Cefn Graianog Quarry Extension

Archaeological Evaluation

GAT Project No. G1598

Report No. 811

July 2009

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust
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Watching Brief:
Cefn Graianog Quarry

Report No. 811

Prepared for Ellesmere
Sand and Gravel Ltd

July 2009

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CEFN GRAIANOG QUARRY (G1598)
WATCHING BRIEF
(with appendix on radiocarbon dates from a previous phase of the project)

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CEFN GRAIANOG QUARRY (G1598)
WATCHING BRIEF

SUMMARY
Gwynedd Archaeological Trust were commissioned by Ellesmere Sand and Gravel Ltd. to undertake an archaeological evaluation (strip/map/sample) at Cefn Graianog Quarry, Gwynedd (NGR SH46164992), as part of a long-standing project monitoring the extension of a sand and gravel quarry.

A drystone boundary wall was recorded prior to its demolition. This wall formed part of a larger system of field boundaries and was erected prior to the compilation of the 1840 parish tithe map. No artefacts were recovered to aid in the more precise dating of this boundary.

A single pit of unknown date and function was identified and excavated. No artefactual material was recovered.

An appendix to this report presents the results of radiocarbon dating on a curvilinear ditch excavated in a previous phase of this project. The dates place the ditch in the 8th to 9th centuries AD.

1.0 INTRODUCTION

Gwynedd Archaeological Trust (GAT) were commissioned by Ellesmere Sand and Gravel Ltd. (ESG) to undertake an archaeological evaluation (strip/map/sample) at Cefn Graianog Quarry, Gwynedd (NGR SH46164992), as part of a long-standing project monitoring the extension of a sand and gravel quarry.

The original assessment of the expansion area was undertaken in 1994 by GAT for Tarmac Quarry Products Ltd. (Flook 1994 GAT Report no. 124) and this was followed by a series of watching briefs to the south and east of the current area (see GAT Reports 344, 424, 505, 530, 549, 676 and 724). The evaluation reported on in the last of these recommended radiocarbon dates be obtained on samples from the fill of a curvilinear ditch of unknown date. Appendix I has been added to the current report to present the results of this analysis and to discuss these results in relation to the other known archaeology of the Graianog Ridge.

2.0 METHODS AND TECHNIQUES

A watching brief was undertaken between the 8th of June and the 2nd July, 2009.

The aim of the watching brief was to monitor the topsoil strip of an area of 0.8ha situated to the immediate east of the current quarry zone (figure 1). This included the recording of a drystone wall, which was partially demolished to accommodate the quarry extraction.

A 21-tonne 360° tracked excavator was used throughout the watching brief.

Identified features were recorded photographically and by notes and sketches, and located by measuring from the field boundaries. The archive is held by GAT under the project number G1598.

3.0 TOPOGRAPHY

Cefn Graianog translates as a gravely ridge (Mason 1998, xvi) and this name accurately describes the character of the area. The low hummocky ridge lies at the eastern end of the Lleyn Peninsula, within a basin of approximately 3km width and is surrounded by hills. Cefn Graianog rises to a height of 160m and forms an island in an area of wetter, heavier soils and bog. The soils from the basin are derived from glacial and fluvio-glacial deposit, mostly of Snowdonian origin, which have been heavily weathered under periglacial conditions. In poorly drained areas silty clays and peat have formed, but the soils on the ridge are well drained, if stony, brown earths of the Arfon series, with brown podsols on the steeper slopes.

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Prehistoric and Roman activity

The early prehistory of the ridge is far from clear. Mesolithic occupation is predominantly concentrated in coastal areas and as yet no artefacts from this period have been discovered at Cefn Graianog. There are however some slight hints from the pollen record that forest clearance may have occurred before 4000BC (Chambers 1998, 57) as a patch of burnt stone under a later burnt mound was dated to 5955-5500 cal BC (CAR-721) (Kelly 1992, 85). Kelly (*ibid.*, 86) dismisses the date as a result of dating inadequate quantities of charcoal, but a recent excavation about 1km southwest of the ridge also produced Mesolithic dates. The dates, ranging from 5310-6625 cal BC at 2 sigma, were from a deposit of charcoal within what may be a natural, periglacial formation (Kenney 2000). The evidence raises the possibility of deliberate burning of the vegetation in the Mesolithic period.

As in the preceding Mesolithic period Neolithic structural and artefactual evidence is invisible on the Cefn Graianog ridge. It is however clear from pollen evidence that there was anthropogenic forest clearance during this period (Chambers 1998, 57). The long history of farming on the ridge began during this period, although no trace of these early farmers has yet been found. The nearest Neolithic monument is the chambered tomb at Penarth (PRN 199), situated 3.25km northwest of the ridge (Kelly 1998, 161).

The earliest monument on the ridge itself is a standing stone (PRN 124) of presumed Bronze Age date. Whilst the numerous cairns on the ridge are generally undated, the two located close to the standing stone are presumably also Bronze Age, and appear to be funerary monuments rather than clearance cairns (PRN 224, 225). These three monuments are collectively scheduled as Cn98 (Mason 1998, xix). The pollen evidence shows phases of clearance and regeneration throughout the Bronze Age, and the presence of burnt mounds may indicate Bronze Age settlement in the area (Kelly 1998a, 161). One of these mounds (PRN 129) was excavated (Kelly 1992), producing dates demonstrating its use between the third and early second millennium BC, and later in the late second to early first millennium (Kelly 1998, 161). There is another burnt mound site, 175m south of the excavated one, which appears to be a complex site with three conjoined mounds (PRN 3997). The chance discovery of the ring (PRN 3446), of the type known as Bronze Age ring money, by a farm worker in 1970, suggests Bronze Age activity near the summit of the ridge.

Major and sustained forest clearance started on the ridge in the mid first millennium BC, and the earliest settlement sites discovered so far date from the mid 2nd century BC. Three hut groups have been excavated on the ridge (Mason 1998). The Graianog site and Cefn Graianog II were founded in the 2nd century BC and continued through the end of the Roman period (Kelly 1998b; Mason and Fasham 1998). The third hut group, Cefn Graianog I, was established in the 2nd century AD, and again continued to the end of the Roman period. There may have been a fourth hut group (PRN 118) 300m to the west of Graianog (Kelly 1998a, 162) and there are similar sites about 1km away to the southwest of Caerau (PRN 108, 109). The Iron Age is further represented in the area by a small hillfort (PRN 203) on Y Foel, the rounded hill to the north of the area (Mason 1998, xix).

Medieval and later periods

Although the hut groups went out of use at the end of the Roman period the pollen record showed that ridge continued to be farmed, and the settlements had probably not moved very far away (Kelly 1998a, 162). Resettlement of the ridge probably occurred from the 10th century AD. The Graianog hut group site was reoccupied sometime between the 10th and 13th centuries (Kelly 1998b).

In 2007 a truncated sub-circular ditch was uncovered to the west of Cefn Graianog Farm. The ditch was cut into the glacial horizon and measured 0.80m in width and covered an area *c*.20.0m across (GAT report 724). Two radiocarbon dates were obtained from samples recovered from the ditch fill (KIA38220 and KIA38219). Both dates suggested a date within the 8th to 9th centuries AD (appendix I).

A medieval homestead (PRN 120) was excavated by Kelly (Kelly 1982) and was found to have been in use between the 11th and 13th centuries. A further group of medieval platform houses (PRN 123) were located on the bog margin to the south, but they were destroyed without excavation (Kelly 1998a, 162). A possible medieval farmstead (PRN 3999) and an isolated platform house (PRN 4360) are located on the north-eastern slope of the ridge.

In the medieval period Graianog first appears in the written history, the confirmation of the grant of 'Grayanawt' to the *clas* of Clynnog Fawr, in the 1209 charter of Llewelyn ap Iorwerth, probably refers to the excavated medieval homestead (PRN 120) (Kelly 1998a, 162). Modern Graianog was probably founded in the 15th century, when the pollen record shows intensified clearance activity. The present settlement was certainly established by the early 17th century, when a farmhouse was built. This is now a Grade II listed building (RCAHMW 1960, site 800, p44). The modern farm of Cefn Graianog was founded in the mid 19th century, and was demolished in 1990 in advance of quarrying (Kelly 1998a, 160,162). The existing field system probably dates to the early 19th century, when fields were enlarged to open up areas for progressive farming techniques (Flook 1994, 4). Gravel extraction has taken place on the ridge for at least 100 years, with large-scale extraction started after the Second World War (Mason 1998, xvi). The quarrying activity has been the impetus for much of the archaeological work on the ridge, as sites have been excavated in advance of the gravel extraction.

5.0 STRIP/MAP/SAMPLE RESULTS

The strip, map and sample area was centred on NGR SH46164992.

The remains of a drystone boundary wall were visible within the area stripped and were recorded prior to its demolition (plates 1-5). The remains of the aforementioned wall ran for a distance of approximately 44.0m, survived to a maximum height of 1.5m and were approximately 1.15m wide at its base. The wall was constructed from unshaped boulders of local stones and randomly coursed. There was a gateway flanked by two large stone posts (plates 2 & 4) with iron swing hinges positioned approximately 20m from the eastern corner of the field boundary.

The wall formed part of a larger system of field boundaries and through map regression was found to predate the 1840 parish tithe map. It is not possible to obtain a more precise date for the origins of this feature.

A single pit with a diameter of approximately 1.5m (see figures 1-3, plates 6-7) was identified near the eastern limit of the excavation area. As no artefactual material or associated archaeological features were present the function and date of the pit remain illusive.

6.0 CONCLUSION

A drystone boundary wall was recorded prior to its demolition. The wall formed part of a larger system of field boundaries and was erected prior to the compilation of the 1840 parish tithe map. No artefacts were recovered to aid in the more precise dating of this boundary.

A single pit was identified near the eastern limit of the excavation area. As no artefactual material or associated archaeological features were present the function and date of the pit remain illusive.

7.0 SOURCES CONSULTED

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APPENDIX I: RADIOCARBON DATES ON A CURVILINEAR DITCH DUG IN 2007

Introduction

In an earlier phase of this project an archaeological evaluation was carried out at Cefn Graianog Quarry in October 2007. During that evaluation a curvilinear ditch was found and excavated as reported in GAT Report 724 (see figure 1 for location and figure 4 for detail). At the time it was thought possible that this formed the remains of the truncated ring ditch of a prehistoric barrow and it was recommended that samples of charred plant remains from the ditch be sent for radiocarbon dating.

Results

Charcoal from bulk soil samples from the ditch fill was recovered by wet sieving and studied by Pat Denne of the European Plant Science Laboratory, Bangor. Most of the identifiable pieces were of oak and hazel with occasional birch, alder, willow and Pomoideae family (apple, pear, rowan, whitebeam or hawthorn). There was also a fragment of hazelnut shell. (See appendix 1.1 for the full report on this material).

From the identified pieces of charcoal two samples were chosen and in January 2009 these were sent to Leibniz Labor für Altersbestimmung und Isotopenforschung, Kiel, Germany for accelerator mass spectrometry dating. Both samples were hazel charcoal from the fill of the curvilinear ditch. The results of the radiocarbon dating are as below, calibrated using the CALIB rev 5.01 program (Data set: IntCal04, Reimer et al., Radiocarbon **46**:1029-1058). (See appendix 1.2 for full details on the dates and the dating process).

Lab number	Context number	Material	Date BP	Calibrated date (Probability 95.4 %)
KIA 38219	004	charcoal hazel	1241 ± 20	AD 687 - 866
KIA 38220	004	charcoal hazel	1237 ± 23	AD 688 - 872

Discussion

The range of species identified in the charcoal samples suggests a sample of the natural woodland cover in the area and could result from a deliberately or accidentally set woodland fire or fairly unselective collection of wood for a domestic fire.

The material dated originates from the fill of a ditch and is therefore of insecure provenance, but the two radiocarbon dates are statistically indistinguishable. The fact that different samples from different parts of the ditch have the same date suggests that the all charcoal was generated by the same event. This event occurred between the late 7th and late 9th century AD. It is possible that the charcoal originated from hearths within the enclosed area used over a fairly short period of time. However, in this case discrete layers and lens of charcoal might be expected in the ditch yet the charcoal was seen to be distributed in small fragments fairly evenly throughout the ditch fill. The evidence suggests that the charcoal most likely represents clearance of woodland in the area by burning and that the charcoal has gradually become incorporated into the ditch fill.

The date demonstrates that the curvilinear ditch was not the ring ditch for a round barrow, and in fact it seems too irregular and narrow to be one. Presumably the ditch formed part of a small sub-circular enclosure, although it possibly could have been the corner of a larger irregular enclosure. The charred remains suggest that the use of the ditched enclosure was related to the clearance of a mixed oak woodland. The presence of hazel and alder implies a rather open, shrubby woodland, probably secondary regrowth. The clearance was probably related to the reoccupation of the Graianog Ridge in the early medieval period after a period of abandonment. There is little other evidence for settlement in the area during the 8th and 9th centuries AD. An archaeomagnetic date of AD 500 to 900 (95% confidence limit) was produced from a hearth in house A (a rectangular structure) in the Graianog settlement, but this date is problematic. A radiocarbon date on associated charcoal gave a Roman date (AD 20 to AD 350) and radiocarbon dates on a corn drier supposedly associated with the latest use of the house gave dates spanning the 10th to 12th centuries AD (Kelly 1998, 136-137). An 8th to 9th century date for occupation at this site can therefore not be taken as proved. The platform houses (PRN 123) that formerly existed about 100m north of the curvilinear ditch are assumed to date to the 13th or 14th centuries but could have been older (Kelly 1998, 162), and as they were lost without any excavation their date can now not be known. The medieval homestead (PRN 120) to the west was in

use between the 11th and 13th centuries (Kelly 1982), so the bulk of the current evidence for renewed activity on the ridge seems to be from the 10th century or later. However the dates from the curvilinear ditch do support at least farming activity and clearance on the ridge before this date.

Appendix 1.1: Charcoal Identification from G1598

Pat Denne, EPSL, Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG

Overall comments
A wide range of species were found in these samples. Several bags included a high proportion of twigs and small branches: where twig diameters have been indicated below, these were estimated from the arc of the growth rings. It is likely that some other pieces were also branch material, but this could not be determined on those that were too narrow to show the arc, or where the growth rings were unclear.

It should be noted that it can sometimes be difficult to distinguish between birch and alder, and between alder and hazel, especially in small pieces of charcoal, or in charcoal that has been badly incinerated (birch, alder and hazel are closely related, with a similar structure). Many of these charcoal pieces were rather small, on the limits of possibility for identification.

Detailed analysis

Sample <3> Context (004) flot
Many pieces, mainly twigs and small branches. The identified species are wrapped in paper, the remainder were not examined microscopically, but appear to be of the birch/hazel/alder group.
Oak (*Quercus* sp), 5 pieces including 3 small branches estimated to be 1-2cm diameter.
Hazel (*Corylus* sp) 3 pieces, including 2 small branches estimated to be 2-3cm diameter.
Probably birch (*Betula* sp) or possibly alder (*Alnus* sp), 8 pieces including 5 small branches estimated to be 3-4cm across.
Alder (*Alnus* sp) 1 piece

Sample <3> Context (004) Residue
Fragments too small and fragile for identification

Sample <3> Context (004)
Hazelnut shell

Sample <5> Slot 0 Context (004) Residue
Alder (*Alnus* sp) 1 piece 12x10x6mm

Sample <5> Context (004) Residue
Oak (*Quercus* sp), 2 pieces both with growth rings about 2.5mm wide

Sample <5> Context (004) flot
Many pieces, attempted ID only of pieces more than 4mm minimum diameter in cross section.
Oak (*Quercus sp*) 6 pieces
Hazel (*Corylus* sp) 5 pieces, plus one small twig estimated to be 1cm diameter, probably hazel
Alder (*Alnus* sp) 1 piece
Pomoideae (this group of the Rosaceae includes apple, pear, rowan, whitebeam and hawthorn) 1 piece
Willow (*Salix* sp) 1 piece

Sample <6> Context (004) flot
Many pieces, mainly too small for positive identification. The identified species were not kept separate in this sample as they were too small and fragmented.
Oak (*Quercus* sp), 4 pieces including a twig estimated to be about 8mm diameter.
Birch (*Betula* sp), 1 piece, a small branch estimated to be about 3cm diameter.
Alder (*Alnus* sp) 1 piece
Hazel (*Corylus* sp) 1 piece

Gorse (*Ulex* sp) or broom (*Cytisus* sp), 1 piece, a small twig about 6mm diameter.
Probably heather (*Calluna* sp) 1 piece

Sample <6> Context (004)
Too small and fragile for positive identification

Sample <7> Context (004) slot 9 Residue
3 pieces
Probably hazel, possibly alder, 2 small twigs (estimated diameter 8mm)
Stone 5x4x2mm

SMS Context (004)
Alder (*Alnus* sp), 1 piece, a twig about 10mm diameter

Appendix 1.2: Results of radiocarbon dates on samples KIA 38219 and KIA 38220

Prof. Dr. P.M.Grootes, Leibniz Labor für Altersbestimmung und Isotopenforschung, Christian-Albrechts-Universität, Max-Eyth-Str. 11-13, D-24118 Kiel, Germany

The samples were checked under the microscope and an appropriate amount of charcoal was selected for dating. The selected material was then extracted with 1 % HCl, 1 % NaOH at 60°C and again 1 % HCl (alkali residue). The combustion to CO_2 was performed in a closed quartz tube together with CuO and silver wool at 900 °C. The sample CO_2 was reduced with H_2 over about 2 mg of Fe powder as catalyst, and the resulting carbon/iron mixture was pressed into a pellet in the target holder.

The ^{14}C concentration of the samples was measured by comparing the simultaneously collected ^{14}C, ^{13}C, and ^{12}C beams of the sample with those of Oxalic Acid standard CO_2 and coal background material. The conventional ^{14}C age was calculated according to Stuiver and Polach (Radiocarbon **19**/3 (1977), 355) with a $\delta^{13}C$ correction for isotopic fractionation based on the $^{13}C/^{12}C$ ratio measured by our AMS-system simultaneously with the $^{14}C/^{12}C$ ratio (note: This $\delta^{13}C$ includes the effects of fractionation during graphitization and in the AMS-system and, therefore, cannot be compared with $\delta^{13}C$ values obtained per mass spectrometer on CO_2). For the determination of our measuring uncertainty (standard deviation σ) we observe both the counting statistics of the ^{14}C measurement and the variability of the interval results that, together, make up one measurement. The larger of the two is adopted as measuring uncertainty. To this we add the uncertainty connected with the subtraction of our “blank”. The quoted 1σ uncertainty is thus our best estimate for the full measurement and not just based on counting statistics. “Calibrated” or calendar age was calculated using “CALIB rev 5.01” (Data set: IntCal04, Reimer et al., Radiocarbon **46**:1029-1058).

Both samples gave more than the 1 mg of carbon recommended for a precise measurement and produced sufficient ion beam. The $\delta^{13}C$ value is in the normal range and insofar the result is reliable.

The dating results of KIA 38219 and KIA 38220 differ by 4 ± 30 radiocarbon years. The difference corresponds to 0.1 sigma. Thus the dating results of the two charcoal samples are identical.

KIA38219 G1598 (004) ; 5 ; flot ; charcoal hazel

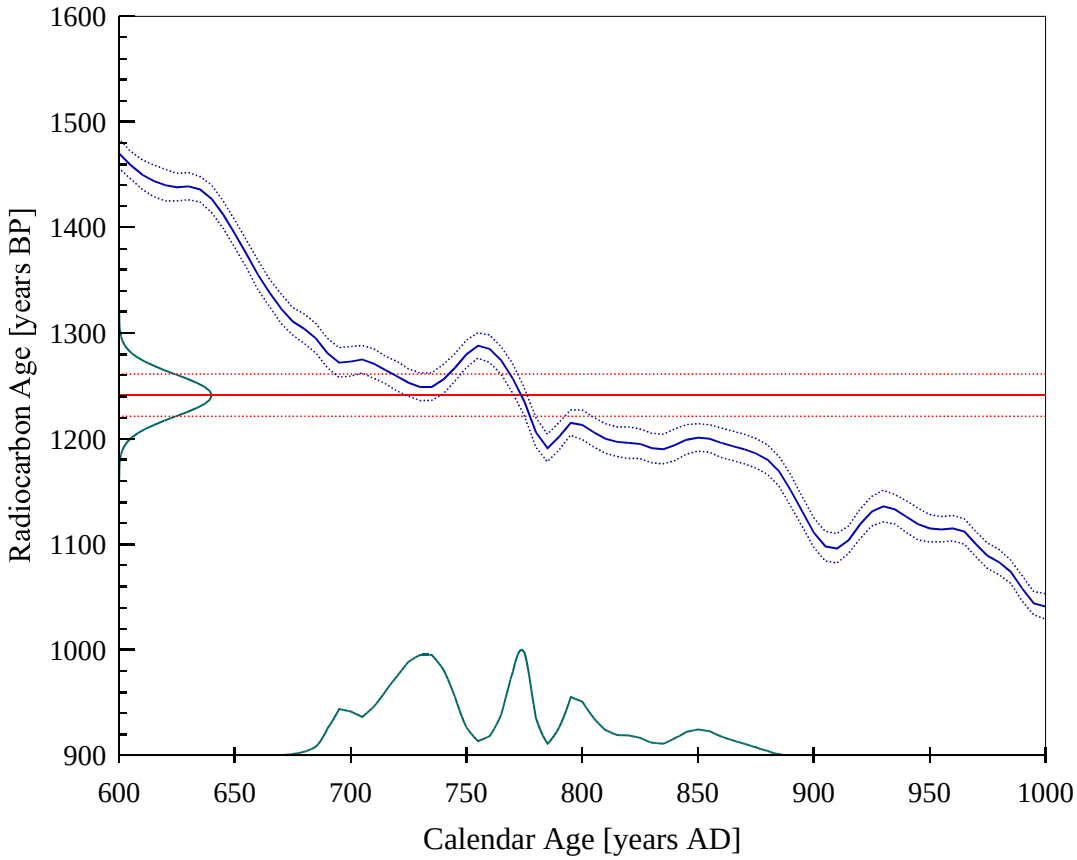
charcoal sample (hazel), reference: 1215tb28/G1598

Fraction	Corrected pMC†	Conventional Age	$\delta^{13}C$(‰)‡
Charcoal, alkali residue, 3.7 mg C	85.69 ± 0.21	1240 ± 20 BP	-27.47 ± 0.12

Radiocarbon Age: BP 1241 ± 20

One Sigma Range: cal AD 694 - 703 (Probability 5.5 %)
(Probability 68,3 %) 706 - 748 (Probability 40.3 %)
765 - 780 (Probability 15.0 %)
792 - 804 (Probability 7.5 %)

Two Sigma Range: cal AD 687 - 828 (Probability 87.8 %)
(Probability 95,4 %) 838 - 866 (Probability 7.6 %)



KIA38220 G1598 ; flot ; (004) ; charcoal hazel

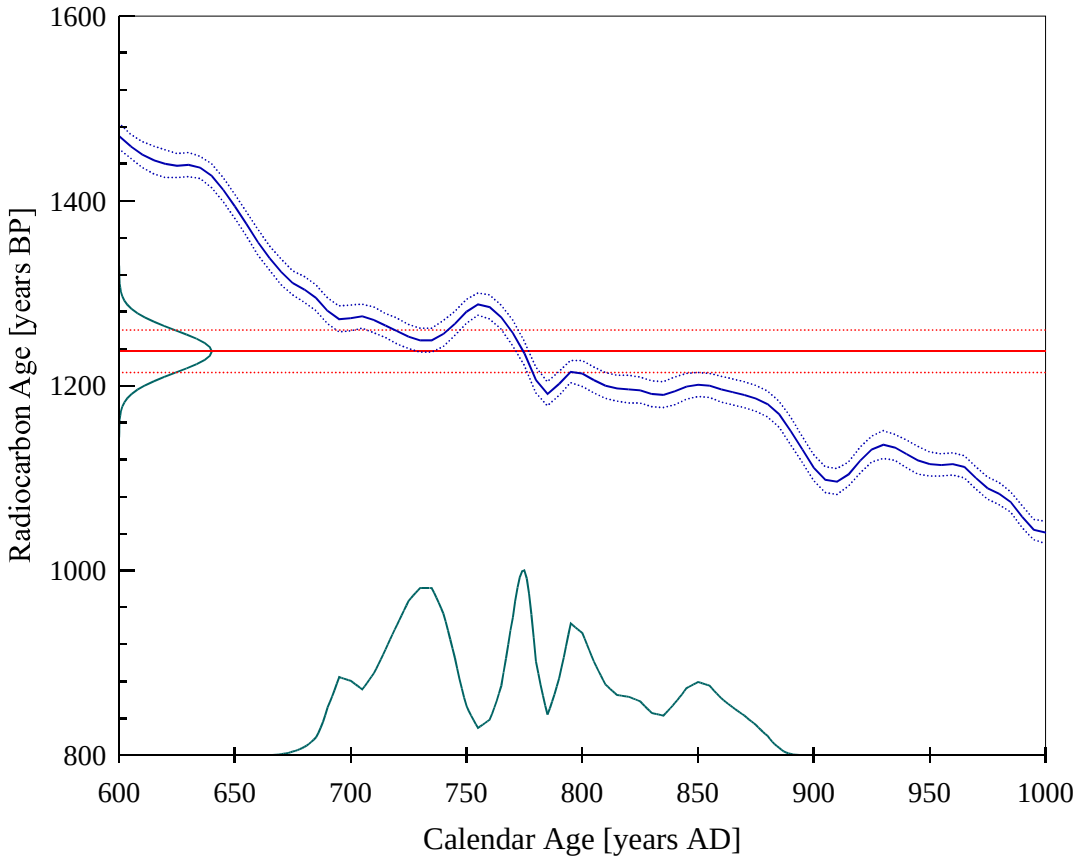
charcoal sample (hazel), reference: 1215tb28/G1598

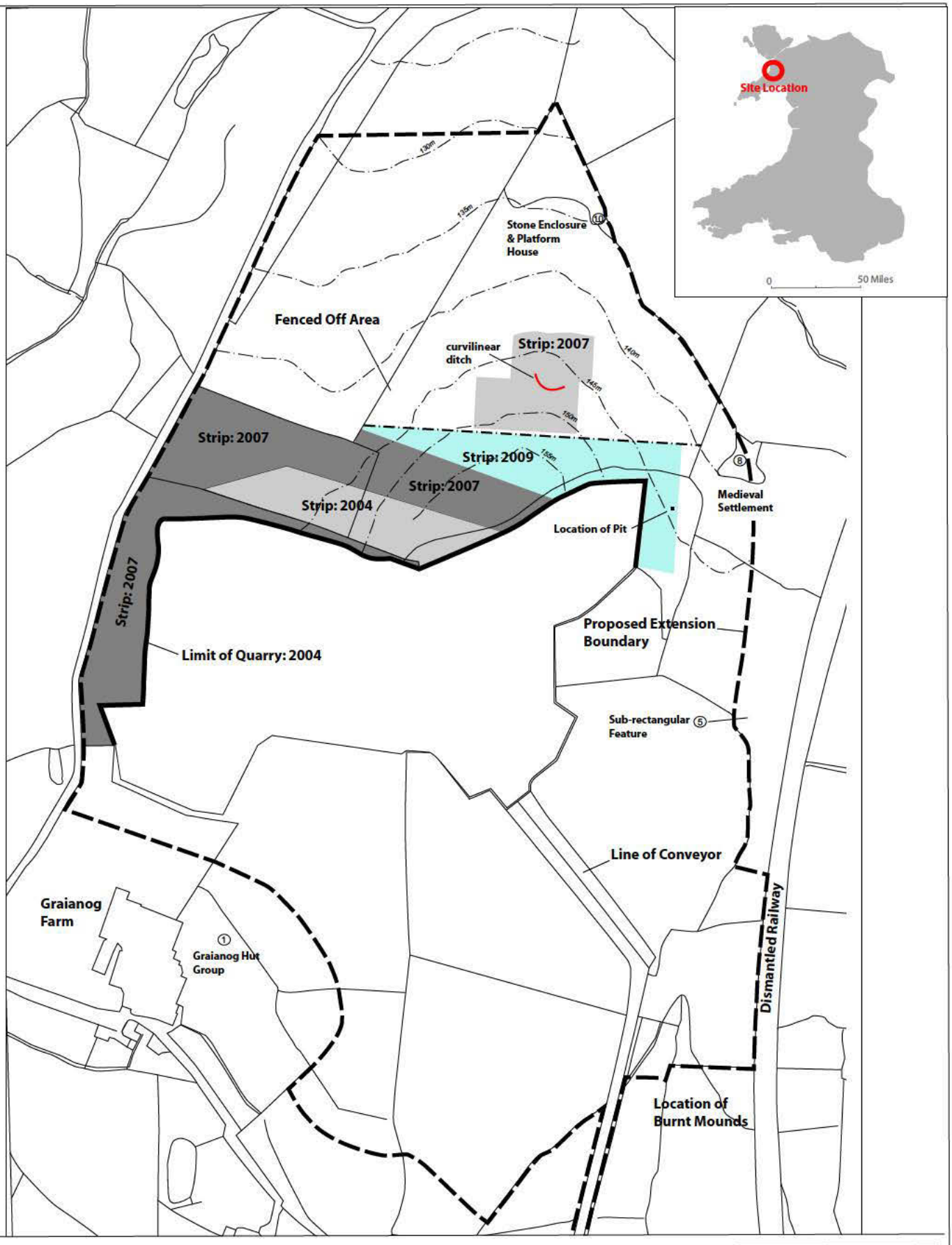
Fraction	Corrected pMC†	Conventional Age	$\delta^{13}C$(‰)‡
Charcoal, alkali residue, 6.0 mg C	85.73 ± 0.25	1235 ± 25 BP	-30.24 ± 0.34

Radiocarbon Age: BP 1237 ± 23

One Sigma Range: cal AD 694 - 703 (Probability 4.1 %)
(Probability 68,3 %) 706 - 748 (Probability 32.8 %)
765 - 782 (Probability 14.3 %)
789 - 810 (Probability 13.7 %)
847 - 855 (Probability 3.4 %)

Two Sigma Range: cal AD 688 - 753 (Probability 42.0 %)
(Probability 95,4 %) 760 - 872 (Probability 53.4 %)





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G1598 Cefn Graianog Quarry, Gwynedd

Figure 1. Site Location
Scale: 1:4000@A4

Figure 2. South-east facing section through pit [004]

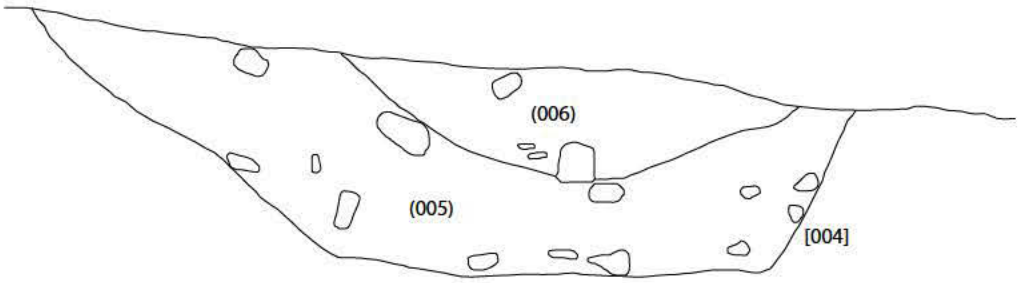
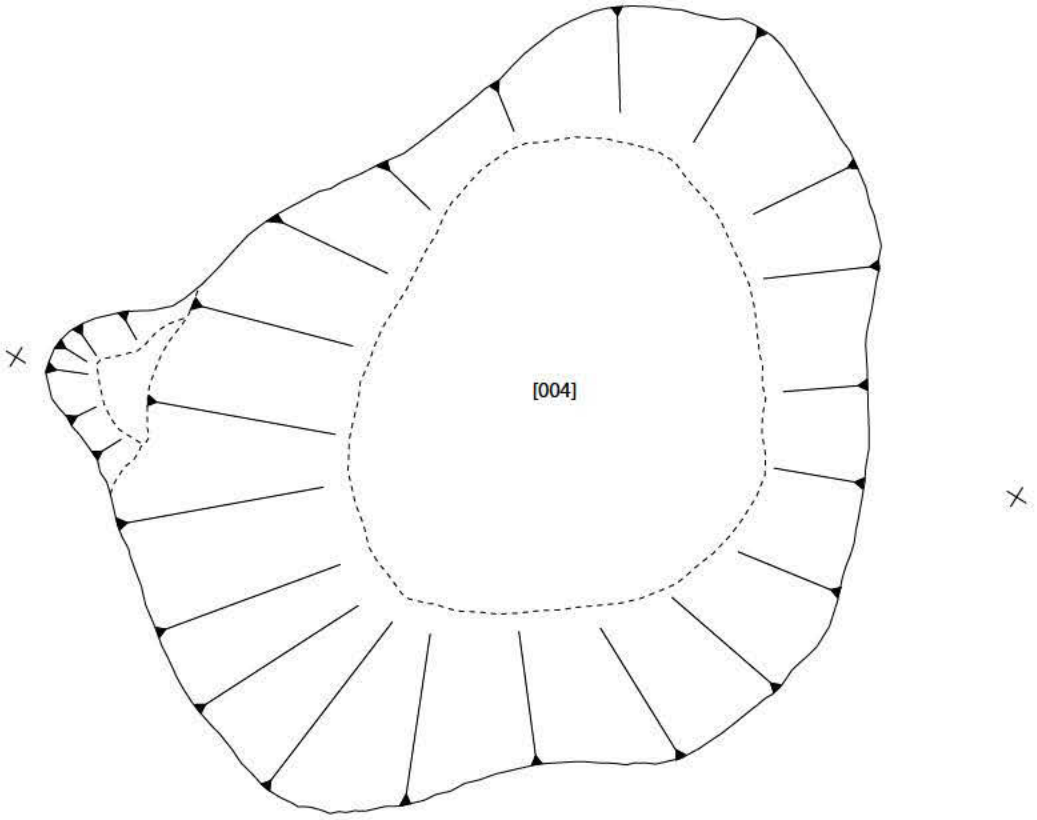


Figure 3. Post-excavation plan of pit [004]



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Figures 2& 3: Pit [004]

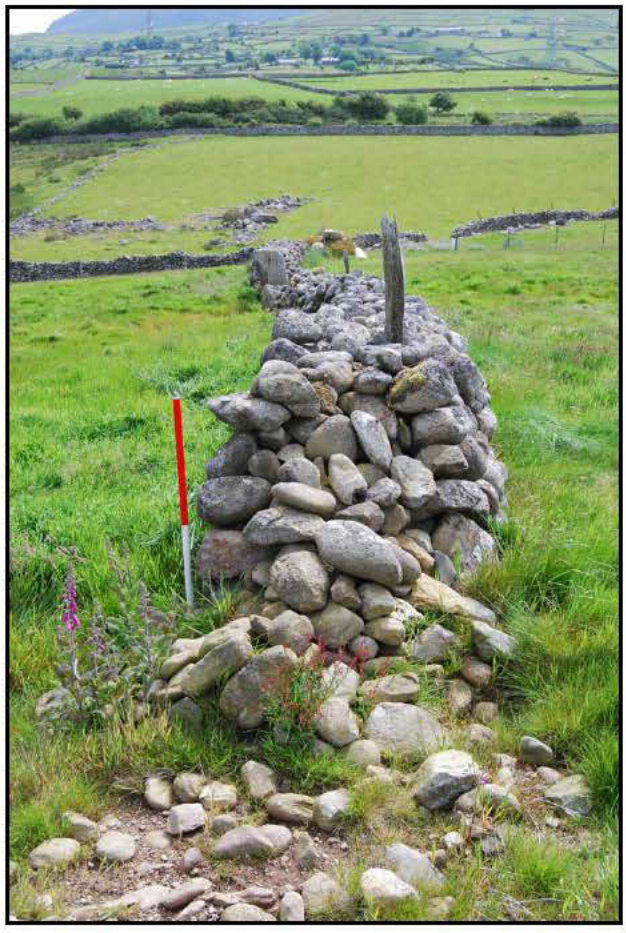

Plate 1. West facing view along length of boundary wall

Plate 2. East facing view of boundary wall gate post

Plate 3: East facing view of boundary wall

Plate 4. West facing gatepost in boundary wall

Plate 5. North facing section of boundary wall showing stone coursing and material size

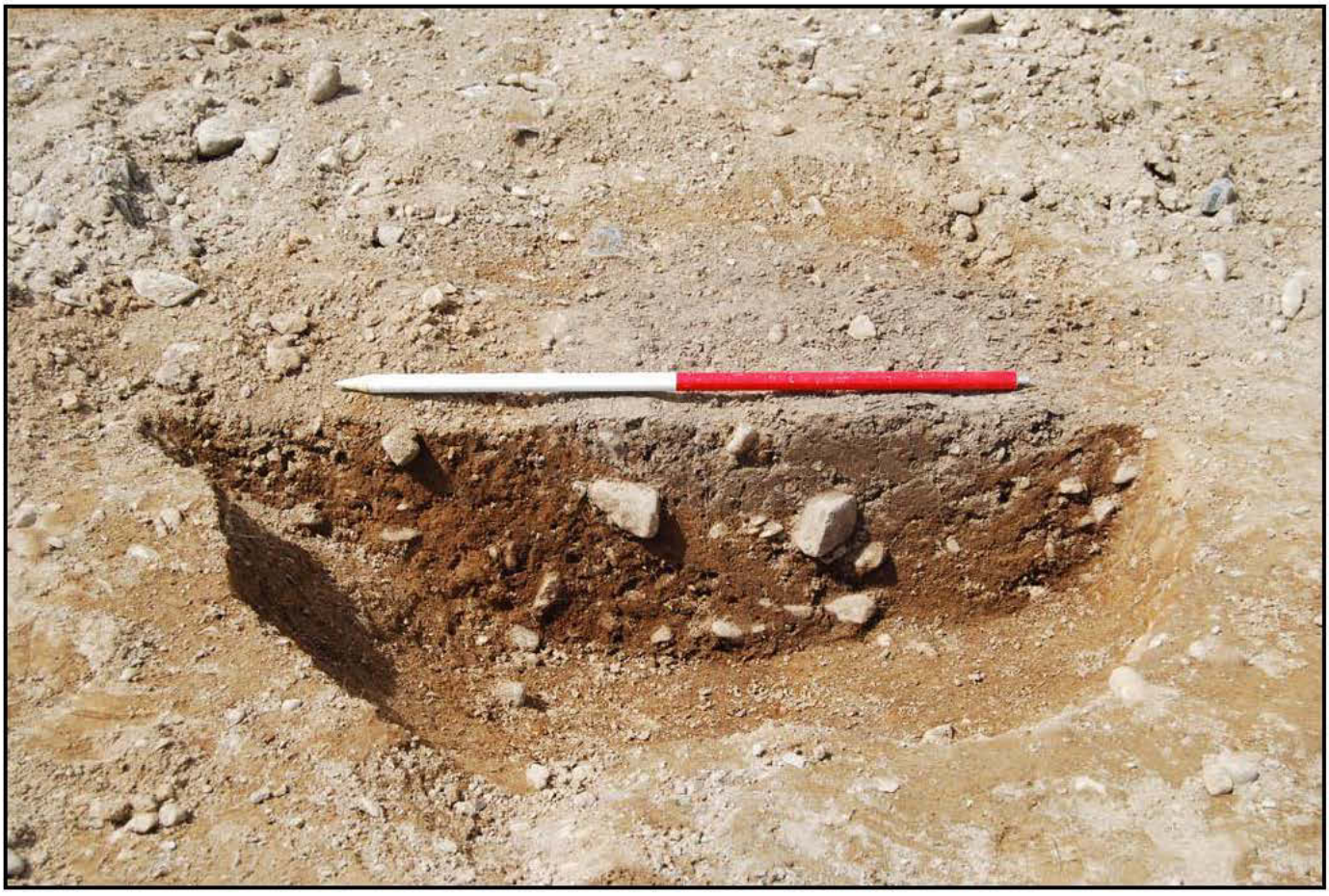

Plate 6. South-east facing section through pit [004]

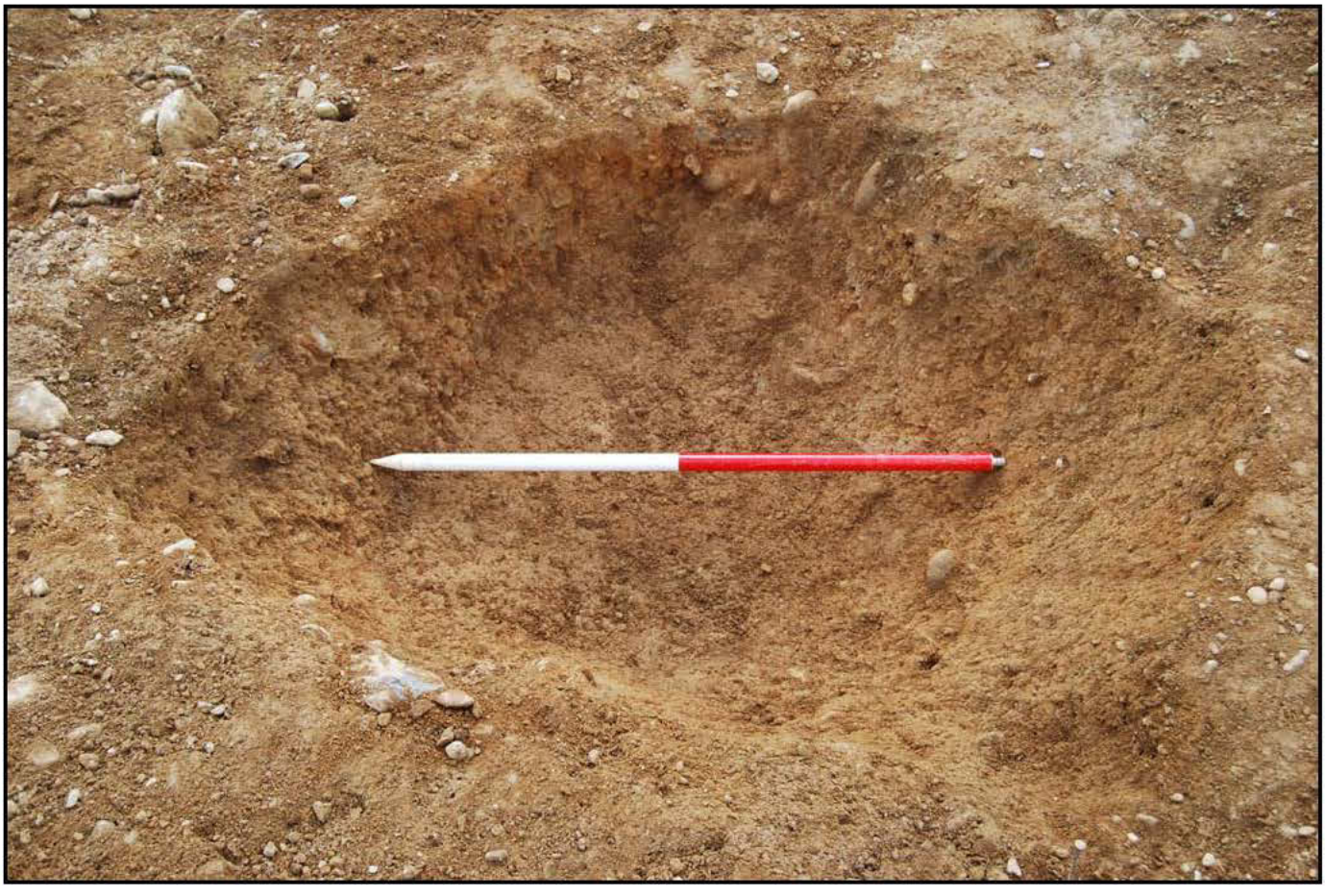

Plate 7. Post-excavation photograph of pit [004]

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