



Pennare Solar Farm, St Allen, Cornwall

Archaeological Mitigation Archive Report



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Archaeological Mitigation

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The Project Manager was Sean Taylor. Graham Britton, Hayley Goacher, Laura Ratcliffe, and Ryan Smith assisted with the fieldwork.

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

Ditch [607] sectioned, facing south

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Abbreviations

HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
NMP	National Mapping Programme
OD	Ordnance Datum – height above mean sea level at Newlyn
RCM	Royal Cornwall Museum
SWARF	South West Archaeological Research Framework

1 Summary

Historic Environment Projects undertook a programme of archaeological mitigation during the construction of a solar farm at Pennare Farm, St. Allen, 5km to the north of Truro, Cornwall. This work was carried out to fulfil a planning condition on the development.

The site had been the subject of an assessment and geophysical survey, the latter having identified what appeared to be settlements and ditches and a trackway belonging to an underlying field system pre-dating the present day field system.

The fieldwork took the form of evaluation trenching over features identified by the geophysical survey prior to the construction phase of the project. During the construction phase a watching brief was also undertaken.

Both phases of work confirmed that at least some of the anomalies represented field ditches thought to be of late prehistoric or Romano-British origin. These included a large ditch thought to be a major land division. The presence of the trackway was also confirmed.

Few artefacts were recovered during the works but these did include a Neolithic greenstone axe and a slate spindle whorl, the latter probably of later prehistoric or Roman date.

Recommendations include submitting the greenstone axe for petrological examination and obtaining a radiocarbon date from material recovered from the substantial ditch. It is further recommended that the results from these analyses should be published as a short article in *Cornish Archaeology*.

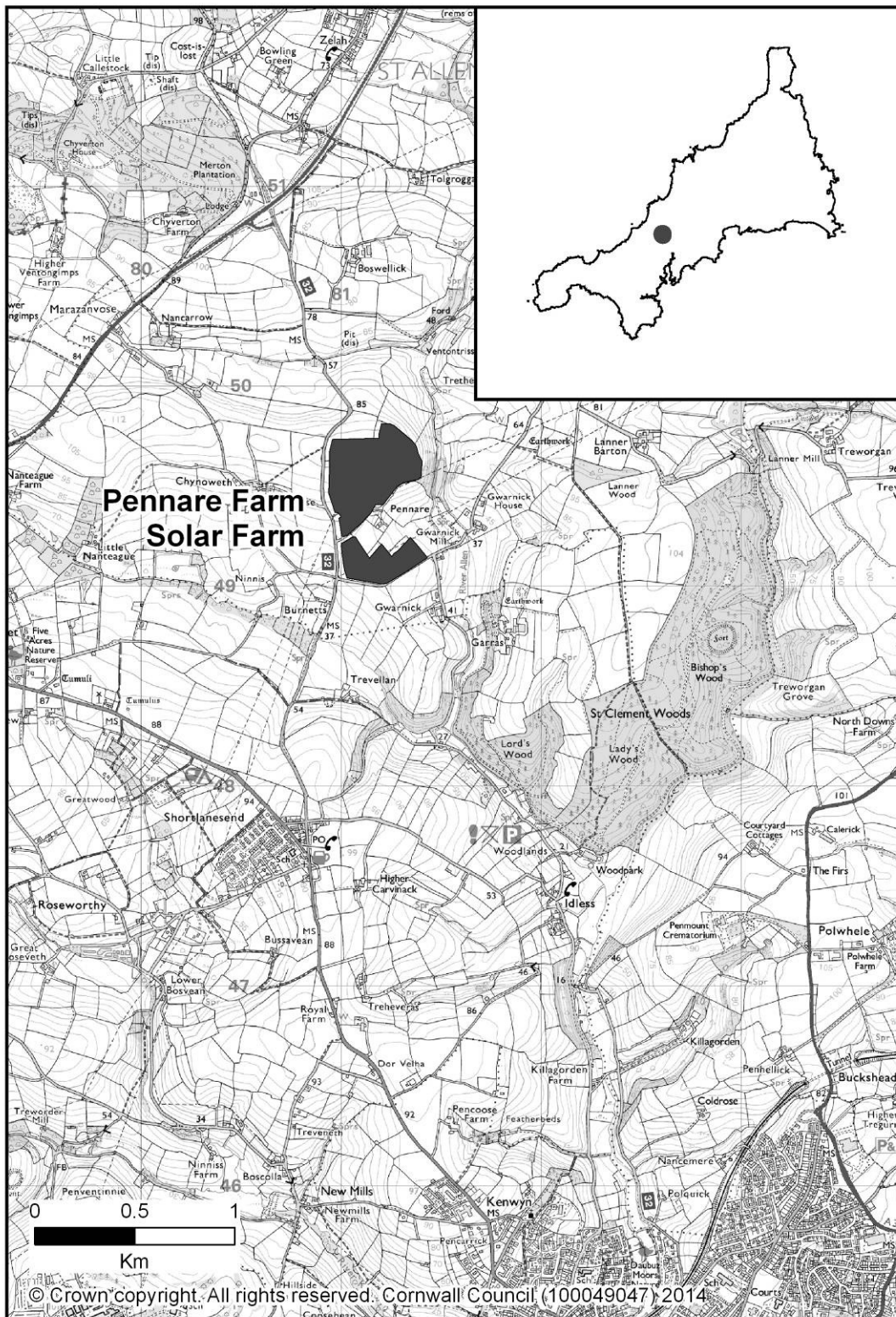


Fig 1 Location map

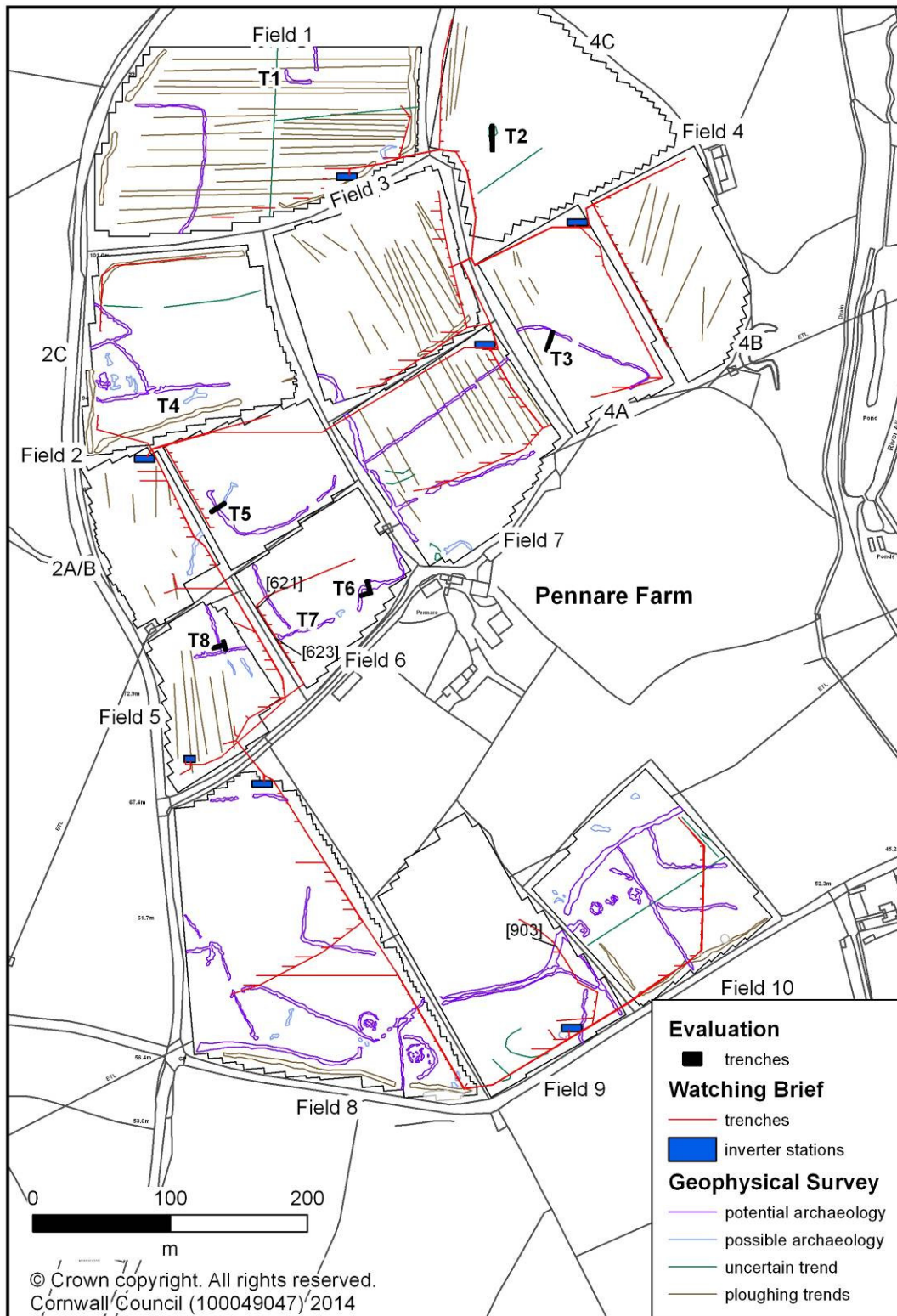


Fig 2 Geophysical survey, evaluation trenches, and watching brief areas

2 Introduction

2.1 Project background

Historic Environment Projects were commissioned by British Solar Renewables to undertake archaeological mitigation in the form of an evaluation and watching brief during the construction of an 11Mw solar farm at Pennare Farm (SW 81120 49380), St. Allen, 5km to the north of Truro, Cornwall (Fig 1). The development covers approximately 21 ha.

The proposed development site has been the subject of a preliminary archaeological assessment, undertaken by Archaeadia in November 2012 (Gent & Manning 2012) whilst a magnetometer survey of the site was undertaken by GSB Propection Ltd. in mid-September 2013 (Watson & Gater 2013).

With the exception of a curvilinear cropmark, plotted by the National Mapping Programme in the south-eastern part of the site, the archaeological assessment did not identify any evidence for significant archaeological features within the project area. The geophysical survey plotted elements of a medieval field system and associated ridge and furrow across much of the site. Underlying this were well-preserved elements of what appeared to be a late prehistoric field system, taking the form of conjoined curvilinear enclosures. In the southern part of the project area these appeared to be associated with at least one possible roundhouse. A further possible prehistoric enclosure was suggested from the geophysical data in the north western part of the site.

The planning permission for the development (PA12/08360) includes a condition that impacts on the sub-surface archaeology would need to be mitigated by a suitable programme of archaeological recording work.

No specific brief was issued but email communication between Cornwall Council's Historic Environment Planning Advice Officer (HEPAO) and Historic Environment Projects (HEP) established the form of mitigation required (Appendix 2).

HEP subsequently provided a WSI (Appendix 3) to guide the fieldwork and reporting stage of the project.

2.2 Aims

As discussed and agreed with the HEPAO, the site specific aims were to:

- Establish the presence/absence of archaeological remains.
- Determine the extent, condition, nature, character, date and significance of any archaeological remains encountered.
- Establish the nature of the activity on the site.
- Identify any artefacts relating to the occupation or use of the site.
- Provide further information on the archaeology of the site and the surrounding area from any archaeological remains encountered.
- Disseminate the results and where significant results are obtained publish them to an appropriate level.

A key objective was to better understand the process and extent of enclosure in this part of Cornwall by investigating the relationships between boundaries of different periods and obtaining dating material from them.

The objective of this stage of the project is to produce a report setting out the results of the archaeological watching brief and recording and placing them in their historical and landscape context.

2.3 Methods

All recording work was undertaken according to the Institute for Archaeologists *Standards and Guidance for Archaeological Investigation and Recording*. Staff followed the *IfA Code of Conduct* and *Code of Approved Practice for the Regulation of Contractual Arrangements in Archaeology*. The Institute for Archaeologists is the professional body for archaeologists working in the UK.

2.3.1 Fieldwork

Soil strips were undertaken in eight areas identified as requiring detailed investigation to examine features of potential significance revealed by the geophysical survey (Fig 2). The sizes of individual trenches varied according to the nature of the boundary relationships examined and the precision with which the area indicated on the geophysical survey could be located on site. All trenches were at least 1.6m wide and between 12m and 19m long. Where trenches failed to locate the geophysical anomalies, additional trenching took place in an effort to find them.

In all cases where soil stripping was undertaken, the topsoil was stripped cleanly to a level at which archaeological features or layers could be expected to be revealed (that is, top of the natural substrate).

During the archaeological recording the archaeologists inspected the excavated areas, and identified and recorded any archaeological features that were revealed in the stripped areas; the level of recording and the depth to which the area under investigation was subsequently excavated was appropriate to the character/importance of the archaeological remains.

Any archaeological features or layers exposed in the stripped area were carefully excavated by hand and archaeologically recorded by written description, plan and section, and photographic record as appropriate by an HE Projects archaeologist. Within those areas where the geophysical survey indicated the potential for the investigation of phase relationships between the field systems, the primary aim of the investigation was to determine (where possible) the phase relationship and dates of the boundary features. If suitable organic material was revealed, this would be sampled for subsequent high precision radiocarbon dating and for the determination of any plant macro-fossil content.

Watching Brief

Across the remainder of the site, where ground disturbance occurred (cable trenching, etc) archaeological monitoring in the form of a watching brief was undertaken. Sample soil sections were recorded within cable trenches and excavated soil inspected for artefacts.

2.3.2 Post-fieldwork

The results from the fieldwork have been collated as an archive. This involved the washing and cataloguing of finds, and the indexing and cross-referencing of photographs, drawings, and context records. Initial processing of palaeoenvironmental samples has been undertaken. This involved the flotation of bulk samples to recover plant macrofossils and other remains.

- All finds and samples, etc are stored in a proper manner (being clearly labelled and marked and stored according to HE guidelines).
- All records (context sheets, photographs, etc) were ordered, catalogued and stored in an appropriate manner (according to HE guidelines).
- All site drawings were scanned, plans and selected sections have been converted to AutoCad drawing files
- A spreadsheet containing all records for the site has been produced; this forms the source of the record tables in the back of this report

- A summary of the results has been presented to the HEPAO, Cornwall Council.
- The site archive and finds will initially be stored at HE premises and, subject to the permission of the landowner, transferred to the Royal Cornwall Museum at the end of the project. The RCM conditions for archives will be followed.

3 Location and setting

Pennare Farm in the parish of St. Allen, to the north of Truro, has been in existence since at least 1327, when it was named 'Pennard', comprising the Cornish elements *pen*, 'promontory' or 'headland' and *arth*, of uncertain meaning (Padel 1985). The surrounding landscape has a Historic Landscape Character of Anciently Enclosed Land (AEL) - Farmland Medieval, and most of the field boundaries owe their alignments to a fossilisation of a mixture of medieval cropping units and groups of strip fields (Cornwall County Council 1996). However, the geophysical survey (Watson & Gater 2013) indicated that the modern and medieval field systems are overly groups of curvilinear boundaries indicative of a field system of prehistoric or Romano-British date (43 BC to AD 410) (Fig 2). At least two associated roundhouses were also suggested by the geophysical survey in the south west corner of the development site. Collectively these highlight the long-settled nature of much AEL and its high potential for the survival of sub-surface archaeological features relating to prehistoric settlement and agriculture.

The development area consists of seven sub-divided post-medieval enclosures on land falling from a high point of 103m OD to the north to 56m OD in the south east. The site has a generally southerly and south easterly aspect. The underlying geology consists of Devonian slaty mudstones and siltstones.

4 Archaeological results

The field numbers (F1, F2, etc) below follow those used by the geophysical survey; evaluation trench numbers (T1, T2, etc) were assigned by HE Projects (Fig 2). Blocks of context numbers were assigned by field so that that, for instance, in F1 these start at (101), in F2 from (201), etc. Deposits (layers and fills) are given in round brackets, for example (101), cuts in square brackets, for example [607]. Full context descriptions are given in Appendix 1).

4.1 Field 1

This field formed the northernmost area in the scheme, although the northern half of the field, sloping down to the north, was not included within the final development. South of the break of slope it was fairly level and exposed. One evaluation trench (Trench 1, see below) was opened up towards the centre of the field. Two conduit trenches and the foundation cut for an inverter station were monitored during the watching brief but no features and deposits of archaeological value were identified.

4.1.1 Trench 1

This trench was opened up to investigate a curvilinear geophysical anomaly towards the centre of F1, just north of the summit of the hill. The trench was stripped to natural head material (103), revealing a shallow irregular gully corresponding to the position and alignment of the anomaly. The irregularity of the feature indicated a natural origin, although no further interpretation can be offered.

A curvilinear band of upstanding slate at the southern end of the trench was identified as natural rock, possibly bedrock, set within the head material.

4.2 Field 2

This field actually comprised three fields, divided by wire fences, 2a, 2b, and 2c.

F2a, immediately east of the Shortlanesend to Goonhavern road, did not contain an evaluation trench. A conduit trench and the foundation cut for an inverter station were monitored during the watching brief but no features and deposits of archaeological value were identified. The reddish brown topsoil ranged from 0.3m thick at the top of the field to 0.5m at the bottom.

F2b, east of F2a, contained an evaluation trench (Trench 5, see below). Three conduit trenches were monitored during the watching brief but no features and deposits of archaeological value were identified.

F2c, north of F2a and F2b, is a large field within which one evaluation trench (Trench 4, see below) was opened up towards the south-western corner of the field. Three conduit trenches were monitored during the watching brief but no features and deposits of archaeological value were identified.

4.2.1 Trench 4 (Figs 3-6)

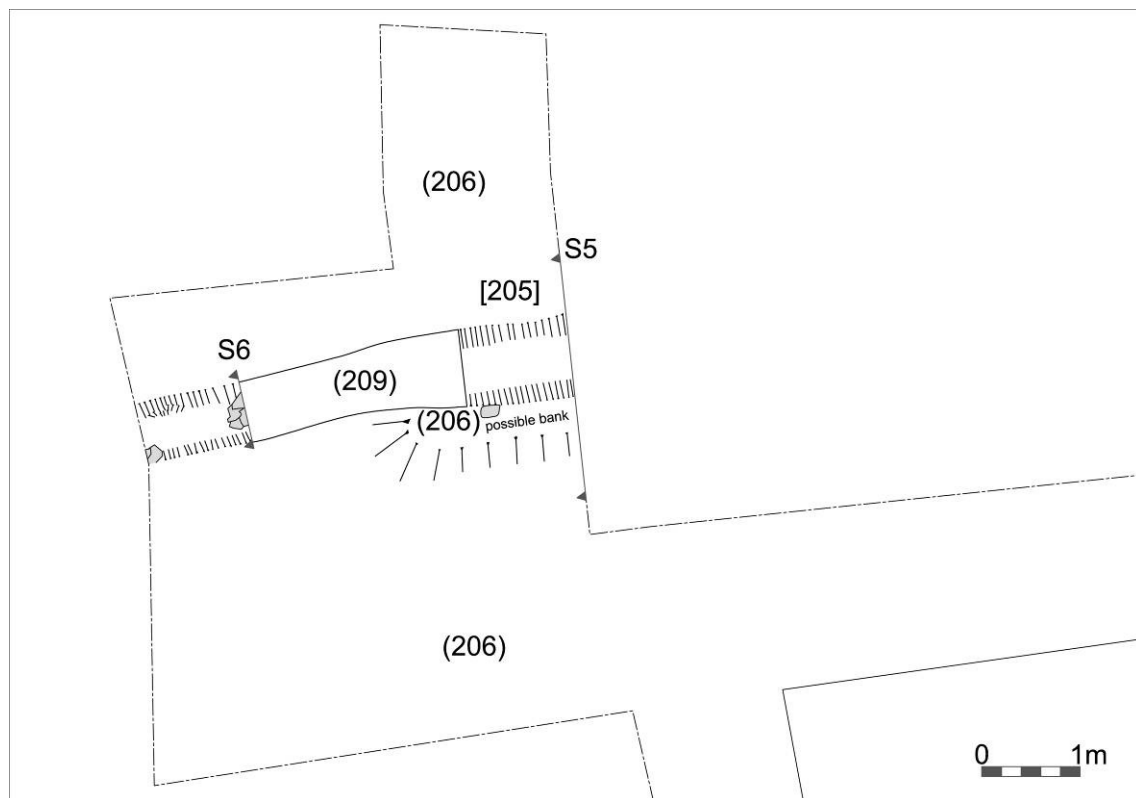


Fig 3 Trench 4 plan

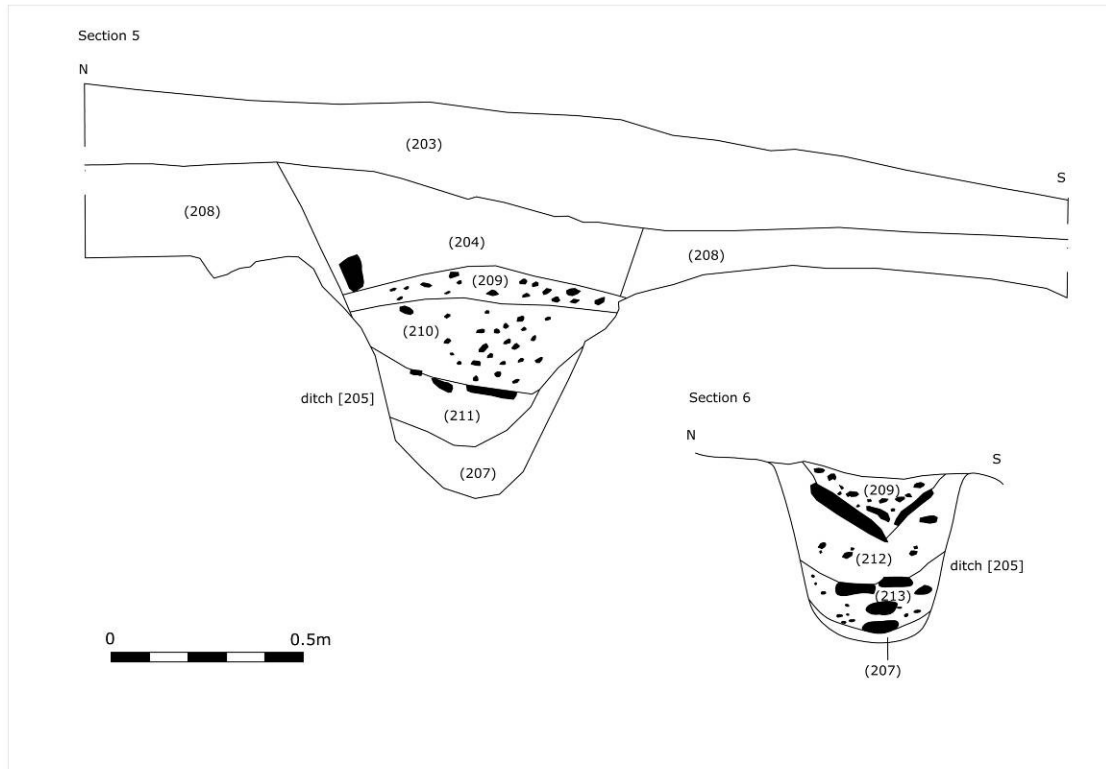


Fig 4 Trench 4, sections 5 and 6



Fig 5 Section 5, facing west (0.5m scale)

This trench was opened up to investigate two intersecting linear geophysical anomalies towards the south-western corner of F2c, one aligned north west – south east, the other approximately east - west. The trench was stripped to natural head material (204), revealing a ditch, [205], corresponding to the position and alignment of the east

- west anomaly. Excavation of two 1m wide slots across the ditch revealed a deep feature with a complex sequence of deposition.

The ditch was steep-sided, 0.8m deep and 0.95m wide, with a concave base. A thin primary fill, (207) was present in both excavated slots. Two unworked water-worn quartz pebbles, probably derived from a beach environment, were recovered from this fill. Above this deposit the fills varied in the two slots, despite being only 2.25m apart.

Section 5 (Figs 4 and 5), excavated against the eastern baulk of the trench, contained above (207), in order of deposition, fills (211), (210), (209), and (204). The latter was sealed by topsoil (203). In this section the ditch could be seen to cut buried soil horizon (208), and thus, if the ditch is of prehistoric or Romano-British date as its profile and depth might suggest, this soil horizon is of some antiquity.



Fig 6 Section 6, facing west (0.5m scale)

Section 6 (Figs 4 and 6), excavated at the western end of the trench, contained a stony fill, (213), above (207). Above this was fill (212), and then (209). Fill (204) had been truncated by the machine. Fill (209) displayed a steeper basal profile in this section, indicative of a recut, and it may be that this deposit should have had a different identifier and is in fact a distinct deposit from that recorded in section 5.

A raised area of natural (206) was situated on the southern side of the ditch at the eastern end of the trench only. This is likely to represent an area protected by a bank, and if so, indicates an entrance over the western half of the exposed section of ditch. This may explain the variation in deposition between the two excavated sections. If this

does represent a gateway it must have been at a later phase to the construction of the boundary since a ditch would have prevented access into the field.

Unfortunately the trench missed the north-west – south-east anomaly so the relationship between the features could not be evaluated.

4.2.2 Trench 5

This trench was opened up to investigate a strong curvilinear geophysical anomaly arcing around the southern edge of F2b. However, within the trench at least, the anomaly was found to coincide with a sharp linear variation in the natural substrate, (202). The natural substrate consisted of slate bedrock at the eastern end of the trench, changing sharply to a mid grey clay, then to a yellowish grey clay at the western end. The geophysical anomaly coincided with the grey clay.

4.3 Field 3

No evaluation trenches were excavated in this field, which lies towards the centre of the fields north of the lane leading to the farm complex. Two conduit trenches running along the southern and eastern edges of the field were monitored during the watching brief but no features and deposits of archaeological value were identified. The topsoil was up to 0.5m thick in this field.

4.4 Field 4

This 'field', in the north-east corner of the project area, comprised three fields, 4a, 4b, and 4c.

F4a is mostly steep and south-facing. Two conduit trenches were monitored but no features and deposits of archaeological value were identified. An evaluation trench (Trench 3, below) was opened up towards the centre of the field.

F4b contained no trenching that was monitored.

F4c slopes down gently to the east from the highest point within the project area. A conduit trench was monitored but no features and deposits of archaeological value were identified. An evaluation trench (Trench 2, below) was opened up towards the western edge of the field.

4.4.1 Trench 2

This trench was positioned to investigate a sub-circular geophysical anomaly measuring approximately 9m by 7m in F4c. A sub-linear gully, [403], corresponding with the southern edge of the anomaly was identified. It was 0.5m wide and 0.15m deep and had irregular sides and a concave base. It contained a single fill. The gully was observed to cut an earlier pit-like feature, [405], measuring 0.76m by 0.46m and 0.2m deep. This also contained a single fill. Neither feature could be identified as being of anthropogenic origin. Both may be of geological, perhaps periglacial, derivation.

4.4.2 Trench 3

This trench was positioned to investigate a curvilinear geophysical anomaly in F4a. The anomaly runs north west – south east across the south-west-facing slope. No feature corresponding with the anomaly was identified, although it should be noted that the north-eastern end of the trench may have stopped just short of it. However, a small irregular gully, [408], running roughly parallel 7m to the south west of the anomaly, may be related in some way. It contained a number of small holes, interpreted as root holes, in its base, worthy of note because all contained moderate quantities of charcoal. However, without the benefit of additional evidence the features could not be ascribed to human agency.

4.5 Field 5

This field lies at the south-western corner of the fields north of the farm lane, immediately east of the Shortlanesend to Goonhavern road. Four conduit trenches were monitored but no features and deposits of archaeological value were identified. An evaluation trench (Trench 8, below) was opened up in this field.

4.5.1 Trench 8

Trench 8 was opened up over the intersection between two linear geophysical anomalies in the north eastern corner of F5, one running north – south, the other east-west. Unfortunately the trench appeared to miss all but the edge of one of the anomalies despite an effort to extend the trench laterally in order to find them. The anomaly that was identified appeared to be part of the north – south feature and took the form of the terminals of 2 parallel ditches (or possibly two adjacent pits), [503] and [505], both extending into the trench for approximately 0.5m. Both contained single fills.

4.6 Field 6

This field lies immediately north of the farm lane. Two conduit trenches were monitored within which two features were identified. In addition two evaluation trenches were positioned in this field (Trenches 6 and 7, see below). Towards the north-western corner of the field an east – west ditch, [621], was recorded in both sections of a trench (Figs 2 and 12). The ditch, which did not appear as an anomaly on the geophysical survey, was 1.2m wide and 1m deep and contained a single fill.

Towards the south-western corner of the field a small pit, [623], was recorded in the east-facing section only of the trench (Figs 2 and 12). The pit was 0.8m wide and 0.4m deep and contained a single fill displaying some evidence of burning, particularly against the edge of the feature, which indicates that the burning was probably *in situ*.

A greenstone axe of Neolithic date was recovered from the surface close to the north-western gateway into the field.

4.6.1 Trench 6 (Figs 7-10)

This trench was positioned to investigate an angled linear section of a large geophysical anomaly. This was situated in the south-eastern corner of F6, although it appeared to form part of a more extensive field system represented by anomalies in the western part of F6 (see Trench 7, below) and continuing east in F7.

This trench was subdivided into T6a and T6b, the former running east-west across the anomaly, with T6b excavated perpendicular to this to catch the anomaly again as it turned to the east. Two sections were cut through the ditch, one in each trench. The excavations revealed a large ditch, 2.6m wide and 1.05m deep, with steep sides and a flat base.

The ditch cut two buried soil horizons, (604) and (605), as well as the natural substrate, (606). The earliest soil horizon, (605), was thicker on the acute angle of the ditch, that is, to the south and east of the ditch. Here it was up to 0.23m thick whilst to the west of the ditch, coincident with a rise in the natural, it was only 0.12m thick. This deposit sealed the fill of a small pit or posthole, [613], lying immediately east of the ditch in T6a.

Above (605), but only identified to the west of the ditch in T6a, was another buried soil horizon, (604), also cut by ditch [607]. The presence of this horizon on one side of the ditch only might indicate that this is the truncated remains of a bank.

Ditch [607] was filled by a complex series of fills, up to six, and whilst these were broadly comparable in both of the excavated sections, there were differences.

Section 9 (Figs 8 and 9) in T6a revealed six fills. The earliest, primary fill (612), was a substantial stony deposit up to 0.25m thick containing an abundance of sub-angular shillet blocks. This deposit only appeared in this section and may represent a localised event such as the collapse or deliberate pushing in of a section of walling. Soil samples were taken from this deposit in the hope of recovering material suitable for radiocarbon dating and palaeoenvironmental analysis. Initial assessment of the flot revealed only three small pieces of charcoal (Julie Jones pers comm).

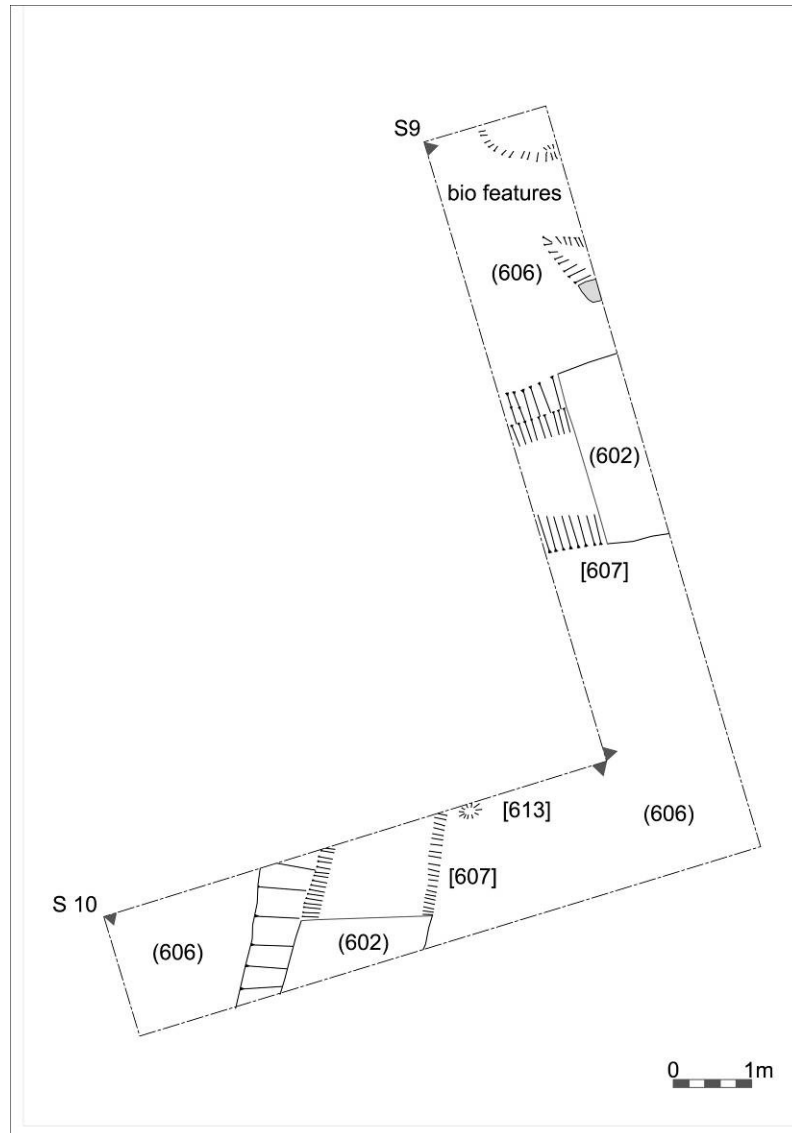


Fig 7 Plan of Trench 6

The primary deposit in Section 10 (Figs 8 and 10) in T6b was (611), which lay over deposit (612) in T6a. Above this deposit (610) formed a secondary fill, representing the gradual silting up of the ditch over a number of years. In T6b the section appeared to show that this deposit was recut, whereupon it silted up again with deposit (609). However, in T6a there was no evidence of a recut with (609) continuing the silting up of the ditch over (610). Deposit (609) was distinctive in being a very dark fill and there can be no question of a misidentification of two different layers. A small piece of slate that appears to have been cut was recovered from this deposit. Soil samples were also taken from this deposit in the hope of recovering material suitable for radiocarbon dating and palaeoenvironmental analysis. Initial examination of the flots recovered

from this sample indicated around 20 charcoal fragments plus two wheat grains (Julie Jones pers comm). It seems that the dark colour of the deposit was not due to the presence of charcoal as was initially thought during the fieldwork. Instead the deposit may be rich in organic material as was the case, for example, in several fills from an Iron Age enclosure at Camelford (Jones & Taylor forthcoming).

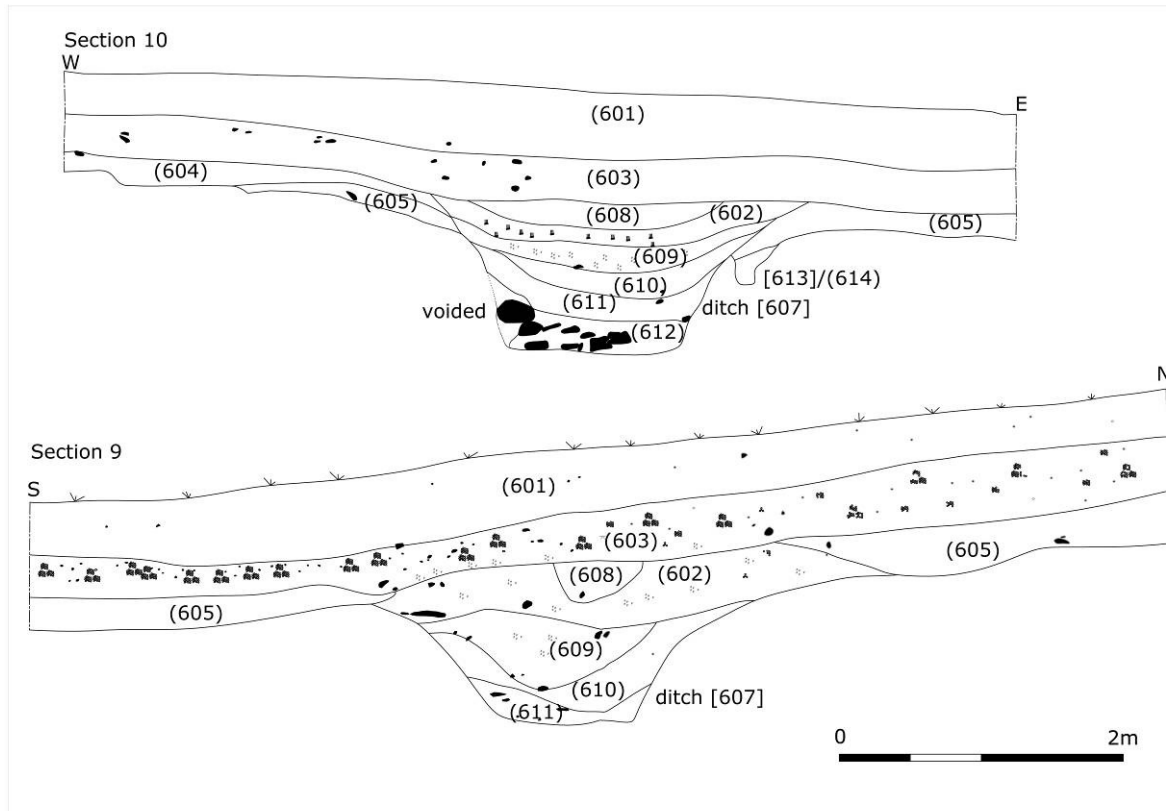


Fig 8 Trench 6, sections 9 and 10



Fig 9 Section 9 facing south (1m scale)



Fig 10 Section 10 facing east (1m scale)

Above (609) the silting of the ditch continued with the deposition of fill (602). The final fill of the ditch, (608), displayed a similar characteristic to (609) in that it appeared to lie in a recut in T6a but was a continuation of the tertiary silting of the ditch in T6b.

The fills of ditch [607] were sealed by a substantial subsoil horizon, (603), up to 0.4m thick. A holed slate object, probably a loom weight, was recovered from this deposit. Ploughsoil (601) sealed all deposits and features.

4.6.2 Trench 7 (Figs 11 and 12)

This trench was positioned to investigate the intersection of two linear geophysical anomalies. One runs east-north east to west-south-west and appears as if it might be a continuation of the anomaly investigated in T6 (see above), the other is aligned north west – south east and runs parallel to the extant boundary, albeit curving to the north at the northern end of F6.

Excavation of the trench revealed two intersecting ditches, [616] running east-north east to west-south-west, and [618] running north west – south east.

Ditch [616] was the earliest feature. It was 0.5m wide but only 0.05m deep, containing a single fill, (615).

Ditch [618] could clearly be seen to cut ditch [616] and its fill. The former was deeper, at least 0.5m deep and 0.5m wide, but the full extent of the ditch was not uncovered. It contained two visible fills. It could be seen to terminate where it intersected with [616] and even if it did post-date this boundary feature, as the stratigraphy suggests, it appeared to respect it.

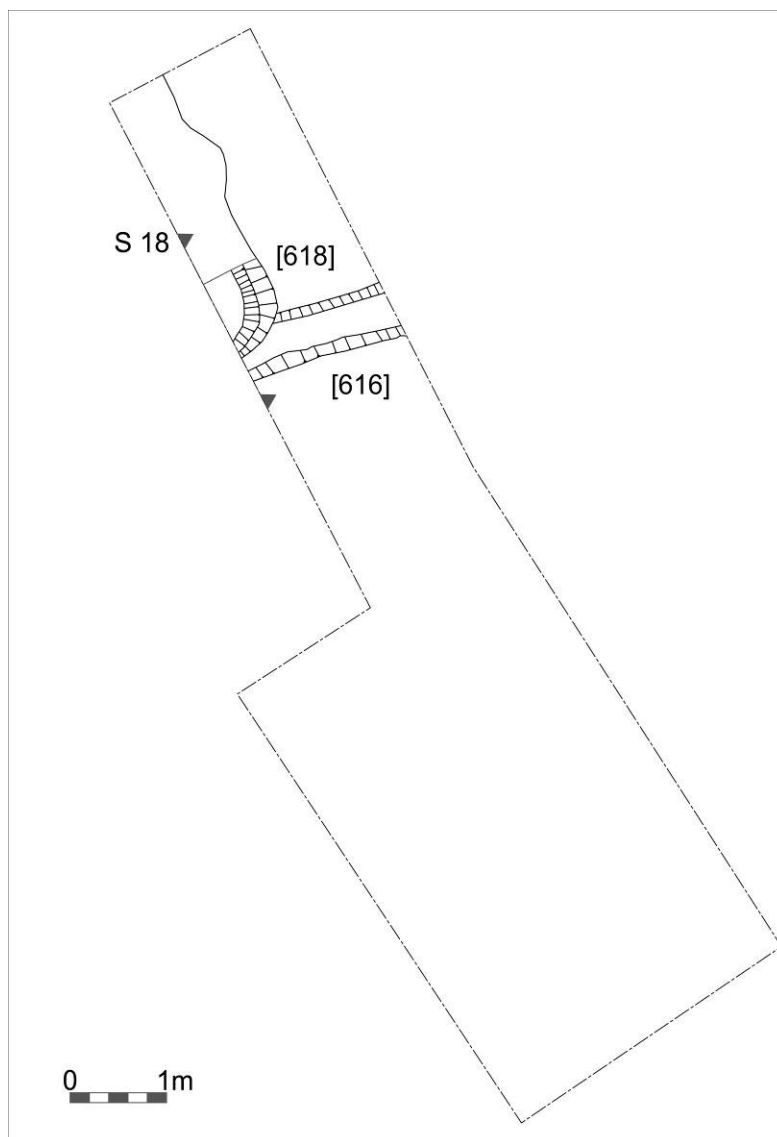


Fig 11 Trench 7 plan

4.7 Field 7

This field lies immediately north of the farm complex. Four conduit trenches and the foundation cut for an inverter station were monitored during the watching brief but no features and deposits of archaeological value were identified.

4.8 Field 8

This large field lies immediately south of the farm lane and east of the Shortlanesend to Goonhavern road. Four conduit trenches were monitored during the watching brief but no features and deposits of archaeological value were identified.

4.9 Field 9

This field lies in the centre of the southern part of the project area, to the south of the farm. Four conduit trenches and the foundation cut for an inverter station were monitored during the watching brief. One feature, holloway [903] (Figs 2 and 12), 3.89m wide and up to 0.75m deep, with slightly convex sides and a concave base, was identified at the eastern edge of the field. It contained a single fill, (902). The feature corresponds to a large curvilinear geophysical anomaly that runs through fields 8, 9, and 10 approximately south west to north east. It passes through the boundary

between fields 9 and 10 through an existing gateway. It is notable that other linear geophysical anomalies running up to it from the south, representing a field system predating the current one, respect it.

4.10 Field 10

This field lies at the eastern end of the southern part of the project area, to the south of the farm. One conduit trench was monitored during the watching brief but no features and deposits of archaeological value were identified.

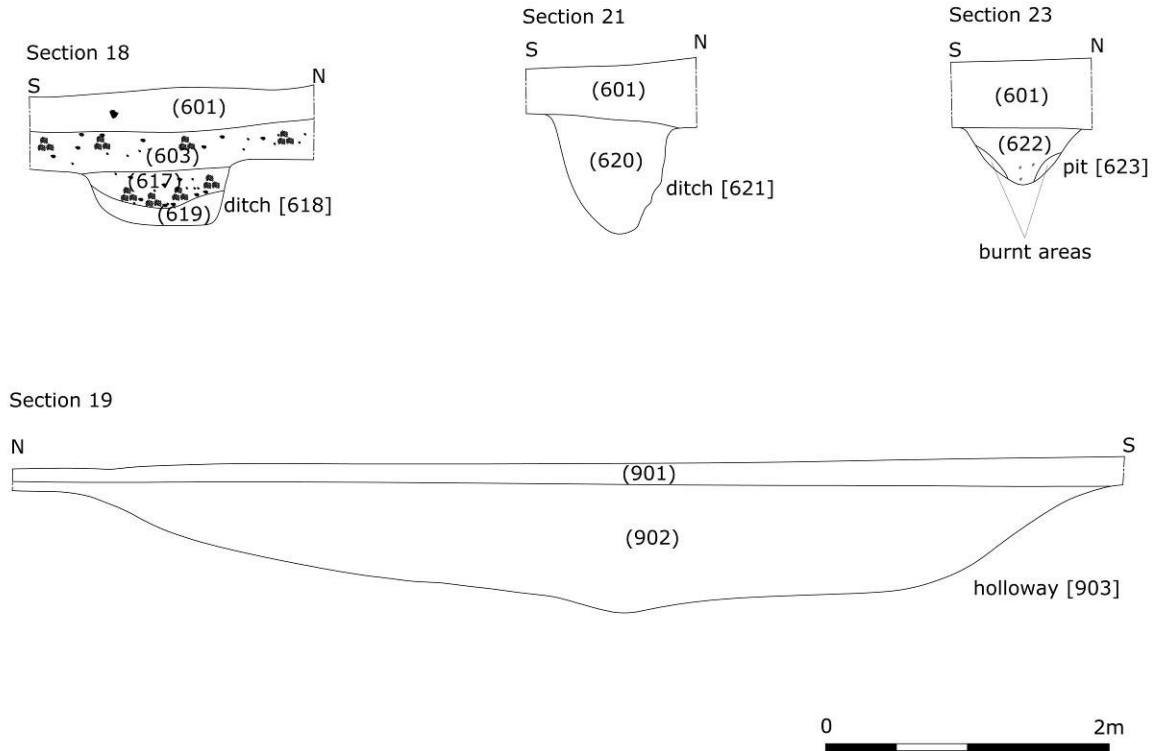


Fig 12 Field 6 and holloway [903] sections

5 Conclusions/discussion

This project identified a number of features presumed, at this stage, to be of prehistoric or Romano-British date. It also raised a number of issues regarding the limitations with the interpretation of results from the geophysical survey. A small, but important, finds assemblage was also recovered.

The most important artefact, a polished greenstone axe of Neolithic date (Figs 13 and 14), was sadly an unstratified surface find. Nonetheless the axe is of regional importance. Stone implements of this type formed a part of a distinctive regional identity in the Neolithic period (c 4000-2500 cal BC) (Griffith *et al* 2007). Greenstones from a variety of sources in south west Britain were fashioned into artefacts and distributed throughout the British Isles. These implements have been grouped by their petrologies (Clough & Cummins 1988), linking, or attempting to link, these with production sites in Cornwall (Jones & Quinnell 2011).



Fig 13 Polished greenstone axe (a)



Fig 14 Polished greenstone axe (b)

The geophysical survey had identified a number of linear and curvilinear anomalies that were interpreted as representing enclosures belonging to a field system or systems of earlier, possibly prehistoric (or Roman) date (Watson & Gater 2013). The evaluation and watching brief tended to confirm this interpretation despite a relative lack of dateable artefacts or ecofacts.

The only feature identified during the watching brief in the southern half of the project area, to the south of the lane leading to Pennare Farm, was a trackway or holloway, [903]. The feature was identified during conduit trenching and therefore only a narrow section was revealed, ruling out any investigation of its base. This might have revealed ruts or surfacing, as well as artefacts that could have enabled an attempt at dating. However, the scale and nature of it was similar to other recorded holloways or trackways, for example those leading down from Castle Killibury, St Kew (Taylor 2011). Like those, the feature at Pennare is assumed to be of prehistoric or Roman date and, in this case, the evidence is supported by the data from the geophysical survey (Watson & Gater 2013). The feature appears as a curvilinear anomaly snaking its way from the western corner of F8, through F9, and on to close to the north-eastern corner of F10.

For part of its length the feature has been interpreted by the geophysical survey as a parallel ditched feature (Watson & Gater 2013), perhaps indicating a system of flanking drainage ditches similar to the trackway excavated on the eastern edge of Truro recently. This feature has been provisionally dated to the Middle Iron Age on the basis of a pottery assemblage associated with it (Taylor, 2013).

The Cornwall NMP has identified a continuation of the holloway into the field to the east of F10 heading towards Gwarnick Mill. The feature is respected by linear anomalies running up to it from the south and, to the west, anomalies running up to it from the north west. Anomalies that may represent two ring-gullied roundhouses and/or ditched enclosures appear to be integral to this trackway and field system at the southern end of F8. Less certain anomalies of a similar nature lie to the south of the trackway in F10.

It is possible that the trackway is perpetuated by the existing road to the east from Gwarnick Mill and also to the west, in the lane to Chynoweth. Geophysical survey on land at Chynoweth shows a curvilinear ditched response snaking across two fields to the south and east of the farm complex that could be a continuation of the track. Intriguingly, this anomaly also bisects anomalies that appear to represent a sub-oval enclosure containing two or possibly three ring-ditched features (Astill 2011).

The longitudinal axis of the field system identified by the geophysical survey to the south of the lane leading to Pennare Farm is west-north-west to east-south-east. Despite the absence of three intervening fields from the survey, thus dislocating the two areas either side of the lane, it seems that most of the anomalies representing fields identified to the north of the lane belong to the same system although the axis has shifted to west-east. Ditches from these fields were identified and excavated in three evaluation trenches and an additional ditch was recorded in section during the watching brief.

The majority of the positive identifications of the field system came in F6. Here, two evaluation trenches and monitoring during the watching brief identified four elements of the system.

Field divisions were identified in two of the trenches and in one area of watching brief. In T4 and T7 the ditches related to identified geophysical anomalies; in F6 the watching brief identified a ditch that had not been picked up by the geophysics. All three were steep-sided and V-shaped (albeit that the ditch in T7 was not fully revealed) and from form would seem to be of prehistoric or Roman date. Generally, medieval or post-medieval field ditches tend to be much shallower and flatter-based. This has been seen, for example, at Scarcewater, St Stephen-in-Brannel (Jones & Taylor 2010) and the Tregurra Valley, Truro (Taylor 2013). At these sites Iron Age/Romano-British and medieval/post-medieval field ditches were excavated side by side at sites covering

large expanses of landscape and these generalisations held. Examples of deeper medieval field ditches tend to relate to specific stock-keeping requirements such as deer parks, as, for example, at Victoria, Roche (Taylor forthcoming).

This interpretation might suggest that the shallower later ditch in T7 is therefore the remains of a medieval strip field division rather than a continuation of the large ditch in T6 as a glance at the geophysical survey might suggest.

The largest feature identified, ditch [607], at the eastern end of the field, was far larger in scale than any of the others and seemed unlikely to represent a mere field division. The ditch was 2.6m wide and over a metre deep and its wide flat-bottomed profile was unlike the narrower V-shaped profiles of the field ditches. If there had been any evidence of a bank on the inside edge of the corner of the investigated section of ditch then the interpretation might have leaned towards identifying it as part of a settlement or working enclosure, a round of Iron Age or Roman date. However, all evidence of a bank, in the form of a higher level for the natural substrate (indicating protection from plough truncation relative to that on the opposite side) and a possible relict bank was situated on the outside edge of the corner, or at least part of it. This would seem to indicate that the bank did not form part of an enclosure or serve as a defensive earthwork. Therefore it seems more likely that the ditch represents a major land division, integral to the field system, but dividing properties or holdings. Indeed, there is a marked change in the geophysical interpretation, from small rectangular fields to the west of this ditch to a long thin enclosure to the east and what appears to be unenclosed land to the north east. However, caution should be exercised in taking the geophysical interpretation to be entirely accurate, as discussed below.

Negative evidence for strong geophysical anomalies was recorded in four trenches, T1, T3, T5, and T8. It is possible that the evaluation trenching missed the anomaly in T3. However, in the other three trenches the anomalies appear to have been fully investigated. In T5 the anomaly clearly coincided with a linear change in the natural substrate. In T1 the anomaly seemed to coincide with a natural gully, as did a weaker signal in T2. The strong anomaly investigated in T8 did not represent a linear archaeological feature as it suggested. Of course caution must be exercised in taking the results from narrow evaluation trenches as being representative of an entire anomaly but it does seem that over half of the anomalies investigated were of geological or uncertain origin. This is despite the fact that, on the face of it, the anomalies appear to form part of a coherent field system, at least some of which is 'real'.

6 Recommendations

The project has led to the recovery of a small but significant finds assemblage and a number of features which would benefit from further post-excavation analysis. The scope of this analysis will need to be agreed with the Historic Environment Planning Advice Officer. However, outline recommendations for further work are presented below.

6.1 Suggested further analyses

6.1.1 Greenstone axe

Due to the importance of this artefact, both in terms of its Neolithic date and the possibility of adding its petrology to the national database of such objects, it is recommended that the axe is submitted for analysis. This would involve obtaining a thin-section of the axe which would then be analysed and matched with the geologically grouped collections held at Taunton. Cornish greenstones represent one of the major sources of stone for axe heads throughout the Neolithic period and the thin-sectioning of the axe would help to better characterize the distribution of axes in Cornwall by linking it to its potential source.

It is also recommended that the axe is drawn by a suitably qualified archaeological illustrator for inclusion within the publication.

This would address **Research Aim 38** of the research agenda of the South West Archaeological Research Framework (SWARF), to:

Widen our understanding of the extraction, processing and transportation of minerals, stone and aggregates.

Specifically:

c. More work is required on the exploitation of flint, chert and other stone sources, and the transportation of these materials in prehistory.

(Webster 2007b, 288)

6.1.2 Dating of the major land division

Charcoal and plant macrofossils from contexts in ditch [607] in T6 appear to be suitable for radiocarbon dating. It would be useful to obtain a date for the establishment of this feature since it is obviously integral to the establishment of enclosed agriculture in this area.

This might address **Research Aim 40** of the research agenda of SWARF, to:

Improve our understanding of agricultural intensification and diversification in later prehistory.

There is a need to better understand the chronology and regionality of crop diversification and intensification of production, which appears to take place from around the Middle Bronze Age onwards. Well-dated assemblages from a range of settlement contexts are required to examine introductions of new crops and associated wild species

It might also address **Research Aim 41** of the research agenda of SWARF, to:

Assess the impact of the Roman empire on farming.

We still do not fully understand the effects of "Romanisation" on plant and animal use and cultivation methods or whether regional differences can be attributed to this or other factors.

(Webster 2007b, 289-90)

6.2 Publication

It is recommended that the results of the further analyses are combined with a summary of these results for a short article in a suitable periodical, for instance *Cornish Archaeology*.

7 References

7.1 Primary sources

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

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

Ordnance Survey, 2007. *Mastermap Digital Mapping*

Tithe Map and Apportionment, c1840. *Parish of St Allen*

7.2 Publications

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7.3 Websites

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

8 Project archive

The HE project number is **146317**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Fal Building, 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. Field plans and copies of historic maps stored in an A2-size plastic envelope (GRE808).
3. Electronic drawings stored in the directory R:\Historic Environment (CAD)\CAD Archive\Sites P-Q\Pennare Farm Solar Farm 2013 146317

4. Black and white photographs archived under the following index numbers: GBP 2327
5. Digital photographs stored in the directory R:\Historic Environment (Images)\SITES.M-P\Sites P\Pennare Farm 2013 146317
6. GIS mapping stored in the folder L:\Historic Environment (Data)\HE_Projects\Sites_P\Pennare Farm Solar Farm 2013 146317
7. English Heritage/ADS OASIS online reference: cornwall2-175813

This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites P\Pennare Farm solar farm 2013 146317\Final report\Pennare Farm Archive Report.doc

Artefacts and environmental material retrieved during the project are currently stored at the HE Projects Finds Archive Store, Cardrew Industrial Estate, Redruth. When space becomes available these will be transferred to an archive repository. The site code is LL13.

Appendix 1: Context index

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
101	T1 F1	D	Topsoil in F1. A dark greyish brown plastic silty clay 0.15m thick.		
102	T1 F1	D	Subsoil in F1. A mid brown plastic silty clay 0.2m thick.		
103	T1 F1	D	Natural in F1. A light whitish grey compact clay containing frequent shillet fragments. A curvilinear band of slate at the southern edge of T1 was set within it and identified as natural bedrock.		
201	F2B T5	D	Topsoil in F2B. A dark reddish brown friable silty clay 0.3m thick.		
202	F2B T5	D	Natural substrate in F2B. Slate bedrock at the eastern end of T5, giving way to a mid grey friable silty clay containing frequent shillet fragments, then a yellowish grey clay. The interfaces between the different deposits were sharp and the mid grey clay coincided with a linear geophysical anomaly.	4	
203	F2C T4	D	Topsoil in F2C. A dark greyish brown plastic silty clay 0.3m to 0.5m thick containing moderate shillet fragments.		5
204	F2C T4	D	Upper fill of ditch [205]. A dark reddish brown friable silty clay 0.24m thick with moderate shillet fragments. Lies above (209) and below (203).		5
205	F2C T4	C	Cut of ditch 0.95m wide and 0.8m deep. The ditch is linear in plan with steep sides and a concave base. It runs east-west across F2C, corresponding with a geophysical anomaly. It cuts soil horizon (208) and contains five fills, in order of deposition, (207), (211), (210), (209), and (204). Two slots were excavated through this feature.	8	5 6
206	F2C T4	D	Natural substrate in F2C. Light grey slate interspersed with patches of reddish brown silty clay. Cut by ditch [205].	8	5 6
207	F2C T4	D	Primary fill of ditch [205]. A dark brown friable silty clay 0.13m thick containing infrequent small angular stones. Lies below (211)/(213). Finds: two small quartz pebbles.		5 6
208	F2C T4	D	Buried soil horizon in F2C. A mid reddish brown plastic silty clay 0.23m thick. This deposit, beneath topsoil (203), is cut by ditch [205], implying considerable antiquity since the ditch is likely to be of Roman date or earlier.		5

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
209	F2C T4	D	Fill of ditch [205]. A mid reddish brown loose clayey loam 0.1m thick containing moderate angular shillet. Lies above (210)/(212) and below (204).	8	5 6
210	F2C T4	D	Fill of ditch [205] (slot 2 only). A mid reddish brown friable silty clay 0.23m thick containing moderate angular shillet, particularly towards southern side. Lies above (211) and below (209). Probably same as (212).		5
211	F2C T4	D	Fill of [205] (slot 2 only). A mid reddish brown friable silty clay 0.16m thick with occasional larger stones. Lies above (207) and below (211). Probably same as (213).		5
212	F2C T4	D	Fill of [205] (slot one only). A dark reddish brown friable silty clay 0.15m thick containing moderate small shillet. Lies above (213) and below (209). Probably same as (210).		6
213	F2C T4	D	Fill of [205] (slot one only). A mid brown friable stony clay 0.11m thick containing abundant large sub angular stone. Lies above (207) and below (212). Probably same as (211), however much stonier. This may represent localised collapse of stone field wall into the ditch..		6
401	F4C T2	D	Topsoil in F4C. A dark greyish brown friable silty clay 0.4m thick.		2
402	F4C T2	D	Fill of gully [403]. A dark greyish brown friable silty clay 0.15m thick containing frequent small shillet.		2
403	F4C T2	C	Cut of gully. A curvilinear feature in plan, 0.5m wide and 0.15m deep, with irregular sides and a concave base. Appears to correspond with part of a large sub-circular geophysical anomaly. Of unknown origin but presumed to be natural. Cut earlier pit [405]. Filled by (402).	1	2
404	F4C T2	D	Natural substrate in F4C. A light reddish grey compact clay containing frequent angular shillet. Variable over the range of T2 (18.8m) ranging from slate to the north to more angular stone in a clay matrix to the south.	1	2
405	F4C T2	C	Cut of irregular pit 0.76m by 0.46m and 0.2m deep. Cut by gully [403]. Probably the result of biological activity. Filled by (406).	1	
406	F4C T2	D	Fill of pit [405]. A mid reddish brown soft silty clay 0.2m thick containing occasional sub-angular slate.		

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
407	F4C T2	D	Subsoil horizon in F4C. A mid brown compact silty clay 0.1m thick containing frequent small slate.		2
408	F4A T3	C	Cut of gully 1.8m long, 0.8m to 0.9m wide, and 0.1m deep. Filled by a mid reddish brown friable silty clay. What appeared to be root holes in the base of the northern end of the gully contained fills with charcoal.	3	
409	F4A T3	D	Natural substrate in F4A. A light grey compact clay containing frequent angular shillet.	3	
501	F5 T8	D	Topsoil in F5. A dark brown friable silty clay 0.28m thick containing occasional small shillet.		13
502	F5 T8	D	Subsoil horizon in F5. A dark reddish brown plastic silty clay 0.34m thick containing moderate small grit.		13
503	F5 T8	C	Cut of ditch terminal 0.73m wide and 0.17m deep with concave sides and a flattish base. Exposed for a length of 0.56m. Runs parallel to [505], which lies 0.8m to the east. Filled by (504).	14	13
504	F5 T8	D	Fill of ditch [503]. A mid greyish brown plastic silty clay 0.17m thick containing frequent large slate.		13
505	F5 T8	C	Cut of ditch terminal 0.7m wide and 0.14m deep with concave sides and a flattish base. Exposed for a length of 0.5m. Runs parallel to [503], which lies 0.8m to the west. Filled by (506).	14	13
506	F5 T8	D	Fill of ditch [505]. A mid greyish brown plastic silty clay 0.14m thick containing occasional small slate.		13
507	F5 T8	D	Natural substrate in F5. A light reddish grey compact clay containing frequent sub-angular shillet, slate, and quartz.	14	
601	F6 T6	D	Topsoil in F6. A mid brown friable silty loam 0.5m thick.		10 a&b
602	F6 T6	D	Tertiary fill of ditch [607]. Light yellowish brown plastic clay 2.6m-2.8m wide and 0.12m thick. Lies above fill (609) and below fill (608).		10 a&b
603	F6 T6	D	Subsoil horizon in F6. A dark reddish brown friable silty clay 0.32m thick containing occasional sub angular slate. Lies above buried soil horizon (604) and below topsoil (601). Finds: slate loom weight.		10 a&b

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
604	F6 T6	D	Buried soil horizon or bank material to W of ditch [607] and cut by it. A mid reddish brown plastic clay 0.18m thick. This material was only identified on the western, higher, side of [607] and may be a buried soil horizon or the remains of a bank. If it is the latter ditch [607] has been recut after the bank was created. Lies above buried soil horizon (605) and below subsoil (603).		10 a&b
605	F6 T6	D	Buried soil horizon. A light reddish brown plastic silty clay 0.12m-0.23m thick containing occasional sub-angular slate and very occasional mottled charcoal. The deposit was thicker on the 'inside', southern and eastern, edge of the ditch. Lies above natural (606) and below buried soil horizon (604) to the west of ditch [607] and below subsoil (603) to the east.		10 a&b
606	F6 T6	D	Natural substrate in F6. A light yellowish grey compact clay.		10 a&b
607	F6 T6	C	Cut of large ditch 2.6m wide and 1.05m deep with steep sides and a flat base. Exposed in two sections of trench T6a and T6b perpendicular to each other. The ditch corresponds to a large angled geophysical anomaly. It cuts soil horizons (604) and (605) and contains six fills, in order of deposition, (613), (611), (610), (609), (602), and (608). Two slots were excavated through this feature.		10 a&b
608	F6 T6	D	Upper fill of ditch [607]. A mid reddish brown plastic silty clay 1.77m wide (in S-facing section), 0.63m (in E-facing), and 0.18m thick. Lies above fill (602) and below subsoil horizon (603). The profile of the deposit was narrower and steeper in T6b.		10 a&b
609	F6 T6	D	Charcoal rich fill of [607]. A dark reddish brown plastic silty clay 2.3m wide (in S-facing section), 1.65m (in E-facing), and 0.2m thick containing frequent charcoal. Lies above fill (610) and below fill (602). The profile of the deposit was narrower and steeper in T6b, perhaps indicating a recut. Finds: one piece of possibly worked stone.		10 a&b

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
610	F6 T6	D	Stony fill of [607]. A mid yellowish brown plastic silty clay 1.8m wide and 0.1m-0.16m thick containing frequent small shillet and slate fragments. Lies above fill (611) and below fill (609). It appears to be composed largely of redeposited natural and may represent slumped bank material. If so it seems more likely to have been on the outer, northern and western, side of the ditch due to a slight asymmetry in the profile of the fill.		10 a&b
611	F6 T6	D	Fill of [607]. A mid reddish brown soft clay 1.6m wide and 0.2m thick. Forms the primary fill of ditch [607] in T6b. Lies above fill (612) (in T6a) and below fill (610)		10 a&b
612	F6 T6	D	Stony primary fill of [607]. A light reddish brown plastic clay 1.1m wide and 0.25m thick containing frequent large sub-angular shillet. Only recorded in T6a where it lies below fill (611). This deposit may represent the remains of a wall that has been pushed in or fallen.		10 a&b
613	F6 T6	C	Cut of possible post hole on the eastern side of ditch [607] in T6a. A small oval cut 0.3m by 0.2m and 0.18m deep with vertical sides and a flat base. Filled by (614).		10b
614	F6 T6	D	Fill of possible posthole [613]. A light greenish grey plastic clay 0.18m thick. Sealed by soil horizon (605).		10b
615	F6 T7	D	Fill of ditch [616]. A mid brown friable silty clay 0.05m thick containing frequent small sub-angular shillet.	15	
616	F6 T7	C	Cut of shallow ditch 0.5m wide and 0.05m deep crossing T7 east-west. Cuts ditch [618].	16 17	18
617	F6 T7	D	Fill of ditch [618]. A mid reddish brown friable silty clay 0.6m wide and 0.2m thick containing moderate amounts of small sub-angular shillet. Lies above fill (619).	15	
618	F6 T7	C	Cut of ditch at least 0.5m wide and 0.5m deep steep sides and a concave base extending N-S into T7 for 3.1m. Terminates where it intersects with [616], which cuts it. Filled, in order of deposition, by (619) and (617).	16 17	18
619	F6 T7	D	Primary fill of [618]. A mid reddish brown plastic silty clay 0.1m thick containing infrequent small sub-angular shillet fragments.		18
620	F6		Fill of ditch [621]. A mid reddish brown soft silty clay 1m thick containing frequent shillet fragments.		21

Context Number	Site sub-division	Type (Cut/Deposit/Build)	Description	Plan Number	Section Number
621	F6		Cut of v-shaped ditch 1.2m wide and 1m deep with steep sides and a concave base. Contained a single fill, (620). The ditch runs east-west across the northern part of F6 but did not get picked up by the geophysical survey.		21
622	F6		Fill of pit [623]. A mid reddish brown friable silty clay 0.4m thick and containing frequent small slate fragments and very occasional mottled charcoal.		23
623	F6		Cut of pit 0.8m wide and 0.4m deep with convex sides and a concave base. Contained a single fill, (622), but the edge of the pit on either side was stained brownish red: whether this was oxidised natural or an additional oxidised fill was not established. The pit was only visible in the east-facing section of a conduit trench.		23
901	F9	D	Topsoil in F9. A Mid reddish brown soft silty clay 0.3m thick containing occasional small slate fragments.		19
902	F9	D	Fill of holloway [903]. A mid reddish brown silty clay up to 0.75m thick.		19
903	F9	C	Linear feature, probably a holloway, 3.89m wide and up to 0.75m deep, with slightly convex sides and a concave base. Contains a single fill, (903). The feature corresponds to a large curvilinear geophysical anomaly that runs through fields 8, 9, and 10 approximately south west to north east. It passes through the boundary between fields 9 and 10 through an existing gateway.	20	19
904	F9	D	Natural in F9. A light reddish yellow clay containing frequent small shillet fragments.		19

Appendix 2: Finds inventory

Area	Context No	Cut No	Feature	Material	No of items	Weight (g)	Description
F2	207	205	Field ditch	Stone	2	83.90	Two water worn quartz pebbles, unworked. Beach pebbles.

Area	Context No	Cut No	Feature	Material	No of items	Weight (g)	Description
F6	U/S		Surface find	Stone	1	1098.90	Greenstone axe, 0.2m by 0.07m, tapering to 0.012m, and 0.04m thick. One side is flattish and highly polished, possibly enhancing an already smoothed beach pebble. The other side is convex, and has a shallow depression, possibly a thumb grip, and a shallow notch adjacent to one edge. The blade end is rounded and slightly chipped, the other end has a larger break. Found in NW corner of field by gateway.
F6	603		Subsoil	Stone	1	191.30	Circular object made from slate, 0.1m in diameter, with a hole in the centre. The hole is 0.012m across but elongated on one side suggesting wear from use as a hanging weight, possibly a loom weight.
F6	609	607	Enclosure ditch	Stone	1	4.80	Possible worked piece of slate. Curved section of slate, the curvature apparently natural, but the piece appears to have been cut at one end.

Appendix 3: Planning brief

No formal planning brief was issued by the HEPAO. However, the following guidance was issued by email between the HEPAO and HEP:

'We would recommend that the basic scope for a WSI would be for watching brief coverage of all ground works, in areas characterised by field system anomalies , with targeted trenches to establish points where the overlapping prehistoric and medieval field systems intersect – Ideally I would like to see some stratigraphic relationships between the systems clarified and phased.'

Where there are more complex features indicated (e.g. the complexes of features in the southern part of the site within fields 8, 9, and 10 and the enclosure to the west of field 2) we would expect full excavation of archaeological features if there are to be intrusive works of any kind (piling, cable trenching, inverter platforms, access tracks etc). It would be appropriate for an early stage of trial trenching to inform significance and full mitigation responses over such features. Otherwise we would welcome the development of viable and defensible preservation in situ arrangements for these areas – for instance the deployment of pre-cast (ie cast off site) surface mounted concrete foundations in these areas with service cabling clipped to the underside of array tables. This would of course negate the need for costly archaeological excavations of these areas.'

A follow up email from the HEPAO to HEP clarifying the form of mitigation required stated:

'The scheme has consent, so the applicant has planning permission to develop as set out in the application on the condition that an appropriate WSI is approved and then implemented to deal with the archaeological impacts.'

Option 1) would be full mitigation of the features with no design mitigation (concrete shoes etc). If this was what the applicant wanted to do I think on a site with this kind of survey it would be proportionate to expect first trenching to determine significance and survival (and potential mitigation costs) and then potentially full excavation of those areas, alongside watching brief engagement over the apparently 'rural areas' of the site but with some trenches put in for good measure in order to characterise and phase that rural landscape (i.e. ditch intersections etc).

However I would expect that presented with the costs involved most developers would be interested in talking about ways to reduce the impact of the scheme in order to avoid the necessity of full excavation. As we've done on other sites if they can guarantee preservation in situ of sensitive areas before construction then the WSI need be no more than that outlined above for the 'rural areas', i.e. WB monitoring of works with the aim of characterisation of the rural landscape (modern and prehistoric).

Hence the variety of technical approaches which might form part of a WSI for the site, and the difficulty in writing a specific brief at this stage – I'd recommend there is a consultancy role for you at this point with _____ in developing the way forward that will maximise what they can technically achieve – this is no doubt a balance between archaeological costs, delays and maximising the economic value of the finished development.'

Appendix 4: Written Scheme of Investigation

Historic Environment Projects

Cornwall Council



Pennare Farm, St. Allen: Written Scheme of Investigation for an archaeological watching brief during groundworks for a solar farm

Client : British Solar Renewables
Client contacts: Victoria Prescottt
Client email: Victoria.Prescottt@BritishRenewables.com
Client tel: 01458 222007

Site history

Pennare Farm in the parish of St. Allen, to the north of Truro has been in existence since at least 1327, when it was named 'Pennard'. The surrounding landscape has a Historic Landscape Character of Anciently Enclosed Land (Farmland Medieval), and most of the field boundaries owe their alignments to a fossilisation of a mixture of medieval cropping units and groups of strip fields. However, a 2013 geophysical survey indicates that the modern and medieval field systems are underlain by groups of curvilinear boundaries indicative of a field system of prehistoric date. At last two associated roundhouses are also suggested by the geophysical survey in the south west corner of the development site. Collectively these point up the long-settled nature of much AEL and its high potential for the survival of sub-surface archaeological features relating to prehistoric settlement and agriculture.

The development area consists of seven sub-divided post-medieval enclosures on land falling from a high point of 103m OD to the north to 56m OD in the south east. The site has a generally southerly and south easterly aspect. The underlying geology consists of Devonian slaty mudstones and siltstones.

Project background

Historic Environment Projects were approached by Victoria Prescottt of British Solar Renewables on 15 October 2013 with a request for the production of a Written Scheme of Investigation (this document) and a cost breakdown for undertaking an archaeological watching brief and other fieldwork recording during the construction of an 11Mw solar farm at Pennare, St. Allen to the north of Truro, Cornwall.

The proposed development site has been the subject of a preliminary archaeological assessment, undertaken by Archaeadia in November 2012 (Gent and Manning 2012), whilst a magnetometer survey of the site was undertaken by GSB Prospection Ltd. in mid-September 2013 (Watson and Gater 2013).

With the exception of a curvilinear cropmark plotted by the National Mapping Programme in the south-eastern part of the site which appeared to represent a ploughed-out early field boundary, the archaeological assessment did not identify any evidence for significant archaeological features within the development boundary. The

geophysical survey plotted elements of a medieval field system with and associated ridge and furrow across much of the site. Underlying this were well-preserved elements of a probably late prehistoric field system having the form of conjoined curvilinear enclosures. In the southern part of the development boundary these appeared to be associated with at least one possible roundhouse. A further possible prehistoric enclosure is suggested from the geophysical data in the north western part of the site.

The proposals (PA12/08360) gained planning permission on 26/04/2013, includes a condition that impacts on the sub-surface archaeology would need to be mitigated by a suitable programme of archaeological recording work, the form taken by the work to be undertaken as set out in a WSI being subject to approval.

No specific brief has been issued to guide the writing of this WSI. However, an email dated 15 October 2013 from Dan Ratcliffe (Historic Environment Planning Advice Officer, Cornwall Council) to British Solar Renewables stated:

'We would recommend that the basic scope for a WSI would be for watching brief coverage of all ground works, in areas characterised by field system anomalies, with targeted trenches to establish points where the overlapping prehistoric and medieval field systems intersect – Ideally I would like to see some stratigraphic relationships between the systems clarified and phased.'

Where there are more complex features indicated (e.g. the complexes of features in the southern part of the site within fields 8, 9, and 10 and the enclosure to the west of field 2) we would expect full excavation of archaeological features if there are to be intrusive works of any kind (piling, cable trenching, inverter platforms, access tracks etc). It would be appropriate for an early stage of trial trenching to inform significance and full mitigation responses over such features. Otherwise we would welcome the development of viable and defensible preservation in situ arrangements for these areas – for instance the deployment of pre-cast (ie cast off site) surface mounted concrete foundations in these areas with service cabling clipped to the underside of array tables. This would of course negate the need for costly archaeological excavations of these areas.'

A follow up email from Mr. Ratcliffe to Adam Sharpe of Historic Environment Projects clarifying the form of mitigation required stated:

'The scheme has consent, so the applicant has planning permission to develop as set out in the application on the condition that an appropriate WSI is approved and then implemented to deal with the archaeological impacts.'

Option 1) would be full mitigation of the features with no design mitigation (concrete shoes etc). If this was what the applicant wanted to do I think on a site with this kind of survey it would be proportionate to expect first trenching to determine significance and survival (and potential mitigation costs) and then potentially full excavation of those areas, alongside watching brief engagement over the apparently 'rural areas' of the site but with some trenches put in for good measure in order to characterise and phase that rural landscape (i.e. ditch intersections etc).

However I would expect that presented with the costs involved most developers would be interested in talking about ways to reduce the impact of the scheme in order to avoid the necessity of full excavation. As we've done on other sites if they can guarantee preservation in situ of sensitive areas before construction then the WSI need be no more than that outlined above for the 'rural areas', i.e. WB monitoring of works with the aim of characterisation of the rural landscape (modern and prehistoric).

Hence the variety of technical approaches which might form part of a WSI for the site, and the difficulty in writing a specific brief at this stage – I'd recommend there is a consultancy role for you at this point with Victoria in developing the way forward that will maximise what they can technically achieve – this is no doubt a balance between

archaeological costs, delays and maximising the economic value of the finished development.'

A subsequent telephone conversation between Victoria Prescott and Adam Sharpe established that British Solar Renewables have opted for siting the solar arrays in the sensitive areas in the southern part of the solar park and the possible enclosure in the north-western part of the site on ground-based concrete shoes. The scope of the work to be undertaken therefore focuses on the controlled excavation of selected junctions and phase relationships between the two field systems visible in the geophysical survey results and carrying out an archaeological watching brief in those areas of the site where significant ground-breaking activities will take place. This will include the sites of transformer and inverter buildings, major cable trenches and any compound areas or site roadways where the topsoil will be removed.

This project design covers the fieldwork and archive reporting stages. In the event that significant archaeological remains are recorded, further project designs for analysis and publication stages may be required and additional costs incurred.

Project extent

The project extent covers an area of 25.044 Ha of currently agricultural land at Pennare Farm proposed for the solar park. This is centred at SW 81185 49435.

Aims and objectives

The project objective is produce a report setting out the results of the archaeological watching brief and recording and placing them in their historical and landscape context. A further objective is to produce an OASIS/ADS-Online entry for the project.

As discussed with Mr. Ratcliffe, the site specific aims are:

- Establish the presence/absence of archaeological remains.
- Determine the extent, condition, nature, character, date and significance of any archaeological remains encountered.
- Establish the nature of the activity on the site.
- Identify any artefacts relating to the occupation or use of the site.
- Provide further information on the archaeology of the site and the surrounding area from any archaeological remains encountered.
- Disseminate the results and where significant results are obtained publish them to an appropriate level.

A key objective is to better understand the process and extent of enclosure in this part of Cornwall by investigating the relationships between boundaries of different periods and obtain dating material from them.

Working methods

All recording work will be undertaken according to the Institute for Archaeologists *Standards and Guidance for Archaeological Investigation and Recording*. Staff will follow the IfA *Code of Conduct* and *Code of Approved Practice for the Regulation of Contractual Arrangements in Archaeology*. The Institute for Archaeologists is the professional body for archaeologists working in the UK.

Desk-based assessment

- A desk-based assessment and magnetometer survey have been carried out, and will be used to inform this fieldwork stage (Archaedia 2012 and Watson and Gater Prospection 2013 respectively).

Archaeological recording (controlled areas and watching brief)

Detailed areas (see attached figure)

Soil strips will be undertaken in the eight areas identified as requiring detailed investigation to investigate features of potential significance revealed by the geophysical survey (see attached plan for locations). The sizes of individual trenches will vary according to the nature of the boundary relationships to be examined and the precision with which the area indicated on the geophysical survey can be located on the site. Most trenches are likely to be between two and four metres wide and between four and ten metres long.

Soil strips will also be carried out under archaeological supervision using a machine fitted with a toothless bucket in areas of the site where inverter stations or other extensive groundworks. These trenches will echo the footprints of the inverter buildings.

In all cases where soil stripping is undertaken, the topsoil will be stripped cleanly to a level at which archaeological features or layers can be expected to be revealed (i.e. top of the "natural"). Machines will not run over the stripped area until the archaeological recording has been completed.

During the archaeological recording the archaeologist will inspect the excavated areas, identify and record any archaeological features that are revealed in the stripped areas; the level of recording will be appropriate to the character/importance of the archaeological remains and the depth to which the area under investigation will subsequently be further excavated.

Any archaeological features or layers exposed in the stripped area will be carefully excavated by hand and archaeologically recorded by written description, plan and section and photographic record as appropriate by an HE Projects archaeologist. Within those areas where the geophysical survey indicates the potential for the investigation of phase relationships between the field systems indicated in the magnetometer data, the primary aim of the investigation is to determine (if possible) the phase relationship and dates of the boundary features. If suitable organic material is revealed, this will be sampled for subsequent high precision radiocarbon dating and for the determination of any plant macro-fossil content.

Watching Brief (remainder of site)

Across the remainder of the site, an archaeological watching brief will be undertaken (i.e. excavation activities will be monitored by the site archaeologist). Sample soil sections will be recorded within cable trenches and excavated soil monitored for artefacts. In the event that the watching brief indicates that significant archaeological features have been intersected, more detailed archaeological excavation may be required. This will be discussed with the HEPAO and the site developer and the extent and nature of any further recording required will be agreed prior to it being undertaken.

Excavation of significant features

If complex and/or significant archaeological deposits are encountered in any part of the site, then the archaeological requirements should be reviewed by the client, the Historic Environment Planning Advice Officer and HE Projects. In the event that remains cannot be preserved *in situ* then full-scale excavation may be required. A contingency should be allowed to record any significant archaeological remains which are uncovered during the stripping. The significance of the remains should be agreed between the client, the Historic Environment Planning Advice Officer and HE Projects. A contingency of five days for such excavation has been allowed for in the project cost breakdown as a guide, but the precise scope of any additional contingency works which might be

required will need to be reviewed in the light of findings during the watching brief and agreed between the Historic Environment Planning Advice officer and the Client.

Where necessary the detailed archaeological recording may include:

- Excavation of archaeological features exposed in the stripped area and plotting them onto a base map.
- Production of plans and section drawings of the excavated features and recording of features using a continuous numbering system.
- Retrieval of artefacts.

Recording - general

Site drawings (plans, sections, locations of finds) will be made by pencil (4H) on drafting film; all plans will be linked to the Ordnance Survey Landline (electronic) map; all drawings will include standard information: site details, personnel, date, scale, north-point.

All features and finds will be accurately located at an appropriate scale. Sections will normally be drawn at 1:10 and plans at 1:20.

All archaeological contexts will be described to a standard format linked to a continuous numbering sequence.

Photography: scaled monochrome photography will be used as the main record medium, with colour digital images used more selectively and for illustrative purposes. This will include both general and site specific photographs. Photographs should have a scale and detailed ones should include a north arrow.

Drawings and photographs will be recorded in a register giving details of feature number and location.

Sealed/undisturbed archaeological contexts in the form of buried soils, layers or deposits within significant archaeological features (ditches and pits, etc) will be sampled for environmental evidence and dating material. In the event that significant organic remains are encountered, advice may be needed from Vanessa Straker (Regional Advisor for Archaeological Science).

If human remains are discovered on the site the Historic Environment Planning Advice Officer and the Ministry of Justice will be informed. All recording will conform to best practice and legal requirements.

If human remains are uncovered, which require excavation, they will be will be excavated with due reverence. The site will be adequately screened from public view. Once excavated, human remains must not be exposed to public view.

If human remains are not to be removed their physical security will be ensured, by back filling as soon as possible after recording.

Treatment of finds

The archaeological fieldwork may produce artefactual material.

All finds in significant stratified contexts predating 1800 AD (e.g., settlement features) should be collected by context and described. Post-medieval or modern finds may be disposed of at the cataloguing stage. This process will be reviewed ahead of its implementation.

All finds will be collected in sealable plastic bags which will be labelled immediately with the context number or other identifier.

Creation of site archive

To include:

- Archiving of black and white photographs to HER standards. All monochrome photographs will be archived using the HE photo database
- Digital colour photographs (stored according to HER guidelines and copies of images made available to the client)
- Preparation of finished drawings
- Completion of the English Heritage/ADS OASIS online archive index

Archive report

A written report will include:

- Summary
- Project background
- Aims and objectives
- Methodologies
- Location and setting
- Designations
- Site history
- Archaeological results
- Chronology/dating evidence
- Significance
- Conclusions
- References
- Project archive index
- Supporting illustrations: location map, historic maps, plans, elevations/sections, photographs

A paper copy and a digital (PDF) copy of the report, illustrations and any other files will be held in the Cornwall HER. Paper copies of the report will be distributed to the client, to local archives and national archaeological record centres.

Analysis and publication

In the event of significant archaeological findings, further stages of analysis and publication in a national academic journal will be required. The details of this phase of the project would be subject to the results of discussions with the Historic Environment Planning Advice Officer, would require a separate WSI and would require the determination of related additional costs.

Archive deposition

An index to the site archive will be created and the archive contents prepared for long term storage, in accordance with HE standards.

The archiving will comprise the following:

1. All correspondence relating to the project, the WSI, a single paper copy of the report together with an electronic copy on CD, stored in an archive standard (acid-free) documentation box
2. A2 drawn archive storage (plastic wallets for the annotated record drawings)
3. Archive standard negative holders and archive print holders, to be stored in the HES system until transferred to the Royal Cornwall Museum.

4. All black and white photographs will be archived using captioned labels, appropriate record forms and location plans. Other photo records will be supplied with written captions and subject to appropriate batch archiving to be held in safe archival storage.
5. The project documentary archive will be deposited initially at ReStore PLC, Liskeard and in due course (when space permits) at either the Royal Cornwall Museum (if accompanied by artefacts) or at the Cornwall Record Office.
6. The results of the watching brief will be reviewed on completion with the HEPAO and the Client to establish whether these warrant a programme of further analysis and publication.

Timetable

The study is anticipated to be commenced during mid- to late-October 2013. The archive report will be completed within 3 months of the end of the fieldwork. The deposition of the archive will be completed within 3 months of the completion of the archive report.

Monitoring and Signing Off Condition

Monitoring of the project will be carried out by Dan Ratcliffe, Historic Environment Planning Advice Officer. Where the Historic Environment Planning Advice Officer is satisfied with the archive report and the deposition of the archive written discharge of the planning condition will be expected from the local planning authority (LPA).

Monitoring points during the study will include:

- Approval of the WSI
- Completion of fieldwork
- Completion of archive report
- Deposition of the archive

Historic Environment Projects

Historic Environment Projects is the contracting arm of Historic Environment, Cornwall Council (HE). HE employs some 20 project staff with a broad range of expertise, undertaking around 100 projects each year.

HE is committed to conserving and enhancing the distinctiveness of the historic environment and heritage of Cornwall and the Isles of Scilly by providing clients with a number of services including:

- Conservation works to sites and monuments
- Conservation surveys and management plans
- Historic landscape characterisation
- Town surveys for conservation and regeneration
- Historic building surveys and analysis
- Maritime and coastal zone assessments
- Air photo mapping
- Excavations and watching briefs
- Assessments and evaluations
- Post-excavation analysis and publication
- Outreach: exhibitions, publication, presentations

Standards



HE is a Registered Organisation with the Institute for Archaeologists and follows their Standards and Code of Conduct.

As part of Cornwall Council, HE has certification in BS9001 (Quality Management), BS14001 (Environmental Management), OHSAS18001 (Health, Safety and Welfare), Investors in People and Charter Mark.

Terms and conditions

Contract

The HE projects team is part of Historic Environment, Cornwall Council. If accepted, the contract for this work will be between the client and Cornwall Council.

The views and recommendations expressed will be those of the HE projects team and will be presented in good faith on the basis of professional judgement and on information currently available.

Project staff

The project will be managed by a nominated Senior Archaeologist (Adam Sharpe BA MIfA) who will:

- Discuss and agree the detailed objectives and programme of each stage of the project with the client and the field officers, including arrangements for health and safety.
- Monitor progress and results for each stage.
- Edit the project report.
- Liaise with the client regarding the budget and related issues.

Work will be carried out by HE field staff, with assistance from qualified specialists and sub-contractors where appropriate.

Report distribution

Paper copies of the report will be distributed to the client, to local archives and national archaeological record centres.

A digital copy of the report, illustrations and any other files will be held in the Cornwall HER and also supplied to the client on CD or other suitable media.

Copyright

Copyright of all material gathered as a result of the project will be reserved to the Historic Environment, Cornwall Council. Existing copyrights of external sources will be acknowledged where required.

Use of the material will be granted to the client.

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.

HE will ensure that all information arising from the project shall be held in strict confidence to the extent permitted under the Act. However, the Act permits information to be released under a public right of access (a "Request"). If such a Request is received HE may need to disclose any information it holds, unless it is excluded from disclosure under the Act.

Health and safety statement

Historic Environment is within the Environment Directorate of Cornwall Council. The HE projects team follows Cornwall Council's *Statement of Safety Policy*.

Prior to carrying out on-site work HE will carry out a Risk Assessment.

Insurance

As part of Cornwall Council, HE is covered by Public and Employers Liability Insurance.