Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement main: Archaeological Mitigation Report

Archaeological Mitigation

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GWALCHMAI BOOSTER TO BODFFORDD LINK WATER MAIN AND LLANGEFNI TO PENMYNYDD REPLACEMENT MAIN: ARCHAEOLOGICAL MITIGATION REPORT

Prepared for

Laing O'Rourke Ltd.

August 2010

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SUMMARY

Gwynedd Archaeological Trust (GAT) was commissioned by Laing O'Rourke on behalf of Dŵr Cymru Welsh Water to complete a programme of archaeological mitigation during groundworks associated with water main improvements between Gwalchmai and Bodffordd and Llangefni to Penmynydd, Ynys Môn.

The pipeline project was completed in two 6.0km stages: the Gwalchmai to Bodffordd link main (NGR SH38907730 to NGR SH43207670), completed between October and December 2008, and the Llangefni to Penmynydd replacement main (NGR SH46167510 to NGR SH51497448), completed between February and July 2009. The work was monitored on behalf of the local planning authority by Gwynedd Archaeological Planning Services

The archaeological mitigation comprised an initial watching brief of the topsoil strip within the easement corridor for both stages (width: 10.0m), followed by a strip/map/sample of the pipeline route within this corridor (width: 1.60m). Further archaeological mitigation was dependant on the results of each stage and comprised evaluation of identified features (including post-medieval field drains) and/or targeted excavation.

Targeted excavation was limited to two areas of Neolithic activity (Sites 1 and 2) and the remains of seven early medieval cist graves (Site 6), both along the Llangefni to Penmynydd section and three burnt mounds (Sites 3 to 5), two along the Gwalchmai to Bodffordd section and one along the Llangefni to Penmynydd section. A right angled ditch of unknown provenance (Site 7) was also identified along the Llangefni to Penmynydd section close to Site 5.

A large amount of post medieval and modern gravel filled drains where identified along the whole route indicating the long history of agricultural land use in this region; within the Gwalchmai to Bodffordd section specifically, this activity represented the large-scale post-medieval improvement of marginal lands. Large amounts of 17th to 20th century pottery where also recovered from the development area.

1 INTRODUCTION

Gwynedd Archaeological Trust was commissioned by Laing O'Rourke and Dŵr Cymru Welsh Water to conduct archaeological mitigation in advance of proposed improvements to the water main system on Ynys Môn.

The pipeline project was completed in two stages: Gwalchmai to Bodffordd (NGR SH38907730 to NGR SH43207670) completed late in 2008, followed by Llangefni to Penmynydd (NGR SH4616751 to NGR SH51497448) completed between March and July 2009. Both schemes were *c.*6.0km in length (as indicated on client drawings **U5717/000** to **012**).

A mitigation brief was prepared by Gwynedd Archaeological Planning Services, and a project design was produced by Gwynedd Archaeological Trust to the requirements of the brief and to the guidelines specified in *Standard and Guidance for Archaeological Excavation* (Institute for Archaeologists, 1994, rev. 2001).

1.1 Acknowledgements

GAT would like to acknowledge the assistance and co-operation provided by *Laing O'Rourke* throughout all elements of the scheme. GAT would also like to acknowledge the guidance and assistance provided by Gwynedd Archaeological Planning Services, both in terms of spearheading the project and in providing advice during the fieldwork element. GAT would also like to acknowledge the contribution made by pottery specialist Frances Lynch, lithic specialist George Smith and the palaeoenvironmental team a*t Birmingham Archaeo-Environmental.*

2. PROJECT AIMS

2.1 Introduction

The aim of the project was to mitigate the impact of the scheme upon the archaeological resource. This was achieved by a staged programme of archaeological assessment and mitigation. This report contains the results of the mitigation phase of the project (the results of the assessment phase were discussed in GAT report **738**).

The purpose of the mitigation was to gain information about the archaeological resource within a given area or site (presence or absence, character, extent, date, integrity, state of preservation and quality), in order to make an assessment of its merit in the appropriate context, leading to one or more of the following:

- The formulation of a strategy to ensure the recording, preservation or management of the resource
- The formulation of a strategy to initiate a threat to the archaeological resource
- The formulation of a proposal for further archaeological investigation within a programme of research

The work programme involved the strip/map/sample of the designated route followed by targeted excavation where necessary. The known archaeological remains were used both to help determine the likely location of, and the character of, new archaeological findings.

The purpose of the targeted excavation was to examine the archaeological resource within a given area or site, within a framework of defined research objectives, to seek a better understanding of and compile a lasting record of that resource, to analyse and interpret the results, and disseminate them.

The archaeological mitigation was monitored by the Gwynedd Archaeological Planning Service, which carried out site visits and produced written monitoring reports and recommendations on behalf of the local planning authority.

2.2 Description of the project

2.2.1 Archaeological assessment

An archaeological assessment of the portions of the route (both elements) was undertaken by GAT in May 2008 (GAT Report 738).

Documentary, cartographic and aerial photographic evidence for historical and archaeological sites along the route were examined, and a walk over survey carried out. A possible prehistoric site that was previously unidentified south of Pen-yr-Allt, Penmynydd was noted. A post-medieval quarry and limekiln were identified. Changes to landscape usage and field patterns over times were also identified, as were a number of important buildings close to the route of the pipeline, including Bodwrog Church, Tregarnedd and the Penmynydd Almshouses. The majority of the route was found to be within areas of Medium or Medium/High archaeological potential. Two small lengths were identified as High potential. Two other lengths through built up areas within Llangefni were identified as Low potential.

Recommendations for archaeological mitigation were made within the assessment report, which included strip/map/sample with the medium to high potential areas and a watching brief in the low potential areas. These recommendations were revised for the specification produced by GAT for the main works: the strip/map/sample mitigation was expanded to cover the subsurface excavations outside of the built-up areas and the watching brief was expanded to monitor the topsoil strip of the easement route in advance of the main subsurface works (see para. 2.2.2. for appropriate methodology).

2.2.2 Mitigation excavation

The archaeological mitigation comprised an initial watching brief of the topsoil strip within the easement corridor (width: 10.0m), followed by a strip/map/sample of the pipeline route within this corridor (width: 1.60m). Further archaeological mitigation was dependant on the results of each stage and comprised evaluation of identified features (including post-medieval field drains) and/or targeted excavation.

Targeted excavation was limited to two areas of Neolithic activity (Sites 1 and 2) and the remains of seven early medieval cist graves (Site 6), both along the Llangefni to Penmynydd section and two burnt mounds along the Gwalchmai to Bodffordd section (Site 3 and 4) and a burnt mound on the Llangefni to Penmynydd section (Site 5). A linear feature of unknown provenance was identified near Site 5 (Site 7). Detailed descriptions of the targeted excavation areas are discussed in para. 4.0.

2.2.3 Post-excavation phase

A post-excavation assessment of the archaeological mitigation results was produced in August 2009, which was submitted to the client as a MAP 2: phases 3 to 5 design. This design described the results of the mitigation phase and the potential of the artefactual and environmental remains and suggested appropriate research guidelines and specialist analyses.

The archive resulting from the excavations, including paper records, drawings, photographs and artefacts will be stored and available for consultation at Gwynedd Archaeological Trust, Craig Beuno, Bangor, until suitable long term storage facilities are available at the recognised regional museum for the area at Oriel Môn, Llangefni.

A summary of the excavation results will be published in the Council for British Archaeology (Wales) journal Archaeology in Wales.

3. BACKGROUND INFORMATION

3.1 Geology and topography

(Reproduced from GAT Report 738).

Ynys Môn is tilted from the northeast to southwest, and thus the natural ridges and drainage pattern, enhanced by the last glaciation, follows this directional trend to give a corrugated effect of ridges of harder rock separated by shallow valleys. The study area crosses one of these ridges at Cefn Poeth (SH74304940), west of which the eastern end of Malltraeth marsh is overlooked. The route crosses the Afon Ceint, canalised in the 18th century, which along with the Afon Cefni comprise the two main tributaries running into Malltraeth Marsh from the higher ground to the north and east. West of Llangefni the pipeline route overlooks Cors Bodwrog to the west and north on a limestone ridge, where significant outcropping is observed, before descending slightly towards Bodffordd, where a more undulating landscape of improved fields is seen.

The solid and drift geology of the route consists of Pre-Cambrian metamorphic rocks around Penmynydd, with some Ordovician rocks and carboniferous limestone, changing to schists and gneisses of the Mona Complex west of Llangefni. These include significant outcropping, particularly west of Llangefni (Smith and George 1961). Soils consist of brown earths of the Arfon and Pentraeth series with occasional gleying (Jones 1972, 141). East of Llangefni these have been described as some of the most fertile on the island (Roberts 1958, 41-2).

The route is in two main sections, consisting of the Gwalchmai to Bodfford link main and the Llangefni to Penmynydd replacement main. The route follows a height of approximately 100m OD at the Penmynydd reservoir, falling away sharply at the ridge at Cefn Poeth to between 20m OD and 30m OD before reaching the moat at Tregarnedd at 15m OD, overlooked by the hill promontory of Bryn Cefni. At Bryn Ala the route lies at approximately 75m OD, falling to 50m OD at Bodffordd, following a course through the rocky outcrops to the north and west of Cors Bodwrog.

3.2 Archaeological and historical background

(Reproduced from Evans 2008, GAT report **738**)

3.2.1 Llangefni to Penmynydd Replacement Main

Much of the pipeline route lies along the old turnpike route from the Menai ferry to Holyhead, created in 1765, on which tolls were collected until Thomas Telford built a completely new turnpike in association with the building of the Menai Bridge in the early years of the 19th century (Pritchard 1972, 65). It commences in the east at the Penmynydd water treatment works, heading south across the B5420 road and passing the Penmynydd Almshouses (SH513742), which lie at right angles to it. These were built in 1620 under the will of Lewis Rogers, and consist of a single storey linear range, symmetrically planned with advanced central gabled porch and gabled end projections. They were built of local rubble limestone and the advanced gabled centre has a rounded doorway with a keystone in the shape of a shield, above which is a weathered central panel with the date and initials IP HS/ 1620 (Anglesey Archives WPE/6/292-3). The houses in the range are grade II* listed buildings.

The route follows a westward course through undulating fields to the south of the B5420 through hedged fields of probable 19th century date, passing south of Cae Helig (SH508743), crossing a minor road south of the former Horeb Independent chapel. The regular pattern of enclosed fields in this section suggests that they were formally laid out in the 19th century, probably by the Bulkeley estate of Baron Hill, Beaumaris, the major landowner in this area (UWB Baron Hill 6569). Centred on SH 50217447, aerial photographs dated to 1945 suggest the presence of an enclosure of possible prehistoric date (RAF 106G/UK/655 13th Aug 1945, frame 4062), although on more modern images the evidence is less clear. The fields west of Horeb are rather larger than those seen further east, where the pipeline route passes north of Cefn Poeth. It then crosses a steep ridge before heading slightly north westward meeting the minor road heading to Pentre Berw south of Ceint Fawr. After crossing the Afon Ceint the route then passes to the north of a standing stone (PRN 2737, NGR SH 48427463). It is possible that there may be prehistoric archaeology in this area associated with this site, as areas around standing stones are often associated with other funerary and ritual features (Lynch 1991, 32). The route passes north of Hirdrefaig (PRN 11105, SH 48047485), a grade II listed farmhouse of post medieval date, though possibly the site of an earlier settlement, Hirdrefaig being believed to be a medieval bond township (Jones -Pierce 1951, 23). The house is early 18th century in date with late 18th century alterations, 'L' shaped in plan, an earlier south wing having been demolished (RCAHMW 1937, 79). A small lime kiln and quarry was noted north west of Hirdrefaig at SH 47897511. The route passes north of Tre-garnedd, to the south of which lies Capel Carnedd Maes Lidr (PRN 2675, SH 47307510), the site of a medieval chapel and a medieval township, giving the 'Tre' part of the place name (Jones-Pierce 1951). The route then turns south westward past the site of a burnt mound and associated pit (PRN 16,073, SH 46907500) which was excavated in advance of the construction of the Bryn Cefni Industrial Park (Smith 2002).

The route passes north of Llwyn Ednyfed (Tregarnedd) before reaching the water treatment works at Parc Bryn Cefni, a moated enclosure of medieval date, the construction of which is traditionally associated with a descendant of Ednyfed Fychan, Gruffydd ap Rhys, in the 14th century, although it may have been Gruffydd's father, Rhys, who was responsible for its construction (Carr 1992). It is the only known moated site on Anglesey, and is a Scheduled Ancient Monument (PRN 2727, SH 46867464, SAM Ref: A047). The enclosed area, about 100m square has surviving ramparts on its north-west and south-west sides, although partially covered by more recent farm buildings. The 'garnedd' part of the place name comes from a prehistoric burial mound (PRN 2733), described as 'an extensive pile of stones, surrounded by a circle of stones about 86 yards in diameter [and] removed in 1822' (Lewis 1833). A possible location of this at SH 46807470 was identified during investigations associated with the construction of phase 2 of the Bryn Cefni Industrial Park (Kenney 2002, Fig. 1).

3.2.2. Gwalchmai Booster to Bodffordd Link Main

The route in this area follows the boundary between an upland area to the north with exposed rock outcrops and Cors Bodwrog to the south. It passes to the south of Bodwrog Church (PRN 6912, SH 40027763), a grade II* listed building. The church is late 15th century in style, rebuilt in Henry VII's

reign (1485-1509) when Wales was quiet and there was consequently a great deal of building activity. Richard Bulkeley was Archdeacon of Anglesey in 1500 and would have been concerned with the re-building of the church and was probably a benefactor. The east and two side windows are original, whilst the middle side windows are 17th or 18th century. Restored in mid-late C19, the church lies in an irregular enclosure, which has been straightened on the south and north sides. It is unclear whether the churchyard was originally curvilinear or rectilinear in form as it appears to be a rectangle with rounded corners. This could imply that the churchyard was originally curvilinear and that the main sides had been straightened out (Davidson 2000, 25). No traces are visible of any external boundaries however, but it is possible that the route of the pipeline could cut an earlier enclosure on the southern side. The route beyond the church heading towards the junction of the road with the main road at Llynfaes follows the interface between the upland zone and the bog, but at Llynfaes at the road junction the area is characterised by small enclosed fields. The medieval landscape was dominated by large open fields lying close to the settlements, and each of the fields was divided into strips for cultivation. Further from the settlements, usually on poorer land, lay paddocks and large common areas for grazing, many of these not being enclosed until the time of the enclosure movement in the 18th century, and are associated with development of Llynfaes along the 1765 turnpike road from Holyhead to the Menai ferry (Pritchard 1972, 65).

Although the township of Bodffordd dates from medieval times (Carr 1982, 69), the development of the nucleated settlement at Bodffordd along the old post road to the Menai ferry can be attributed to similar circumstances as at Llynfaes, evidence for which is provided by an enclosure map of 1812 (Fig.2, Bangor Archives, Tynygongl 186) which shows enclosed fields to the north of the turnpike road at the junction of the road to Mona past Heneglwys church and evidence for the early development of Bodfford. This area was described by Samuel Lewis in 1833 as 'bleak and exposed…consisting chiefly of swampy flats and rocky promontories (Lewis 1833). Settlement had probably shifted from its medieval centre around Heneglwys church (PRN 5283) about 1km to the south, to the more advantageous position along the post road.

3.2.3 Historical Land Ownership

The majority of the land in the section of the pipeline route east of Llangefni was the property of the Bulkeley family of Baron Hill, Beaumaris by the 18th century. Estate maps survive for this area from the early part of the 19th century shows that the field systems were much the same as they are today, indicating that agricultural improvements were already well advanced. Hirdrefaig was the property of the Lloyd family of Tregaian, but no early plans were of this property have been located. The almshouses at Penmynydd, a charity set up by Lewis Rogers in 1620 and administered by the parish of Penmynydd have a significant amount of surviving documentation associated with them, although the land is described on the tithe map of 1843 as being owned by Lord Bulkeley. A number of plans of the almshouses survive, including a late 18th century plan indicating that the current extent of the property results from the acquisition of land from Lord Bulkeley in order to provide gardens for the houses (Anglesey Archives WPE/6/293), which indicates that the boundaries to the property were similar to today.

West of Llangefni much of the land is the property of the Bulkeley family also, however there are a significant number of other landowners, including the Marquis of Anglesey and a number of smaller landowners, the latter being particularly in the region of Bodffordd. Some estate maps survive for this area also, including evidence that some of the land had been encroached upon on the road between Bodwrog church and Llanfaes (UCNWB Baron Hill B6553). However, the earliest cartographic evidence comes from the Bodwryn estate maps of 1792 (Anglesey Archives WDY/1) and an enclosure map of 1812 (UCWB Tynygongl 186, Fig. 2). The pipeline route is shown on the Bodwryn maps estate west of Bodfordd around 'Shop' and Cerrigduon. These demonstrate that whilst some of the field boundaries present in 1792 survive to this day, there were a few additional ones in the 18th century, particularly just west of the common land near Cerrigduon (GAT Report 738; Figs. 14 and 15). This suggests that the marginal lands of the area were in the process of improvement at that time.

The enclosure map shows the junction of the road between Telford's Holyhead road at Mona and the old Menai Ferry to Holyhead Road at Bodffordd (B5109). This indicates that Bodffordd had developed little by this time, although on the north side of the road in addition to four houses a number of plots

had been laid out, the property of Gethin Williams and Edward Hughes, both clergymen, and John Hughes. This suggests that the development of the village of Bodffordd along the road was shortly to take place. Earlier settlement would have been located closer to the church at Heneglwys.

4. ARCHAEOLOGICAL MITIGATION RESULTS

4.1 Introduction and Methodology

- The Gwalchmai to Bodfordd Link Main archaeological mitigation was undertaken between October and December 2008.

- The Llangefni to Penmynydd Replacement archaeological mitigation was undertaken between February and July 2009.

As a result of an archaeological assessment of the route (GAT Report **738**), recommendations were made for archaeological mitigation in the form of a strip/map/sample (s/m/s) process throughout both pipeline routes.

The topsoil within the easement route was removed by 360^0 crawler excavator across the entire 10.0m width of the easement, which was monitored by GAT as a watching brief. A working corridor of 1.60m was then excavated within this easement by crawler excavator as part of the s/m/s; this working corridor represented the route of the replacement main and link main. GAT defined the limit of excavation depth as the identification of natural (glacial deposits and/or geological landforms). The width of the s/m/s was modified to examine the full extent of any features identified and the lateral spread of any activity: this was undertaken at five locations where archaeological sites were identified (Site 1 to 5; paras. 4.2 to 4.6).

Once an area within the easement and s/m/s zone was deemed archaeologically sterile, either due to there being no archaeological features present, or because the features had been recorded to a degree deemed necessary, the field was signed over to the contractor who excavated the pipeline route to a suitable working depth. The entire route and all relevant features were surveyed by GAT using a Total Station. The archive is held by GAT under the project number **G2063** (Llangefni to Penmynydd).

A total of seven identified sites were were investigated in detail (paras. 4.2 to 4.6). A large number of post-medieval field drains were identified within the easement. Both these and all breached boundaries were recorded by GAT as part of the s/m/s exercise.

Environmental and artefactual samples were taken where necessary and in some cases sent for specialist analysis. A summary of the results of the specialist analyses are included in the descriptions of the individual sites, whilst the original specialist reports are included as a Appendices I - IV.

The specialist analyses comprised:

- A report on the prehistoric pottery from sites 1 and 2 (Appendix I).
- A report on the lithics from Sites 1 and 2 (Appendix II)
- A report on the charcoal samples including species identification from all relevant sites (Appendix III).
- Radiocarbon dating results on samples from sites 1 and 2 (Appendix IV).

The areas of archaeological interest identified during the mitigation and investigated through targeted excavation are discussed separately below as individual sites. The sites are discussed in order of antiquity.

4.2 Site 1: Neolithic Pit/Linear Feature (NGR SH48037493; PRN 31282; figures 01 & 10; plates 23 to 24)

4.2.1 Introduction:

Site 1 was located in a large trapezoidal field north of Hirdre-faig Farm and south of the B5420 road, *c.*1.23km east of the start of the scheme (figure 01). The site was identified during the s/m/s stage within the pipeline route and initially comprised a section of a large pit and part of a shallow linear feature. The s/m/s zone was subsequently extended within the easement, to the south, to encompass an area 4.0m by 2.0m in size, to examine the full extent of both features (plate 23). The extension exposed the full extent of the pit and confirmed that the linear feature continued outside of the easement.

4.2.2. Topographic location:

Site 1 was located on a natural terrace on a low west facing slope (centred on SH48037493). The field comprised improved grassland. A large orchard, Coed Cae Bryn (0.84ha in size), was located *c.*40.0m to the north; a Scheduled Monument, prehistoric standing stone AN155 (PRN 2,737; SH48427463) was located 460.0m southeast of Site 1.

4.2.3. Targeted Excavation:

The excavation programme targeted both the pit and the linear feature. The pit (context 0042) was fully exposed within the easement route and was completely excavated and samples taken. The linear feature (context 0055) continued outside of the easement route and was only investigated within the easement. No other definitive features were identified within the s/m/s route at this location.

The use of square brackets below indicates cut features; the use of round brackets indicates deposits and fills.

4.2.3.1. Late Neolithic Pit [context 0042]

The pit [context 0042] was ovate in plan and measured 1.22m in length, 0.80m wide and 0.23m deep with a steep bowl shaped profile (the western edge of the showed signs of slumping at the western edge of the cut) (figure 10). The pit contained two fills (plate 24): a primary fill of soft light-brown silt-clay (context 0045) 0.10m deep; a secondary fill of charcoal-rich clay-silt with red and orange patches (context 0041), 0.13m deep, with frequent small to medium angular stones and lumps of burnt clay. Three large angular stones visible from the top of the pit ran through both deposits and were imbedded into the cut. A large quantity of Prehistoric flint tools and pottery was found within the secondary fill (context 0041), including five scrappers and a convex blade, along with two flakes (one chert; see figure 17 for examples); the pottery included ten sherds and twelve fragments (see para. 4.2.5 for discussion and Appendices I and II for respective specialist analyses). The pit cut into a 0.28m deep firm yellow-orange clay-silt (context 0058). This deposit was interpreted as a buried soil atop the natural glacial till.

A palaeoenvironmental sample was taken from the secondary fill (context 0041) for macrobotanical analysis and radiocarbon dating.

4.2.3.2. Linear Feature [context 0055]

A shallow linear feature [context 0055] 4.24m in length, 0.57m wide and 0.11m deep, ran on a roughly north-south axis to the east of the pit [context 0042]. The fill was light brown silt-sand and contained frequent charcoal flakes. The linear feature cut into a 0.28m deep firm yellow-orange clay-silt (context 0058). This deposit was interpreted as a buried soil atop the natural glacial till.

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A palaeoenvironmental sample was taken for macrobotanical analysis. No suitable dating material was recovered from this sample.

4.2.4. Dating

Table 1 Summary of radiocarbon dating evidence

Context no.	*Description*	*Charcoal*	*Dating method*	*Lab No.*	*Conventional radiocarbon age*	*2 Sigma calibration*
0041	Secondary fill of Pit 0042	Hazel	AMS	Beta-280899	3800 +/- 40 BP	Cal BC 2390 to 2390 AND Cal BC 2340 to 2130

A single radiocarbon date was obtained for the secondary fill (context 0041) of the pit [context 0042]; no dates were obtainable from the linear feature, the buried soil or the primary fill of the pit.

The radiocarbon date (2 sigma calibration) for the secondary fill of the pit was Cal BC 2390 to 2390 & Cal BC 2340 to 2130 (Beta-280899). (For the *Beta-Analytic* specialist report, see Appendix IV.) This placed the activity within the pit to the third millennium BC.

4.2.5 Macrobotanical analysis

The macrobotanical analysis of the carbonised remains from the secondary fill of the pit produced charred *Corylus* (hazelnut) shell fragments. The specialist report (*Birmingham Archaeo-environmental*; reproduced as Appendix III) suggested that "these remains may reflect waste from the consumption of a gathered food resource, although the shell fragments do not show any marks typically associated with processed hazelnuts" (McKenna, R. 2010 *Plant macrofossil assessment of samples from Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement: 01*).

4.2.6. Pottery Analysis

The analysis of the pottery sherds from the secondary fill of the pit was completed by Frances Lunch. The pottery sherds were identified as Early Beaker Ware, representing two pots (see figure 11). According to Frances Lynch, the typology corresponds to the radiocarbon date range in suggesting Late Neolithic occupation (cf. Appendix I for the full specialist report).

4.2.7. Lithic Analysis

The analysis of the lithics from the secondary fill of the pit was completed by George Smith (cf. Appendix II for the full report).

The lithic material was typified by small convex 'thumbnail' scrapers which are characteristic of Beaker period flint assemblages (see figure 17 for examples). Within this assemblage, the report identified two pieces of "much better quality dark flint, one of which (small find 69) was a finely worked piercer or knife with cortex that was more certainly nodular and therefore probably imported, perhaps chalk flint from southern England".

4.2.8 Discussion

4.2.7.1 Late Neolithic Pit

The results of the specialist analyses confirmed that the feature was Late Neolithic in origin.
The primary fill of the pit (context 0045) could indicate that it was open for a short period of time before it was backfilled with the charcoal rich deposit (secondary fill context 0041). The lack of visible fire damage to the surrounding soils suggested that this was not in-situ burning and the deposit could have been brought to the pit from outside of the stripped area. The flint tools show little sign of use or fire damage and although clearly deposited at the same time as the fill, they appear to have been added to the burnt material when deposited. The large stones within the pit showed no evidence of burning and were too widely spaced to represent post packing and they appear to have been deposited at the same time as context (0041), although there function remains unknown.

4.2.7.2 Linear Feature

The linear feature was not exposed in full; its function and relationship with the pit were unclear. This feature ran on a north south axis across the terrace. Other linear features recorded further along the s/m/s route near this location ran in an opposing direction and were interpreted as field drainage. This suggests that it does not represent modern field drainage although it may be a contributory drain to a larger east-west system.

The pit, and possibly the linear feature also, may represent part of a larger area of Neolithic or Bronze Age activity. Pit [0042] shows many aspects considered typical of components of Neolithic or early Bronze Age pit types suggested by Thomas (Thomas 2001: 66). The high proportion of tools and the lack of waste/working flakes suggest that they weren't made on site and were deliberately brought with the fill.

The buried soil cut by both the pit and the linear feature was the earliest archaeological deposit on site, but was extant in a truncated form within the s/m/s zone. The pottery fragments recovered from the buried soil were featureless sherds and crumbs. The fabric was identified by the pottery specialist as broadly similar to that of the Beaker ware sherds found in the pit (the fabric was yellow with a black core). This suggests contemporary activity.

4.3 Site 2 Late Neolithic Pit Group (centred on NGR SH50627431; PRN 31283; figures 01, 09 and 12 to 18; plates 26 to 28)

4.3.1 Introduction:

Site 2 was identified during the s/m/s stage and was located in a large trapezoidal shaped field north of Mynydd Mwyn Farm (centred on NGR SH50627431; figure 01 and 09). Initially, a single pit [context 0098] was identified that contained sherds of suspected Neolithic pottery and worked flint. The flint assemblage included an arrowhead, a number of flint scrapers and numerous waste flakes. Following this initial discovery a decision was made in conjunction with Laing O'Rourke and Gwynedd Archaeological Planning Services to extend the excavation area to encompass the full easement, within the surrounding area. A further twelve archaeological features were subsequently identified in the immediate vicinity of the original pit (plate 26): an irregular grouping of five large pits, a smaller pit, four postholes and three stake-holes. The largest of the pits [context 0146] appeared to contain three re-cuts: ([context 0162], [context 0159] and [context 0158]; plates 27 and 28). A large outlying feature was identified to the north-west of this grouping. On excavation this was revealed to be large modern pit containing animal remains

4.3.2. Topographic location:

Site 2 was located across a gentle northwest to southeast grassland slope with an open aspect encompassing views across to Gwynedd. No known prehistoric archaeological sites were identified in the local vicinity. Two natural springs were located to the southeast.

4.3.3. Targeted Excavation:

4.3.3.1. Pit Group

A total of five pits were identified within the confines of the easement. The pits were spread laterally, with no intercutting except for pit [context 0146]. For the distribution of the pits, cf. figure 12 and plate 26.

Each pit is described in turn:

Pit [0098] was a sub-circular feature with concave sides and a flat base with a central depression. It had a diameter of 0.80m and survived to a maximum depth of 0.22m, although due to the shallow depth of top/subsoil, the feature was likely to have been heavily truncated. Pit [0098] contained four distinct fills the lowest of which, context (0117), was a layer of red-brown silt-clay-gravel, interpreted as natural silting. Immediately above this layer was a secondary fill of charcoal-rich dark brown/black

silt-clay (context 0102); within the fill were burnt hazelnut shells, flint flakes and prehistoric pottery. A third deposit (context 0101) of yellow-brown silt-clay also contained occasional charcoal flecks, a sherd of prehistoric pottery and three flint flakes. The presence of this amount archaeological material in the deposit would suggest a deliberate backfilling episode rather than natural silting.

Pit [0105] lay to the east of [0098]. It was sub-circular in plan with a diameter of 1.10m. The sides of the pit were concave and the base was flat. The feature survived to a maximum depth of 0.18m, although as with pit [0098] this is unlikely to represent the original depth. The feature contained three fills, the lowest of which (context 0110) was a charcoal rich silt-clay with degraded pink schist stone; the middle fill (context 0109) was a yellow brown deposit similar to context (0101). The uppermost fill: context (0106), was similar to context (0109), but contained a more moderate amount of charcoal.

Pit [0094] lay to the south-west of pit [0098]. It was sub-circular in plan with concave sides and a flat base. It was approximately 0.85m in diameter and survived to a maximum depth of 0.20m. The pit contained two distinctive fills: the lower was a grey-brown silt fill (context 0095), with occasional small stones and charcoal flecks that contained prehistoric pottery and a possible flaked stone; this was overlain by an upper darker charcoal rich fill (context 0096), that contained organic material.

Pit [0146] lay to the immediate south of pit [0094]. This feature was roughly oval in plan with concave sides and a flat base and measured 1.60m x 1.10m in size and survived to a maximum depth of 0.42m. The feature was the largest of the five pits and the only feature to contain clear re-cuts (figure 13). The lowest fill of [0146] was mid-grey silty clay gravel (0153) and was very similar to the surrounding natural. It appears to be a silting episode. The layer above this (0152) was a charcoal rich silty clay deposit. This in turn was overlain by a mid orange-brown silty clay layer (0151). This layer contained occasional charcoal flecks and it was unclear if this represented a silting episode or if the material had been collected from nearby and deposited in a single backfilling episode.

Pit [0135] was located *c.*2.80m to the north-west of pit [0146]. It was of similar size and shape to pits [0094] and [0098], in being sub-circular in plan with a diameter of *c.*0.85m. It had steeply sloping sides to the north-east and shallower sides on the south-west. Pit [0135] had a flat base with a large stone placed in the centre of the feature prior to backfilling. It contained three fills: contexts (0136), (0137) & (0138). Primary fill (0136) was a charcoal rich silt-clay deposit and as with the charcoal rich fills in the other pits does not appear to have been burnt *in situ*. The primary fill was overlain by a light yellow-grey silt-clay (context 0137). This deposit contained a moderate amount of charcoal and a large amount of prehistoric pot indicating it is more likely to have been the result of deliberate backfilling rather than natural silting. This layer was overlain by a dark brown charcoal-rich silt-clay (context 0136), which contained a single flint flake.

4.3.3.2 Postholes

Within the confines of the easement it could not be confirmed that the postholes formed a distinct feature. For the distribution of the postholes, cf. figure 12.

Posthole [0103] lay between pits [0098] and [0094]. It was circular in plan with a diameter of approximately 0.30m. The sides were steeply sloping and the feature had a concave base. It survived to a depth of 0.24m and contained a single mid grey-brown silt-clay fill (0104). The fill contained no finds or charcoal and there was no evidence of a post-pipe.

Posthole [0156] was sub-circular in plan with a diameter of 0.30m and survived to a maximum depth of 0.10m. Although slightly obscured by rooting the profile is v-shaped with steeply sloping sides and a concave base. It contained a single orange-brown silt-clay fill (0157) and as with feature [0103] it contained no finds or charcoal and there was no evidence of a post-pipe.

Posthole [0139] was a circular feature with a diameter of 0.30m. The feature had a shallow v-spared profile and survived to a depth of 0.23m. It contained a single yellow grey silt-clay fill (0141). This fill contained a possible packing stone, a polished stone tool and a polished Graig Llywd axe.

Posthole [0160] lay to the north east of feature [0107] and was subcircular in plan. It had a diameter of 0.30m and survived to a maximum depth of 0.15m. It contained a single mid brown silt-clay fill (01610 with charcoal flecks. The feature had a concave bowl shaped profile.

4.3.3.3. Stakeholes

Within the confines of the easement it could not be confirmed that the stakeholes formed a distinct feature. *For the distribution of the stakeholes, cf. figure 12*

Stakehole [0154] lay immediately to the north-east of posthole [0156]. It was the largest of the stakeholes and measured 0.20m x 0.12m in plan, was sub-rectangular in shape and survived to a depth of 0.10m. The feature had steeply sloping sides which joined in a point at the base. It contained a single, charcoal rich fill (0155).

Stakehole [0111] lay near the centre of the feature group. It was subcircular in plan, had a diameter of 0.11m and survived to a depth of 0.07m. The feature had steep v-shaped sides and a concave base. It contained a single mid grey brown silt-clay fill (0112) with occasional charcoal flecks.

Stakehole [0115] lay immediately to the north west of posthole [0160]. It was sub-circular in plan, had a diameter of 0.11m and survived to a depth of 0.05m. The feature had a shallow bowl shaped profile with a concave base. It contained a single fill (0116) which was similar to fill (0112).

4.3.3.4 Other Features

Two distinct deposits (contexts 0149 and 0151) were identified within Site 2 that could not be interpreted as specific features.

Deposit context (0149) was cut by two smaller features [0159] and [0158]. No direct stratigraphic relationship exists between the features but they are assumed to be roughly contemporary due to their close proximity. Both features were sub-circular in plan with [0159] measuring approximately 0.30m in diameter and [0158] measuring approximately 0.58m in diameter. Both features had a bowl shaped profile with [0159] surviving to a depth of 0.12m and feature [0158] surviving to a depth of 0.25m. Both features contained a single charcoal rich silty clay fill which contained worked flint and prehistoric pottery.

Deposit context (0151) was cut by feature [0162]. The feature is oval in plan with a bowl-shaped profile. It was approximately 1.20m in length, 1.0m wide and survived to a depth of 0.35m. Feature [0162] contained two distinct fills, a charcoal rich layer similar to (0152) at the base and an overlying mid orange-brown silty clay layer (0149). This layer was very similar to (0152) and as with the aforementioned fill it was not determined if it represented a silting episode or a deliberate backfilling event.

Feature [context 0107] was positioned to the north of feature [0135] and was identified as a small pit. It is oval in plan (measuring 0.54m x 0.31m) with uneven sides and base. It survived to a maximum depth of 0.11m. The irregularity of the feature was thought to be the result of bioturbation. Feature [0107] contained a single charcoal rich dark brown silty clay fill. The fill contained sherds of Prehistoric pottery which was similar to the material excavated in the neighbouring features. Although the feature was not as distinct as other pits in the area the presence of archaeological remains appear to be indicative of anthropogenic origins.

4.3.4. Dating:

Table 2 Summary of radiocarbon dating evidence

Context no.	*Description*	*Charcoal*	*Dating method*	*Lab No.*	*Conventional radiocarbon age*	*2 Sigma calibration*
0102	Lower fill of 0098	Hazel	AMS	Beta-280900	4380 +/- 40 BP	Cal BC 3100 to 2900 (Cal BP 5050 to 4850)

0136	Upper fill of 0135	Hazel	AMS	Beta-280901	4390 +/- 40 BP	Cal BC 3260 to 3250 (Cal BP 5210 to 5200) AND Cal BC 3100 to 2910 (Cal BP 5050 to 4860)

A single radiocarbon date was obtained for the lower fill (context 0102) of pit [context 0098]. The radiocarbon date (2 sigma calibration) for this fill was Cal BC 3100 to 2900 (Cal BP 5050 to 4850) (Beta-280900). (For the *Beta-Analytic* specialist report, see Appendix IV.) This placed the activity within the pit to the third millennium BC.

A single radiocarbon date was obtained for the upper fill of pit [context 0135]. The radiocarbon date (2 sigma calibration) was Cal BC 3260 to 3250 (Cal BP 5210 to 5200) & Cal BC 3100 to 2910 (Cal BP 5050 to 4860) (Beta-280901). (For the *Beta-Analytic* specialist report, see Appendix IV.) This placed the activity within the pit to the third millennium BC.

4.3.5 Macrobotanical analysis

Nine of the twenty two samples from Site 2 that produced identifiable remains were dominated by hazel; six of the samples were dominated by oak, four of the samples contained purely hazel and one contained purely oak (024). Most of the samples were a mixture of the two taxa. Alder was present in small numbers in two of the samples (McKenna, R. 2010 *Plant macrofossil assessment of samples from Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement: 01*). The report concluded that the samples produced relatively low concentrations of charcoal and plant macrofossils. The very low quantities of cereals and associated weed seeds probably did not reflect a high incidence of cereal consumption/processing on the site. The comparatively high numbers of hazelnuts suggested that gathered 'wild' food resources were more significant on this site, although their presence alongside that of hazel charcoal, may indicate that these remains were largely representative of the burnt debris of hazel wood. The sparse presence of grains of cereal indicated the disposal of general domestic waste. Charcoal remains also showed the exploitation of several species native to Britain, with oak as well as hazel being used as fire wood. Oak was commonly used for structures/artefacts and may have had subsequent use as a fire fuel (ibid).

4.3.6 Pottery Analysis

An analysis of the pottery assemblage was completed by Frances Lynch.

The pottery represented is Neolithic Grooved Ware with at least 14 pots identified in fragmented form. Raised cordon decoration was identified on several examples, stylistically similar to material from Capel Eithin which is located 2.0 km to the south-west. The other characteristic is the use of whipped cord, often pressed deeply into grooves. This occurs on thin, probably small diameter pots with in-curved rims. Whipped cord is not common on Grooved Ware, but not unknown (Appendix I: 04).

The two radiocarbon dates discussed in para. 4.3.4 provide a date range of 3100 to 2900 cal BC which is at the earlier end of the general date-range for this type of pottery in Britain (Garwood 1999; Appendix I).

4.3.7. Lithic Analysis

The lithic assemblage was analysed by George Smith. Small quantities of lithic material were recovered from seven of the pits, the largest amount from Pit context 0158. Further objects were also recovered while cleaning the subsoil surface in the vicinity of the pits, presumably the remnants of a buried land surface (context 0100). (The assemblage is summarised in Appendix II: Table 2). Both the assemblages from the pits and from the buried soil were most likely imported.

The retouched pieces included four convex scrapers, an edge-retouched knife, and a tang. There were five retouched pieces from the buried soil (context 100). These comprised a small convex

scraper on a flake, a possibly unfinished larger convex scraper, a piercer, an edge retouched knife and a fragment of possible spurred piece or other unidentified object.

One unstratified piece was a small fragment of retouched object, possibly a spurred piece.

4.3.7.1 Other stone objects

Two stone objects were found in pit (context 139). The pit was interpreted as a post-hole because of its small size, and the stone objects were thought to have been used as post-packing. This first object was a remnant of an axe of Graig Lwyd stone, identified as a mid fragment of quite a large axe that had been ground until almost all the flake facets had been removed. The second fragment was a small ovoid cobble of dense hard igneous rock. Both ends were broken off suggesting that it had been used as a hammer stone. The central part of one face had been smoothed by use as a polishing or abrading 'pillow' stone. There were no striations on the polished surface showing that it had been used in working an organic material like wood, antler, bone or leather.

The only stylistically diagnostic flint object is the fine bifacially worked transverse arrow head fragment. This object is quite different technically from the rest of the worked pieces and it is quite likely to have been imported. *The other objects may have been made locally but on imported material.* This seems to have been from two sources, one of fine, homogenous translucent dark flint, possibly from southern England, the other of mottled light/mid/dark grey flint, possibly from northern England.

4.3.8 Discussion

The presence of numbers of waste flakes shows that material was being worked on site but the near absence of irregular fragments and of cores suggests that primary manufacture was taking place elsewhere, with material brought in as flake blanks. This would have been the preferred method of importing raw material from any distance as exemplified by the large, broad flakes in the hoard of flake blanks of probable Neolithic date found at Ro-wen Mountain, Penmachno (Davies 1939). The value of such imported material would lead to a high curation rate which is also shown here by the high proportion of retouched objects to debitage (1:8) and by the frequency of signs of utilisation on flakes (18 out of 79). These proportions are even higher if the minor waste pieces under 10mm long are excluded.

The number of features and the quantity of material suggested somewhat more than just brief transitory occupation and the presence of quantities of pottery shows a period of settled activity. The presence of hazel nut shells shows that this occupation included the autumn season. The flint assemblage is dominated by cutting tools including a knife, utilised cutting flakes and convex scrapers.

The arrow head is of a type that is characteristic of Late Neolithic Grooved Ware assemblages in Britain, found at settlements, henges and flint mines (Green 1984). However it has also been found in indisputably earlier contexts, for instance at the Staines Early Neolithic causewayed enclosure (Robertson-Mackay 1987, 107). It is uncertain what the exact original shape of the arrowhead was, but it is most likely to be a 'chisel' form which Green's research (1980, 1984) has shown to have a notably close association with the Woodlands style of Grooved Ware, although also occurring in other contexts.

The polished axe fragment of Graig Lwyd stone was of a large and slightly unusual form with flat side-facets. There is insufficient information at present to provide a chronological typology (Clough and Cummins 1979, Pitts 1996) but its occurrence here in association with good dating evidence, showing that it falls within a date range of 3100 to 2900 cal BC, and in association with Grooved Ware is very useful. Its condition shows it had a long period of use but was not carefully curated after breakage. Enough still remained of it for it to have been re-ground or flaked to re-sharpen, or re-worked to produce some useful flakes, so may have been buried with the intention of possible future recovery, perhaps at a seasonally re-occupied site.

Interpretation

The pit fills and stray finds show evidence of activities that are considered typical in the Neolithic, flint working, pot used and broken, fires lit and the use of wild resources (Garrow, Beadmoore & Knight 2005, 156). A common component of all the pit deposits is the evidence of burning before being placed into the pits, and it's unlikely that these pits where used as hearths. Only four artefacts showed signs of being exposed to heating two flakes each in pits [0098] and [0105].

This is one of the common principles relating to the fill of Neolithic and Early Bronze age pits discussed by Thomas (Thomas 2001 p68). Thomas study notes that there's a higher proportion of flint tools to waste found within the majority of pits fills. Pits [0094], [0098] and [0158] contained tools. Decorated pottery was found in the fill of four of the pits [0094], [0098], [0105] & [0135] with pottery only found in the two re-cuts in [0146], [0158] and [0159].

The large amount of flint debitage and larger flakes spread around the area could point towards the working of flint within the vicinity. It is also possible that they represent the truncation of some of the pits by later agricultural activity. Pit [0146] the largest pit is over 0.20m deeper than the other pits, this could represent the true height of the all the pits. The large amount of flint could be remnants of the tops of these pits.

Evidence of four post holes and a three stake holes are suggestive of some form of structure or marker posts, but this could not be confirmed within the confines of the easement. The post holes mark out a roughly rectangular in shape, with the stake holes being too interspersed to create any form. Three of the postholes [0156], [0103] and [0160] had very clean single fills, posthole [0139] held evidence of packing in the form of a broken stone axe, the axe showed signs of re- working before its use as packing with this there was a green igneous rock which showed use as a pillow stone.

Pit groups have been often associated with transient settlements; it's unclear if the pits and postholes are a single settlement and pit filling episode, or it was an area that they returned to over time with each pit representing a visit. The burnt fills appear to have been transported to the site although if this was carried out within the immediate area or from further away is unknown. The large amount of lithics recovered could suggest that flint knapping was carried out within the pit area.

The placement of lithics and pottery in the pits fills seems to be a deliberate act that could hold some ritual meaning. The stone axe and polishing stone found within the post hole could where clearly used for a practical purpose but could also hold a ritual meaning.

4.4 Site 3 - Burnt Mound Stone Spread (NGR SH39397719; PRN 31284; figure 19 and plate 05)

4.4.1. Introduction and description

Burnt mounds are the end product of a water heating process, they are created by the accumulation of burnt and fire cracked stone. These stones were usually heated and then placed in to a pit or trough which was filled with water. The water in the trough, heated by the stones, was used for a variety of activities, which might have included cooking, dyeing or brewing.

Site 3 was located *c.*500.0m east of the start of the scheme (Gwalchmai to Bodffordd section), within a large trapezoidal pasture field between Bryn Ala Farm and Bodwrog Farm (centred on SH39397719; figure 01). The site was situated on the western slope in a natural undulation in the topography. Site 3 comprised a burnt stone spread (context 1032) that extended south from the northern edge of the easement section with a depth between 0.10m to 0.20m; the extent of the spread within the easement was 2.50m (w) by 1.0m (l). The mound comprised charcoal stained black silt made of 90% fire-cracked stones. This was overlaid by thin layers of fine silt (context 1033 & context 1034), which indicated that the area was exposed to light flooding; there was no evidence of related features.

To the west of Site 3 was a second small spread of burnt stone (context 1035) 0.60m (w) by 0.58m (l) that appeared to continue outside the easement, but could not be identified as an additional mound. There was no clear relationship between the two spreads visible within the easement.

4.4.2. Discussion

No suitable palaeoenvironmental samples were recovered from Site 03, nor any suitable dating material (including material radiocarbon for radiocarbon dating).

Whilst no datable material was recovered, the site type corresponded to a Bronze Age burnt mound and was similar in appearance to Sites 4 and 5, identified along the Gwalchmai to Bodffordd portion of the route and the Llangefni to Penmynydd portion of the route, respectively. Unlike Sites 4 and 5, no trough or gully was identified, but the full extent of the burnt mound was not extant within the easement and may continue outside to the north. Burnt mounds are amongst the most common Bronze Age features identified in the landscape. As with most burnt mound site types, there was no evidence for contemporary settlement and the site may have represented transient hunting or herding activity. Unlike Sites 4 and 5, the spread of fire-cracked stone was not as heavily truncated as those examples. The mound in turn had been sealed by fine silts that appeared to represent seasonal flooding, which submerged the mound after it went out of use. The relatively small mound may indicate that the feature saw relatively limited use, rather than successive seasonal use. However, full interpretation could only be gained from full excavation of the feature.

4.5 Site 4 - Burnt Mound (NGR SH41957796; PRN 31285; figure 23 and plate 11)

4.5.1. Introduction and description

Burnt mounds are the end product of a water heating process, they are created by the accumulation of burnt and fire cracked stone. These stones where heated and then placed in to a pit or trough

Site 4 comprised a truncated burnt mound spread and an associated trough (contexts 1123 and 1124 respectively). The site was located *c.*3.5km east of the star of the scheme (Gwalchmai to Bodffordd section), within a large trapezoidal shaped field west of Tan-y-Bwlch Farm (centred on NGR SH41957796; figure 01). The site was situated towards the base of a rock outcrop that formed a west to east slope, and was situated in an area prone to flooding.

The site had been truncated by ploughing and was extant as a 2.90m wide and 0.17m deep spread of fire cracked stone atop the natural clay-silt. Beneath the spread, cutting the natural, was preserved a trough [context 1124] and a gully [context 1126]. The trough was roughly ovate in plan and measured 2.20m wide and 1.30m long and 0.28m deep. The trough had convex sides with a rounded brake of slope and a flat base.

The fill of the trough (context 1125) contained compact fire cracked stone and charcoal. Stone inclusions were similar in appearance to the burnt mound spread (context 1123), although there was a higher percentage of larger stones. The drainage feature [context 1126] was slightly curved in plan and measured 1.40m in length, 0.54m wide and 0.17m deep with convex sides and a flat base. The fill (context 1127) was a loose grey brown silt fill with occasional small burnt fire cracked stones. The gully was attached to the trough at its south western corner coming south down the slope and could have been used to fill the trough, although there was no evidence of an opposing feature leading out of the trough down slope.

It appears that the trough [context 1124] was backfilled with elements of the burnt mound (context 1123), which may have caused the gully to silt up. The trough showed no evidence of lining although it was cut into very compact clay which would act as water proofing.

4.5.2. Discussion

No suitable palaeoenvironmental samples were recovered for species identification and/or radiocarbon dating. No artefactual material was recovered.

Whilst no datable material (palaeoenvironmental or other wise) was recovered, the site type corresponded to a burnt mound and was similar in appearance to Sites 3 and 5, identified along the either portion of the scheme. Burnt mounds are amongst the most common Bronze Age features identified in the landscape. As with most burnt mound site types, there was no evidence for

contemporary settlement and the site may have represented transient hunting or herding activity. As with Site 5, a trough and gully were identified. A burnt mound found at Bryn Cefni, Llangefni, *c.*4.50km to the southeast (PRN 16,073; NGR SH46907500), showed a similar design with a trough and mound on a low hill with an earlier stream in the vicinity and associated leat's (Smith, G. 2002, GAT Project **G1723**/Report **432**).Unlike Sites 3 and 5, the spread was contained within the easement. The mound had been truncated and the material spread within the easement confines. The spread was confined and suggested that the mound was not large and did not indicate successive seasonal use, but a more limited timeframe.

4.6 Site 5 - Burnt Mound (NGR SH50817421; PRN 31286; figure 09 and plate 31)

4.6.1 Introduction and description

Burnt mounds are the end product of a water heating process, they are created by the accumulation of burnt and fire cracked stone. These stones where heated and then placed in to a pit or trough

Site 5 was located in an irregular shaped pasture field northeast of Mynydd Mwyn Farm (centred on SH50817421; figure 01), 4.58km from the start of the scheme. A stream formed the southern boundary of the field. The site comprised a truncated spread of burnt stone and a drain or gully. The stone spread (context 0118) included a 0.22m thick deposit of silt-clay with frequent (up to 80%) fire cracked stones and a large amount of charcoal staining. No datable material was recovered from the palaeoenvironmental samples taken.

Beneath the spread of burnt stone was a suggested drain or gully [context 0113] that measured 1.60m in length, 0.60m in width and 0.20m in depth; orientated north-south. The drain was filled with fire cracked stone and charcoal (context 0114). No evidence for an associated trough was identified within the confines of the easement. Site 5 was only partially extant within the easement and continued further to north outside the mitigation zone.

4.6.2 Discussion

Whilst no datable material (palaeoenvironmental or other wise) was recovered, the site type corresponded to a burnt mound and was similar in appearance to Sites 3 and 4, identified along the Gwalchmai to Bodffordd portion of the route. As with Site 4, a trough and gully were identified; like Site 3, the spread appeared to continue outside of the easement. A burnt mound found at Bryn Cefni, Llangefni, *c.*2.80km to the west (PRN 16,073; NGR SH46907500), also showed a similar design with a trough and mound on a low hill with an earlier stream in the vicinity and associated leat's (Smith, G. 2002, GAT Project **G1723**/Report **432**).

Burnt mounds are amongst the most common Bronze Age features identified in the landscape. As with most burnt mound site types, there was no evidence for contemporary settlement and the site may have represented transient hunting or herding activity. The burnt mound appeared to have been truncated and the mound was extant as a thin spread of material. Due to this and the fact that the spread continued outside of the easement, it could not be determined how extensive the mound was and how indicative it was, through the size of the mound, of intensity of occupation and use. The identification of Sites 3 to 5 can be added to the growing list of burnt mounds identified in North Wales, however, including the 14 burnt mounds scattered across the site of Parc Bryn Cegin, for example (GAT Report 666).

4.7 Site 6 - Cist Cemetery (NGR SH471375254; PRN 31287; figures 06 and 21 and plates 17 to 22)

4.7.1 Introduction and description

Site 6 was located *c.*0.75km from the start of the scheme, close to the southwestern boundary of a large rectangular field (centred on NGR SH471375254; figure 01). Site 6 was sited at the top of a slight incline leading up to a flat topped hill a number of modern field boundaries cross the hill. Two stone lined adult *'cist'* graves were originally identified within the easement during the s/m/s stage. The graves were orientated generally east – west.

The s/m/s area was subsequently extended to the edge of the easement and a further three adult sized '*cist'* graves and two child sized graves were identified. These additional graves were preserved in-situ and were not excavated as they were outside the specific route of the pipeline.

The length of the visible adult 'cist' grave structures ranged from 1.60m [0011] (although damaged), 1.80m [0084], 1.89m [0024] and 2.00m [0014] in length. The two smaller graves measured 0.72m [0031] and 0.82m [0027]. Grave [0079] was not exposed to the extent where cist structure was visible, but had a full length of 2.0m.

4.7.2 Description

All graves were cut though a compact yellow-orange clay that was interpreted as an earlier buried soil deposit (context 0018).

Each grave will be described in turn. For the distribution of the graves, cf. figure 21.

4.7.2.1 Grave cut (context [0011])
Grave cut (context [0011]) was approximately 1.70m long and 0.87m wide with a depth of 0.50m, on a east west alignment (plate 21). Within [0011] was a stone cist (context (0010) 1.60 m in length and 0.58m wide at its largest point with a depth of 0.50m. The cist contained a compact mid brown silt-clay fill (context (0012) this contained small bone fragments. The structure of the base was made up of irregularly placed stones (context (0016)) and appears to have been fitted after the construction of the side slabs cist (context (0010) (plate 22). Backfilled between the cist (context (0010) and cut (context [0011]) was a dark brown silt-clay (context (0036)) this was difficult to define but measured approximately 0.04m-0.06m wide. The western edge of the cist had been removed/destroyed by the construction of a local field boundary. No cap stones where observed.

4.7.2.2 Grave cut (context [0014])
Grave cut (context [0014]) was 2.44m long and 0.94m wide with a depth of 0.33m, on an east west alignment. Within [0014] was a stone cist (context (0013) 2.0 m in length and 0.66m wide at its largest point with a depth of 0.25m. The cist contained a compact mid brown silt-clay fill (context (0015); embedded into which were the remains of possibly collapsed sub rounded cap stones (context (0019)), the largest 0.28m by 0.23m. None of the cap stones where large enough to span the cist structure. The structure of the base was made up of irregularly placed stones (context (0017)) and appears to have been fitted after the construction of the main side slabs of the cist (context (0010).

4.7.2.3 Grave [0082]
Grave [0082] was 2.15m long and 1.0m wide with a depth of 0.32m, on a north east- southwest alignment (plate 17). The stone cist consisted of stone side slabs (0084) of mixed sizes lengths ranged from 0.30m-0.42m with the widths between 0.08m and 0.11m. Four large (0.35m by 0.32m average with a height of 0.11m) flat cap stones where left in place above the grave and covered 1.31m of the cist feature the cap stone covering the area of the head was missing. Smaller rounded stones (0.10m by 0.12m average) were imbedded around the cap stones and filled the smaller gaps. The fill between cut [0082] and slabs (0084) comprised fine grained dark brown silt-clay (plate 18). The base of the cist was made up large to medium irregularly placed flat stones: the largest measured 0.30m by 0.28m, the smallest 0.12m by 0.11m (plate 19).

The adult grave to the south had a cut (context [0024]) was 1.94m long, with a width of 0.78m wide, the visible '*cist'* has a length of 1.89m and a width of 0.69m on an east west alignment. There was no evidence of capping stones.

4.7.2.4 Grave [0079]
Grave [0079] comprised a sub- rectangular cut with rounded corners and measured 2.0m long and between 0.60m -0.65m wide on a east-north-east, west-south-west alignment. The grave cut was filled with a mid brown fine silt (context 0080). There was no internal visible cist structure, although seven flat irregular shaped stones between 0.20m -0.50m in length (0081) were places on top and appeared to be the remains of capping stones (although none of them where larger enough to span the whole grave cut).

4.7.2.5 Grave (context [0027] (0026))
This grave was short in length and interpreted as a child's grave. The feature comprised a grave cut and visible '*cist'* stones (context [0027] (0026)) and measured 0.82m long and 0.30m wide, on a north east-south west alignment. Two remaining cap stones and one larger displaced cap stone were identified (context (0029)).

4.7.2.6 Grave (context [0031] (0030))
This grave was short in length and interpreted as a child's grave. The feature comprised a grave cut and visible '*cist'* stones (context [0031] (0030)) and measured 0.72m long, with a width of 0.36m wide, on an east west alignment.

4.7.3 Discussion

This small group of five adult and two infant cist graves were located on ground sloping to the west, and close to (less than 1.0km) from the east end of the Cefni estuary. It is unlikely that the full extent of the cemetery has been identified, and more graves are likely to lie east. The graves are all orientated close to east-west, though with slight variations. Virtually no skeletal evidence remains because of the acid soils, but the shape of the grave would imply burials were extended inhumations, and it is usual therefore for the head to be to the west. This is confirmed by the tapering shape of graves 14 and 11, which are both wider on the west side. Graves of this style and shape usually date from the 5th and 6th centuries AD.

The graves appear to have been disturbed by ploughing, and it is difficult, therefore, to identify structural characteristics. However six of the graves have stone slabs forming upright sides between 0.3 and 0.5m high. The basal slabs were best evidenced in graves 82 and 11, where they consisted of a patchwork of small slabs, probably laid down following construction of the side slabs. The covering or lintel slabs had been largely removed or displaced by ploughing, but the evidence suggested they had not been laid across and supported on the side slabs but that the graves had been backfilled and the covering slabs laid on to backfilled material.

The shallow depth of top soil above the graves would explain the lack of lintel stones surviving, but the indication that the lintels were placed on the backfilled grave might also suggest the former existence of a prominent mound above the graves used as a marker.

4.8 Site 7 Ditched Enclosure (NGR SH50817421; PRN 31288; figure 22 and plates 29 to 30)

4.8.1 Description
Site 7 was located towards the end of the scheme, east of Sites 2 and 5 (NGR SH50817421; figure 09). The site comprised a shallow ditch [context 0129] with straight edges that ran north from the easement edge for a length of 6.20m, before turning on a right angle towards the east for a distance of approximately 5.0m where it rejoined the easement. The depth ranged from 0.16m to 0.28m, with rounded brake of slope and sides and a concave brake of slope leading to a flat base. This was filled by context (0130): a fine grained gray silt clay with rare large and occasional irregular small stones. A small post hole [context 0165] cut into the base of the ditch at the right angle corner (figure 22); the posthole was roughly circular with a diameter of 0.22m and measured 0.12m deep, with a similar fill to the main ditch cut. A single oval feature [context 0131] 0.31 x 0.36m and 0.08m deep, of unknown provenance and function, with a brown silt clay fill was observed within the area enclosed by ditch [context 0129]. All features where cut into bright yellow natural clay.

4.8.2 Interpretation
The provenance of the feature was unknown due to the lack of datable artefacts and palaeoenvironmental evidence and also due to the fact that the feature continued outside of the easement. A single musket ball was found high up in the fill of the ditch (0130). The musket ball weighing 0.36g with a diameter of 0.70" (1.7cm). Based on the three basic military gun types this musket ball falls within the size ranges of the pistol ball 0.56"-0.75"or carbine 0.65" (a short barrelled rife). These sizes are based on the standard military sizes used between the late 17th century and mid 19th century, it unlikely that this single musket ball represents any form of military action. The musket ball is most likely to be intrusive and does not date the filling up of the ditch; therefore, the function of this feature remains unknown.

5.0 Post Medieval Activity

High concentrations of post medieval pottery where collected to the north and west of Tregarnedd Farm (NGR SH47377521). The spreads of ceramic possible indicate periods of manuring where the house hold waste mixed with broken ceramics was spread out on to the fields.

The development revealed a number of archaeological features ranging from the Neolithic to Early Medieval with a large number of features associated with land improvement and agricultural activity. A total eighty two ditches where identified along the route as well as a large number of modern stone filled drains. Large concentrations where noted along Gwalchmai to Bodffordd link main within an improved lowland area (centred on NGR SH40087593), close to Bowdrog Farm, leading to marshy ground.

North of Tregarnedd Farm an area of possibly cobbling (context 0021) (NGR SH47377521) made up of small rounded stones identified in a small evaluation slot. Above this there was a stone spread (0022) with a length of 5.0m and 0.30m wide interpreted as either a rough built boundary wall or a demolition spread. There is no evidence of a building on the first edition OS map 1888, although the field boundaries haven't change and do contain two gates, one to the south and west of (0021) and (0020). These deposits could represent an attempt to firm up the ground for cattle between these two entry points

6.0 CONCLUSION

The strip/map/sample mitigation completed along the two portions of the scheme provided an opportunity to examine a long tract of land located between two distinctive areas: the Gwalchmai to Bodffordd link main, which represented a more marginal agricultural area, comprising semi-improved land and pasture land, and the Llangefni to Penmynydd replacement main, located within a more populated area within better drained land and known prehistoric and medieval archaeological activity.

The archaeology within the Gwalchmai to Bodffordd link main was limited to two Bronze Age burnt mound sites (Sites 3 and 4), both located near former watercourses. Whilst Site 3 was only partly extant within the easement, the relatively shallow depth of the mound, covered in alluvial silts, suggested the site saw limited rather than continual seasonal use. A similar conclusion was reached with Site 4, which was fully extant with the easement, but had a thin stone spread, representing the former mound. Unlike site 3, this site included a trough and gully. Site 5, along the Llangefni to Penmynydd replacement main, also contained a trough and gully, but, like Site 3, continued outside the easement and could not be fully interpreted. It was also noted that a burnt mound site, similar in appearance to Sites 4 and 5, was identified at the Bryn Cefni Industrial Estate, Llangefni in 2002. Due to the narrow confines of the easement route, at 10.0m wide, it was not possible to determine whether the burnt mounds along both portions of the scheme represented isolated features or more extensive groupings of burnt mounds, similar to those identified at Parc Bryn Cegin, Llandygai (GAT Report **764**). Either way, there was no evidence for contemporary settlement, but such settlements would most likely be located in better drained land away from the locations of the mounds.

The first 2.5km of the Gwalchmai to Bodffordd link main was mainly characterised by poorly drained marginal lands and the high frequency of agricultural drainage systems, especially across the large fields southeast of St. Twrog's Church, indicated the extent of post-Medieval land improvements. Whilst the individual drains were not dated, the majority were interpreted as evidence of the major estate improvements. The 3.5km of the scheme continued through more undulating topography with areas of better pasture and drainage, leading to Bodffordd. Field drainage systems were still in evidence, but not in as great a quantity as the area around the church.

The Llangefni to Penmynydd replacement main portion of the scheme was characterised by areas of undulating topography with better pasture and drainage and with known prehistoric and medieval activty, including the burnt mound at Parc Bryn Cefni, the standing stone close to Hir-drefaig Farm, the medieval moated site near Parc Bryn Cefni and the site of Capel Carnedd Maes-Lidr, near Tregarnedd Farm. The close proximity of these respective sites suggested greater potential along this portion of the route for archaeological activity. This was reflected in the identified sites, which included

the two Neolithic sites at Hir-drefaig and near Penmynydd, the cist grave site near Tregarnedd Farm, and the burnt mound west of Penmynydd. Only the Neolithic sites produced datable artefactual and palaeoenvironmental evidence: the recovered datable artefacts from both corresponded with the radiocarbon date ranges in suggesting Late Neolithic occupation.

Whilst no datable material was recovered form the cist graves (Site 6) near Tregarnedd Farm, the style and shape of the graves suggested a date range from the 5th and 6th centuries AD. It was not possible, within the confines of the easement, to confirm whether the graves formed part of a larger group, or were potentially associated with the nearby site of Capel Garnedd Maes Lidr, Tregarnedd (PRN 2675). The provenance of the right-angled linear feature (Site 7) near the end of the scheme was unclear within the confines of the easement; the recovery of a 17th/18th century musket ball provided a *terminus ante quem* for the backfill of the ditch but this could not be confirmed as a date for the feature.

Overall, the two portions of the scheme identified varying examples of ritual and domestic activity covering a wide date range indicating the extensive use of the landscape from the Neolithic to the medieval. The post-medieval drainage features indicated the extensive estate and land management undertaken to improve poorly drained marginal lands, particularly along the Gwalchmai to Bodffordd portion.

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APPENDIX I

G2063 Llangefni - Penmynydd Pipeline

Description of prehistoric pottery.

0018 sf 1 Tiny sherds . Some pieces may be stone. No comment possible.

0041, 0057 and 0058 are all fills of the same pit near Hirdre Faig (SH 4803 7493).

0041 sf 3 ***Box 1*** One section of the body (recently broken) and 2 other sherds and crumbs of Beaker (B1) decorated with hyphenated lines. Where they join it is clear that the wrapping of the lines has not been kept level. The depth of the decorated zone is uncertain but there is an undecorated area below it and at the ? top of a slightly thicker sherd which must be closer to the base.
Both rim and base are missing and the reconstruction of the neck is hypothetical, but a rather narrow (diameter 140mm) bell beaker is suggested. The walls are 7-8mm thick and the fabric is yellow throughout but rather soft, with a noticeably worn outer surface. The ancient breaks are abraded.
Drawn 1

0041 sf 3 ***Box 1*** Two sherds of a different, incised, Beaker (2). This is rather more beige than yellow and 10mm thick. One sherd shows evidence of two lightly incised lines; the other, approximately the same size, is undecorated. The pieces may be close to the base since the diameter is only 100mm. No reconstruction is possible but it is likely that the sherds come from a similar type of Beaker.
Drawn 2
0041 sf 3 ***Box 2*** 2 lumps of clay, 1 sherd (30x20x8mm) and 6 fragments probably Beaker 1

0058 sf 5 Featureless sherds and crumbs, possibly some pieces of stone. The fabric is broadly similar to that of the Beakers (yellow with black core).

0057 sf 8 Crumbs yellow/beige fabric + 2 small stones. Similar to sf 19

All the other finds come from a group of 9 pits and several post holes and stakeholes near Ty'n Mynydd at Penmynydd (SH 5062 7471)

0095 sf 19 1 fragment of orange/black pottery. A bit too rough to be from the Beakers. No other comment possible. Fill of Pit 0094 (with flint scraper and arrowhead)

0099 sf 37 1 sherd + crumbs red/orange poorly fired pottery, broadly similar to the thick sherds in sf 46 *Fill of Pit 0098 (with scraper and flint flake)*

0099 sf 68 4 joining sherds (+2 crumbs) of a small bowl or cup with flat-topped rim decorated with two undulating raised cordons and a line of diagonal dashes under the rim. The diameter is 160mm, the depth might be 94 and the base is probably flat. The fabric is dark and contains much small rounded stone grit despite its thinness (6mm); it has been well-fired but the surface is badly worn and eroded. Grooved Ware. ***Drawn*** 3 *Fill of Pit 0098 (with scraper and flint flake)*

0101 sf 34 Rim with sharp triangular-sectioned cordon immediately below it; another sherd shows 2 curvilinear triangular-sectioned cordons. Yellow/black fabric, rather fragile and vesicular like sf 61.
Drawn 6

Small sherd (20x25x6mm) in similar fabric, but less yellow, with lightly impressed whipped cord ***Drawn*** 11. Another small sherd (27x15x6mm) with a groove and whipped cord (not drawn)

1 thin black sherd (40x32x5m) from a straight sided jar (possible diameter 140mm) with 2 shallow grooves. The fabric is compact and has almost a burnished surface, unlike the others present. ***Drawn*** 8 *Fill of Pit 0098 (with scraper and flint flake)*

0102 sf 45 Crumbs, red/orange with a good deal of grit. Similar to sf 53 No other comment possible *Fill of Pit 0098 (with scraper and flint flake)*

0102 sf 29 ***Box 1*** Recent breaks can be joined to make a single piece of thin dark pottery (82x82x5-8mm)). The outer surface is eroded but seems to be covered with some form of rustication. The inner surface is smooth. The segment shows no curvature and it is difficult to guess size or shape except that it must be from a large straight-sided jar, despite the thin wall. *Fill of Pit 0098 (with scraper and flint flake)*

0102 sf 29 ***Box 2*** Damaged rimsherd (diameter c 160mm) with in-curved rim and horizontal lines of whipped cord pressed into shallow grooves forming a band of decoration about 35mm deep above an undecorated body (2 sherds which do not join). Fabric beige/black, light and thin (5mm) with small angular grits. The surfaces are smooth. A sherd from sf 34 is similar but more lightly impressed and probably not from the same pot. There is also a rather thicker sherd from sf 60 which has a well defined groove filled by whipped cord. ***Drawn*** 10 *Fill of Pit 0098 (with scraper and flint flake)*

0106 sf 78 1 featureless sherd (50x60x15mm) + 2 crumbs of soft orange fabric. It is strangely light, despite containing a lot of stone grit. *Fill of Pit 0105 (with burnt flint flakes)*

0109 sf 28 7 Featureless sherds (largest 60x40x15mm) similar to sf 78. *Fill of Pit 0105 (with burnt flint flakes)*

0108 sf 27 Crumbs similar to sf 46 or 60; dark in colour. *Fill of Pit 0107*

0137 sf 46 ***Box 1*** 3 small sherds from a pot with decoration similar to sf 61: a area of dashes above a curving cordon. Made in hard yellow/grey clay with a few minute grits; the decoration has been confidently and carefully formed. The thickness of the wall (6mm) would suggest that they came from a pot much the same size as sf 61. The 3rd sherd (23x23x6mm) has a damaged surface (not drawn) ***Drawn*** 7

4 sherds from a simple incurved rim of an undecorated jar, diam. 270mm. ***Drawn*** *14*
The fabric is poorly fired, especially the 5 probably body sherds (2 slabs (50x50x17mm) with a crumbling pink outer surface; 3 other sherds c. 30x20x17mm.

1 sherd (35x27x13mm) with hint of a cordon, in hard yellow/grey clay perhaps from the same pot as the heavy rim in sf53 (not drawn) *Fill of Pit 0135 (with flint flakes)*

0137 sf 46 ***Box 2*** Fragments and crumbs similar. *Fill of Pit 0135 (with flint flakes)*

0147 sf 53 ***Box 1*** Rimsherd, probably in-curved, with internal bevel, grooves and whipped cord maggots inside and out; from a larger-scale pot than sf 29. ***Drawn*** *12*

1 tiny rim similar to sf 68 but no sign of decoration (not drawn)

1 tiny rimsherd similar to sf 61, but not the same pot. ***Drawn*** 4

1 tiny rimsherd similar to sf 29 but with two lightly cut grooves without whipped cord impressions. Soft dark fabric badly worn and abraded. ***Drawn*** *9* *Fill of Pit 0158 (with flint tools and flakes)*

0147 sf 53 ***Box 2*** Fragments: 3 soft orange, 5 harder, brown with large angular grits. *Fill of Pit 0158 (with flint tools and flakes)*

0147 sf 60 ***Box 1*** 1 base sherd 100mm in diameter (wall 13mm thick) with lightly incised zigzag decoration ***Drawn*** 16; 4 other sherds (largest 35x30x8mm) in similar, but thinner, hard brown heavily gritted fabric may come from the same pot because 3 show indications of incised cross hatching.

1 rounded rim in fragile dark fabric with grits, with faint indication of lightly incised chevrons on the inside This is not the same fabric as the base ***Drawn*** 15

3 softer featureless fragments *Fill of Pit 0158 (with flint tools and flakes)*

0147 sf 60 ***Box 2*** 2 sherds (larger 40x30x9mm) in very hard fabric with a lot of large grit, but not obviously the same as the base. The outer surface mostly gone; 5 smaller sherds and crumbs; 1 small sherd in softer material. *Fill of Pit 0158 (with flint tools and flakes)*

0148 sf 61 Section of an elaborately decorated Grooved Ware bowl 240mm in diameter with incurving rim. The edge of the rim is damaged and its exact form is unclear. It is difficult to judge whether this pot should be reconstructed as a shallow rounded bowl or a taller sinuous jar. The decoration is complex, combining straight and undulating cordons and grooves, two of the cordons being nicked and impressed. This general scheme of decoration is found on other sherds but they do not belong to this pot. Fabric is rather fragile, beige/black vesicular with no visible grit. ***Drawn*** 5

1 thick red/black sherd (37x25x13mm) and 1 black fragment. *Fill of Pit 0159*

Comment

The pottery represented is Early Beaker and Grooved Ware. Although there are some similarities to Fengate Ware in the undulating bands of cordoned decoration, obvious Peterborough Ware is absent. As at other sites, though the pottery styles may overlap chronologically, they are spatially distinct.

The Beaker comes from the fill of a single pit (0042) found with a linear feature near Hendre Faig (SH 4803 7493). The Grooved Ware comes from a site at Ty'n y Mynydd near Penmynydd (SH 5062 7431) some 2.5 km to the east, where 9 pits and several postholes and stakeholes were found. The pottery comes from 7 of the pits often associated with flint tools and flakes. A polished stone axe came from one of the postholes, but no other finds. .

The Beaker sherds represent two pots, both of which might be considered early in the typological sequence of Beakers in Britain (Lanting and Van der Waals 1972). Such early (Step 1) pots are very rare in Wales (Lynch *et al* 2000 112-16) but a few sherds of similar zoned hyphenated and cord decorated Beakers have recently been found at Cromlech Farm, Llanfechell, Anglesey (GAT Report unpublished). Such Beakers only appear as sherds in funerary contexts, so they are elusive in the archaeological record, represented only by occasional scraps from settlement contexts. The radiocarbon date (G2063-SN4: 2340 to 2130 cal BC) obtained from this pit is appropriate for this kind of Beaker pottery.

The Grooved Ware comes from 7 pits of the 9 pits found with postholes at Ty'n y Mynydd near Penmynydd and is more extensive and more varied. At least 14 pots are involved but very small quantities of each are represented; most breaks are abraded and little can be said about any deliberation in the deposit.

The most notable feature of the assemblage is the number of pots with raised cordon decoration (3-7). In this it resembles the material from Capel Eithin which is located 2km to the south-west (Longworth in White and Smith 1999, 76-7). The triangular-sectioned cordons of 6, the nicked cordons of 5, the cup shape of 3, the in-curved rims and the occasional very thin walls are all comparable. The Capel Eithin assemblage was compared to the Woodlands Style better known in the south of England.

However what remains of the pots from Capel Eithin (and it is not much) suggests that the cordons are straight, whereas the patterns here are all essentially curvilinear, the bands of decoration undulating around the circumference. In this they are very similar to larger pots found at Ty'n Coed, Clynnog (GAT Report G1560) which were judged to belong to the Fengate style, rather than Grooved Ware (although there was some Grooved Ware from the site). In these pots the patterns were formed by grooves rather than raised cordons bounded by grooves as here, and they occurred on what were obviously collars, in one case with characteristic pits beneath it. The wave pattern is not common in either Fengate or Grooved Ware, though a straight-sided Grooved Ware bowl from Sowerby Cottage, Bridlington, has multiple undulating lines, but grooved rather than raised (Manby in Fenton-Thomas 2009 and *pers comm*). In Welsh Grooved Ware assemblages, of which Walton (Gibson 1999) and Llandygai (Kenney 2008) are probably the largest, most of the raised cordons are vertical and are not emphasised by adjacent grooves, a technique which makes the decoration on 5, for instance, so rich.

The other characteristic of the very fragmentary pots from Ty'n y Mynydd is the use of whipped cord, often pressed deeply into grooves. This occurs on thin, probably small diameter pots with in-curved rims and on the rather heavier example, 12 which has a complex internal moulding to the rim whose angle is uncertain.

Whipped cord is not common on Grooved Ware, but not unknown. In the large assemblage from Durrington Walls where twisted cord is common, whipped cord is only found once, on P373 where it is pressed into a groove as on 13 (Wainwright and Longworth 1971, 67 and Fig 54). In the Walton Basin where Peterborough pottery is also present in large quantities, it is found on the undoubted Grooved Ware jar, P68 (Gibson 1999, 89). Despite its rarity, the in-curved rims and the fine yellow fabric used for pots 10-13 confirm a Grooved Ware ascription. The single sherd from a straight-sided jar, 8, is decorated with two shallow horizontal grooves and finely made from a dark clay not found elsewhere in the assemblage. It could have been a tankard.

The plain in-curved rim on a large undecorated jar, 14, is not distinctive but the type can be found amongst Grooved Ware assemblages at Llanbedrgoch, Anglesey (Redknap unpublished, find 698) and in the Walton Basin (P38, 47 and 69). The single rounded rimsherd, 15, is unusual in fabric and shape. The outer profile is very uneven but seems to be complete. A hint of chevrons on the inner surface might suggest Fengate Ware, but the bulbous shape is not characteristic. The base sherd with incised decoration down to the very bottom is difficult to place. The heavily gritted fabric might suggest a Collared Urn but it is very unusual for urns to be decorated on the lower body, so it is more probably late Neolithic (Lynch in Kenney 2008, 45, compare PGVI.A and a decorated base from Walton, P40).

The fabrics used for the decorated pots have light, often yellow, surfaces and dark cores in which very little stone grit is visible. Some of them (5, 6, 9, 10) are notably fragile suggesting that they were not

fired to a very high temperature, while 3, 7 and 12 are hard and compact. The large jar 14 contains a good deal of stone temper but has not been well fired. An unusual soft fabric, very light despite containing a lot of stone grit, yellow throughout, occurs in sf 78 and 28 (both from the same pit 0105); there are several sherds but all are featureless. There are also featureless heavily gritted sherds in sf 60 and 53 from Pit 0158 which seem to contain unusual rocks and cannot be linked to any of the illustrated pots. However it is not suggested that full petrographic analysis should be undertaken since there are no archaeological questions which would hang upon the results.

Two radiocarbon dates have been obtained from the pits at Ty'n y Mynydd. They both provide a date range of 3100 to 2900 cal BC which is at the earlier end of the general date-range for this type of pottery in Britain (Garwood 1999).

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July 6th 2010

APPENDIX II

LLANGEFNI TO PENYMYNYDD WATER PIPELINE MITIGATION, G2063

LITHICS DRAFT REPORT

G H SMITH, 11th August 2010

Area 1 Flint and chert

This small assemblage came from a single isolated pit and is summarised in Table 1

Table 1 Area 1 Flint and chert summary

Flake/ Flake frag	Irregular frag	Utilised piece	Casually retouched piece	Retouched piece	Core	Core frag	Core trimming flake
-	-	1	-	6	-	-	1

The raw material is all flint. Five pieces are of a mottled grey colour with cortex that indicated nodular material rather than local glacial pebbles. One piece (12) is different in colour being yellow-brown and may be residual in the context. Two pieces (13 and 69) are made from a fine dark grey translucent flint of which cortex remaining on 69 is thin and nodular suggesting imported material.

The retouched pieces are all made on small thick flakes with steep marginal working, four retaining cortex.

This small assemblage is notable for the lack of waste material indicating that the objects were brought to the site rather than being produced there.

It is significant that five of the eight objects are convex scrapers, the four complete examples all small thick 'thumbnail' scrapers, the other being just a fragment of snapped-off working edge. Such small scrapers are sometimes determined by the small size of the available (pebble) raw material but these are all made on true flakes, if small and thick, and with cortex that appears to nodular rather than pebble.

The utilised piece (12) is just a small flake with gloss on one sharp edge. The core trimming flake and the other remaining piece are made on better quality flint derived from larger-sized cores allowing production of flake blanks. No. 69 is a thick flake with a cortical platform and has been made into a point by unifacial trimming on both sides, producing a sharp point and sharp, slightly serrated sides so could have functioned as an awl or knife.

Area 2

This area comprised an irregular group of nine pits, four post-holes and three stake-holes. Small quantities of lithic material were recovered from seven of the pits, the largest amount from Pit 158. Further objects were also recovered while cleaning the subsoil surface in the vicinity of the pits, presumably the remnants of a buried land surface (Layer 100). The material is all summarised in Table 2.

The raw material from the contents of the pits is all flint of a variety of colours with shades of grey from light grey to black with a proportion of mottled grey and black with a few of banded grey and black.

The quality of the material is generally quite good. That and the reasonable size of the pieces suggest that some or all of the material was imported. The absence of black chert is notable considering that it was available quite close by *in situ* in outcrops in the limestone on the east

side of Anglesey (Greenly 1919, 648) as well as from pebbles in the drift cover on Anglesey (*ibid* 715). The black chert, however, is of poorer good quality than this flint.

All but one of the pieces with cortex present have thin, irregular surfaced, off-white coloured cortex that appears to be nodular. The one other piece is recognisably produced from a pebble.

The objects from Layer 100 were similar in material and technology to those from the pits and identifiable as probably imported. It contained a high proportion of retouched to waste pieces and an absence of cores.

There were also a few unstratified pieces, all tertiary flakes.

Table 2 Area 2 Flint and chert summary

	Flake/ Flake frag	Irregular frag	Scalar piece	Utilised piece	Casually retouched piece	Retouched piece	Core	Core frag	Core trimming flake
Unstrat	6					1			
Layer 100	14	3		1	1	4			2
Pit 94	2			1		2			
Pit 98	10			4		1			
Pit 105	5			2					
Pit 135				4					
Pit 146	3								1
Pit 158	32	1	1	6	1	3		3	
Pit 162	3								

The presence of numbers of waste flakes shows that material was being worked on site but the near absence of irregular fragments and of cores suggests that primary manufacture was taking place elsewhere, with material brought in as flake blanks. This would have been the preferred method of importing raw material from any distance as exemplified by the large, broad flakes in the hoard of flake blanks of probable Neolithic date found at Ro-wen Mountain, Penmachno (Davies 1939). The value of such imported material would lead to a high curation rate which is also shown here by the high proportion of retouched objects to debitage (1:8) and by the frequency of signs of utilisation on flakes (18 out of 79). These proportions are even higher if the minor waste pieces under 10mm long are excluded.

Retouched and utilised pieces

These, and objects of other stone are summarised in Table 3.

Table 3 Area 2 Flint and chert retouched and utilised pieces and worked and utilised stone objects (*illustrated)

	Layer 100	Pit 94	Pit 98	Pit 105	Pit 135	Post hole 139	Pit 158
Utilised piece cutting edge	1	1	4	2	3		6
Utilised cutting and angle					1		
Edge retouched knife	1*						1*
Casually retouched piece cutting							1
Convex end scraper	1*	1*	1*				2*
Casually retouched piece – Unfinished convex scraper?	1*						
Arrowhead transverse		1*					
Spurred piece	1*						
Piercer	1*						
Polished axe						1*	
Utilised pebble polisher						1	

The utilised pieces are identified by areas of microchipping or gloss. All these occur on straight or slightly convex sharp edges indicating use as a knife. One piece had in addition been used on a sharp, burin-like angle.

The retouched pieces include four convex scrapers (Fig. X, 20, 39, 51 and 52), all made on thinner flake blanks than the scrapers from Area 1. No. 20 is made on the end of a longer flake. One piece (79) is made on a thin flake and the edge retouch is shallow and is best interpreted as an ovate, edge-retouched knife. 76 is the most interesting piece, finely bifacially invasively retouched. It appears to be a tang and although snapped and incomplete it has a small piece of a return angle which shows that it was the tang of a transverse arrow head, its exact original shape uncertain, but probably a simple ‘chisel’ shape. It was made on a large, thin broad flake from a good quality flint. It is of such exceptional material and workmanship compared to the other objects that it was likely to have been imported as a finished object and therefore valuable and not an object of everyday use.

There were five retouched pieces from Layer 100. These comprised a small convex scraper on a flake (14), a possibly unfinished larger convex scraper (26), a piercer (74), an edge retouched knife (30) and a fragment of possible spurred piece or other unidentified object (43).

One unstratified piece was a small fragment of retouched object, possibly a spurred piece.

Other stone objects

Two stone objects were found in feature 139 identified as a post-hole because of its small size, the stone objects were regarded as having been used as post-packing.

Object 49 is a remnant of an all-over ground axe of Graig Lwyd stone. It is a mid fragment of quite a large axe that had been ground until almost all the flake facets had been removed. The sides are quite straight and have been ground to create slight side facets. The grinding direction of the main face was from side to side creating a slightly lenticular 4-sided cross-section. The straight, slightly converging sides suggest the axe was of approximately rectangular, rather than curvilinear overall shape, i.e. with a broad flat butt, rather than pointed. The butt of the axe has broken off leaving a large flake scar. Both the snapped-off

butt and the original blade had continued to be used until completely blunt, when it would only have served as a very crude chopping tool, this despite the fact that enough remained of the axe for the edge to have been re-worked.

Object 50 is a small ovoid cobble of dense hard igneous rock. Both ends have broken off suggesting that it had been used as a hammer stone. The central part of one face has been smoothed by use as a polishing or abrading 'pillow' stone. There are no striations in the polished surface showing that it had been used in working an organic material like wood, antler, bone or leather.

DISCUSSION

Area 1

The small amount of material from Area 1 is typified by small convex 'thumbnail' scrapers which are characteristic of Beaker period flint assemblages, but not exclusively so (Healy 1984). One would expect these small scrapers to have been made on locally available pebbles but the cortex looks more nodular. There were also two pieces on much better quality dark flint, one of which (69) was a finely worked piercer or knife with cortex that was more certainly nodular and therefore probably imported, perhaps chalk flint from southern England.

The scrapers show evidence of use including breakage, edge wear and a snapped-off edge. As a type they are usually regarded as evidence of home-site domestic activity. They are in an unusual concentration in one pit so were probably deliberately deposited. The shape of the pit and the type of its fill suggests that it was a 'burnt mound-type' trough, so perhaps the adjoining linear feature was a water channel. However, 'dry' burnt stone cooking pits also occur in Beaker contexts. The objects were all in the upper fill of the pit, consisting of a mix of angular (burnt?) stones and burnt clay lumps in charcoal-rich clay silt. This upper fill would belong to the abandonment and perhaps backfilling of the pit. The association of a significant group of a specific type of tool with such a pit is significant and is likely to mean a functional relationship with whatever activity was taking place at the pit. These pits are most often interpreted as cooking places, but the association with scrapers could mean an activity such as processing of animal skins. Although scrapers are the commonest tool-type at most domestic sites they are not associated with any debitage here, emphasising that they belonged to a more specialised activity.

Area 2

The quantity of lithic material from Area 2 was much larger than that from Area 1 and the presence of a range of debitage shows that flint working took place on-site. It was noted that some raw material was imported. The number of features and the quantity of material suggests somewhat more than just brief transitory occupation and the presence of quantities of pottery shows a period of settled activity. The presence of hazel nut shells shows that this occupation included the autumn season. The flint assemblage is dominated by cutting tools including a knife, utilised cutting flakes and convex scrapers. The difference in technique of production of these scrapers compared to those found at Area 1 is notable.

The only stylistically diagnostic flint object is the fine bifacially worked transverse arrow head fragment. This object is quite different technically from the rest of the worked pieces and it is quite likely to have been imported. The other objects may have been made locally but on imported material. This seems to have been from two sources, one of fine, homogenous translucent dark flint, possibly from southern England, the other of mottled light/mid/dark grey flint, possibly from northern England.

The arrow head is of a type that is characteristic of Late Neolithic Grooved Ware assemblages in Britain, found at settlements, henges and flint mines (Green 1984). However it has also been found in indisputably earlier contexts, for instance at the Staines Early Neolithic causewayed enclosure (Robertson-Mackay 1987, 107). It is uncertain what the exact original shape of the arrowhead was, but it is most likely to be a 'chisel' form which

Green's research (1980, 1984) has shown to have a notably close association with the Woodlands style of Grooved Ware, although also occurring in other contexts.

The polished axe fragment of Graig Lwyd stone was of a large and slightly unusual form with flat side-facets. There is insufficient information at present to provide a chronological typology (Clough and Cummins 1979, Pitts 1996) but its occurrence here in association with good dating evidence, showing that it falls within a date range of 3100 to 2900 cal BC, and in association with Grooved Ware is very useful. Its condition shows it had a long period of use but was not carefully curated after breakage. Enough still remained of it for it to have been re-ground or flaked to re-sharpen, or re-worked to produce some useful flakes, so may have been buried with the intention of possible future recovery, perhaps at a seasonally re-occupied site.

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APPENDIX III

BIRMINGHAM ARCHAEO-ENVIRONMENTAL

BAE

Plant macrofossil assessment of samples from Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement

R. McKenna

GAT-2063-2010

Plant Macrofossil Assessment of samples from Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement

By

R. McKenna

May 2010

Summary

This report describes the assessment of 27 plant macrofossil samples from the above site. These samples were recovered from Neolithic pit and stakehole contexts. Low concentrations of identifiable plant macrofossils were recovered, with hazelnuts well represented and much smaller numbers of cereal grains and probable weeds from arable contexts. Wood charcoal from the site was dominated by oak and hazel, with smaller proportions of ash and alder. It is possible that the samples largely reflect the disposal of burnt hazel wood debris with the sparse evidence for domesticated cereals suggesting the disposal of small quantities of domestic waste. No further work is recommended on these samples.

KEYWORDS: Llangefni, Penmynydd, Wales, Archaeology, Plant Macrofossils

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1. INTRODUCTION

Birmingham Archaeo-Environmental (BA-E) was contracted by Gwynedd Archaeological Trust (GAT) to assess the plant macrofossil content of twenty seven samples from archaeological deposits excavated at the Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd. The archaeological mitigation was carried out by GAT in late 2008, and between March to the end of July 2009. The samples discussed in this report were recovered from two groups of Neolithic pits.

2. METHODS

The material submitted to BA-E was processed by staff at Gwynedd Archaeological Trust using their standard water flotation methods. The flot (the sum of the material from each sample that floats) was sieved to 0.5mm and air dried. The heavy residue (the material which does not float) was not examined, and therefore the results presented here are based entirely on the material from the flot. The flot was examined under a low-power binocular microscope at magnifications between x12 and x40.

A four point semi quantative scale was used, from '1' – one or a few specimens (less than an estimated six per kg of raw sediment) to '4' – abundant remains (many specimens per kg or a major component of the matrix). Data were recorded on paper and subsequently on a personal computer using a Microsoft Access database.

The flot was then sieved into convenient fractions (4, 2, 1 and 0.3mm) for sorting and identification of charcoal fragments. Identifiable material was only present within the 4 and 2mm fractions. A random selection of ideally 100 fragments of charcoal of varying sizes was made, which were then identified. Where samples did not contain 100 identifiable fragments, all fragments were studied and recorded. This information is recorded with the results of the assessment in Table 3 below. Identification was made using the wood identification guides of Schweingruber (1978) and Hather (2000). Taxa identified only to genus could not be identified more closely due to a lack of defining characteristics in charcoal material.

3. RESULTS

The components recorded from each sample are shown in Table 1 and the results of this analysis are presented in Table 2. Of the twenty seven samples submitted, charred plant macrofossils were present in eighteen of the samples but were generally poorly preserved, and lacking in definitive morphological characteristics. The most common remains were charred *Corylus* (hazelnut) shell fragments, which were present in eighteen of the samples in varying quantities but were particularly abundant in Samples 04, 11, 12, 20, 21 and 31. These remains may reflect waste from the consumption of a gathered food resource, although the shell fragments do not show any marks typically associated with processed hazelnuts.

Nine of the samples (004, 007, 011, 012, 014, 016, 020, 021 and 022) samples contained very small/single occurrences of charred cereal grains, many of which lacked identifying

morphological characteristics, and were therefore recorded as 'indeterminate cereal'.

Where it was possible to ascertain identifications, *Triticum* spp (wheat) and *Hordeum* (barley) were represented although again as single occurrences (samples 004, 007, 021) other than in Sample 004 in which 2 grains of *Hordeum* were recorded. Another possible indicator of plant remains derived from cultivated land is the presence of weeds that were found in varying quantities in each of the samples other than 015 and 016. Among these weeds were *Fallopia convovulus* (black bindweed), *Polygonum aviculare* (knotgrass) and *Chenopodium* sp./*Atriplex* sp. (goosefoot/orache) which are characteristic of arable fields.

Charcoal remains were present in all of the samples and scored a '3' or '4' on the abundance scale in the majority of the samples. The preservation of the charcoal fragments was relatively variable, although some of the charcoal was firm and crisp and allowed for clean breaks to the material permitting identification. Most of the fragments were very brittle, and the material tended to crumble or break in uneven patterns making the identifying characteristics harder to distinguish. Material in twenty four of the samples was identifiable (see Table 3).

The total range of taxa comprises *Quercus* (oak), *Fraxinus* (ash), *Corylus* (hazel) and *Alnus* (alder). These taxa represent common native tree/shrub species present in the mid-Holocene woodland. Oak is by far the most numerous and it is possible that this was the preferred fuel wood obtained from a local environment containing a broader choice of species. Oak is often also a 'first choice' structural timber, but off-cuts, deadfall and other debris could also be utilised as fuel.

Ten of the twenty four samples that produced identifiable remains were dominated by hazel (004, 011, 012, 014, 0109, 016, 021, 022, 030, 031). Six of the samples were dominated by oak (007, 009, 018, 020, 027, 028). Four of the samples contained purely hazel (019, 023, 025 and 029) and one contained purely oak (024). Most of the samples were a mixture of the two taxa. Alder was present in small numbers in two of the samples (011, 012) and ash was also present in one sample in small numbers (sample 004).

There are various largely unquantifiable factors that affect the composition of charcoal samples, which include bias in contemporary preference and collection, as well as sample taphonomy (Thery-Parisot 2002). The identified taxa cannot therefore be considered to be proportionately representative of the availability of wood resources in the palaeoenvironment.

Root / rootlet fragments were also present within all of the samples. This indicates disturbance of the archaeological features, which may be due to some of the features being relatively close to the surface, as well as deep root penetration from overlying vegetation. The presence of insect fragments in three of the samples and earthworm egg capsules in fifteen of the samples are further indications of such disturbance

Material from all samples contained material suitable for radiocarbon dating, and has been submitted to GAT for selection. Hazelnut shell fragments were submitted from the all the samples, except 19, 25 and 28 from which hazel charcoal was submitted

4. CONCLUSIONS

The samples produced relatively low concentrations of charcoal and plant macrofossils. The very low quantities of cereals and associated weed seeds probably do not reflect a high incidence of cereal consumption/processing on the site. The comparatively high numbers of hazelnuts may suggest that gathered 'wild' food resources were more significant on this site, although their presence alongside that of hazel charcoal, may indicate that these remains are largely representative of the burnt debris of hazel wood. The sparse presence of grains of cereal might indicate the disposal of general domestic waste. These charcoal remains also showed the exploitation of several species native to Britain, with oak as well as hazel being used as fire wood. Oak is commonly used for structures/artefacts and may have had subsequent use as a fire fuel (Rossen and Olsen 1985).

5. RECOMMENDATIONS FOR FURTHER ANALYSIS

The samples have been assessed, and any interpretable data has been retrieved. No further work is required on any of the samples. Any material recovered by further excavations should be processed to 0.3mm in accordance with standardised processing methods such as Kenward *et al.* 1980, and the English Heritage guidelines for Environmental Archaeology.

6. ARCHIVE

All extracted fossils and flots are currently stored with the site archive in the stores at Birmingham Archaeo-Environmental, along with a paper and electronic record pertaining to the work described here.

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Table 1. *Components of the subsamples from deposits recovered at Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement (G2063). Semi quantitative score of the components of the samples is based on a four point scale, from '1' – one or a few remains (less than an estimated six per kg of raw sediment) to '4' – abundant remains (many per kg or a major component of the matrix).*

Sample No. Context No. Feature No.	004 0041	005 0054	007 0095/96	008 0095	009 0096	010 0097	011 0099	012 0102	014 0106	015 0109	016 0110	018 0141	019 0136	020 0150	021 0152	022 0147
Bone fgts.							1									
CBM fgts.							1									
Charcoal fgts.	4	1	3	2	3	1	3	4	2	2	3	3	3	4	4	4
Earthworm egg capsules	2		1	1			1	1		1	1	1		1		1
Insect fgts.				2			2			1						
Plant macrofossils	2		1	1	2		1	2	1	1	1	1		2	2	1
Root/rootlet fgts.	3	4	3	4	3	3	3	3	3	3	3	3	4	3	3	3
Sand	4	2	4	3	4	4	4	3	4	4	4	4	2	4	3	4

Sample No. Context No. Feature No.	023 0138	024 0140	025 0137	026 0161	027 0148	028 0149	029 0155	030 0151	031 0152
Charcoal fgts.	3	4	4	2	2	3	1	3	4
Earthworm egg capsules			1			2	1		1
Plant macrofossils	1		1				1	1	2
Root/rootlet fgts.	3	3	3	4	3	4	3	3	3
Sand	4	3	4	4	4	4	4	4	3

Table 2: *Complete list of taxa recovered from deposits recovered at Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement (G2063). Taxonomy and Nomenclature follow Stace (1997).*

Sample Number **Context Number** **Feature Number**	**004** **0041**	**007** **0095/96** **0094**	**008** **0095** **0094**	**009** **0096** **0094**	**011** **0099** **0098**	**012** **0102** **0098**	**014** **0106** **0105**	**015** **0109** **0105**	**016** **0110** **0105**	**018** **0141** **0139**	**020** **0150** **0162**	
	Neolithic Pit	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Posthole**	**Pit**	
Sample volume (ml)	**170**	**80**	**50**	**85**	**270**	**125**	**70**	**50**	**90**	**50**	**600**	
LATIN BINOMIAL												**COMMON NAME**
Corylus avellana (fgts.)	252	76	10	55	176	92	21	20	57	4	316	Hazel
Chenopodium spp / *Atriplex* spp.	7		5	7		1	5			2		Goosefoot/Orache
Silene spp. L.			1									Campions
Polygonum lapathafolium	4										1	Pale persicaria
Polygonum aviculare		1	17									Knotgrass
Fallopia convovulus					1							Black bindweed
Rubus spp.			1									Brambles
Galium spp.					1							Bedstraws
POACEAE	3				1	1						Grass
Hordeum spp.	2											Barley
Triticum spp.		1										Wheat
Indeterminate cereal	16	1			1	7	1		1		1	
Unidentified											1	

Sample Number **Context Number** **Feature Number**	**021** **0152** **0146**	**022** **0147** **0158**	**023** **0138** **0135**	**027** **0148** **0159**	**029** **0155** **0154**	**030** **0151** **0146**	**031** **0152** **0146**	
	Pit	**Pit**	**Pit**	**Pit**	**Stakehole**	**Pit**	**Pit**	
Sample volume (ml)	**120**	**380**	**110**	**50**	**>5**	**100**	**320**	
LATIN BINOMIAL								**COMMON NAME**
Corylus avellana (fgts.)	390	120	14	10	2	48	209	Hazel
Chenopodium spp / *Atriplex* spp.		4	2					Goosefoot/Orache
Hordeum spp.	1							Barley
Triticum spp.	1							Wheat
Indeterminate cereal		2						

Table 3. *Complete list of taxa recovered from deposits recovered at Gwalchmai Booster to Bodffordd link water main and Llangefni to Penmynydd replacement (G2063). Taxonomy and nomenclature follow Schweingruber (1978). Numbers are identified charcoal fragment for each sample.*

Name	Vernacular	Sample 004 (0041) 1000+ fgts. max. size-13mm	Sample 007 (0095/96) 500+ fgts. max. size-15mm	Sample 008 (0095) 32 fgts. max. size-11mm	Sample 009 (0096) 200 fgts. max. size-18mm
Corylus avellana	Hazel	69	43	6	13
Fraxinus excelsior	Ash	19			
Quercus	Oak	12	57	14	87
	Indet.			12	

Name	Vernacular	Sample 011 (0099) 1000+ fgts. max. size-9mm	Sample 012 (0102) 1000+ fgts. max. size-13mm	Sample 014 (0106) 100 fgts. max. size-13mm	Sample 015 (0109) 50+ fgts. max. size-13mm	Sample 016 (0110) 500+ fgts. max. size-25mm	Sample 018 (0141) 300+ fgts. max. size-12mm
Alnus glutinosa	Alder	6	12				
Corylus avellana	Hazel	94	56	59	93	75	36
Quercus	Oak		32	41	7	25	64

Name	Vernacular	Sample 019 (0136) 1000+ fgts. max. size-9mm	Sample 020 (0150) 5000+ fgts. max. size-24mm	Sample 021 (0152) 1000+ fgts. max. size-14mm	Sample 022 (0147) 1000+ fgts max. size-14mm	Sample 023 (0138) 500+ fgts max. size-11mm	Sample 024 (0140) 1000+ fgts. max. size-27mm
Corylus avellana	Hazel	100	39	73	84	100	
Quercus	Oak		61	27	16		100

Name	Vernacular	Sample 025 (0137) 500+ fgts max. size-15mm	Sample 027 (0148) 100+ fgts max. size-11mm	Sample 028 (0149) 500+ fgts max. size-13mm	Sample 029 (0155) 25 fgts max. size-8mm	Sample 030 (0151) 1000+ fgts. max. size-22mm	Sample 031 (0152) 2000+ fgts max. size-19mm
Corylus avellana	Hazel	100	18	35	25	74	61
Quercus	Oak		82	65		26	39

APPENDIX IV

BETA ANALYTIC INC.
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REPORT OF RADIOCARBON DATING ANALYSES

Ms. Emma Hopla

Report Date: 6/29/2010

University of Birmingham

Material Received: 6/21/2010

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 280899	3790 +/- 40 BP	-24.6 o/oo	3800 +/- 40 BP
SAMPLE : G2063-SN4			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 2390 to 2390 (Cal BP 4340 to 4340) AND Cal BC 2340 to 2130 (Cal BP 4290 to 4080)			
Beta - 280900	4370 +/- 40 BP	-24.3 o/oo	4380 +/- 40 BP
SAMPLE : G2063-SN12			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3100 to 2900 (Cal BP 5050 to 4850)			
Beta - 280901	4420 +/- 40 BP	-26.9 o/oo	4390 +/- 40 BP
SAMPLE : G2063-SN19			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 3260 to 3250 (Cal BP 5210 to 5200) AND Cal BC 3100 to 2910 (Cal BP 5050 to 4860)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.6:lab. mult=1)

Laboratory number: **Beta-280899**

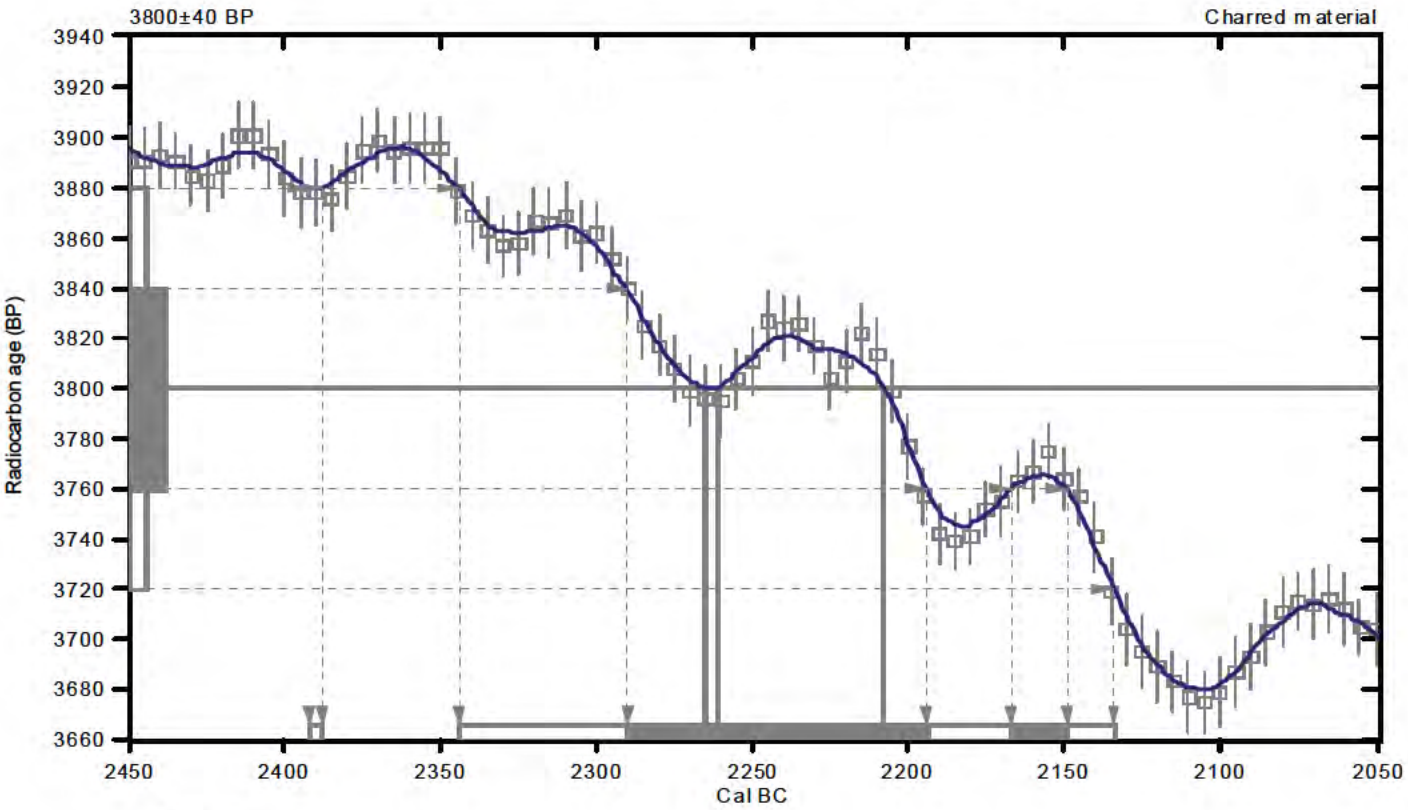
Conventional radiocarbon age: **3800±40 BP**

2 Sigma calibrated results: **Cal BC 2390 to 2390 (Cal BP 4340 to 4340) and**
(95% probability) **Cal BC 2340 to 2130 (Cal BP 4290 to 4080)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal BC 2260 (Cal BP 4220) and
Cal BC 2260 (Cal BP 4210) and
Cal BC 2210 (Cal BP 4160)

1 Sigma calibrated results: Cal BC 2290 to 2190 (Cal BP 4240 to 4140) and
(68% probability) Cal BC 2170 to 2150 (Cal BP 4120 to 4100)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.3:lab. mult=1)

Laboratory number: **Beta-280900**

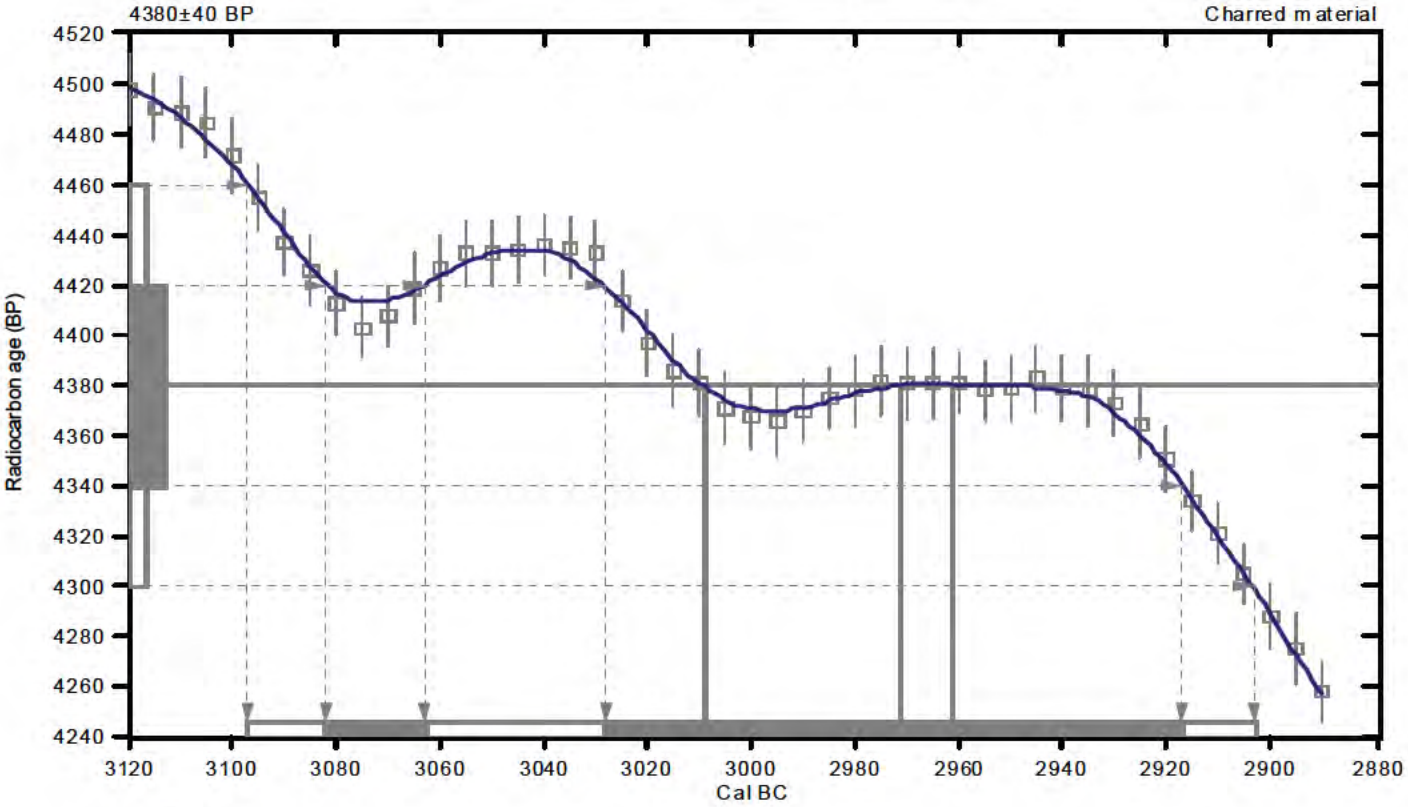
Conventional radiocarbon age: **4380±40 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 3100 to 2900 (Cal BP 5050 to 4850)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal BC 3010 (Cal BP 4960) and Cal BC 2970 (Cal BP 4920) and Cal BC 2960 (Cal BP 4910)

1 Sigma calibrated results: (68% probability) Cal BC 3080 to 3060 (Cal BP 5030 to 5010) and Cal BC 3030 to 2920 (Cal BP 4980 to 4870)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.9:lab. mult=1)

Laboratory number: **Beta-280901**

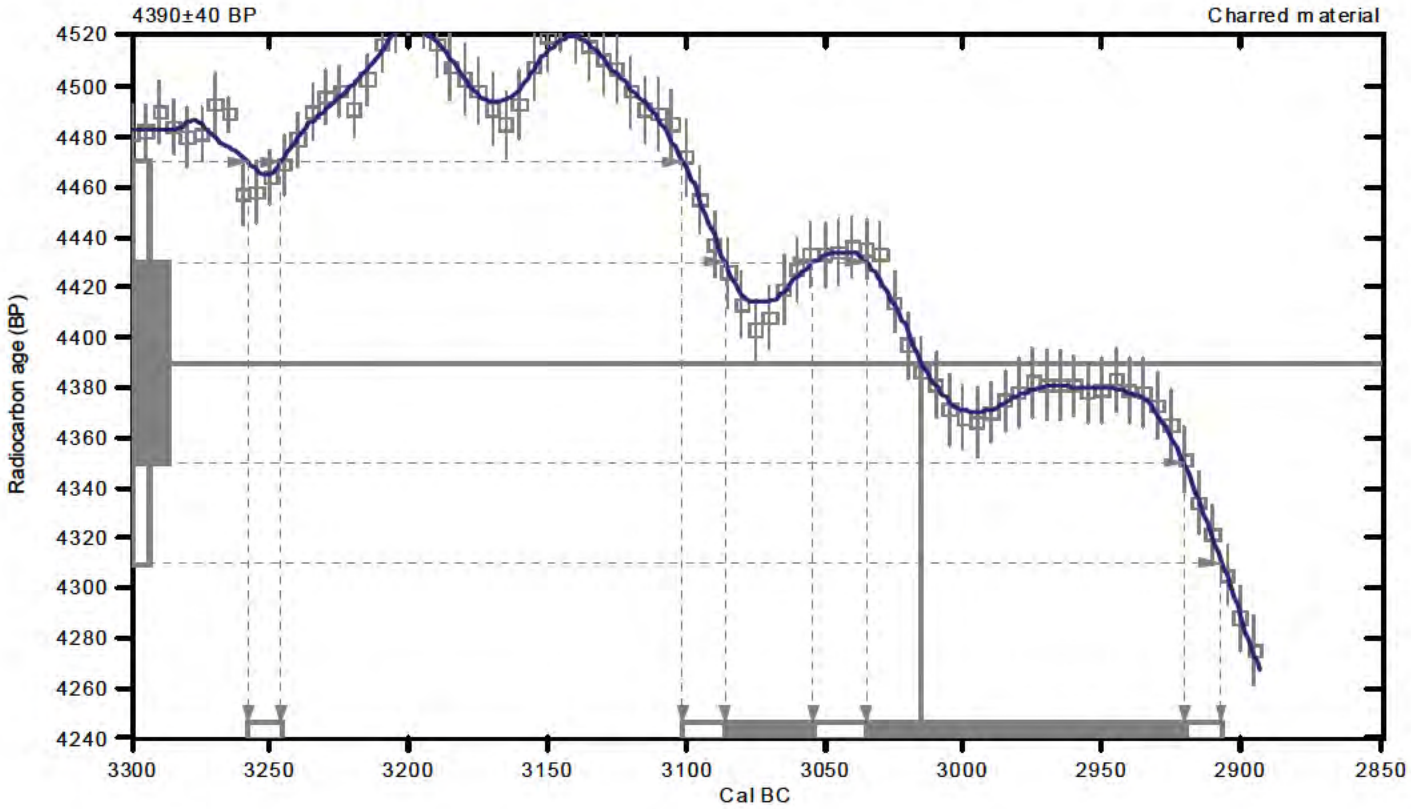
Conventional radiocarbon age: **4390±40 BP**

2 Sigma calibrated results: **Cal BC 3260 to 3250 (Cal BP 5210 to 5200) and**
(95% probability) **Cal BC 3100 to 2910 (Cal BP 5050 to 4860)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 3020 (Cal BP 4960)

1 Sigma calibrated results: Cal BC 3090 to 3050 (Cal BP 5040 to 5000) and
(68% probability) Cal BC 3040 to 2920 (Cal BP 4980 to 4870)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Figure 01: Easement/Pipeline route in RED and area specific figures (Scale 1 to 35000@A3). Map data based on client drawings U5717/000 to 012

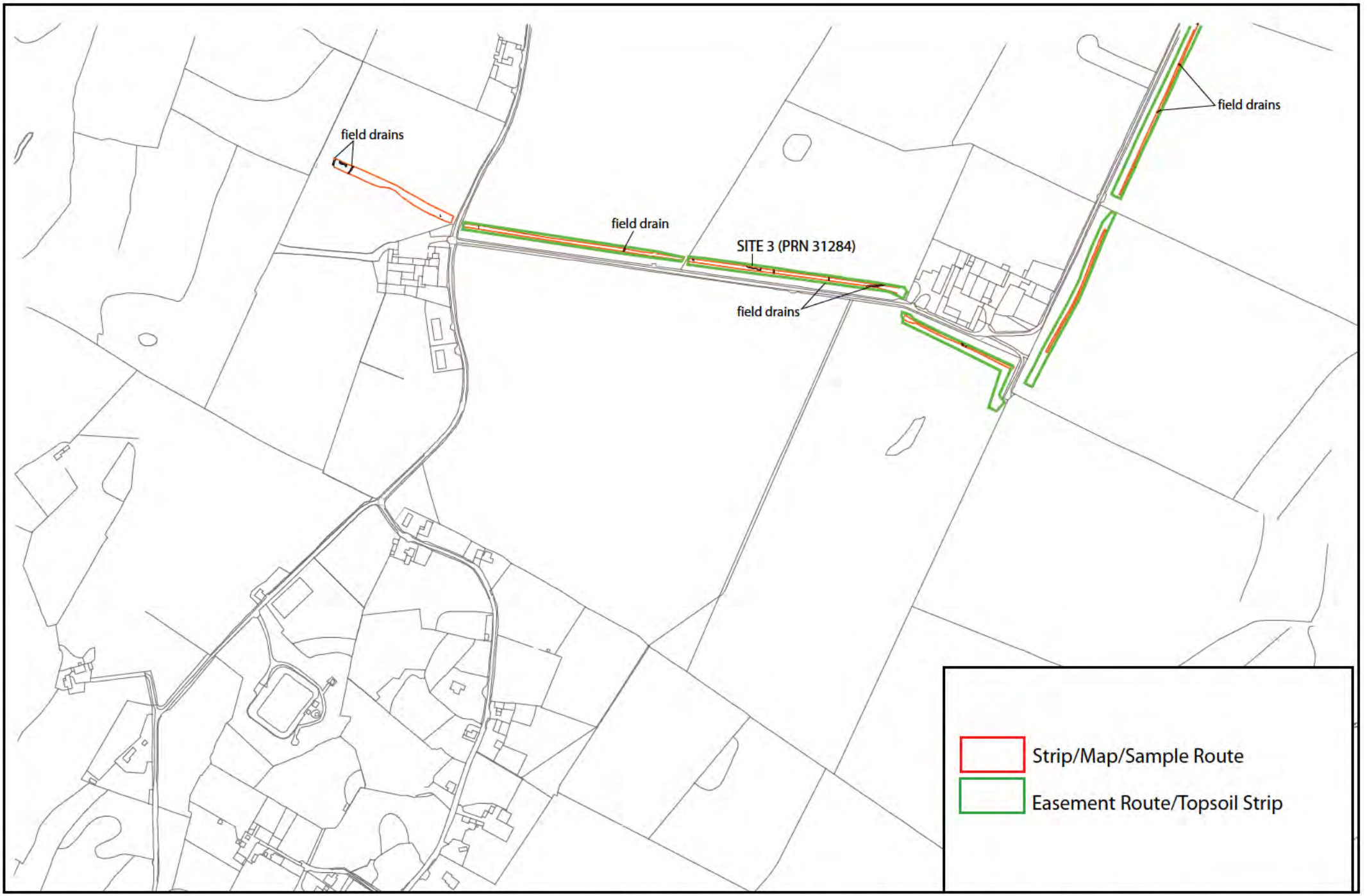


Figure 02: Easement/Pipeline route and location of features/Site 3 (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH39397719

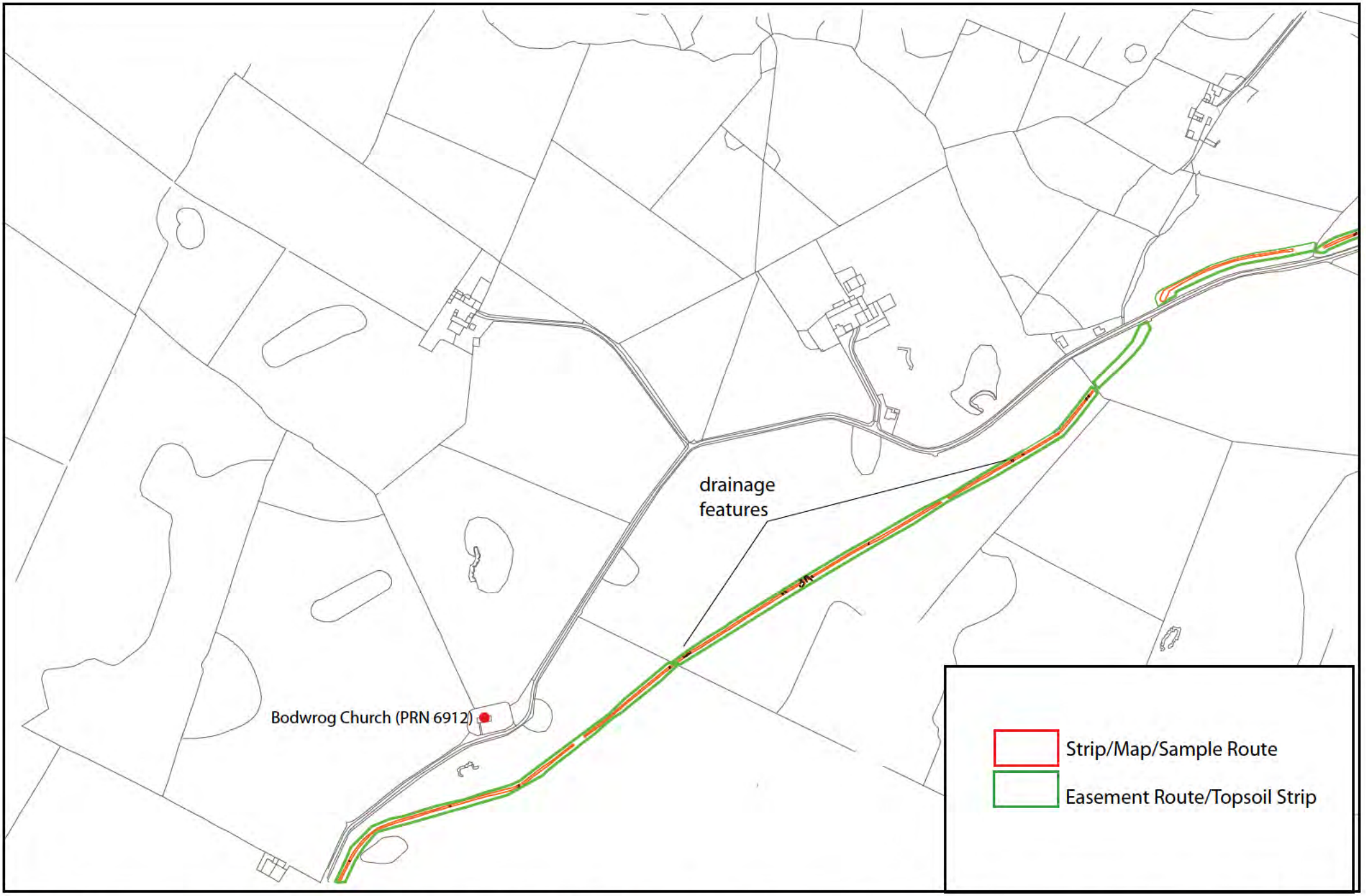


Figure 03: Easement/Pipeline route and location of features (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on SH 40027763

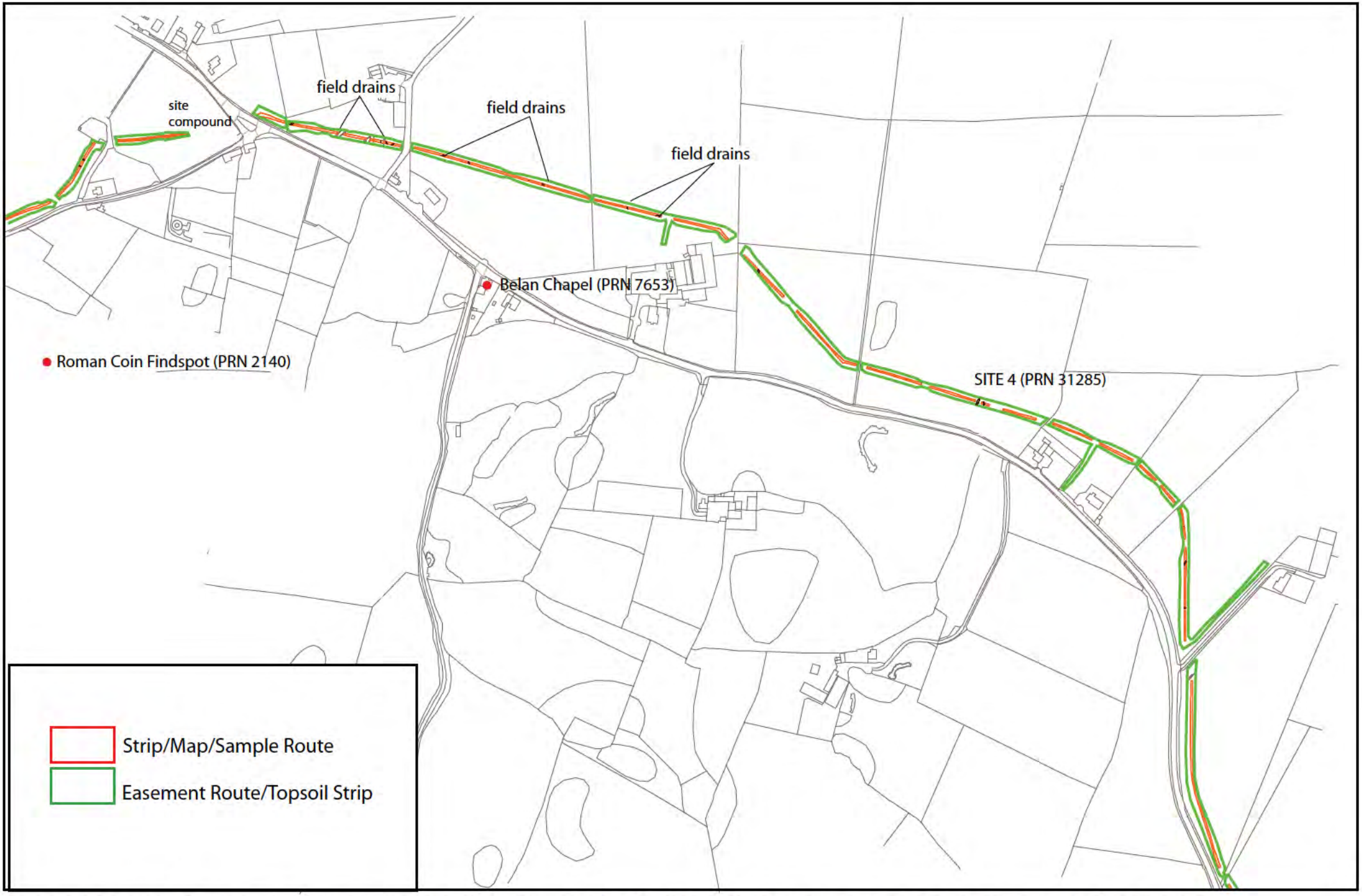


Figure 04: Easement/Pipeline route and location of features/Site 4 (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH41957796

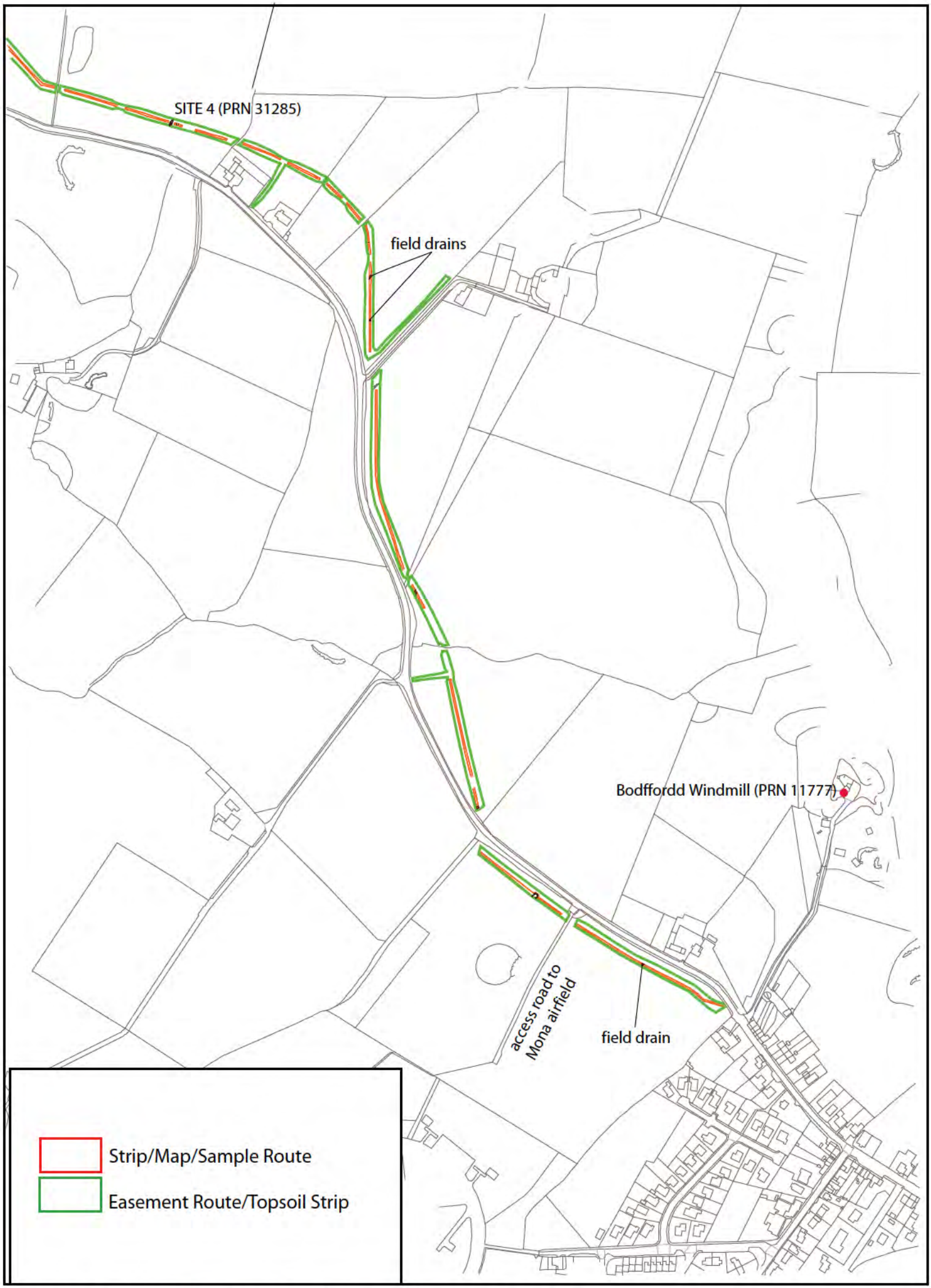


Figure 05: Easement/Pipeline route and location of features (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH42167764

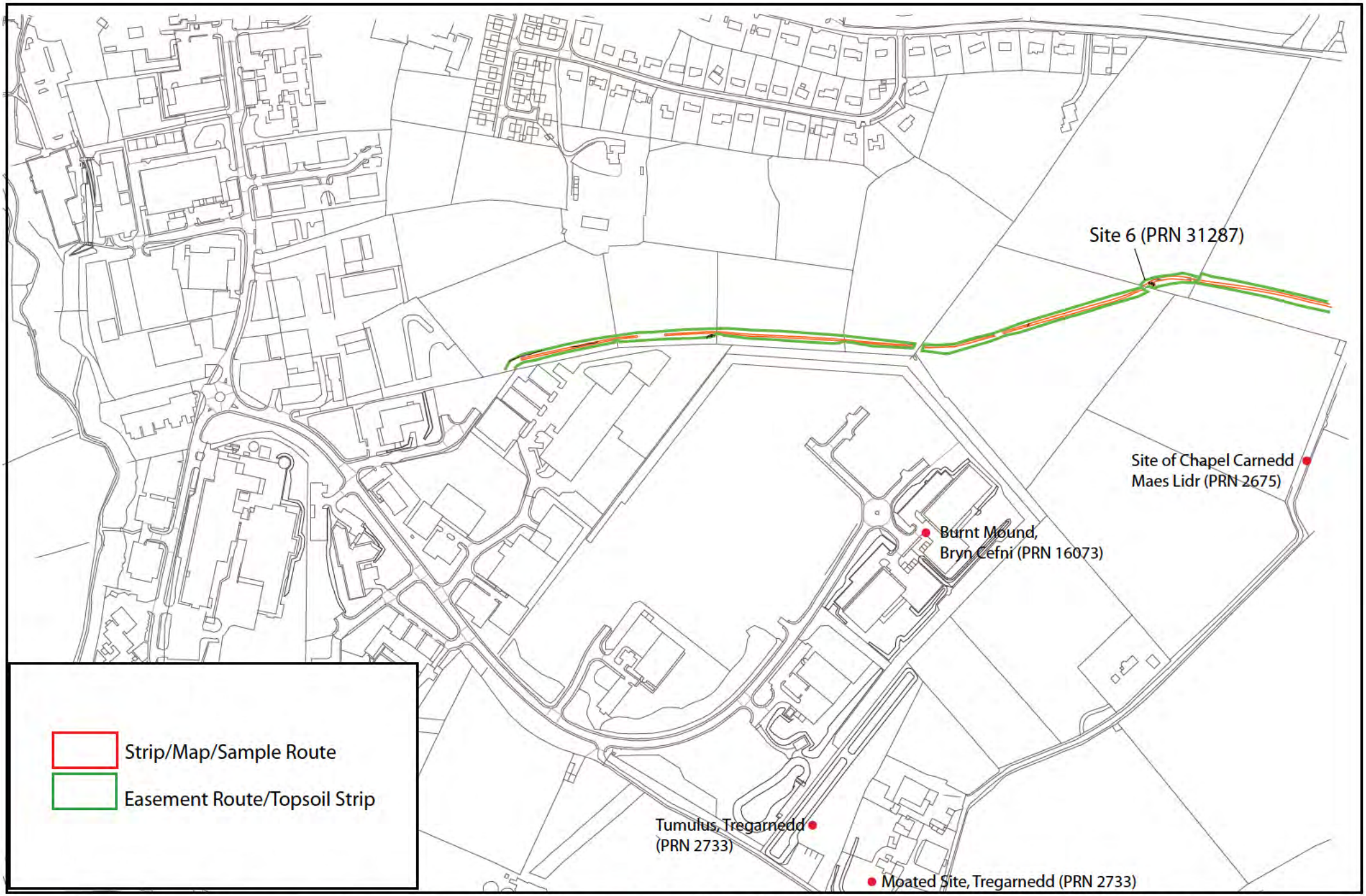


Figure 06: Easement/Pipeline route and location of features/Site 6 (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH471375254

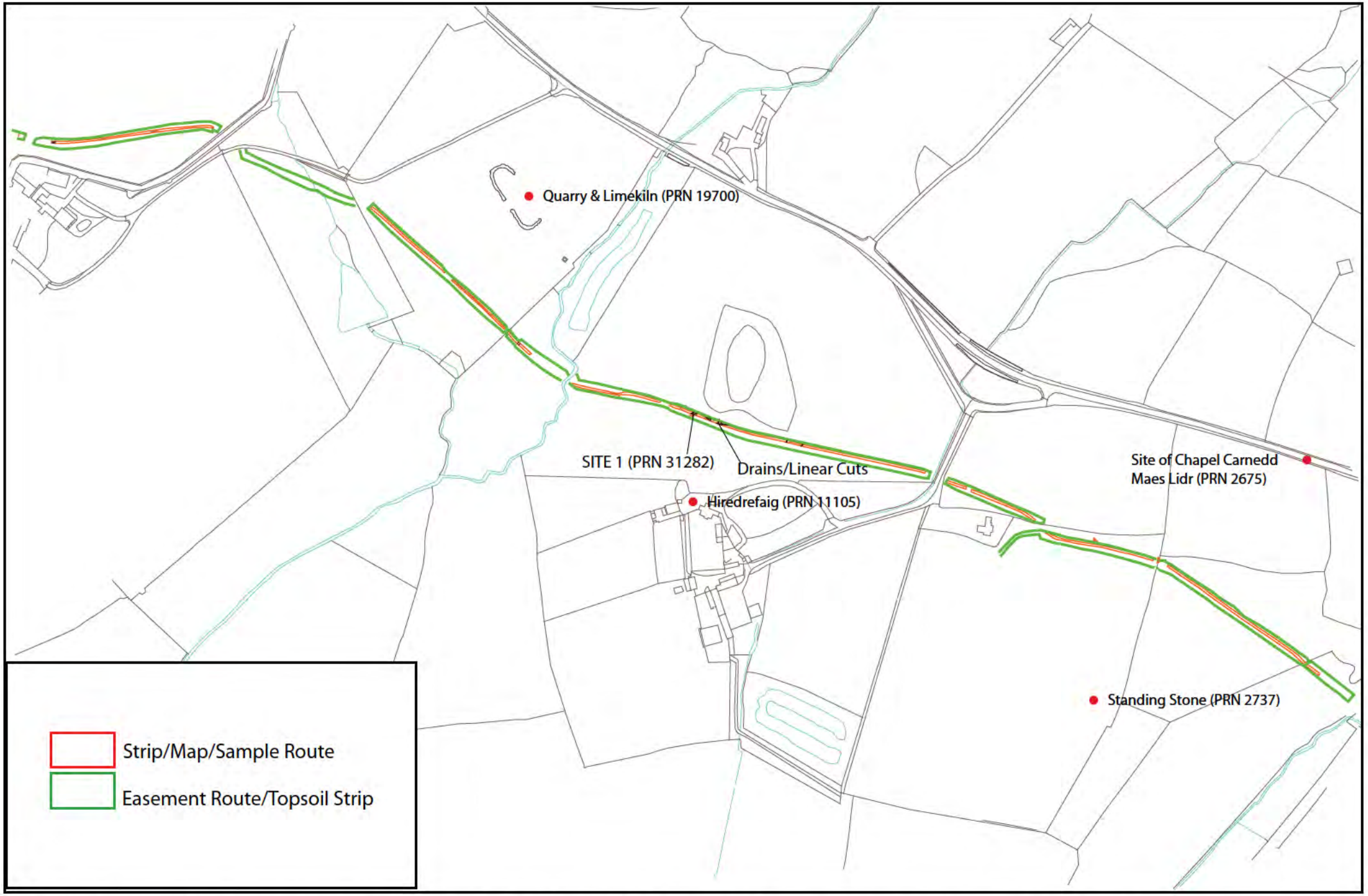


Figure 07: Easement/Pipeline route and location of Site 1 (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH48037493

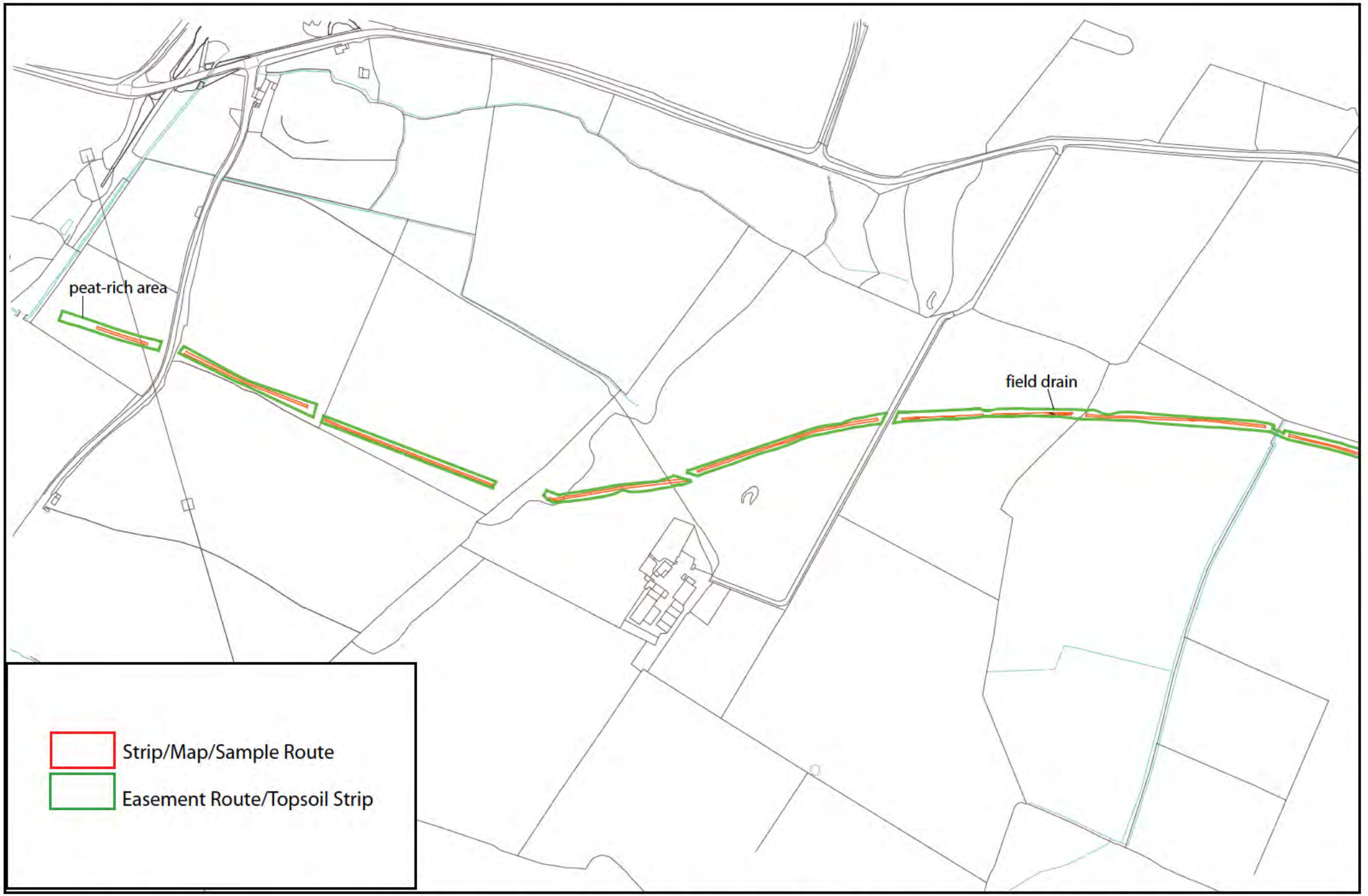


Figure 08: Easement/Pipeline route and location of features (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH49437456

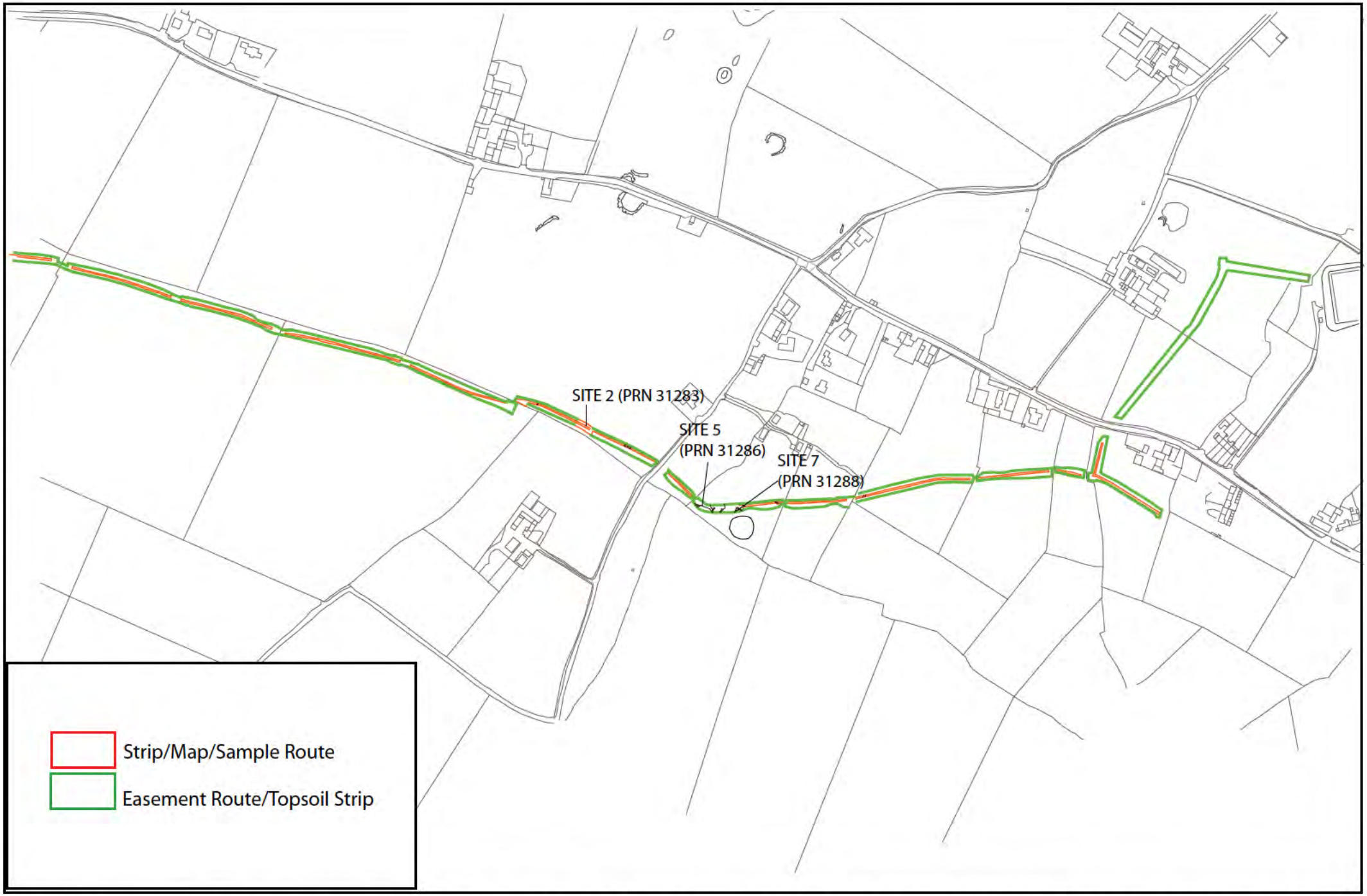


Figure 09: Easement/Pipeline route and location of features and Sites 2, 5 and 7 (Scale 1 to 5000@A3). Map data based on client drawings U5717/000 to 012; centred on NGR SH50817421

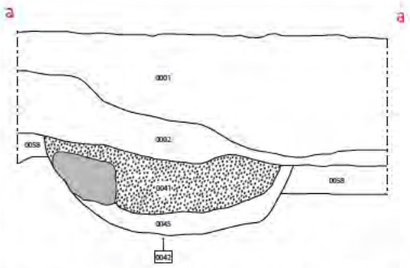
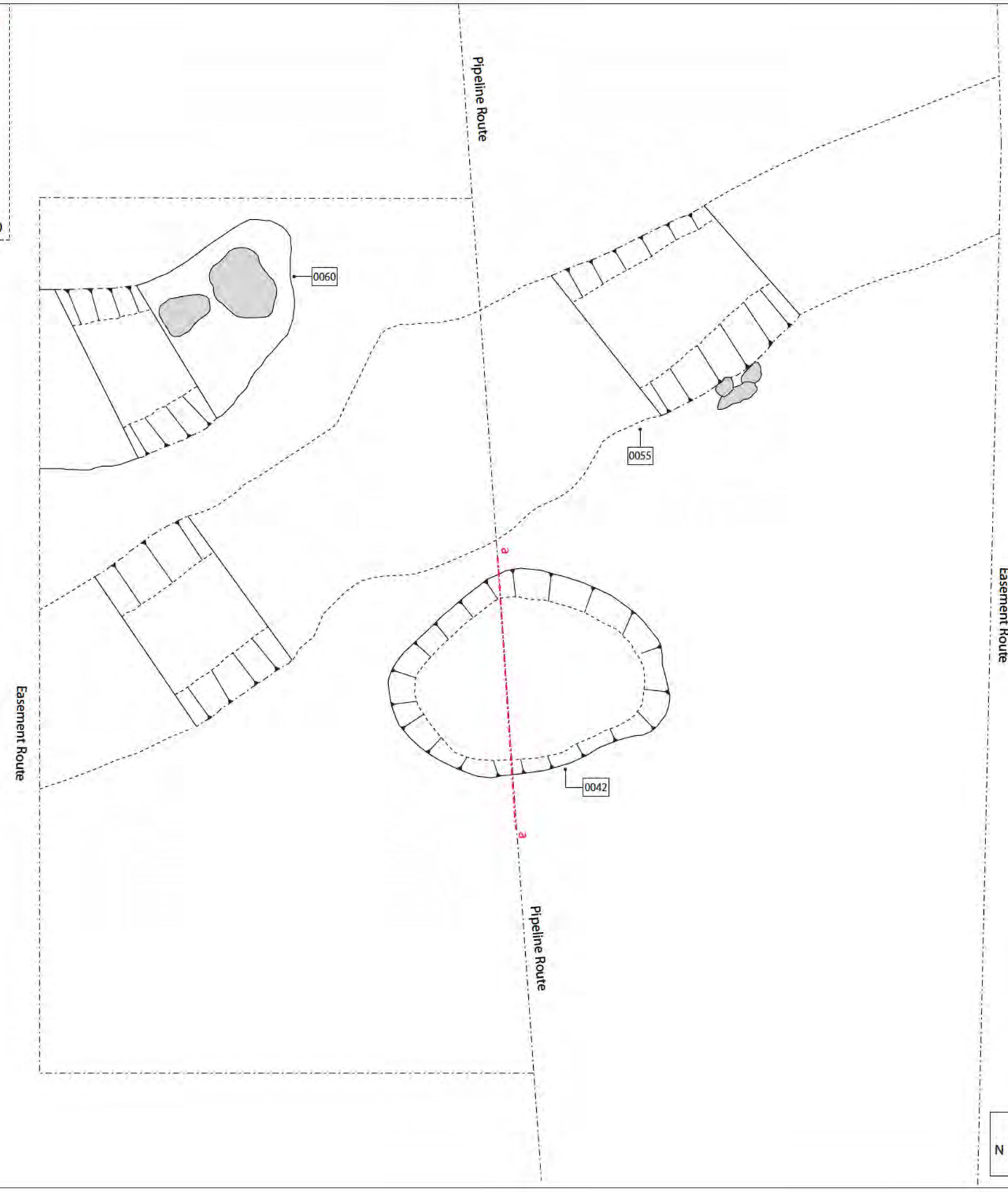


Figure 10 inset: Site 1 - Section Pit [0042] Scale 1:20



Key

stone

charcoal-rich clay-silt

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GWYNEDD ARCHAEOLOGICAL TRUST
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Figure 10: Site 1 PRN 31282 - Plan.
For the locaiton of Site 1, cf. Figures 01 and 07

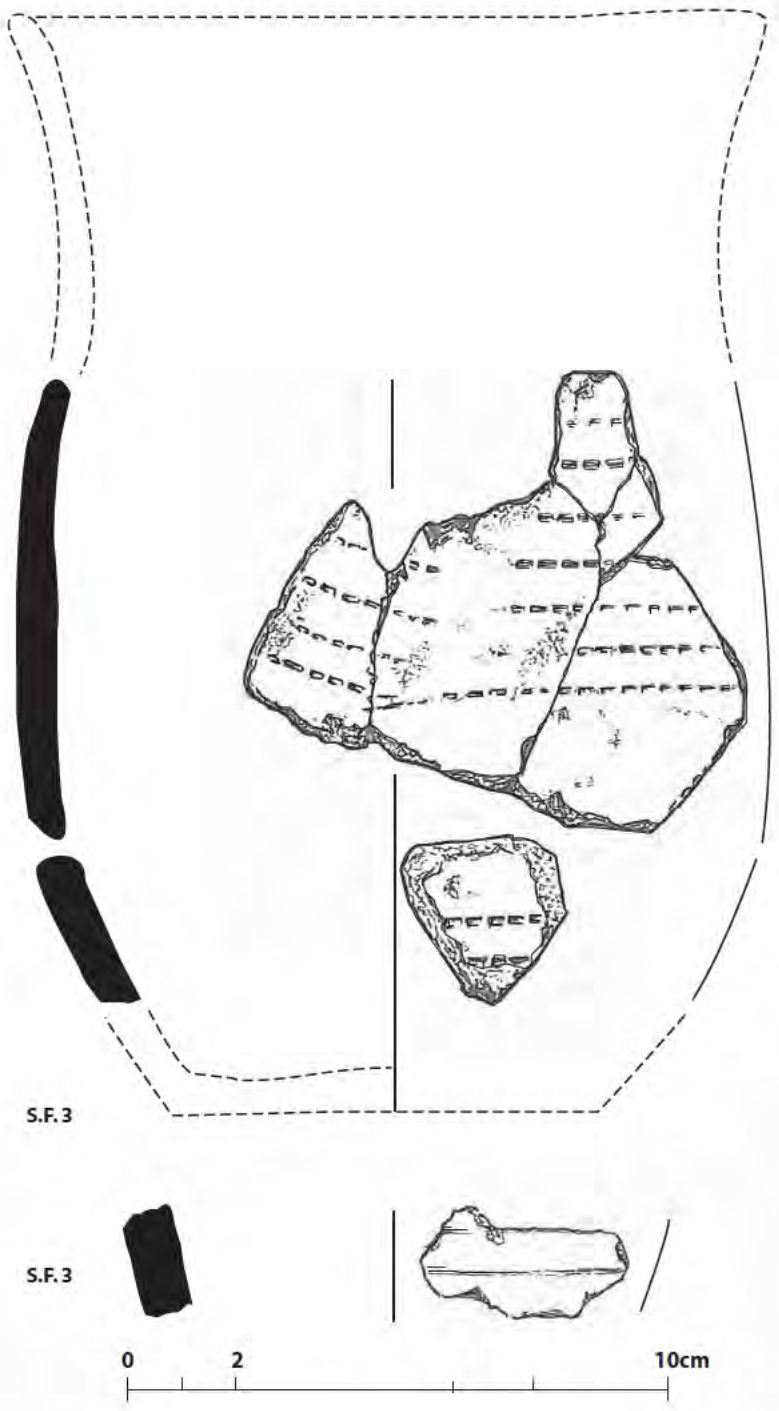

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Figure 11. Site 1 PRN 31282
Beaker Ware Vessel
For the locaiton of Site 1, cf. Figures 01 and 07

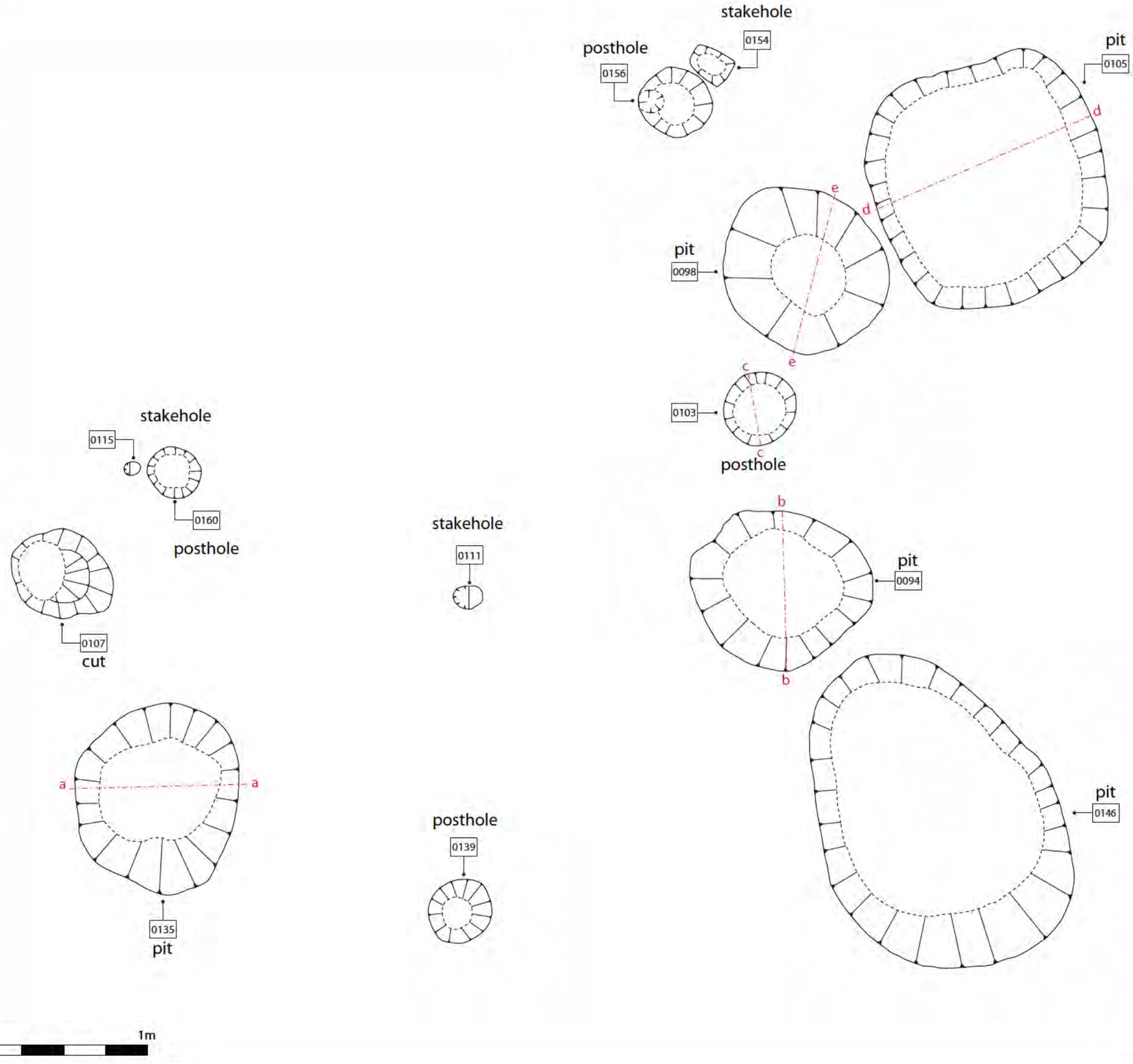

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Figure 12: Site 2 PRN 31283 -Plan
For the locaiton of Site 2, cf. Figures 01 and 09

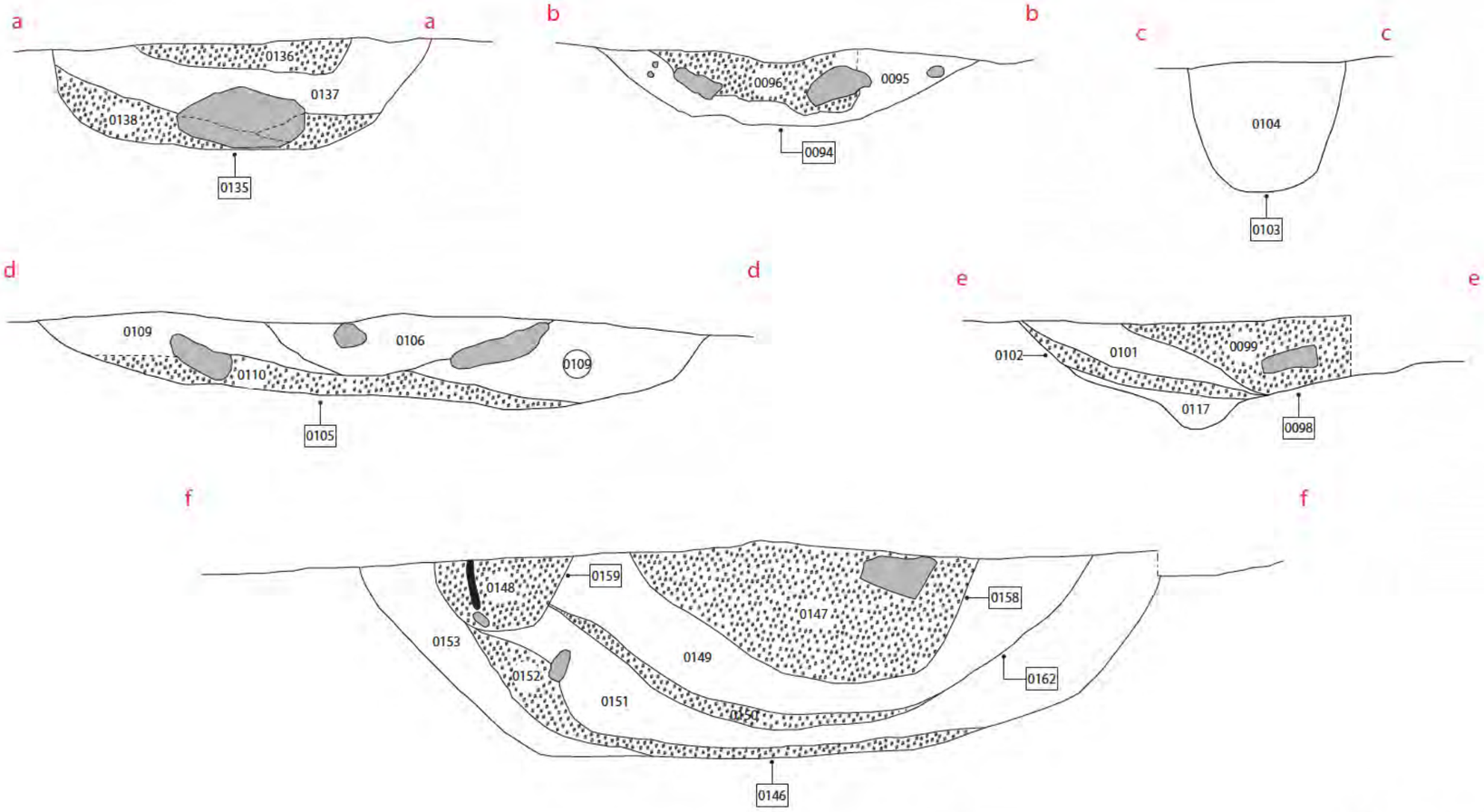

Figure 13a: Site 2 - selected sections

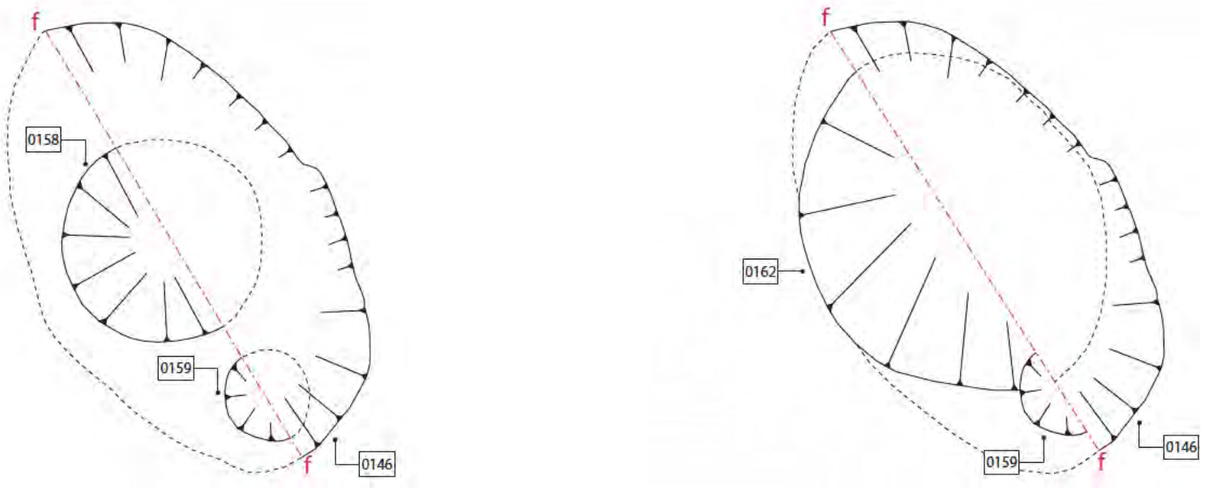

Figure 13b: Site 2 pit 0146 sequential plans

Key

stone

charcoal-rich clay-silt

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Figure 13: Site 2 PRN 31283
For the location of Site 2, cf. Figures 01 and 09

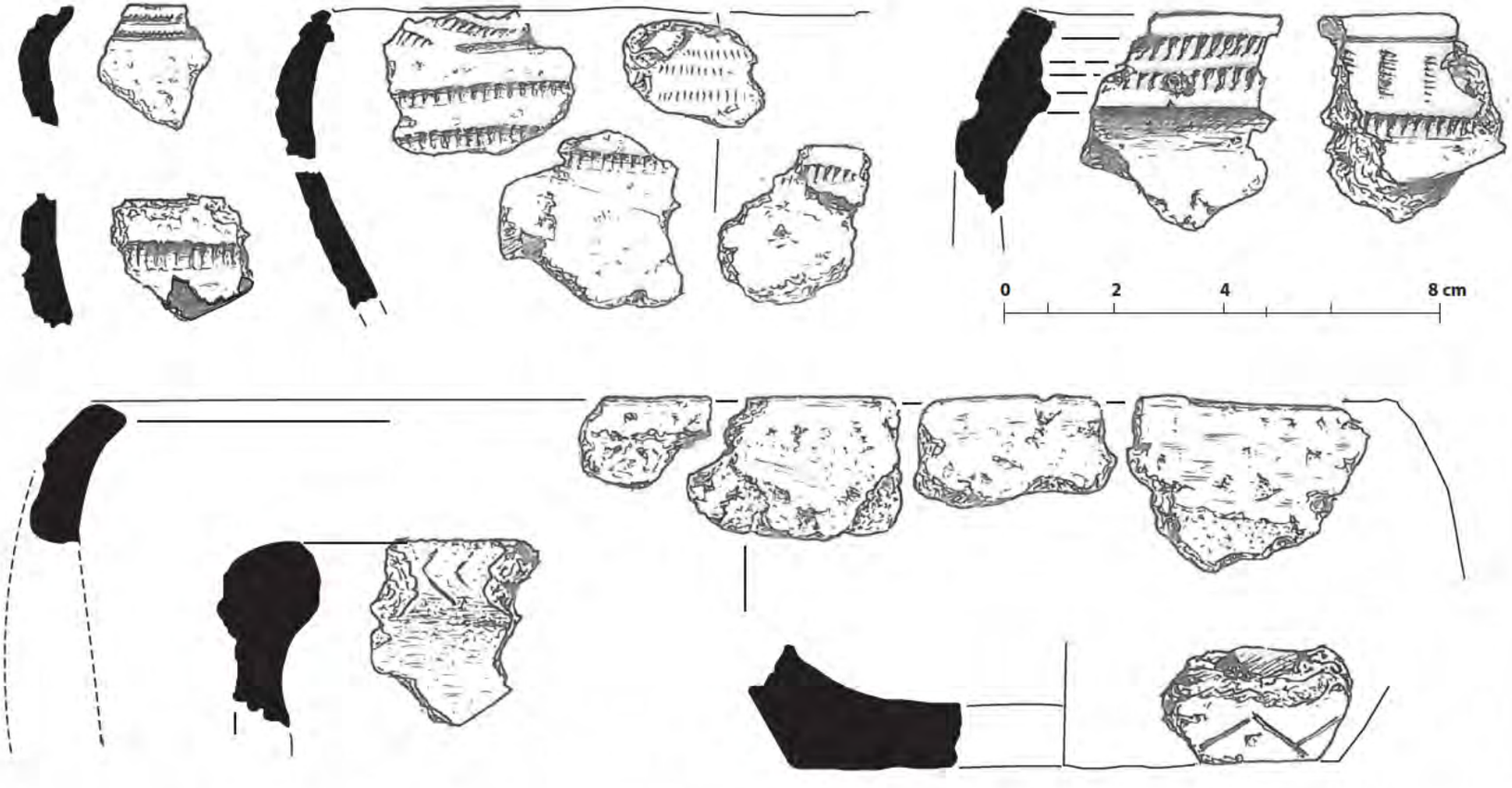

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Figure 14. Site 2 PRN 31283
Grooved Ware Vessel

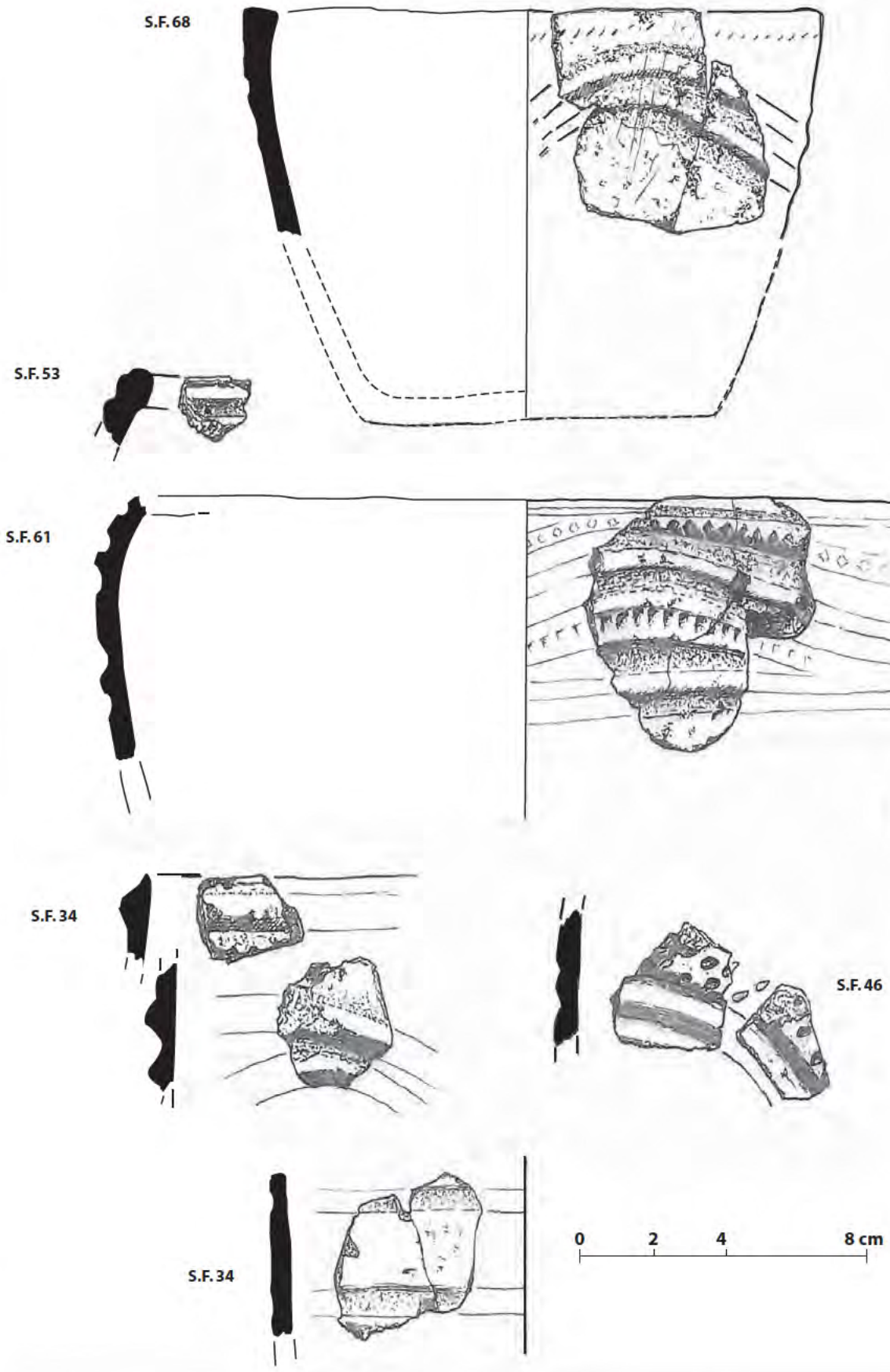

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Figure 15. Site 2 PRN 31283
Grooved Ware

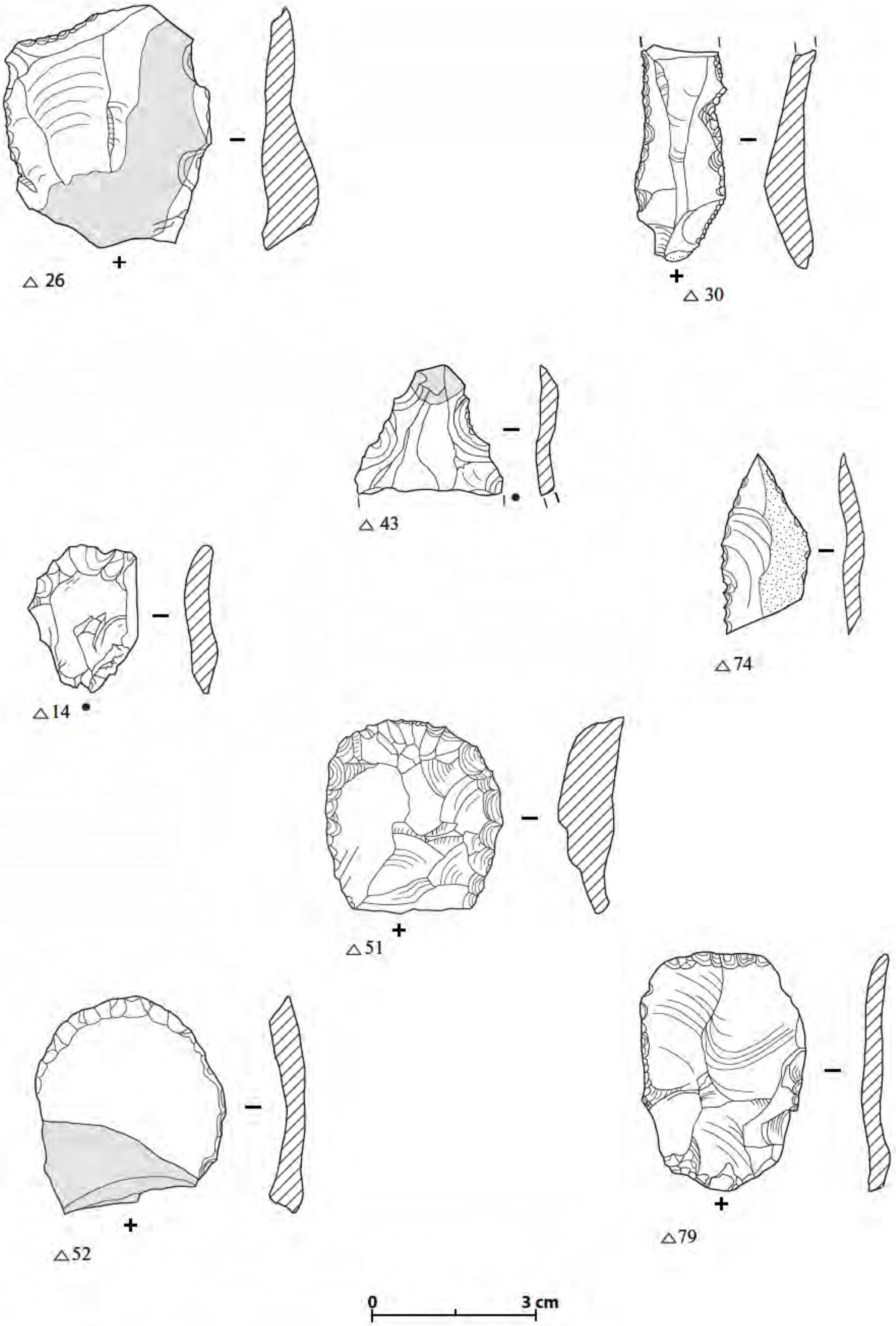

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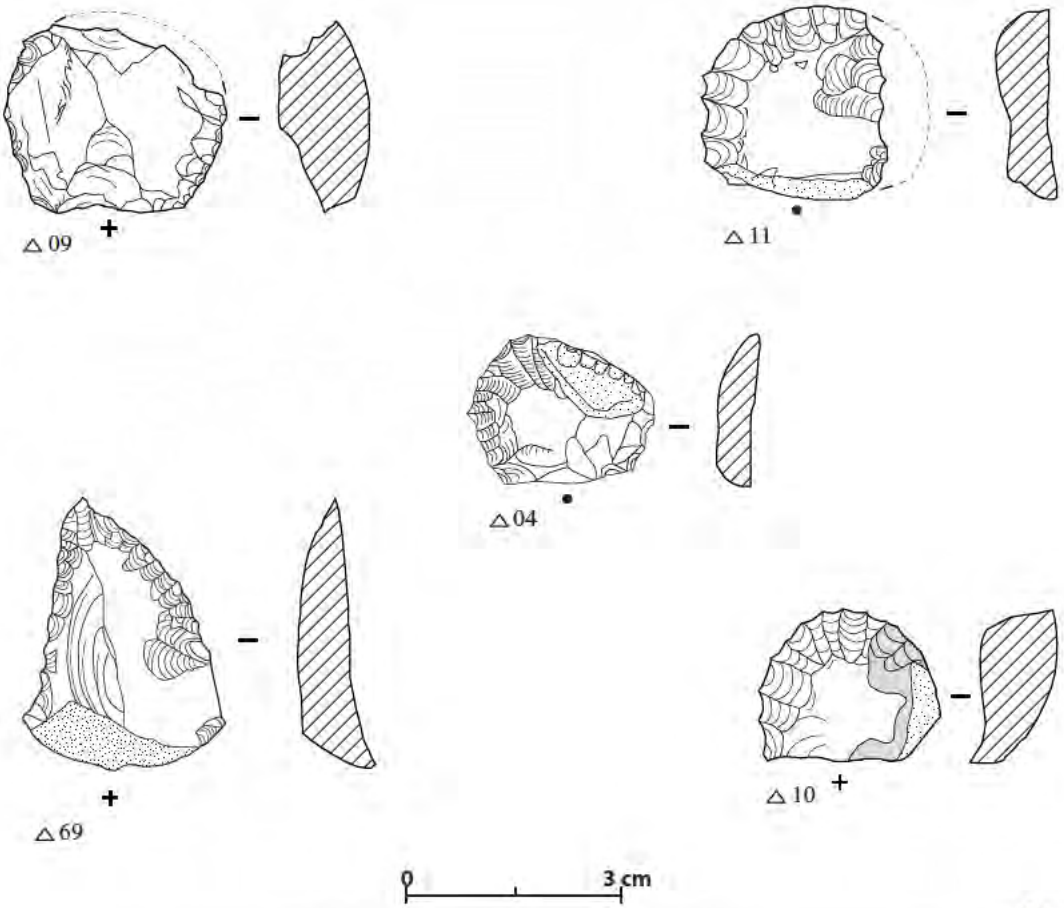
Figure 16. Site 2 PRN 31283 Lithics

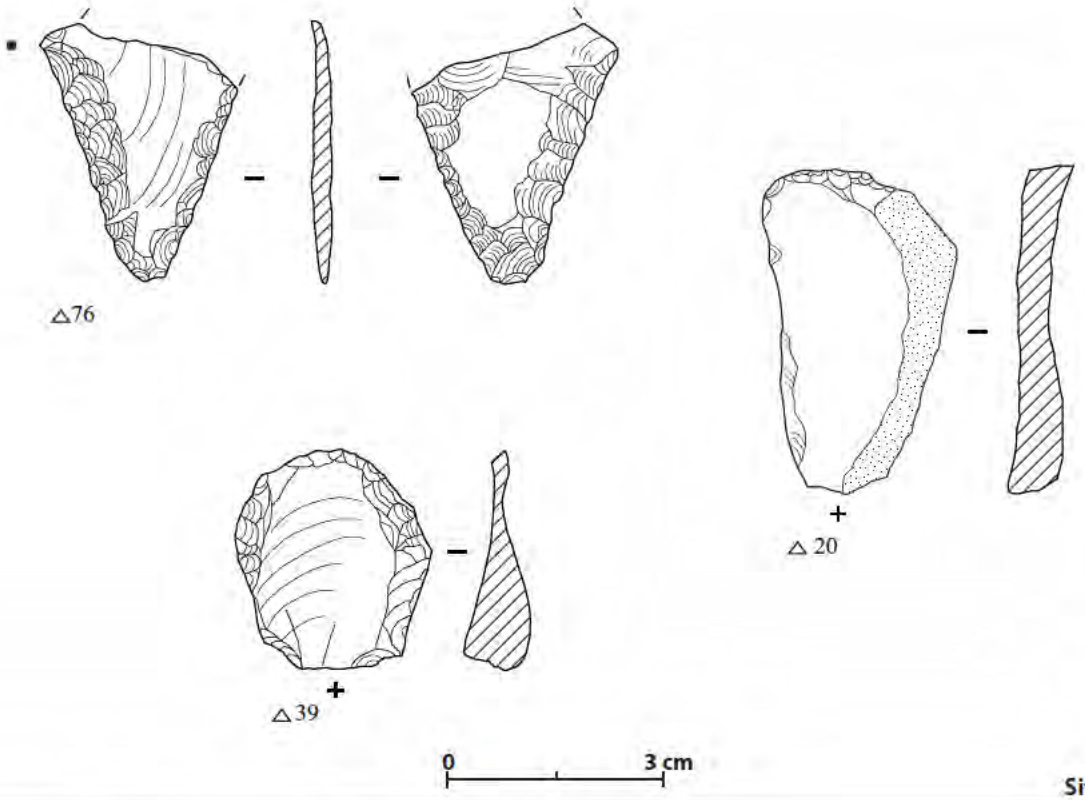
Key

- ● position of removed bulb
- + position of surviving bulb of percussion
- △52 small finds number

NB. small finds 14, 26, 30, 43 and 74 are all from context (0100)



Site 1 Lithic Assemblage



Site 2 Lithic Assemblage

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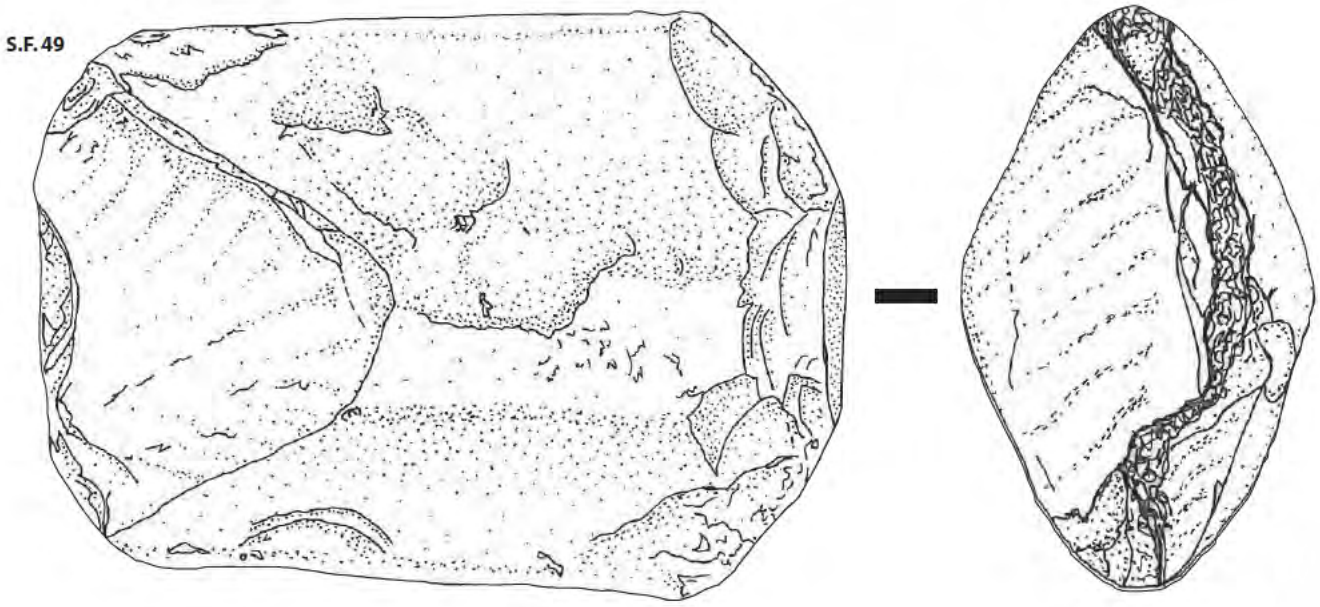
Figure 17. Site 1 & Site 2 Lithics

Key

- • position of removed bulb
- \+ position of surviving bulb of percussion
- △39 small finds number



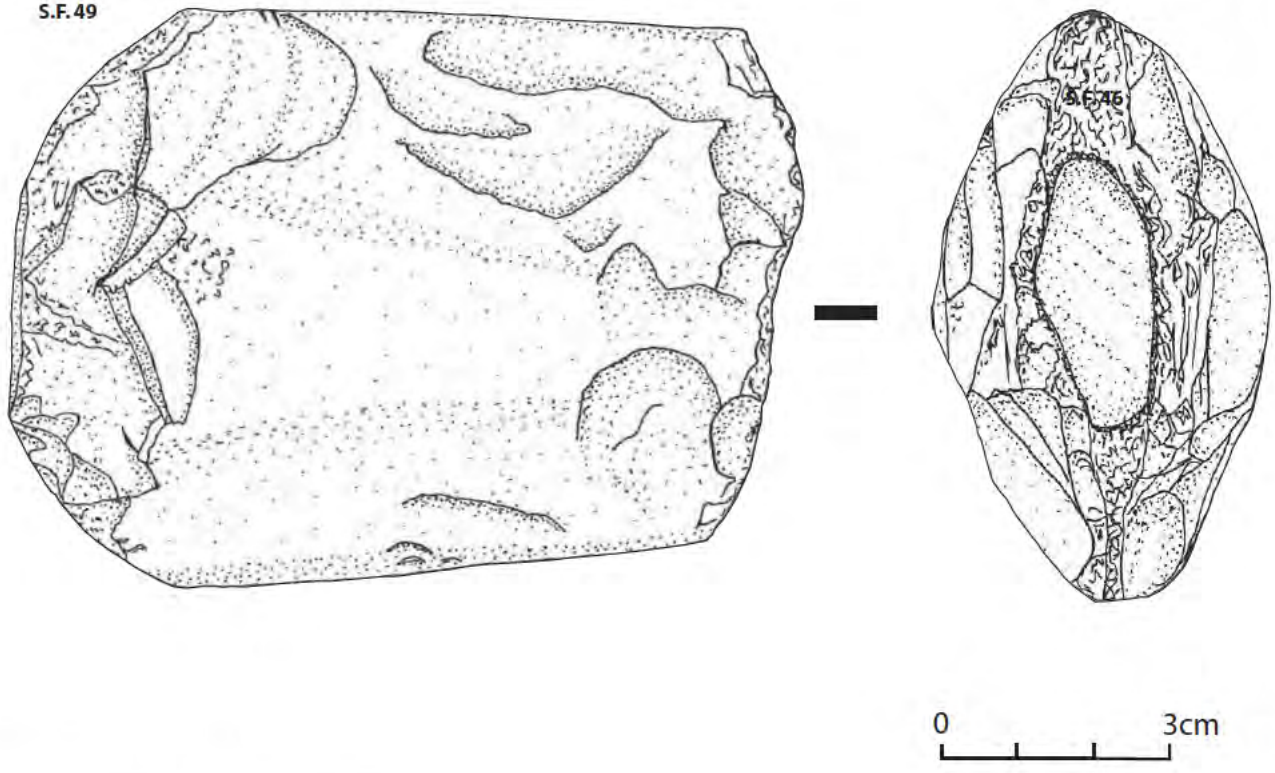


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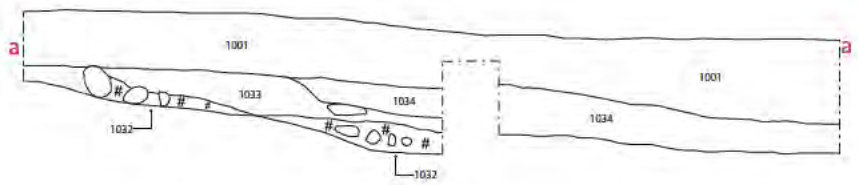
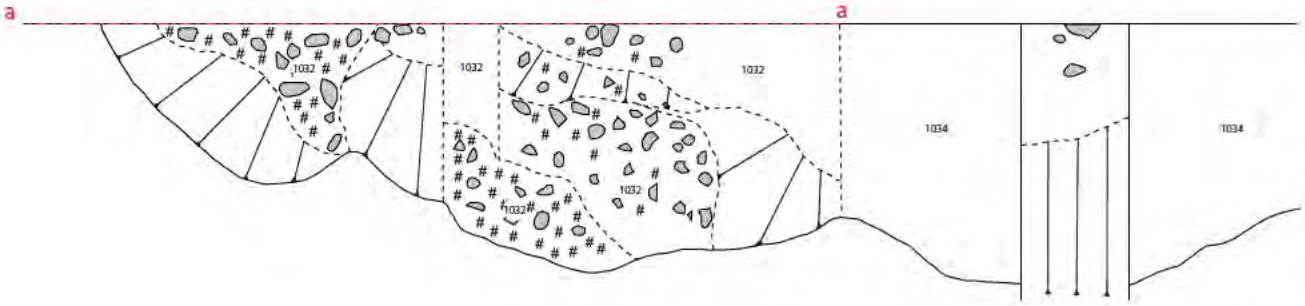
Figure 18. Site 2 PRN 31283: polsihed axe from posthole context (0139)





0 1m

N

Key

stone

charcoal-rich clay-silt

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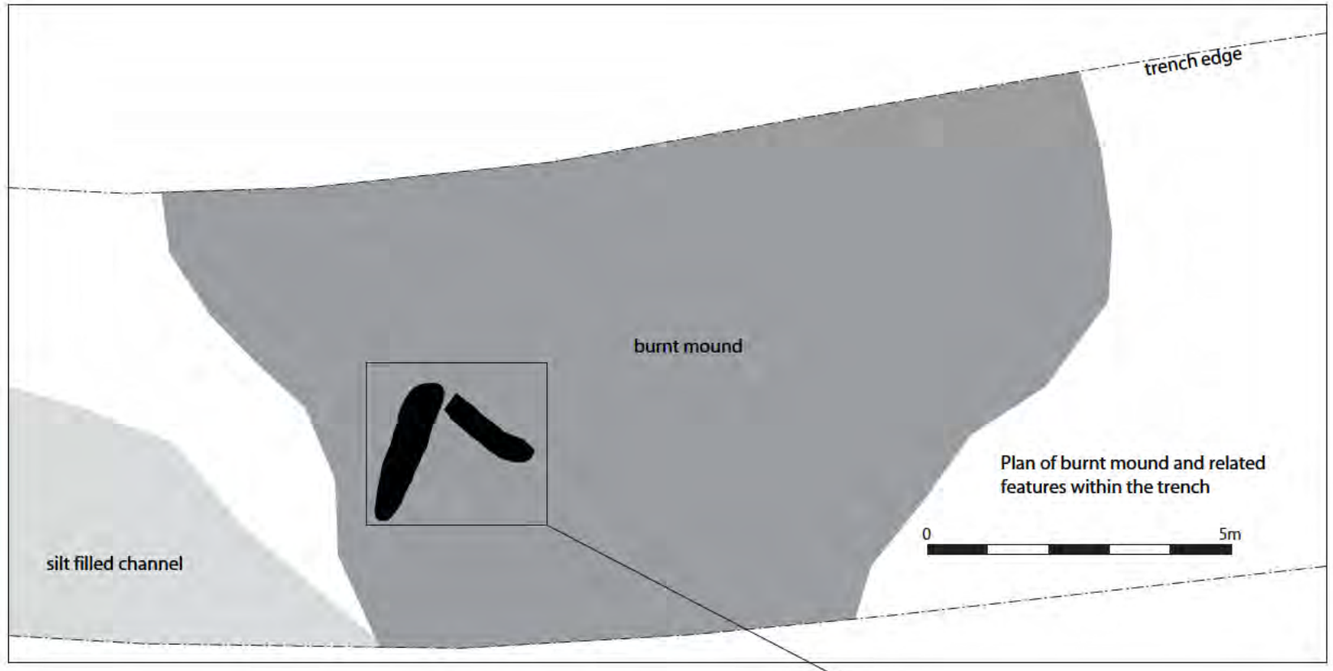
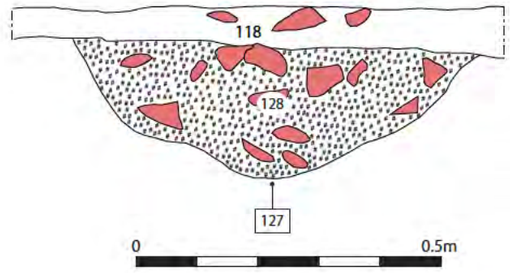
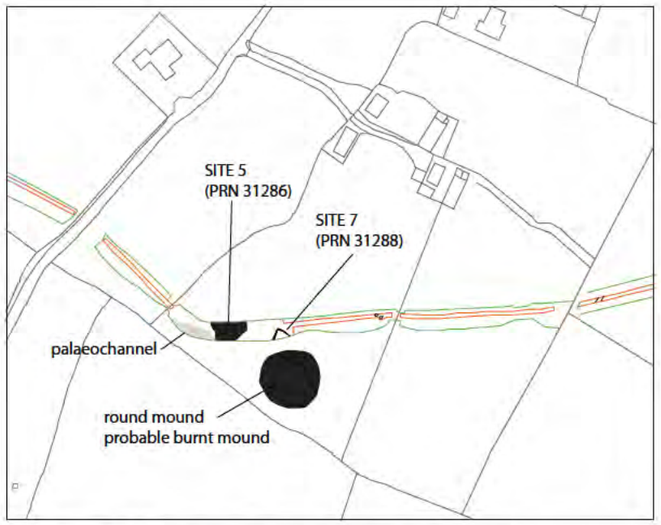
Figure 19: Site 3 PRN 31284 - Plan and Section
For the location of Site 3, cf. FIgures 01 & 02



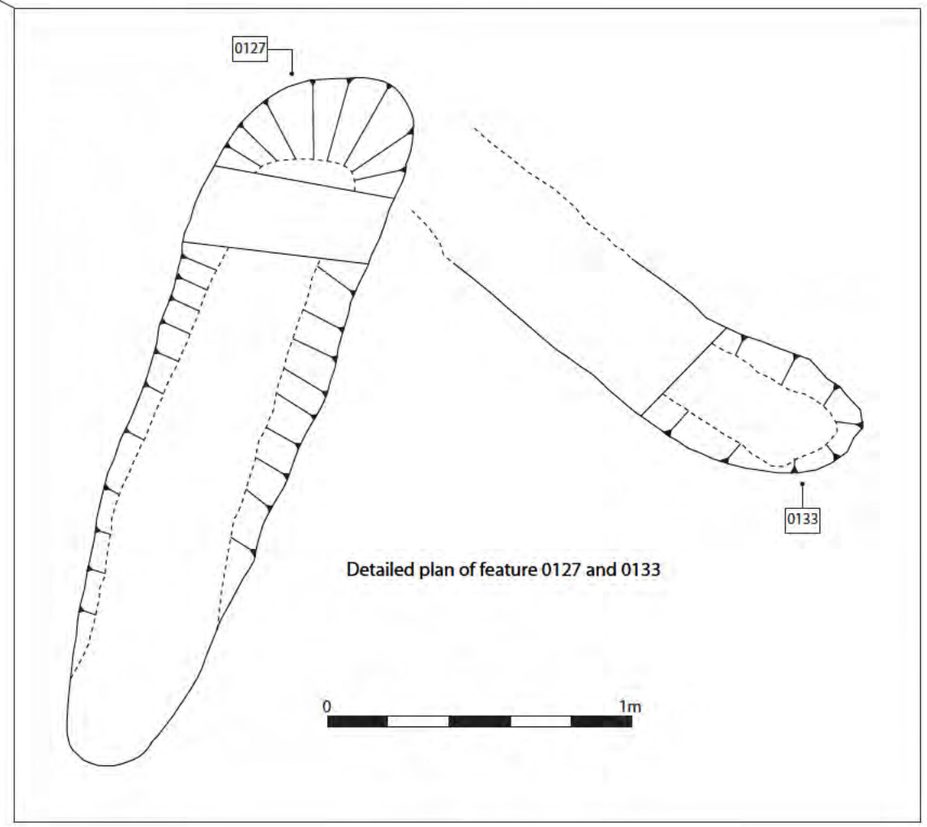
Plan of burnt mound and related features within the trench



South facing section of feature 0127



Location of sites and probable undamaged burnt mound



Detailed plan of feature 0127 and 0133

Key

burnt stone

charcoal-rich clay-silt

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Figure 20: Site 5 31286 - Plan and Section
For the location of Site 5, cf. Figure 09

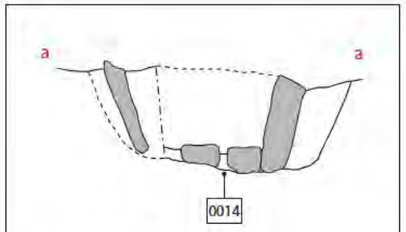

Figure 21 inset: Site 6 Section [0014] Scale 1:20

0079

Modern Water Pipe

Modern Water Pipe

Pipeline Route

Pipeline Route

0027

0031

0014

0082

a

a

0024

Easement Route

Easement Route

0011

Pipeline Route

Easement Route

Cist side slabs

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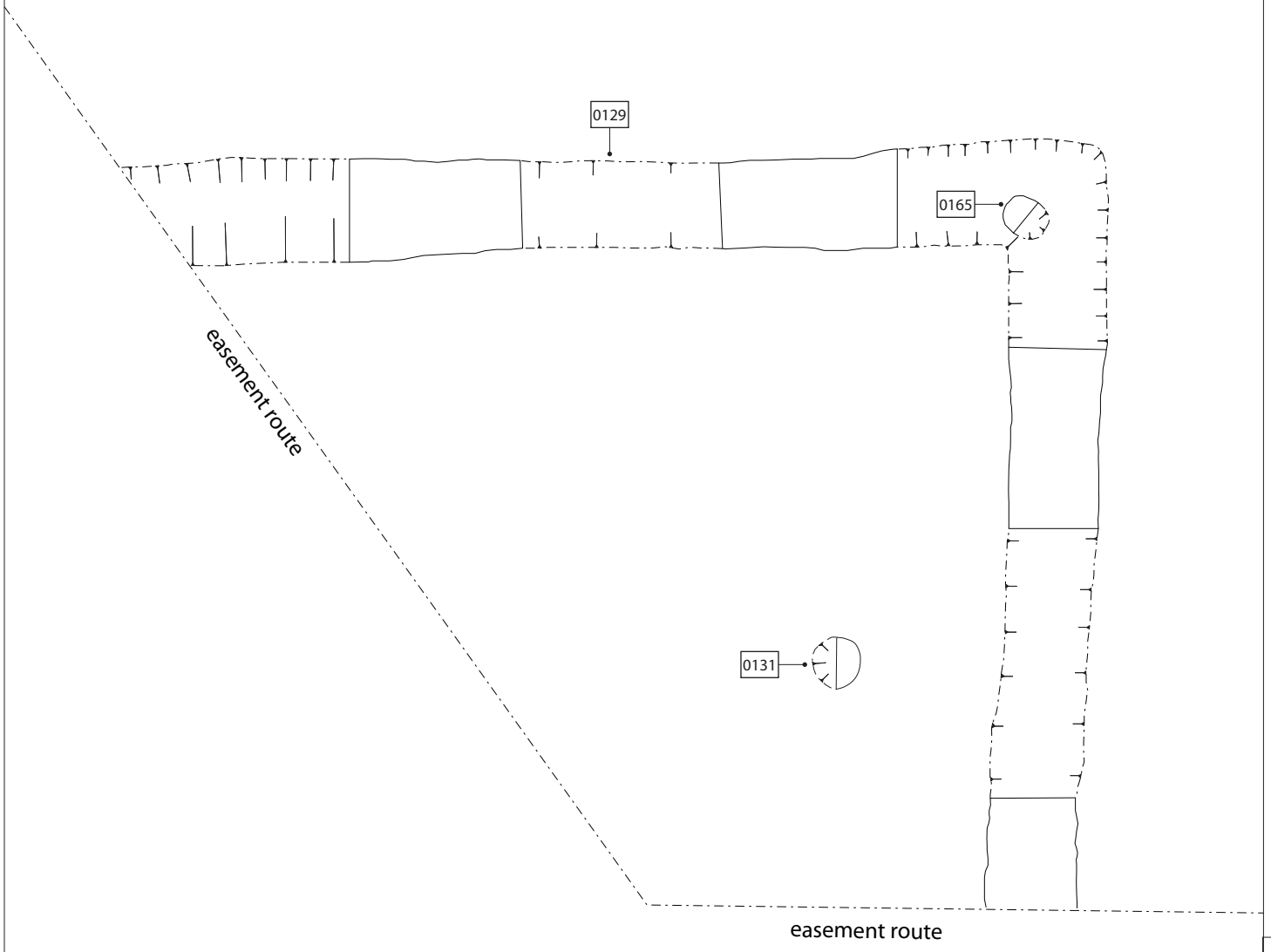
N

0 1m

Figure 21: Site 6 PRN 31287 Plan
For the location of Site 6, cf. Figures 01 & 06



0 1m

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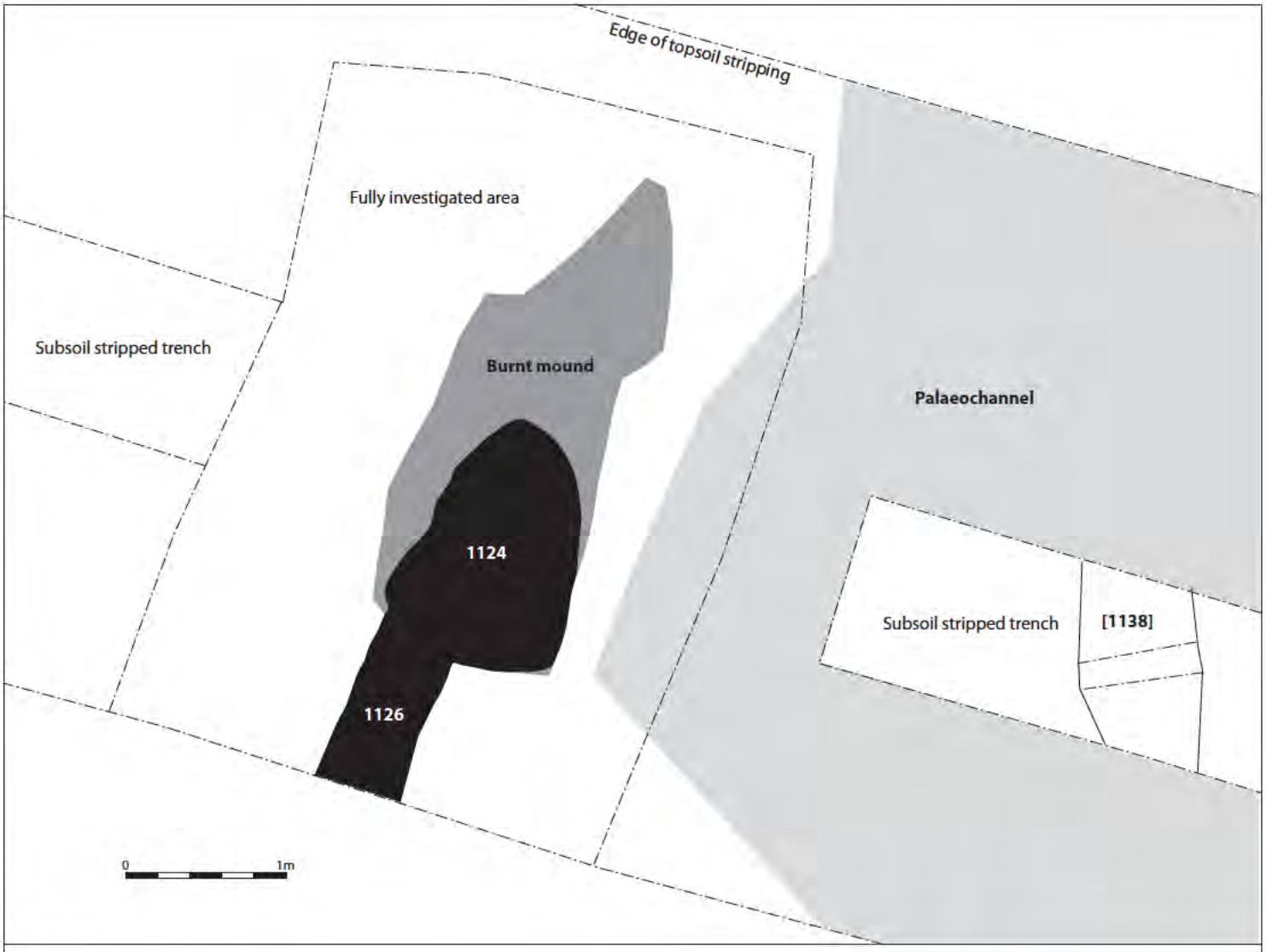
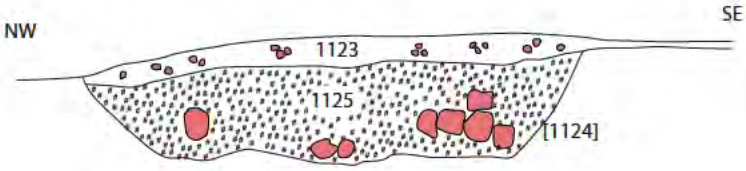
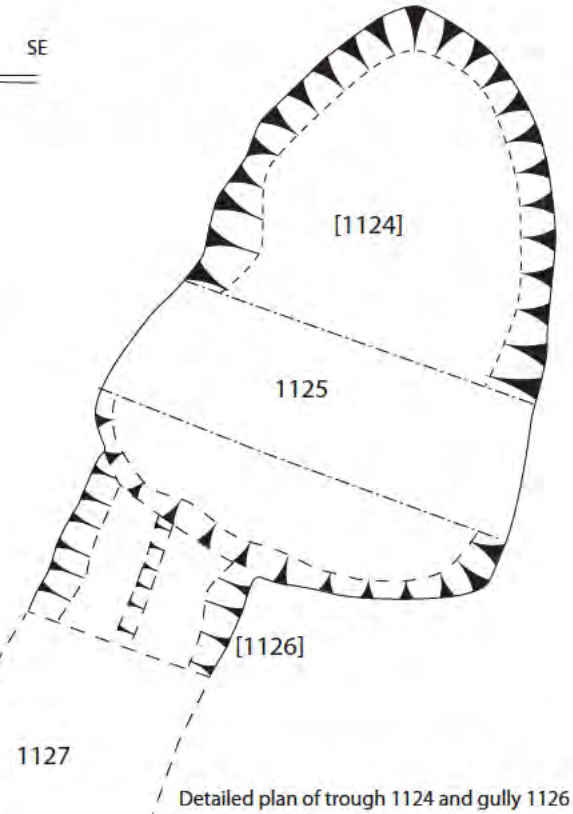
Figure 22: Site 7 PRN 31288 - Plan
For the location of Site 7, cf. Figures 01 & 09





North-east facing section of trough 1124

0 1m



Detailed plan of trough 1124 and gully 1126

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Figure 23. Site 4 PRN 31285
Burnt mound with trough
For the locaiton of Site 4, cf. Figure 05

Plate 01 - Gwalchmai to Bodffordd link main: general view west of the scheme start point detailing size and orientation of easement

Plate 02 - Gwalchmai to Bodffordd link main: view west of scheme at start point detailing full easement strip. The natural at this location was identified as morrainic drift

Plate 03 - Gwalchmai to Bodffordd link main: view west toards scheme start point detailing topsoil strip within easement. This field was the location of Site 3 (cf. Plate 04)

Plate 04 - Gwalchmai to Bodffordd link main: opposite view of Plate 03, looking east, detailing strip/map/sample of pipeline route. Note general location of Site 3 in a low point of the field.

Plate 05 - Gwalchmai to Bodffordd link main: Site 3 during excavation, detailing burnt mound spread. No trough was identified within the easement; the burnt mound spread appeared to continue outside of the easement (represented by the plastic barrier)

Plate 06 - Gwalchmai to Bodffordd link main: general view northeast of easement and strip/map/sample route taken at the 1.0km point along the scheme.

Plate 07 - Gwalchmai to Bodffordd link main: view southwest of easement route after topsoil strip. This former wetland area had been improved through extensive drainage to create grazing land. Bodwrog Church (PRN 6192) can be seen commanding the high ground. The land was improved by the Bodrwyn Estate in the 18th century

Plate 08 - Gwalchmai to Bodffordd link main: general view west c.2.5km along the scheme detailing easement and strip/map/sample route. The visible geology at this locaiton was a glacial drift.

Plate 09 - Gwalchmai to Bodffordd link main: opposite view to Plate 08, detailing easment route and strip/map/sample zone at c.2.5km along the scheme. The geology is visible as a clay-silt drift

Plate 10 - Gwalchmai to Bodffordd link main: view west of easement and strip/map/sample route detailing the exposed bedrock that characterised the 3.0km point of the scheme.

Plate 11 - Gwalchmai to Bodffordd link main: View north of Site 4: Burnt Mound, identified c.3.5km along the scheme. Extant as a truncated burnt mound, trough and gully. The latter two are visible in an unexcavated form to the right of the burnt mound spread in the wet area. The site was fully contained within the easement.

Plate 12 - Llangefni to Penmynydd replacement main: view west of the start of the scheme detailing easement width and strip/map/sample zone. The topsoil was up to 0.40m thick in this area, atop a silt-rich glacial deposit.

Plate 13 - Llangefni to Penmynydd replacement main: view east from start point during easement strip. Note the natural limestone ridge towards left of image

Plate 14 - Llangefni to Penmynydd replacement main: view west towards start of scheme at c.0.5km point detailing strip/map/sample zone, associated depth and exposed natural (clay-silt). Topsoil/Subsoil was up to 0.60m thick at this locaiton. Note replacement main towards left of image.

Plate 15 - Llangefni to Penmynydd replacement main: view east of Site 6/Cist graves located c.0.75km from the start of scheme. The site is enclosed by orange mesh fencing. The strip/map/sample zone can be seen in the foreground. Note the thick deposit of topsoil/subsoil at this location and the replacement pipes to the top left of image.

Plate 16 - Llangefni to Penmynydd replacement main: view south west of Site 6/Cist graves detailing main features after initial cleaning. The listed numbers correspond to the context numbers assigned. Cf. Figures 01 and 06 for the location of Site 6 and Figure 21 for a detailed site plan.

Plate 17 - Llangefni to Penmynydd replacement main: Site 6/Cist grave 0082 after initial cleaning

Plate 18 - Llangefni to Penmynydd replacement main: Site 6/Cist grave 0082 after removal of capping stones

Plate 19 - Llangefni to Penmynydd replacement main: Site 6/Cist grave 0082 after removal of internal fill

Plate 20 - Llangefni to Penmynydd replacement main: Site 6/Cist grave 0082 after removal of lining stones, exposing grave cut

Plate 21 - Llangefni to Penmynydd replacement main:
Site 6/Cist grave 0011 after initial cleaning

Plate 22 - Llangefni to Penmynydd replacement main:
Site 6/Cist grave 0011 after removal of linternal fill

Plate 23 - Llangefni to Penmynydd replacement main: Site 1/Neolithic Pit [context 0042] during intial cleaning. The pit is towards centre of image. The original strip/map/sample zone is located towards left of image, the centre and right of image represents the extension of the strip/map/sample zone into the remainder of the easment. The pit cut both a buried soil and the natural glacial drift. A linear feature of unknown provenance is located towards top of image, which continued outside of the easement.

Plate 24 - Llangefni to Penmynydd replacement main: Site 1/Neolithic Pit [context 0042]: northeast facing section. The pit was ovate in plan and measured 1.22m in length, 0.80m wide and 0.23m deep with a steep bowl shaped profile. The pit contained two fills: a primary fill (context 0045) 0.10m deep; a secondary fill context 0041), 0.13m deep, with frequent small to medium angular stones and lumps of burnt clay.The secondary fill contained sherds of Beaker Ware and thumbnail scrapers

Plate 25 - Llangefni to Penmynydd replacement main: General view east of the scheme c.2.0km along the route, detailing the easement strip, the strip/map/sample zone and the pipe drop. The glacial deposit is visible at the base of the strip/map/sample zone

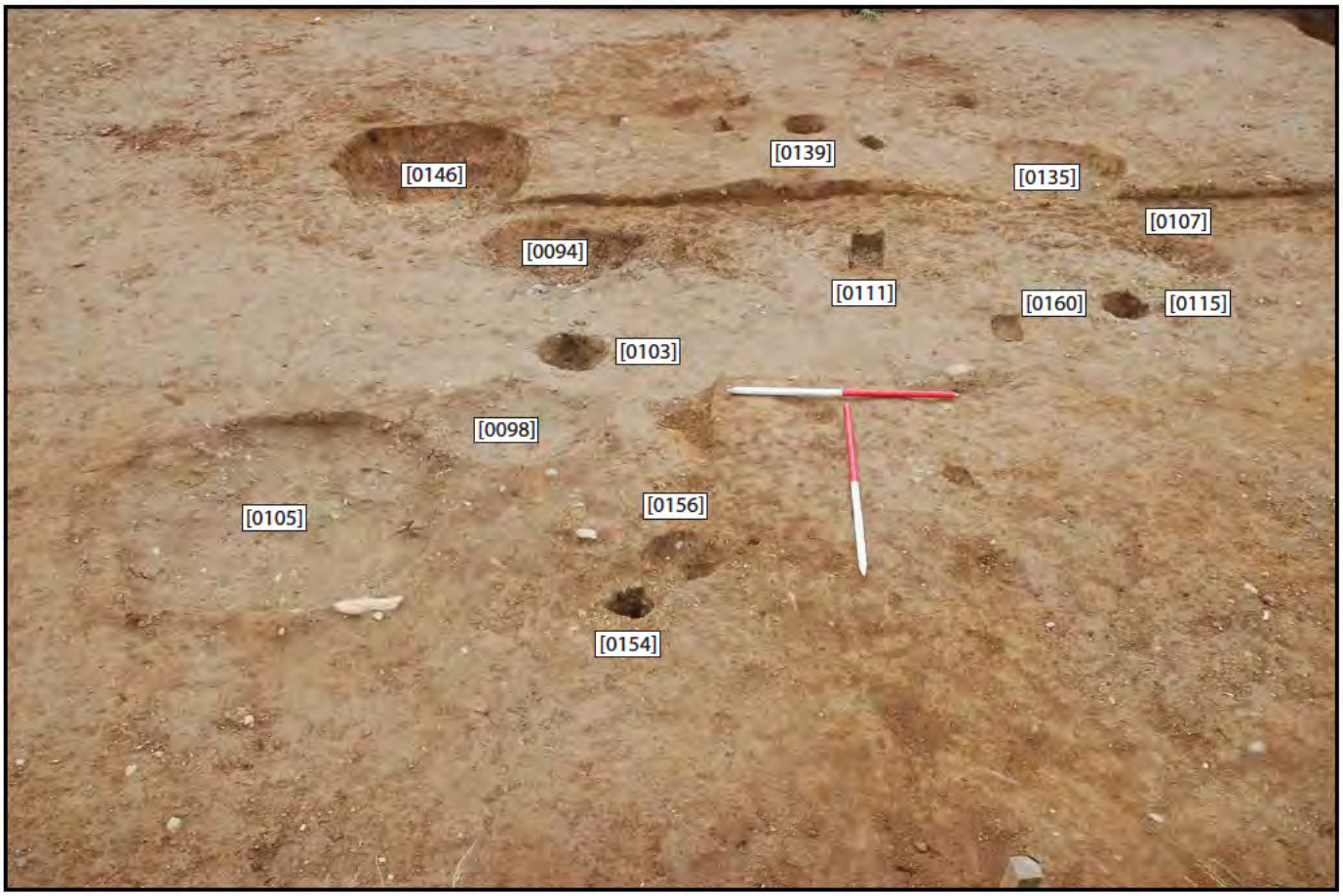

Plate 26 - Llangefni to Penmynydd replacement main: Site 2: General view of features located within the site. Site 2 was identified during the s/m/s stage and was located in a large trapezoidal shaped field north of Mynydd Mwyn Farm (centred on NGR SH50627431) and included five large pits, a smaller pit, four postholes and three stake-holes. The postholes may have supported a rectangular shaped structure. The features contained Grooved Ware vessels, four convex scrapers, an edge-retouched knife, a tang and an arrowhead.

Plate 27: Llangefni to Penmynydd replacement main: Site 2/Pit [0146] during excavation. Located the immediate south of pit [0094]; oval in plan and measured 1.60m x 1.10m in size and survived to a maximum depth of 0.42m. This pit was the largest of the five pits and the only feature to contain clear re-cuts.

Plate 28: Llangefni to Penmynydd replacement main: Site 2/Pit [0146]: during excavation, detailing re-cuts.

Plate 29: Llangefni to Penmynydd replacement main: Site 7. This site was located towards the end of the scheme, east of Sites 2 and 5 (NGR SH50817421). The site comprised a shallow ditch [context 0129] with straight edges that ran north from the easement edge for a length of 6.20m, before turning on a right angle towards the east for a distance of approximately 5.0m where it rejoined the easement.

Plate 30: Llangefni to Penmynydd replacement main: Site 7 during excavation, detailing investigative slots. The depth of the ditch ranged from 0.16m to 0.28m. A small posthole[context 0165] was identified at the apex of the ditch return. A small oval shaped feature, 0.31 x 0.36m and 0.08m deep was identified inside the ditch (visible above the ranging poles. The provenance and function of all features was unknown, but a 17th/18th century musket ball was recovered from the ditch fill.

Plate 31 - Llangefni to Penmynydd replacement main: Site 5/Burnt Mound. Site 5 was located in an irregular shaped pasture field northeast of Mynydd Mwyn Farm (centred on SH50817421), 4.58km from the start of the scheme. The site comprised a truncated spread of burnt stone and a drain or gully. The stone spread (context 0118) included a 0.22m thick deposit of silt-clay with frequent (up to 80%) fire cracked stones and a large amount of charcoal staining. No datable material was recovered from the palaeoenvironmental samples taken.

Plate 32 - Llangefni to Penmynydd replacement main: view north at scheme end point, detailing the easement, the strip/map/sample zone and the pipe drop. Note the glacial drift geology at 0.50m below ground surface level. Two post-medieval drainage ditches are visible close to the ranging pole. Bedrock is visible towards top of image. The replacement main terminated at the Penmynydd reservoir.

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