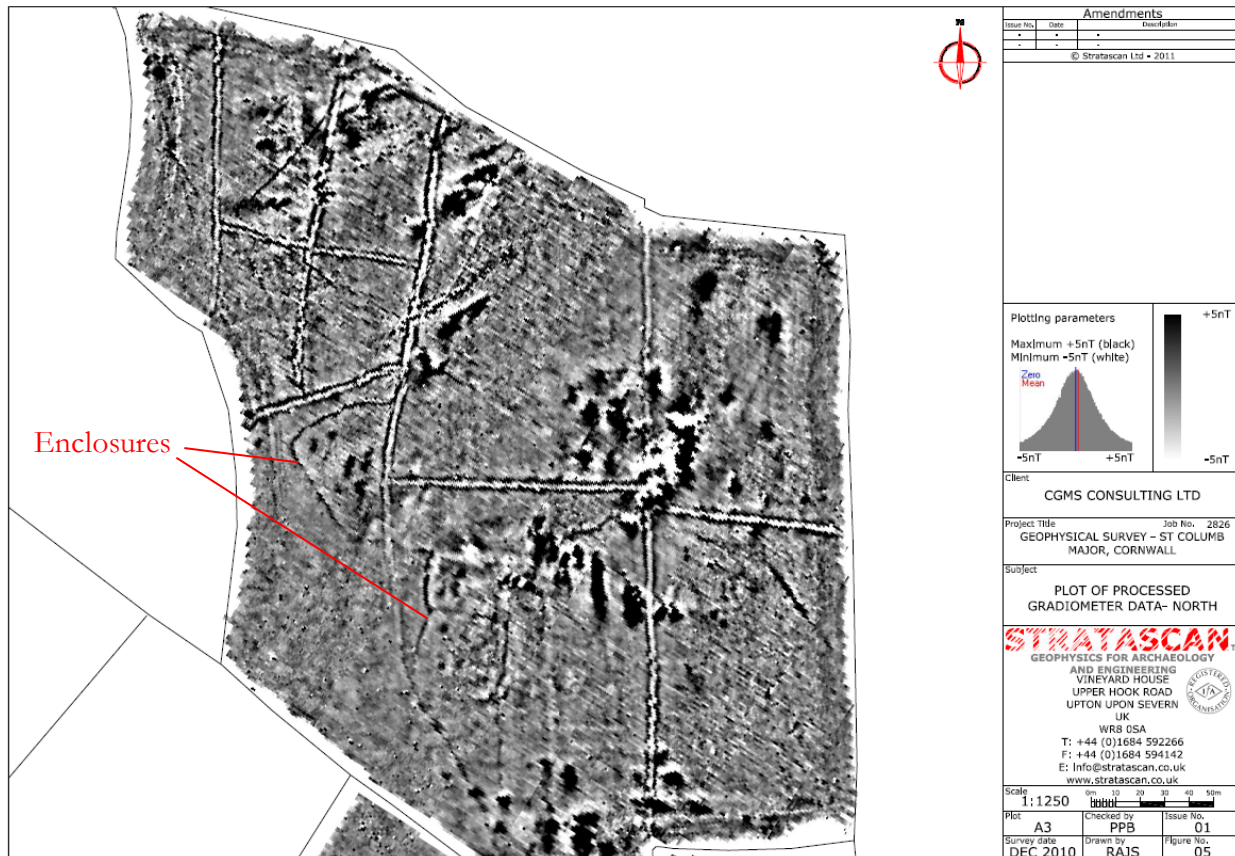


Fig 2: Interim geophysical survey results for the northern half of the site(© Stratascan)

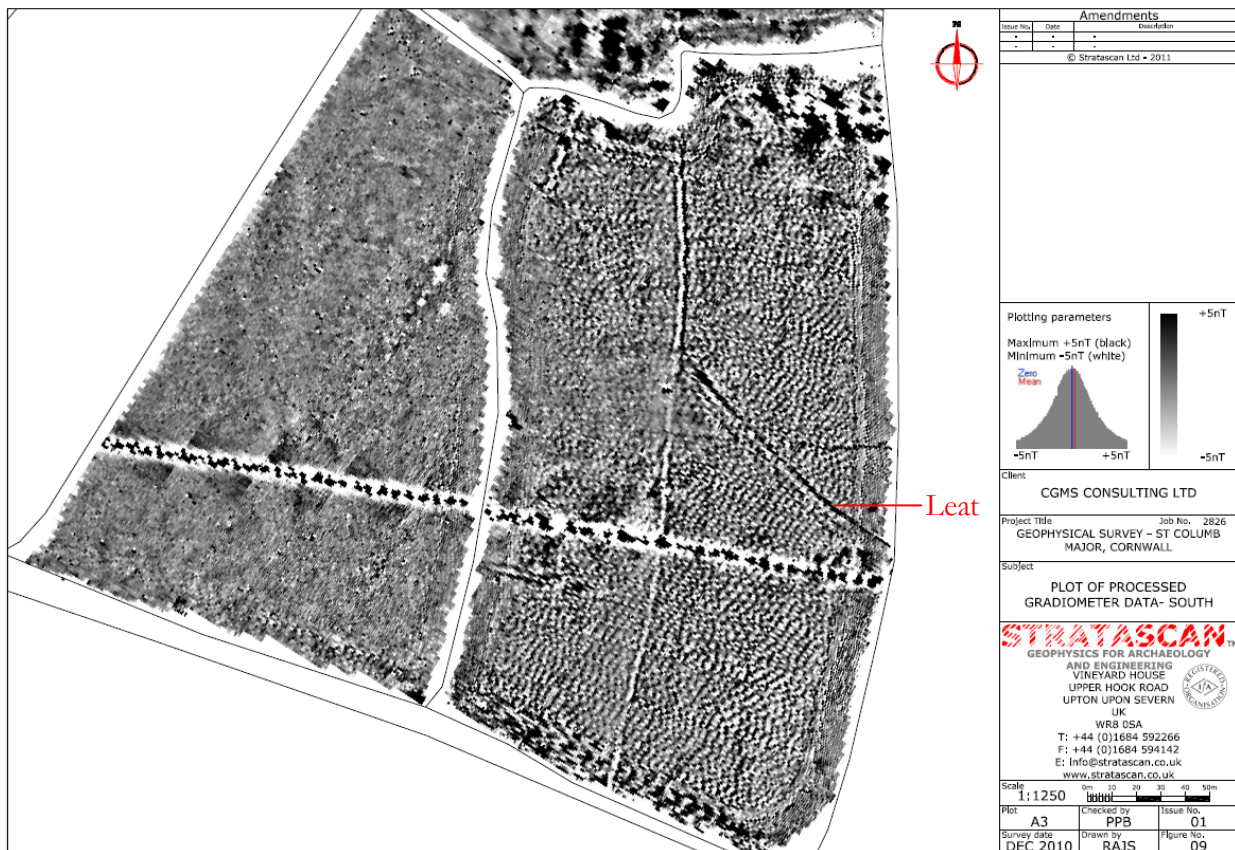


Fig 3: Interim geophysical survey results for the southern half of the site (© Stratascan)

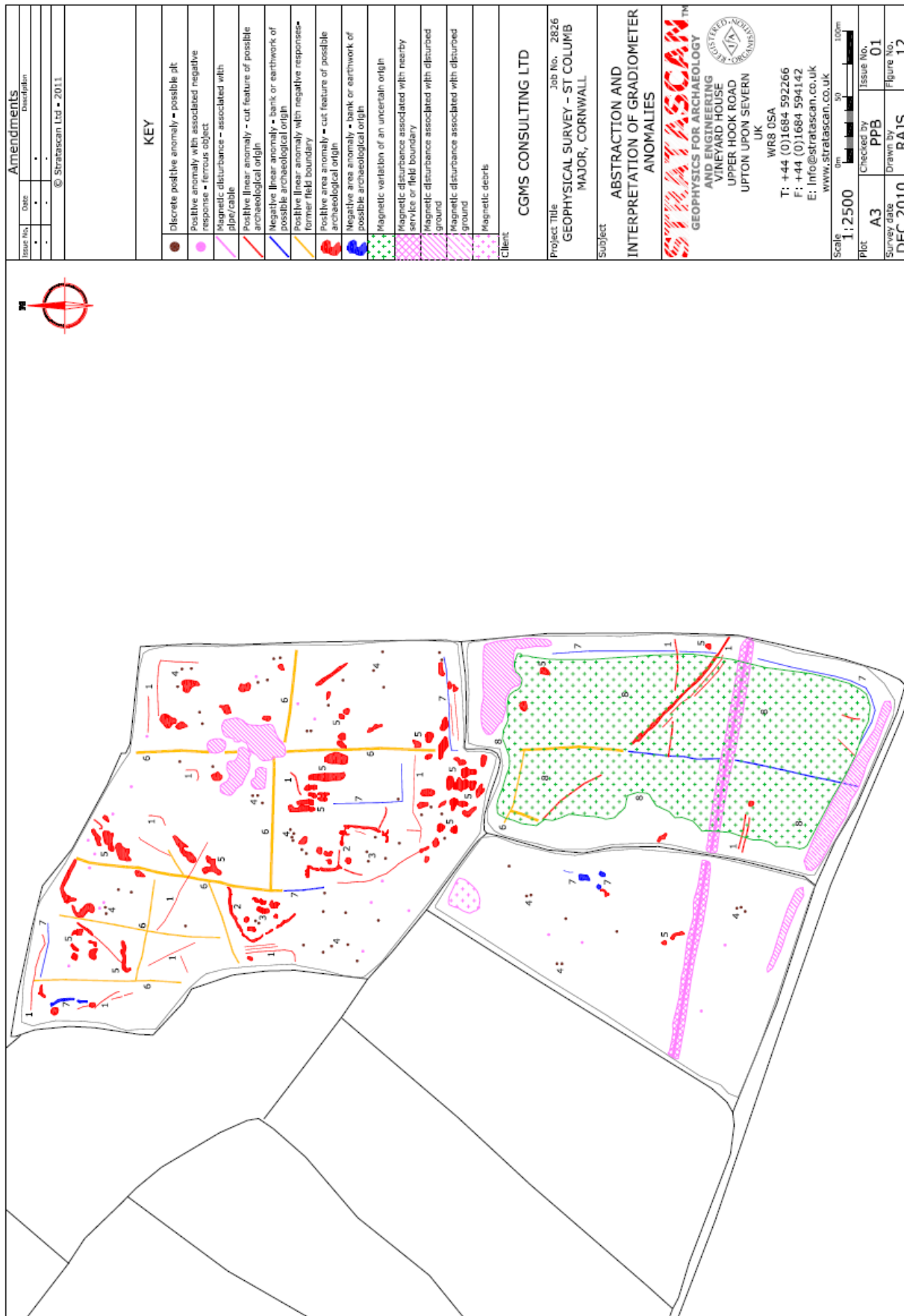


Fig 4: Interpretation of gradiometer anomalies (© Stratascan).

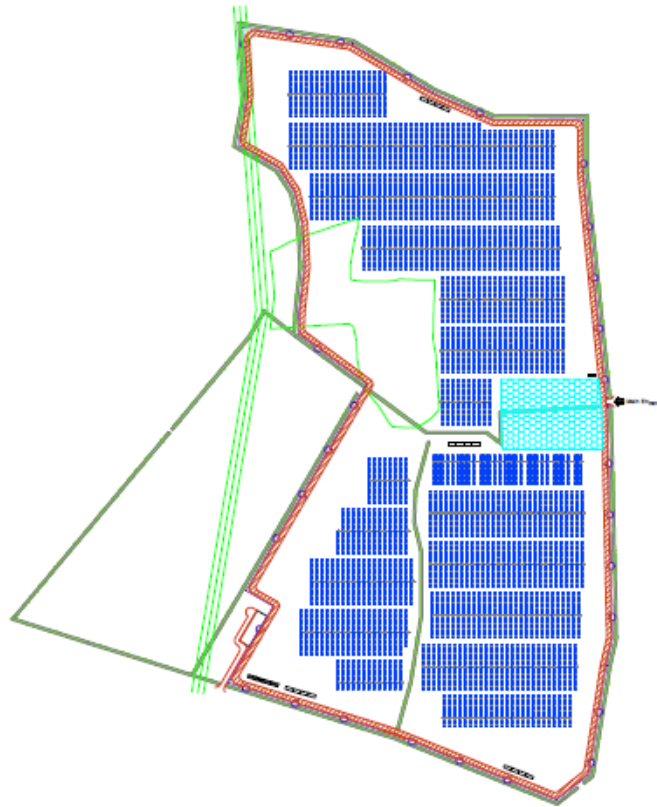


Fig 5: Redesigned layout of solar arrays to avoid the two enclosures in the northern half of the site (supplied by Wardell Armstrong International)