N6 KINNEGAD – ATHLONE SCHEME PHASE 2: KILBEGGAN TO ATHLONE DUAL CARRIAGEWAY

SITE A016/052; E2678: BURROW OR GLENNANUMMER 1

FINAL REPORT

ON BEHALF OF WESTMEATH COUNTY COUNCIL

15 JUNE 2009

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project Reference No.	WH/00/112
Project	N6 Kilbeggan-Athlone
Ministerial Direction Reference No.	A016/052
NMS Registration Number	E2678
Excavation Director	Tim Coughlan
Senior Archaeologist	Shane Delaney
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Westmeath County Council
Site Name	Burrow or Glennanummer 1
Site Type	Burnt Mound and Timber-Lined Trough
Townland	Burrow or Glennanummer
Parish	Kilcumreragh
County	Offaly
NGR (Easting)	E 223351
NGR (Northing)	N 237903
Chainage	18350
Height m OD	61.3m OD
RMP No.	N/A
Excavation Start Date	19 April 2006
Excavation Duration	3 Days
Report Type	Final
Report Date	15 June 2009
Report By	Tim Coughlan

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This report has been prepared by Irish Archaeological Consultancy Ltd on behalf of Westmeath County Council and the National Roads Authority in advance of the construction of the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme.

The excavation was carried out in accordance with the Directions of the Minister for the Environment, Heritage and Local Government (DOEHLG), in consultation with the National Museum of Ireland (NMI) issued under Section 14 of the National Monuments Acts 1930–2004.

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ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by Westmeath County Council (WCC) and the National Roads Authority (NRA), undertook an excavation in the townland of Burrow or Glennanummer at the site of Burrow or Glennanummer 1 in advance of the proposed N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme (Figure 1). The following report describes the final results of archaeological fieldwork at that site. The area was fully excavated by Tim Coughlan under Ministerial Direction (A016/052) and NMS Registration Number E2678 issued by the DOEHLG in consultation with the National Museum of Ireland. The fieldwork took place between 19 and 21 April 2006.

The site at Burrow or Glennanummer 1 was located 4.5km east of Moate town on a small ridge protruding from low lying boggy land. Excavations at the site revealed a disturbed burnt mound and a timber-lined trough. Pomoideae charcoal retrieved from trough fill C4 returned a 2 Sigma calibrated date of 1372–1129 BC placing this deposit within an Irish middle Bronze Age context. The original burnt mound had been significantly disturbed, probably due to modern agricultural practices, and was recorded in two separate deposits. A cut of unknown function was also recorded on site and was filled with burnt mound type material. No finds were recovered during the excavation. Burrow or Glennanummer 1 was part of a cluster of burnt mounds including Burrow or Glennanummer 2 and 3 as well as a significant number recorded in nearby townlands.

CONTENTS

List of Figures:

List of Plates:

1 INTRODUCTION

1.1 General

This report describes the final results of the excavation carried out at the site of Burrow or Glennanummer 1 in the townland of Burrow or Glennanummer, Co. Offaly (Figures 1 and 2) as part of an archaeological mitigation program associated with the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme. Archaeological fieldwork was carried out under ministerial direction by Tim Coughlan of Irish Archaeological Consultancy Ltd (IAC Ltd) and was funded by Westmeath County Council & the National Roads Authority under the National Development Plan 2000–2006, 2007–2013 and the EU Structural fund.

Burrow or Glennanummer 1 was identified during an archaeological assessment undertaken by IAC Ltd. in July 2005 (NMS Registration No. E3273). All features identified during the assessment phase (a burnt mound spread) were subsequently re-identified and the site was fully excavated during the full resolution phase of the site which took place between 19 and 21 April 2006 with a team of 1 director, 1 supervisor and a maximum of 12 site assistants.

The site was located in low lying boggy pastureland, on a small ridge protruding above the peat, north of a stream and at a height of 61.3m OD. It was situated c. 1.5km south of the existing N6 and c. 4.5km east of Moate (Offaly OS sheet 2). Burrow or Glennanummer 1 had not been previously identified and was not a recorded monument.

The site was assigned the following identification data:

Site Name: Burrow or Glennanummer 1; Ministerial Direction No.: A016/052; NMS Registration No.: E2678; Route Chainage (Ch): 18350; NGR: 223351/237903.

1.2 Proposed Development

The proposed N6 Kinnegad–Athlone Scheme is to be constructed in two phases. The Phase 2 Kilbeggan–Athlone scheme will consist of a dual carriageway that will run for a distance of approximately 29km. The location of the route is predominantly to the south of the existing N6 and there will be access to the local road network through the seven grade separated junctions located at Athlone, Farnagh, Moate and Kilbeggan. The cross-section of the mainline consists of 2m wide verges, 2.5m wide hard shoulders, 7m wide two-lane carriageways and a 3m wide central reserve. This central reserve will accommodate 1m hard strips and a safety barrier. In addition to the mainline dual carriageway there is a further 0.3km of standard dual carriageway to the south of Athlone Interchange to connect to the existing N6 and 1.2km to the south of Kilbeggan Interchange to connect to the existing N52.

1.3 Archaeological Requirements

The archaeological requirements for the N6 Kilbeggan to Athlone Dual Carriageway Scheme, are outlined in the Ministerial Directions issued to Westmeath County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and in the terms of the contract between Westmeath County Council and IAC Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Kilbeggan South, Co. Westmeath and Creggan Lower, Co. Westmeath.

The proposed N6 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Sheila Lane and

Associates and presented in 2003. The Record of Monuments and Places, the Sites and Monuments Record, Topographical files, aerial photography, the Westmeath Archaeological Urban Survey and literary sources were all consulted. One phase of geophysical survey was also conducted at selected sites along the proposed route by Target Archaeological Geophysics. As a result of the paper survey, field inspections and geophysical survey, a number of potential sites were recorded in proximity to this section of the overall route alignment.

Advance archaeological testing was completed by IAC Ltd and excavation of the sites identified during testing was conducted by IAC Ltd on behalf of Westmeath County Council.

1.4 Methodology

The topsoil was reduced to the interface between natural and topsoil using a 20 tonne mechanical excavator equipped with a flat toothless bucket under strict archaeological supervision. The remaining topsoil was removed by the archaeological team with the use of shovels, hoes and trowels in order to expose and identify the archaeological remains. A site grid was set up at 10m intervals and was subsequently calibrated to the national grid using GPS survey equipment.

All features were subsequently fully excavated by hand and recorded using the single context recording system with plans and sections being produced at a scale of 1:50, 1:20 or 1:10 as appropriate.

A complete photographic record was maintained throughout the excavation. Digital photographs were taken of all features and of work in progress.

An environmental strategy was devised at the beginning of the excavation. Where relevant features exhibiting large amounts of carbonised material were the primary targets. If present, features containing metallurgical waste were fully sampled for analysis.

Radiocarbon dating of the site was carried out by means of AMS (Accelerator Mass Spectrometry) dating of identified and recommended charcoal samples. All calibrated AMS dates in this report are quoted to 2 Sigma.

All excavation and post excavation works were carried out in consultation and agreement with the Project Archaeologist, the National Monuments Section of the DOEHLG and the National Museum of Ireland.

2 EXCAVATION RESULTS

A disturbed burnt mound, a timber-lined trough and a cut of unknown function were identified at Burrow or Glennanummer 1 described as a single phase of activity (Phase 2). Phase 3 describes the modern activity on site. Phase 1 describes the subsoil and Phase 4 describes the topsoil. Detailed descriptions of the contexts are listed in Appendix 1. The site matrix is detailed in Figure 7.

2.1 Phase 1: Natural Drift Geology

The dominant bedrock geology identified along the corridor of the proposed route are Lower Carboniferous rocks, mainly limestone lithologies, which overlay Devonian Old Red Sandstone rocks. Carboniferous volcanic rocks were also identified as being present locally in the form of sills passing through the bedrock sequences (Riada Consult, 2003). The underlying geology of the area is overlain by occasional moraines and small glacial hillocks covered by grey brown podzolic soils.

The subsoil C2 above bedrock encountered at Burrow or Glennanummer 1 was uniform across the site and consisted of mottled dark grey/brown sandy clay.

2.2 Phase 2: Bronze Age Burnt Mound

2.2.1 Trough C6

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
3	C6	2.03	1	0.24	Timber planks, 10 planks av. 0.95h/0.2w	Base of trough
4	C6	2.1	1.2	0.28	Yellow/grey sand/clay with charcoal	Fill of trough
5	N/A	N/A	N/A	N/A	Brown silt mottled with light grey silt	Re-deposited natural
6	N/A	2.1	1.13	0.24	Rectangular cut, base flat	Trough cut

Finds: None

Interpretation:
These contexts represent a large rectangular timber-lined trough C6 (Figures 4 and 5; Plates 2 and 3; 61.23m OD at base on surface of timbers). The trough was lined by 10 fragmentary timber planks (C3). Five stakeholes (Plate 3) were also recorded cutting the base of the trough. Trough fill C4 contained material similar to that of the overlying burnt mound. Re-deposited natural (C5) sealed the trough. A sample of pomoideae charcoal (10.3g) (O'Carroll, Appendix 2.1) retrieved from fill C4 was selected for AMS radiocarbon dating and returned a date of 2999 +/- 26 BP (UBA 8604, Appendix 2.2). The 2 Sigma calibrated result was 1372–1129 BC dating this deposit to the middle Bronze Age (*ibid.*).

The environmental (charcoal) analysis from fill C4 indicated that hazel, pomoideae and ash trees were more dominant with a lesser presence of alder, oak and holly. The twelve wood samples analysed from the trough lining and base planks (C3) were all identified as split alder (*Alnus glutinosa*) (O'Carroll, Appendix 2.1). Alder would have been selected as it would produce larger planks and would have been easily split and worked for use as timber lining in troughs. The two stakes were identified as ash (*Fraxinus excelsior*) and both were pencil pointed (Plate 6). The wood analysis points to the presence of people skilled in timber splitting techniques in the area, who were using metal axes and most probably wooden wedges and mallets in order to split the alder wood and sharpen the ash stakes (*ibid.*).

2.2.2 Burnt Mound Material

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
9	N/A	7.65	5.22	N/A	Dark grey, extremely sandy/stony	Burnt mound material
10	N/A	7.2	N/A	N/A	Dark brown/black, peaty, charcoal flecks	Spread
11	N/A	12.8	7.8	N/A	Brown/black, wet-heavy rooty clay	Peat-like material
16	N/A	1.2	N/A	N/A	Grey sandy clay with stone inclusions	Stony grey spread

Finds: None

Interpretation:
These deposits represented the residual burnt mound material that was identified on site (Figures 4 and 6; Plate 1). They were likely to have represented the levelling/disturbance of the burnt mound material due to modern agricultural practices.

2.2.3 Spreads

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
17	N/A	8.5	3.65	0.26	Orange/brown sandy clay, stones	Spread
18	N/A	8.5	1.65	0.22	Black/dark grey sandy clay, stone	Spread

Finds: None

Interpretation:
These two deposits represented the disturbance of burnt mound material from the original burnt mound by modern agricultural activity (Figure 4).

2.2.4 Cut C8

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
7	C8	3.94	N/A	0.18	Grey silt/clay, burnt stones, charcoal	Burnt spread material
8	N/A	3.94	N/A	0.18	Flat uneven base, sides not perceptible	Cut

Finds: None

Interpretation:
Shallow cut C8 was located to the northwest of trough C6 (Figure 4). Its fill C7 consisted of burnt mound-type material and contained some wood (Figure 6; Plate 5). The function of the feature is unknown although it may be directly associated with the Bronze Age activity on site given its close proximity to the trough and the nature of its fill.

2.3 Phase 3: Modern Activity

2.3.1 Modern Pipelines

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
12	N/A	10.1	0.25	0.13	Linear cut, concave base	Modern pipeline
13	C12	10.1	0.25	0.16	Light brown silty clay with pebbles	Fill of pipeline
14	N/A	14.35	0.19	0.16	Linear cut, concave base	Modern pipeline
15	C14	14.35	0.19	0.16	Light brown silty clay with pebbles	Fill of pipeline

Finds: None

Interpretation:
These two pipelines extended in different directions. C12 extended north to south and C14 extended southwest to northeast, to the west of the main area of archaeological activity. They were filled with similar fills and intersected towards the south end of pipeline C12. These features truncated the burnt mound material (Cf. Section 2.2.2; Figures 4 and 6).

2.4 Phase 4: Topsoil

2.4.1 Topsoil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
1	N/A	N/A	N/A	N/A	Light grey clay	Topsoil

Finds: None

Interpretation:
Phase 4 represents the topsoil that sealed all of the archaeological deposits and features at Burrow or Glennanummer 1.

3 SYNTHESIS AND DISCUSSION

3.1 Landscape Setting

The new route of the N6 runs from south of Kilbeggan town to east of Athlone Co. Westmeath, crossing through the northern part of Co. Offaly for approximately 7.5km of its entire length. The landscape of this area is comprised of generally flat to undulating terrain. The underlying geology of the area is dominated by carboniferous limestone and is overlain by occasional glacial features such as moraines and eskers. The eskers dominate to the north and south of most of the route, with moraines featuring along parts of the western section toward Athlone. The soil cover varies considerably across the scheme, passing through soil complexes, grey brown podzols, boglands and alluvial deposits. The area is drained by the River Shannon through its tributaries, the Brosna, Boor, Cloghatanny and Gageborough rivers.

The site at Burrow or Glennanummer was located 4.5km east of Moate town on a small ridge protruding from low lying boggy land (61.3m OD). The underlying geology of the area is carboniferous limestone, which is overlain with occasional small glacial hillocks, forming a gently undulating low-lying landscape. Soil cover in this area consists of peat of the Banagher deep phase series which extends over 300m to the south and west into Kilcurley townland and eastwards for 550m into Burrows townland. On the 25" OS map (1887–1913) the field in which the site was located was marked as liable to flood. Today a small stream flows to the south of the site and joins up with the Gageborough River.

3.2 Archaeological Landscape (Bronze Age)

Apart from the publication of archaeological inventories in some midland counties, such as Offaly (O'Brien and Sweetman 1997), and peat-land surveys by the Irish Archaeological Wetland Unit (Moloney *et al*. 1993), our knowledge of the prehistoric archaeology of the midlands is limited (there is no archaeological inventory for Co. Westmeath). We are reliant on data stored at the RMP (see Appendix 3) and information from a limited number of excavations within Westmeath and Offaly. The most important of these is Hencken's (1942) investigation at Ballinderry crannog II in the barony of Kilcoursey, Co. Offaly, which revealed a late Bronze Age settlement phase (see also Newman 1997). This picture is quickly changing as a result of commercially-driven archaeology such as the gas pipeline to the west (Grogan *et al*. 2007) which runs mostly parallel a short distance to the north of the N6, and excavations in advance of this road scheme.

The gas pipeline archaeological investigations have been extremely informative for identifying a range of archaeological sites in south Westmeath a county which has traditionally witnessed only minor scholarly research (Grogan *et al*. 2007, 24). This is most apparent for the Bronze Age as both the gas pipeline and excavations along the N6 have identified a wealth of domestic and burial evidence covering the early, middle and late parts of the period.

The area immediately surrounding Kilbeggan contains direct evidence for a range of Bronze Age sites including barrows, cists and an early Bronze Age pit burial (Grogan *et al*. 2007, 138, fig. 6.6). The cists, at Ardballymore (WM037-009) and Kilgaroan (WM037-010), are located in close proximity to a number of sites impacted by the N6 including those in the townlands of (moving east to west) Kilbeggan South, Tonaphort, Ballinderry Big, Kilgaroan, Ardballymore, Ballinderry Little, Correagh and Kilbeg. This is significant because sites within the majority of these townlands (except Ballinderry Little 1 which was not dated) have produced early to late Bronze Age evidence almost exclusively represented by burnt mounds or components of these.

Prior to the gas pipeline, a small number of excavations had occurred to the north and the northeast of the N6 including the cemetery sites at Knockast (Hencken and Movius 1934; Grogan 2004), Edmondstown (Mount and Hartnett 1993) and Ballybrennan, Barrettstown and Redmondstown (see Waddell 1990). Added to this is the crannog at Coolure, on Lough Derravarragh within the barony of Moycashel, which was the focus of archaeological survey, environmental investigation and artefactual and landscape research (O'Sullivan *et al*. 2007). The island was first occupied in c. 850 BC, during the late Bronze Age, and several late Bronze Age weapons and ornaments have been recovered nearby in the small bay (*ibid*.). The gas pipeline excavations have added considerably to our knowledge of the Bronze Age in this region and Grogan *et al*. (2007, 139) have identified three principal Bronze Age focal zones in –

- The valleys of the Brosna and Clodiagh rivers to the south and east of Kilbeggan.
- The hilly terrain around the Hill of Uisneach.
- The slightly elevated area around Edmondstown to the west of Killucan.

Before the gas pipeline and N6 excavations south Westmeath was considered a 'quiet' zone but a much more intensive Bronze Age landscape has emerged possibly related to the major Bronze Age centre at Knockast (*ibid*., 161). The pipeline revealed a dominance of Bronze Age archaeology mainly dating to the middle and late parts of the period. Settlement, for example, is indicated by the middle Bronze Age house at Knockdomny 3km northwest of Moate town (Hull 2006), and by a number of burnt mounds such as Ballynagarbry, directly to the west of Moate, and at Williamstown (Grogan *et al*. 2007, 139). The N6 traversed the latter townland and revealed a burnt spread dating to the late Bronze Age.

Important late Bronze Age settlements were uncovered in advance of the N6 including the possible house at Creggan Lower 1 and the house, boundary fences and pits at Tober 1. The large rectangular late Bronze Age house at Ballinderry crannog II (Newman 1997 has since argued for the presence of a second rectangular Bronze Age structure) was identified as a thin black deposit which contained occupational debris and fragments of timbers and brushwoods and produced many finds including pottery, knives, flesh-hooks, awls, rings, pins, beads and a variety of stone objects (Hencken 1942, 6–8). When added together these sites demonstrate that this was a well-settled and established region notably in the later part of the period. This interpretation is further reinforced by the large number of burnt mounds that were discovered along the N6 and some notable clusters within certain townlands, for example, at Cregganmacar, Burrow or Glennanummer and Kilbeg.

In Athlone, at the western edge of the scheme and close to Creggan Lower 1, an assortment of high-status Bronze Age artefacts, mainly dating to the middle and late periods, are well represented including, for example, a gold lunula, bronze flat axes and rapiers and later gold items such as bar torcs, penannular bracelets, dress fasteners and ring money (Murtagh 2000, 9). The distribution of further high-status artefacts including the hoards from Ballinderry, Killulagh, Brockagh and Enniscoffey provide further evidence of a well settled Bronze Age landscape in this region (Eogan 1983; Grogan *et al.* 2007, 161). Both the pipeline and N6 excavations have demonstrated how quickly perceptions and knowledge of archaeological landscapes can change as new sites are revealed in areas previously thought to be mostly devoid of such.

Bronze Age Burrow or Glennanummer 1

Burrow or Glennanummer 1 consisted of a burnt mound and a shallow rectangular trough with timber lining. The trough fill produced a 2 Sigma calibrated radiocarbon date of 1372–1129 BC placing the site in the middle Bronze Age. Excavations in advance of the N6 within the same townland also revealed a number of other burnt mound sites. A morphologically similar and contemporary site was revealed at Burrow or Glennanummer 2 (Coughlan 2009a). It survived as a burnt mound that sealed a rectangular wood-lined trough which was dated to 1268–1118 BC (2 Sigma). The remaining burnt mound site in the townland, at Burrow or Glennanummer 3 (Coughlan 2009b), was the most complex of the three sites. Excavations revealed a large burnt mound and a number of troughs that were spatially and physically related through connecting channels and their topographical location. They were constructed in such a way that water in a sub-rectangular trough ran into an oval trough. Twenty three stakeholes were present around a third possible trough – possibly forming a sweathouse – and it appears that it was also related to the neighbouring burnt mound features. Radiocarbon dates from various features at Burrow or Glennanummer 3 reveal that it was utilised throughout the Bronze Age and it is likely that all three Burrow or Glennanummer burnt mound sites were in use contemporaneously for a time during the middle Bronze Age.

Excavations along the N6 also revealed a number of burnt mound sites in proximity to Burrow or Glennanummer. Although later in date, Russagh 2 and 3 were located approximately 2.5km to the east. The former consisted of a late Bronze Age burnt spread, dated to 1181–923 BC (2 Sigma), that overlay a pit (O'Carroll 2009a). A contemporary burnt mound site – a burnt spread that overlay charcoal-rich pits – was located within the same townland at Russagh 3 and was similarly returned a 2 Sigma date range of 1191–939 BC (O'Carroll 2009b). Moving west, the nearest burnt mound sites were approximately 6km away in the townland of Cregganmacar. Cregganmacar 3 consisted of a burnt mound that sealed a potential trough with postholes in its base (Lynch 2009a). The mound was dated to the middle Bronze Age and was possibly contemporary with Burrow or Glennanummer 1. At Cregganmacar 1, a layer of burnt mound material overlay a single pit containing four postholes and returned a 2 Sigma date range of 399–235 BC (Lynch 2009b). At Cregganmacar 2, a burnt spread sealed one trough while another, to the northeast, contained four postholes (Lynch 2009c). A pit, directly north of the burnt spread and with a similar fill, was dated to 912–822 BC (2 Sigma) placing it in the late Bronze Age. Finally, another burnt mound site was excavated in the townland at Cregganmacar 4 although no trough was located. It was dated to the early Bronze Age (Lynch 2009d), and although the four burnt mound sites in Cregganmacar had many similar features none were in use at the same time.

Domestic activity within the local landscape was evident at Tober 1 just 1km to the west of Burrow or Glennanummer (Walsh 2009a). Excavations revealed a round house that was constructed of a double ring of postholes with an internal hearth. A number of boundary fences and pits were also uncovered and the site has been dated to the middle and late Bronze Age with the possibility that it was contemporary with Burrow or Glennanummer 1.

The presence of timber lining within the Burrow or Glennanummer troughs is paralleled by a number of burnt mound sites along the N6. Troughs at Correagh 1 (Lynch 2009e) and Tonaphort 1 (Coughlan 2009c) contained evidence for both postholes and wood lining and wood-lined troughs also occurred at Aghafin 1 (Lynch 2009f), and Kilbeg 3/4, 6 and 7 (Walsh 2009b; Lyne 2009; McManus 2009). Evidence for this has been revealed on other schemes, for example the gas pipeline to the

west, where seven troughs had stakeholes or *in-situ* pegs present while a further five contained *in-situ* timber lining (Grogan *et al* 2007, 85).

The vast majority of burnt mound sites date to the Bronze Age and were most commonly utilised during the middle and later parts of the period (Brindley *et al* 1989−90; Corlett 1997), and the findings from Burrow or Glennanummer 1 are consistent with this.

The burnt mound site at Burrow or Glennanummer 1 is paralleled by a number of similar sites that were revealed along the N6 between Athlone and Kilbeggan. The clustering of burnt mounds in the townland is replicated in other townlands, for example, at Williamstown, Cregganmacar and Kilbeg and this was also evident at Newtown (Stevens 2004a, 2004b, 2004c) and Enniscoffey/Caran (Molloy 2007a, 2007b, 2007c, 341–2), during excavations in other parts of Co. Westmeath. Archaeological investigation on other sections of the N6 has also uncovered various burnt mound sites, for example at Stonehousefarm 6.1 and 6.2 (McDermott 2004).

3.3 Archaeological Typology Background (Burnt Mounds)

Burnt mound sites (also commonly referred to as *Fulacht Fiadh*) are one of the most common field monuments found in the Irish landscape. The last published survey (Power *et al*. 1997), carried out over a decade ago, recorded over 7,000 burnt mound sites and in excess of 1,000 sites have been excavated in recent years through development led archaeological investigations. In spite of this no clear understanding of the precise function of these sites has being forthcoming.

Burnt mound sites are typically located in areas where there is a readily available water source, often in proximity to a river or stream or in places with a high water table. In the field burnt mounds may be identified as charcoal-rich mounds or spreads of heat shattered stones, however, in many cases the sites have been disturbed by later agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

Ó Néill (2003–2004, 82) has aptly identified these sites as the apparatus and by-product of pyrolithic technology. This technology involved the heating or boiling of water by placing fire-heated stones into troughs of water. Small shallow round-bottomed pits, generally referred to as pot boiler pits or roasting pits, are often associated with burnt mound sites. The purpose of these pits remains unclear. Occasionally large pits are also identified and may have acted as wells or cisterns. Linear gullies may extend across the site, often linked to troughs and pits, and demonstrate a concern with onsite water management. Post and stakeholes are often found on burnt mound sites and these may represent the remains of small structures or wind breakers.

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al*. 1989−90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al*. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh, 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a components of the Bronze Age landscape, the use of pyrolithic technology has a long history in Ireland.

Although there is a general consensus that burnt mound sites are the result of pyrolithic technology for the heating or boiling of water, the precise function of these sites has, to date, not been agreed upon. Several theories have been proposed but

no single theory has received unanimous support. The most enduring theory is that burnt mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al*. 2007).

3.4 Discussion

3.4.1 Phase 1: Natural Drift Geology

This phase represents the natural subsoil, which was cut or sealed by all subsequent archaeological features. For the purposes of recording on-site this phase of activity was allocated the context number C2. The subsoil C2 above bedrock encountered at Burrow or Glennanummer 1 was uniform across the site and consisted of mottled dark grey/brown sandy clay.

3.4.2 Phase 2: Bronze Age

Phase 2 represented the Bronze Age activity on site which consisted of disturbed burnt mound material and a timber-lined trough. A sample of pomoideae charcoal retrieved from trough fill C4 was selected for AMS radiocarbon dating and returned a date of 2999 +/- 26 BP (UBA 8604, Appendix 2.2). The 2 Sigma calibrated result was 1372–1129 BC dating this deposit to the middle Bronze Age (*ibid.*). The trough lining and the base planks were identified as split alder (*Alnus glutinosa*) and the two stakes were identified as ash (*Fraxinus excelsior*) (O'Carroll, Appendix 2.1). The burnt mound itself was most likely disturbed by modern agricultural practices and was recorded in two areas on site. A cut of unknown function filled with burnt mound-type material was also recorded in close proximity to the trough.

Two other burnt mound sites were located nearby. Burrow or Glennanummer 2 was located 60m to northeast and returned a middle Bronze Age date. Burrow or Glennanummer 3 was located 230m to the northeast and returned dates from throughout the Bronze Age. Additional burnt mound sites were also recorded between 2.5–6km away and returned dates from throughout the Bronze Age.

3.4.3 Phase 3: Modern Activity

Phase 3 represents the modern activity on site. This consisted of two pipelines, one extending from north to south and one extending from southwest to northeast. Both truncated the burnt mound material (Cf. Section 2.2.2).

3.4.4 Phase 4: Topsoil

Phase 4 represents the topsoil that sealed all of the archaeological deposits and features at Burrow or Glennanummer 1.

4 CONCLUSIONS

Burrow or Glennanummer 1 was located 4.5km east of Moate town on a small ridge protruding from low lying boggy land. Excavations at the site revealed a disturbed burnt mound and a rectangular wood-lined trough. A middle Bronze Age date of 1372–1129 BC (2 Sigma) was retrieved from the trough. The burnt mound itself (heat fractured stone and charcoal rich clays) had been heavily disturbed and was recorded in two separate deposits on site. The wood analysed from the lining and base of the trough was identified as split alder and the stakes were identified as ash. The analysis of this timber suggested the presence of people skilled in timber splitting techniques in the area. The environmental remains suggest the dominant presence of hazel, pomoideae and ash trees in the area as well as the lesser presence of alder, oak and holly. A cut of unknown function was also recorded. Burrow or Glennanummer 1 was part of a cluster of burnt mounds including Burrow or Glennanummer 2 and 3 as well as a significant number recorded in nearby townlands.

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PLATES

Plate 1: E2678: General view of site, mid-excavation, facing north

Plate 2: E2678: Trough C6, mid-excavation, showing timber in base, facing west

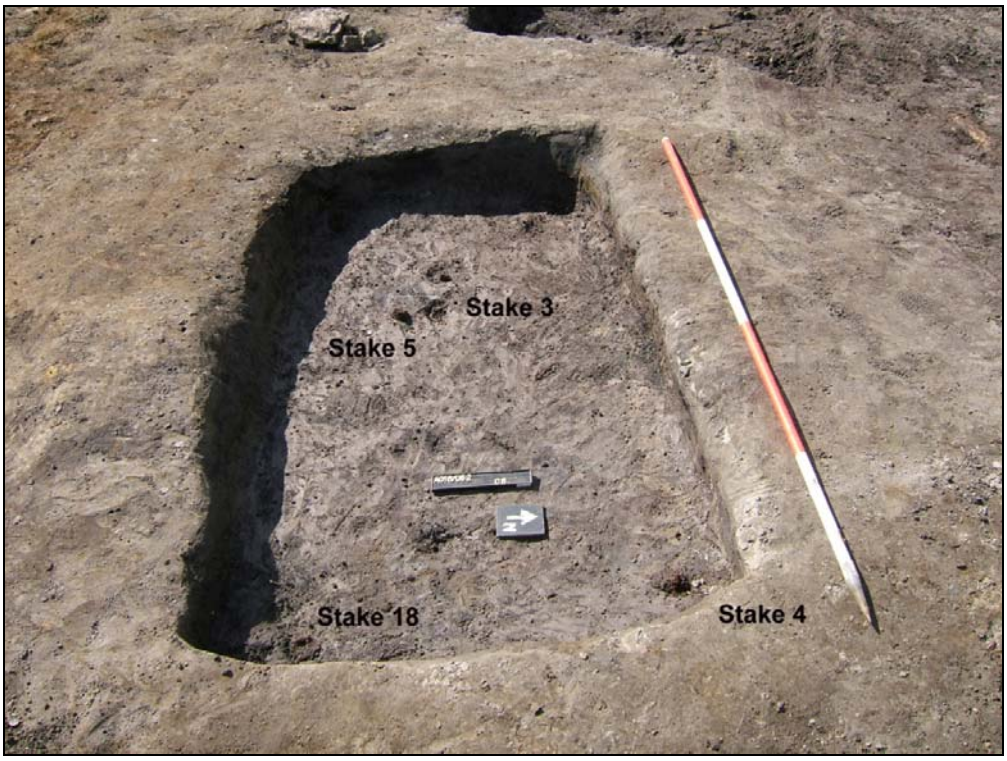

Plate 3: E2678: Trough C6, post-excavation, facing west

Plate 4: E2678: Pre-excavation of peg 5, facing west

Plate 5: E2678: Pit 8, mid-excavation, facing southwest

Plate 6: E2678: Timber 18 from trough C6

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Finds
1	N/A	N/A	N/A	N/A	Topsoil	Light grey clay.	
2	N/A	N/A	N/A	N/A	Subsoil	Mottled dark grey/brown sandy clay.	
3	C6	2.03	1.00	0.24	Bottom of wooden trough	Planks forming trough, 10 planks av. 0.95h / 0.2w.	
4	C6	2.10	1.20	0.26	Fill of trough	Light yellow sand mixed with dark grey charcoal rich silt. Med compaction, loose lower down stratum. Small/medium stones inclusions.	
5	N/A	N/A	N/A	N/A	Re-deposited natural	Light brown silt mottled with light grey silt. Firm compaction.	
6	N/A	2.10	1.13	0.24	Cut of trough	Rectangular in plan, orientated E–W, slightly rounded corners but basically square, sharp break of slope at top, vertical sides, sharp break of slope to flat base.	
7	C8	3.94	N/A	0.18	Burnt spread material	Loose, grey silty clay with burnt stones, wood, charcoal traces.	
8	N/A	3.94	N/A	0.18	Cut filled by burnt spread material	Flat uneven base, sides not perceptible.	
9	N/A	7.65	5.22	N/A	Burnt spread material	Sub-circular, loose/friable, dark grey with white speckles. Extremely sandy/stony.	
10	N/A	7.20	N/A	N/A	Spread under burnt spread material	Sub-circular, dark brown/black, soft, peaty, wet-heavy wooden, occasional charcoal flecks.	
11	N/A	12.8	7.80	N/A	Possible bog material	Sub-circular, dark black/brown, soft, extremely wet-heavy root filled clay.	
12	N/A	10.1	0.25	0.13	Modern pipeline	Linear feature, break of slope top and break of slope/base gradual, steep sides, concave base.	
13	C12	10.1	0.25	0.16	Fill of modern pipeline	Linear shape, loose/medium, light brown silty clay with pebbles.	
14	N/A	14.35	0.19	0.16	Modern pipeline	Linear feature, break of slope/top and break of slope/base gradual, steep sides, concave base.	
15	C14	14.35	0.19	0.16	Fill of modern pipeline	Linear shape, loose/medium, light brown silty clay with pebbles.	
16	N/A	1.20	N/A	N/A	Stony grey spread	Sub-circular, loose/friable, grey sandy clay with stone inclusions.	
17	N/A	8.50	3.65	0.26	Spread	Curvilinear, mid/hard orange/brown sandy clay with sub-angular stones.	
18	N/A	8.50	1.65	0.22	Spread	Sub-linear, mid/hard, black/dark grey sandy clay with sub-angular stone.	

Appendix 1.2 Catalogue of Artefacts

There were no artefacts recovered from this site.

Appendix 1.3 Catalogue of Ecofacts

A total of two bulk soil samples were taken during the course of excavation at this site. Of these one was processed by means of flotation and sieving through a 250µm mesh. The resulting retrieved samples of this process are listed below. In addition to this a total of 13 wood samples were hand retrieved on-site. Details of these samples can also be found listed below.

1.3.1 Charcoal

Context No.	Sample No.	Feature	Sample weight (g)
C4	1	Fill of C6 trough	10.3g

1.3.2 Wood

Context No.	Timber No.	Feature
C3	T1	Trough Plank
C3	T4	Stake
C3	T5	Trough Plank
C3	T6	Trough Plank
C3	T7	Trough Plank
C3	T9	Trough Plank
C3	T10	Trough Plank
C3	T11	Trough Plank
C3	T12	Trough Plank
C3	T15	Trough Plank
C3	T16	Trough Plank
C3	T18	Stake

Appendix 1.4 Archive Checklist

Project: N6 Kilbeggan – Athlone	**Irish Archaeological Consultancy Ltd**	
Site Name: Burrow or Glennanummer 1		
NMS Registration No.: E2678		
Ministerial Directive: A016/052		
Site director: Tim Coughlan		
Date: 14 December 2008		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	3	
Site sections, profiles, elevations	3	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	0	
Site registers (folders)	5	
Survey/levels data (origin information)	100	
Context sheets	18	
Wood Sheets	14	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	43	
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environ. Archive		
Flint/chert	0	
Stone artefacts	0	
Pottery (specify periods/typology)	0	
Ceramic Building Material (specify types e.g. daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	0	
Glass	0	
Other find types or special finds (specify)	0	
Human bone (specify type e.g. cremated, skeleton, disarticulated)	0	
Animal bone	0	
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)	2	
Enviro monolith (specify number of samples and number of tins per sample)	0	
Security copy of archive	1	On IAC server

Appendix 1.5 Copy of Registration No. Document from DoEHLG

National Monuments
Acts (1930-2004)
Ministerial Directions
Record Number for
archaeological activity

AN ROINN COMHSHAOIL, OIDHREACHTA AGUS RIALTAIS ÁITIÚIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE
AND LOCAL GOVERNMENT

File: Direction No. A16

Registration Number: E2678

Directions have been issued to Murty Hanly on behalf of Westmeath County Council in order to regulate archaeological activities carried out on N6 Kilbeggan to Athlone (Phase 2).

Application having been duly made to me by Mr. Tim Coughlan of I.A.C. Ltd,, 8 Dungar Terrace,, Dún Laoghaire,, Co. Dublin.

For a registration number to record excavation at the site of Burrow 052 being part of the townland of BURROW in the County of Offaly.

This registration is not an archaeological licence or consent but it is issued solely for archive purposes and to allow for the material from the activity to be registered with the National Monuments Service and the National Museum.

Signed ..... 31 October 2006

Appendix 1.6 Copy of Ministerial Direction Document

Section 14A(2) National Monuments Acts 1930-2004

Directions to Westmeath County Council for the carrying out of archaeological works on the N6 Kinnegad to Athlone dual carriageway road scheme (Phase 2 * Kilbeggan to Athlone).

1. Introduction

The project is an approved road development, having been approved by An Bórd Pleanála on 26th March 2004.

The development will consist of a dual carriageway that will run for a distance of approximately 57.5km.

In line with recommendations in the Environmental Impact Assessment for the scheme, archaeological investigations included site specific testing followed by a centreline test trench with staggered offsets. The request for directions has an attached strategy document that covers the proposed resolution works

These directions relate to Phase 2 works and are issued following the receipt by the Minister of reports on the testing work carried out in Phase 1.

2. Directions

All aspects of the archaeological works should be conducted in accordance with provisions of the policy and advice notes on archaeological excavations issued by the Department and in line with the provisions of the Code of Practice agreed with the National Roads Authority. Archaeological works shall be carried out in accordance with the Strategy for Proposed Works submitted with the application seeking Directions.

3. Project Archaeologist

The Project Archaeologist appointed for the road development should ensure that the archaeological works are carried out in accordance with the terms of the directions.
· Any changes to the agreed method statement for the excavations should be submitted to the National Monuments Section for approval.
· Any proposal to change any named director of a specific excavation should firstly be notified to the National Monuments Section for approval.

4. Conduct of Archaeological Excavations:

a) The archaeological excavations should be carried out in accordance with the specifications set out in the strategy document submitted to the Minister.
b) The National Monuments Section should be notified of the commencement date of the works on site.
c) The names of the archaeological consultants, including site directors should be submitted to the National Monuments Section in advance of the works commencing.

d) Where necessary the layout of the archaeological trenches should be adjusted to include additional archaeological features and deposits or areas of archaeological potential.
e) All archaeological objects recovered in the course of the test excavations should be treated and conserved in line with the advice notes and guidelines issued by the National Museum of Ireland.
f) A report on the progress of the archaeological works shall be submitted to the National Monuments Section every 4 weeks.

5. Record Number for the scheme:

The record number for the recording of archaeological works is A016/000. Sub-numbers may be allocated by the Project Archaeologist to the additonal works. These numbers should be notified to the National Monuments Section for agreement with full details of the archaeological works involved.

6. Detection Device:

Detection devices may be used as appropriate in the course of archaeological works to recover archaeological objects. Details of proposed methodologies should be notified to the National Monuments Section.

7. Reports:

1. A report on the results of the archaeological excavations should be submitted to the National Monuments Section within 4 weeks of the completion of the works on site. Should additional time be required to complete the report the National Monuments Section should be notified before the expiration of the 4-weeks period. A copy of the report should be sent to the National Museum of Ireland.
2. A summary of the excavation results for the site should be published in the Excavations Bulletin for the year when works are undertaken.

8. National Monuments (Subsection 14A(4)):

If during the carrying out of the archaeological excavations a site should prove to be a National Monument within the meaning of the National Monuments Acts (1930-2004) all works should stop and the National Monuments Section should be informed immediately.

9. Inspection of Works

Officers, servants or agents of the Minister may inspect the archaeological works at any time and full co-operation should be given to them in carrying out the inspections.

APPENDIX 2 SPECIALIST REPORTS

CHARCOAL AND WOOD IDENTIFICATIONS

N6 KINNEGAD – ATHLONE SCHEME
PHASE 2: KILBEGGAN TO ATHLONE
DUAL CARRIAGEWAY

MINISTERIAL DIRECTION NUMBER: A016/052
NMS REGISTRATION NUMBER: E2678
BURROW OR GLENNANUMMER **1**

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Introduction

Twelve wood samples and one charcoal sample were identified and analysed from excavations from a burnt mound and wood lined trough dated to the middle Bronze Age (1372–1129 BC) at Burrow or Glennanummer, Co. Offaly. This site is located in the townland of Burrow or Glennanummer, c. 4.5km east of Moate town. The archaeological excavation was carried out by Irish Archaeological Consultancy Ltd on behalf of Westmeath County Council and the National Roads Authority in advance of the construction of the N6 Phase 2: Kilbeggan to Athlone Dual Carriageway Scheme.

The analysis of charcoal and wood can provide information on two different levels. The analysis is an important component of any post-excavation environmental work as it can help in re-constructing an environment hitherto lost to us, although this must be done with caution as sufficient sample numbers are required for a complete and full understanding of the immediate environment. Keepax suggest 50 charcoal samples in a European temperate climate. Charcoal and wood are also analysed and identified to determine what species are used and selected for particular functions on site i.e. postholes, wall posts, burnt remains of wattle and so on.

Methods

The process for identifying wood, whether it is charred, dried or waterlogged is carried out by comparing the anatomical structure of wood samples with known comparative material or keys (Schweingruber 1990). A wood reference collection from the Botanical Gardens in Glasnevin, Dublin was also used.

Charcoal

The soil samples were processed on-site. The flots were sieved through a 250 micron or a 1mm sieve, while the retent was put through a 2mm or 4mm sieve. All of the charcoal remains from the soil samples were then bagged and labelled.

The identification of charcoal material involves breaking the charcoal piece along its three sections (transverse, tangential and radial) so clean sections of the wood pieces can be obtained. This charcoal is then identified to species under a universal compound microscope reflected and transmitted light sources at magnifications x 10 - 400. By close examination of the microanatomical features of the samples the charcoal species are determined.

The purpose of the charcoal identifications was two-fold. In some cases the identifications were carried out prior to C14 dating in order to select specific species for dating and in other cases the charcoal was analysed for fuel selection policies and selection of wood types for structural use. Each species was identified, bagged together and then weighed. Insect channels were noted on the charcoal fragments identified as this may indicate the use of dead or rotting wood used for fuel or other such functions. The distinction can sometimes be made between trunks, branches and twigs if the charcoal samples are large enough. This was noted where possible. When charcoal samples showed indications of fast or slow growth this was also recorded. The samples identified for environmental reconstruction and wood usage were counted per fragment and then weighed. The smaller sample amounts with less than 50 fragments were all identified while 50 fragments were identified from the larger samples.

Wood

Thin slices were taken from the transversal, tangential and longitudinal sections of each piece of wood and sampled using a razor blade. These slices were then mounted on a slide and glycerine was painted onto the wood to aid identification and stop the wood section from drying out. Each slide was then examined under an E200

Nikon microscope at magnifications of 10x to 500x. By close examination of the microanatomical features of the samples the species were determined. The diagnostic features used for the identification of wood are micro-structural characteristics such as the vessels and their arrangement, the size and arrangement of rays, vessel pit arrangement and also the type of perforation plates.

All of the wood excavated on each site was sampled for identification and further analysis. The wood samples were firstly washed and recorded on wood working sheets and were then identified as to species.

Where appropriate, the samples were measured and described in terms of their function and wood technology. This included point types, split types and individual toolmarks such as facets and tool signatures.

A number of wood taxa cannot be identified to species or sub-species level anatomically. Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*) are both native and common in Ireland and the wood of these species cannot be differentiated on the basis of their anatomic characteristics. English elm (*Ulmus procera*) and wych elm (*Ulmus glabra*) cannot be separated by their wood structure and identifications of elm are shown as *Ulmus* spp. There are also two species of birch (*Betula pendula* and *Betula pubescens*) and several species of willow therefore the identifications are given as *Betula* spp and *Salix* spp respectively. *Prunus* includes blackthorn (*Prunus spinosa*) and cherry (*Prunus padus/avium*) and sometimes it is difficult to differentiate between the different species of *Prunus* spp.

Description of the feature types

The site at Burrow/Glennanummer consisted of a burnt mound/fulacht fiadh. A shallow rectangular trough with the remains of fragmentary timber lining was identified. The trough was c. 2.1m long, c. 1.13m wide and c. 0.23m deep. The mound material was thin and scattered showing significant disturbance.

A sample from the fill of the trough C4 has been dated Cal 1372–1129 BC.

Results

Fifty charcoal fragments were identified from one charcoal sample submitted for dating and environmental re-construction and woodland use. The charcoal is related to the burnt mound activity dating to the middle Bronze Age period in Co. Offaly. The fragment count of each taxa represented in the sample is given below in Figure 1 and Table 1.

Twelve wood samples were also identified from the assemblage. The twelve wood samples were analysed from C3, the trough lining and the base planks were all identified as split alder (*Alnus glutinosa*) (Table 2 & Figure 2). The two stakes were identified as ash (*Fraxinus excelsior*) and both were pencil pointed (Plate 1).

Figure 1: All taxa identified from the charcoal samples analysed

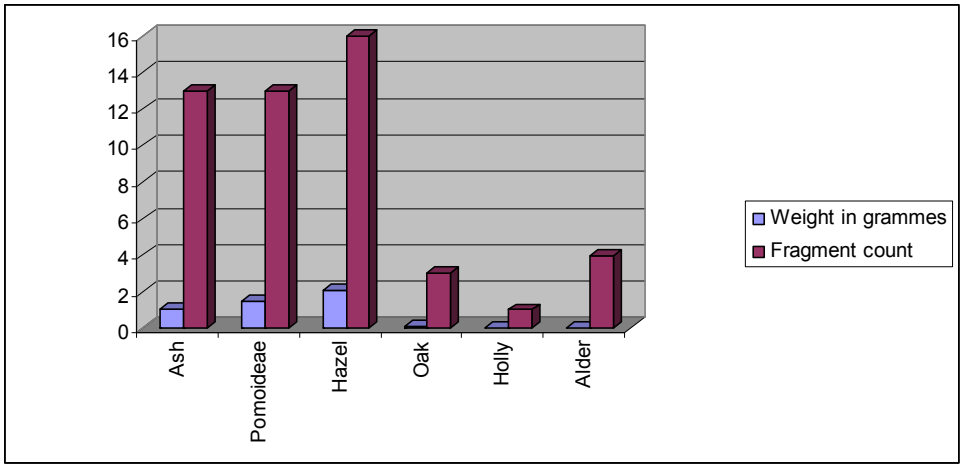


Table 1: Charcoal taxa identified from trough fill

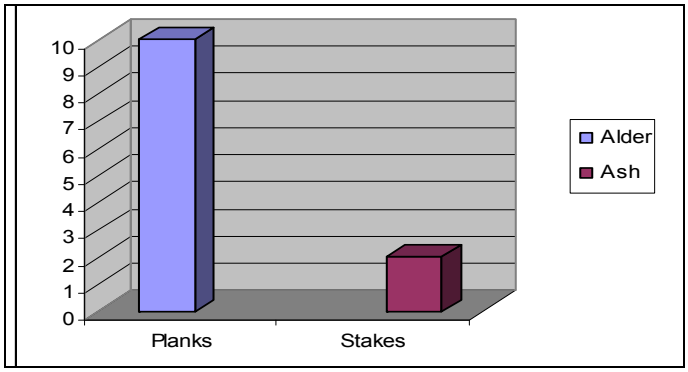
Site no.	Context no.	Context type	Sample no.	Species	Comment
A016-64	4	Trough fill	3	Oak (0.08g*, 3f*), Ash (1.05g, 16f), Hazel (2.05g, 16f), Holly (0.05g, 1f), Alder (.01g, 4f), Pomoideae (1.45g, 13f),	Some ash brushwood

*g = grammes
* f = fragment coun

Table 2: Identifications and analysis of wood samples

Context	Timber No.	Sample no.	Feature type	Identification	Length	Width x Depth / Diameter	Annual tree rings	Growth Rate	Woodworking evidence	Comment	Recommendations
3	1	3	Trough lining	Alder	0.96m	0.23m x 0.02m	25	Moderate to fast	Irregular split	Degraded wood	Discard
3	2	17	Root	Alder/birch						Non-archaeological	Discard
3	4	15	Stake/Trough	Ash	0.18m	0.08m	25	Fast at start and then slower growth rate	Pencil pointed. No specific tool marks	see photo	Discard
3	6	4	Trough lining	Alder	1.06m	0.08 x 0.02m	25	Moderate to fast	Radial split	Degraded wood	Discard
3	7	5	Trough lining	Alder	1.04m	0.22m x 0.03m	25	Moderate	Split		Discard
3	9	13	Trough lining	Alder	1.06m	0.06m x 0.02m	25	Moderate to fast	Irregular split		Discard
3	10	14	Trough lining	Alder	0.94m	0.20m x 0.03m	23	Indeterminate	Irregular split		Discard
3	12	7	Trough lining	Alder	0.94m	0.22m x 0.03m	24	Moderate to fast	Irregular split		Discard
3	13	8	Trough lining	Alder	1.04m	0.23m x 0.03m	25	Indeterminate	Split		Discard
3	14	9	Trough lining	Alder	1.02m	0.17m x 0.04m	20	Fast	Split		Discard
3	15	10	Trough lining	Alder	1.04m	0.175m x 0.04m	20	Moderate	Split		Discard
3	16	11	Trough lining	Alder	0.80m	0.22m x 0.03m	15	Indeterminate	Split		Discard
3	18	16	Stake/Trough	Ash	0.24m	0.086	25	Fast at start and then slower growth rate	Pencil pointed. No specific tool marks	see photo	

Figure 2: Wood types identified from trough



Discussion and Conclusions of Charcoal and wood assemblage

Wood types identified the assemblages

There were six taxa types present in the charcoal remains and two taxa types identified in the wood samples analysed from the trough. Hazel, pomoideae and ash were more dominant in the charcoal identified with lesser fragment counts of alder, oak and holly. Alder planks and ash stakes were present and analysed from the wood assemblage associated with the wooden trough.

The range of taxa identified from the features analysed includes large trees such as oak and ash, medium sized trees (alder) and smaller scrub or hedgerow trees (hazel, holly and pomoideae). Alder trees are generally found growing near wetland areas and are symptomatic of a wetter environment.

The charcoal is related to wood selection in relation to firewood used at the site (C4). The wood analysed is associated with the selection and use of structural wood associated with the wooden trough (C3).

There were different wood types collected and used as firewood and wood types used as lining for the trough. Hazel and pomoideae scrub were more prevalent in the charcoal identifications and alder and ash were used as lining for the trough. Hazel and pomoideae scrub as well as some ash trees may have been growing near the site and was collected relatively easily for firewood. The alder trees would produce larger planks and would have been easily split and worked for use as timber lining in the troughs.

The alder wood analysed from C3 was associated with the base lining of the trough and was specifically collected, split and used as structural wood at the site. The timber was in poor condition when analysed and only one of the timbers was determined as radial split. The remaining timbers were also split and some were recorded as irregular splits. The split alder wood measured between 1.06m and 0.94m in length, 0.23 and 0.08 m wide and 0.04 and 0.02m in depth. Annual tree rings present on the alder planks were between 25 and 15 although the majority of them contained on average 25 tree rings. The growth rate was determined as moderate to fast for the alder samples.

The two ash stakes/posts (timber no. 4 and 18) were pencil pointed and there was very little diagnostic facets or toolmarks present on the samples due the degraded state of the wood (Plate 1). A stepped facet junction was recorded at the end of timber no. 18. Some very faint tool signatures which is an impression left on the

wood samples by a slight nick in the woodcutters blade was also recorded in stake no. 18. The signatures measured 1.3cm and were convex rather than concave in shape. The 25 annual tree rings present on the ash posts show initial fast growth rate followed by a slower growth pattern.

Plate 1: Stakes analysed from C3 (Scale: left stake T18 is 0.24m long and right stake T4 is 0.18m)

The wood analysed points to the presence of people skilled in timber splitting techniques in the area, who were using metal axes and most probably wooden wedges and mallets in order to split the alder wood and sharpen the ash stakes.

Further analysis, discussions and comparisons of results will form part of a final integrated charcoal and pollen study of the sites and the surrounding environment on this scheme which is being undertaken as part of the authors PHD thesis. These results will be published accordingly.

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RADIOCARBON DATING RESULTS
BURROW OR GLENNANUMMER 1

CHRONO LABORATORY, QUEENS UNIVERSITY BELFAST

Colette Rynhart
Irish Archaeological Consultancy Ltd
120b Greenpark Road
Bray
Co. Wiklow, Ireland
Rep. of Ireland
VAT No. IE8288812U

^{14}CHRONO Centre
Queens University
Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification:	UBA-8604
Date of Measurement:	2008-03-20
Site:	A016/52 Burrow/Glenanummer
Sample ID:	S1 C4
Material Dated:	Pomoideae
Pretreatment:	AAA
Submitted by:	IAC

^{14}C Date: 2999±26

AMS δ^{13}C: -30.5

Information about radiocarbon calibration

```
            RADIOCARBON CALIBRATION PROGRAM*
                      CALIB REV5.0.2
        Copyright 1986-2005 M Stuiver and PJ Reimer
*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.
          Annotated results (text) - -
          Export file - c14res.csv
```

```
S1 C4
UBA-8604
Radiocarbon Age BP    2999 +/-    26
Calibration data set: intcal04.14c                  # Reimer et al. 2004
  % area enclosed       cal AD age ranges              relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 1306- 1209                        0.987
                             1138- 1135                        0.013
  95.4 (2 sigma)      cal BC 1372- 1343                        0.064
                             1317- 1187                        0.812
                             1184- 1153                        0.072
                             1146- 1129                        0.052
```

```
 References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, C Bertrand, PG Blackwell,
  CE Buck, G Burr, KB Cutler, PE Damon, RL Edwards, RG Fairbanks, M Friedrich,
  TP Guilderson, KA Hughen, B Kromer, FG McCormac, S Manning, C Bronk Ramsey,
  RW Reimer, S Remmele, JR Southon, M Stuiver, S Talamo, FW Taylor,
  J van der Plicht, and CE Weyhenmeyer (2004), Radiocarbon 46:1029-1058.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE:  Cal ages and ranges are rounded to the nearest year which
       may be too precise in many instances.  Users are advised to
       round results to the nearest 10 yr for samples with standard
       deviation in the radiocarbon age greater than 50 yr.
```

APPENDIX 3 LIST OF RMP SITES IN AREA

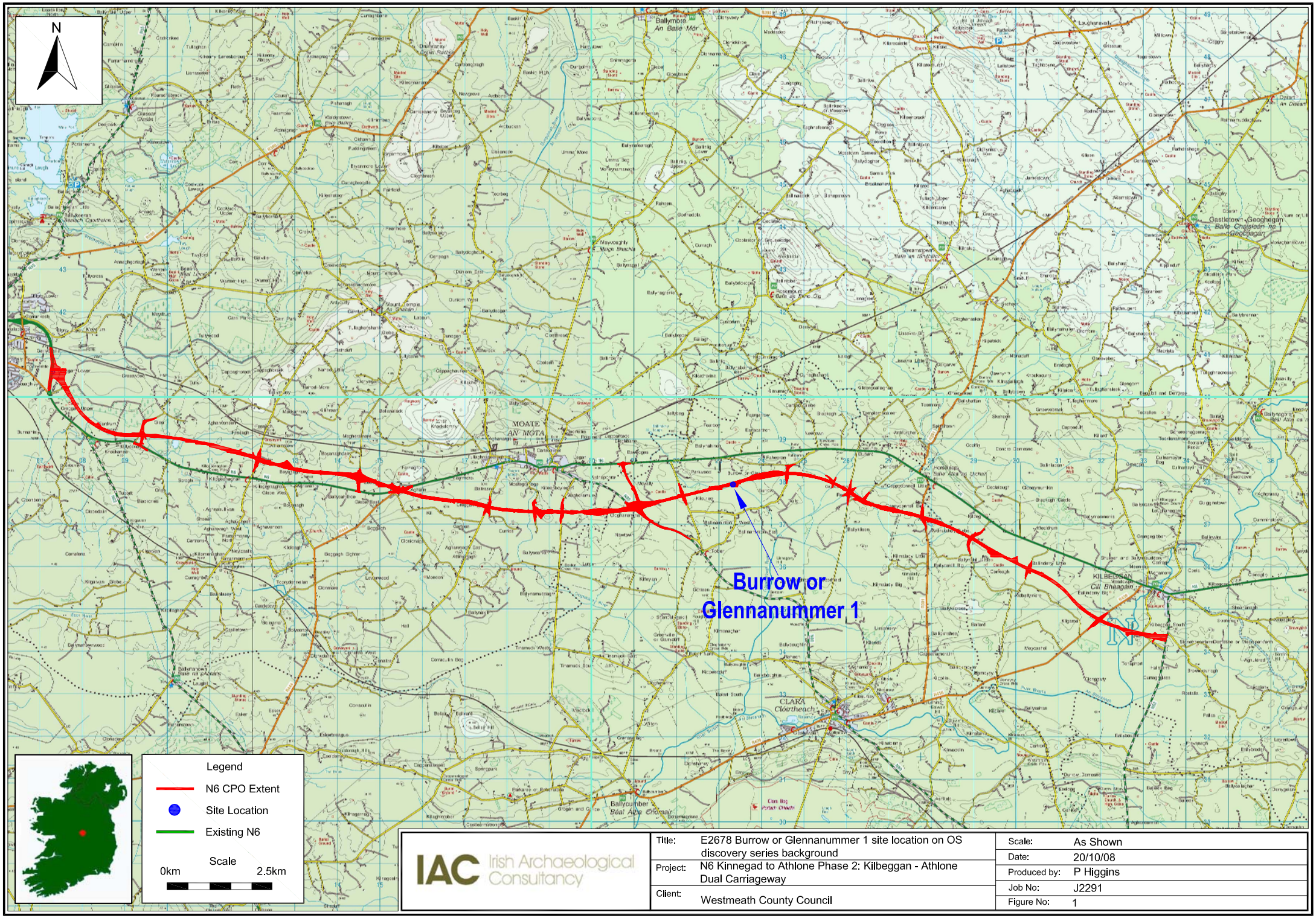
RMP No	Description
OF001-001	Crannog Site
OF001-00201	Tower House and Bawn
OF001-00202	Earthwork
OF001-005	Enclosure Site
OF002-00701	Tower House
OF002-00702	Earthwork
OF002-013	Enclosure Site
OF002-015	Castle Site
OF002-018	Enclosure Site

See Figure 2 for location.

APPENDIX 4 LIST OF N6 SCHEME SITE NAMES

Site Name	Ministerial Direction No.	NMS Registration Number
Seeoge 2	A016/007	E2635
Moyally 7	A016/015	E2643
Kilcurley 1	A016/019	E2647
Cappydonnell Big 1	A016/025	E2653
Ardballymore 2	A016/028	E2656
Creggan lower 1	A016/030	E2658
Creggan lower 2	A016/031	E2659
Williamstown 1	A016/032	E2660
Williamstown 3	A016/033	E2661
Williamstown 4	A016/034	E2662
Boyanaghcalry 1	A016/035	E2663
Seeoge 1	A016/036	E2664
Aghafin 1	A016/037	E2665
Cregganmacar 1	A016/038	E2666
Cregganmacar 2	A016/039	E2667
Cregganmacar 3	A016/040	E2668
Curries 1	A016/041	E2669
Curries 2	A016/042	E2670
Culleenagower 1	A016/043	E2671
Moyally 2	A016/044	E2672
Moyally 1	A016/046	E3274
Moyally 3	A016/047	E2674
Moyally 5	A016/048	E2675
Moyally 6	A016/049	E2676
Tober 1	A016/051	E2677
Burrow or Glennanummer 1	A016/052	E2678
Burrow or Glennanummer 2	A016/053	E2679
Burrow or Glennanummer 3	A016/054	E2680
Russagh 4	A016/055	E2681
Russagh 1	A016/056	E2682
Russagh 2	A016/057	E2683
Russagh 3	A016/058	E2684
Kilbeg 1	A016/059	E2688
Kilbeg 2	A016/060	E2689
Kilbeg 4	A016/062	E2691
Kilbeg 5	A016/063	E2692
Kilbeg 6	A016/064	E2693
Kilbeg 7	A016/065	E2694
Correagh 1	A016/066	E3374
Ballinderry Little 1	A016/067	E2695
Ardballymore 1	A016/068	E2696
Kilgaroan 1	A016/069	E2697
Kilgaroan 2	A016/070	E2698
Kilgaroan 3	A016/071	E2699
Kilgaroan 4	A016/072	E2700
Kilgaroan 6	A016/074	E2702
Ballinderry Big 1	A016/076	E3275
Ballinderry Big 2	A016/077	E3276
Ballinderry Big 3	A016/078	E3277
Tonaphort 1	A016/079	E3278
Tonaphort 2	A016/080	E3279
Tonaphort 3	A016/081	E3280

Site Name	Ministerial Direction No.	NMS Registration Number
Kilbeggan South 1	A016/082	E3281
Kilbeggan South 2	A016/083	E3282
Kilbeggan South 3	A016/084	E3283
Cregganmacar 4	A016/085	E2703
Williamstown 2	A016/086	E2704
Kilbeg 8	A016/087	E3966



IAC Irish Archaeological Consultancy

Title:	E2678 Burrow or Glennanummer 1 site location on OS discovery series background
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	As Shown
Date:	20/10/08
Produced by:	P Higgins
Job No:	J2291
Figure No:	1

N

OF001-001

FEARBOY

BALLYNAHINCH

FAHEERAN

OF002-007

FAHEERAN

OF002-010
DE-LISTED

PARKWOOD

MOYALLY

PARKWOOD

BURROW or GLENNANUMMER

Burrow or Glennanummer 3

Burrow or Glennanummer 2

Burrow or Glennanummer 1

Kilcurley 1

Moyally 7

OF001-002

Moyally 6

Moyally 5

Tober 1

KILCURLEY
Cill Choirill

OF002-013

OF002-018

OF001-005

TOBER
An Tobar

OF001-004
DE-LISTED

TOBER
An Tobar

OF002-014
DE-LISTED

BALLINAMINTON WEST
Béal Átha na Meantán Thiar

BALLINAMINTON EAST
Béal Átha na Meantán Thoir

TULLY
An Tulaigh
ED KILCUMREAGH
Cill Chrualthir Thiachrach

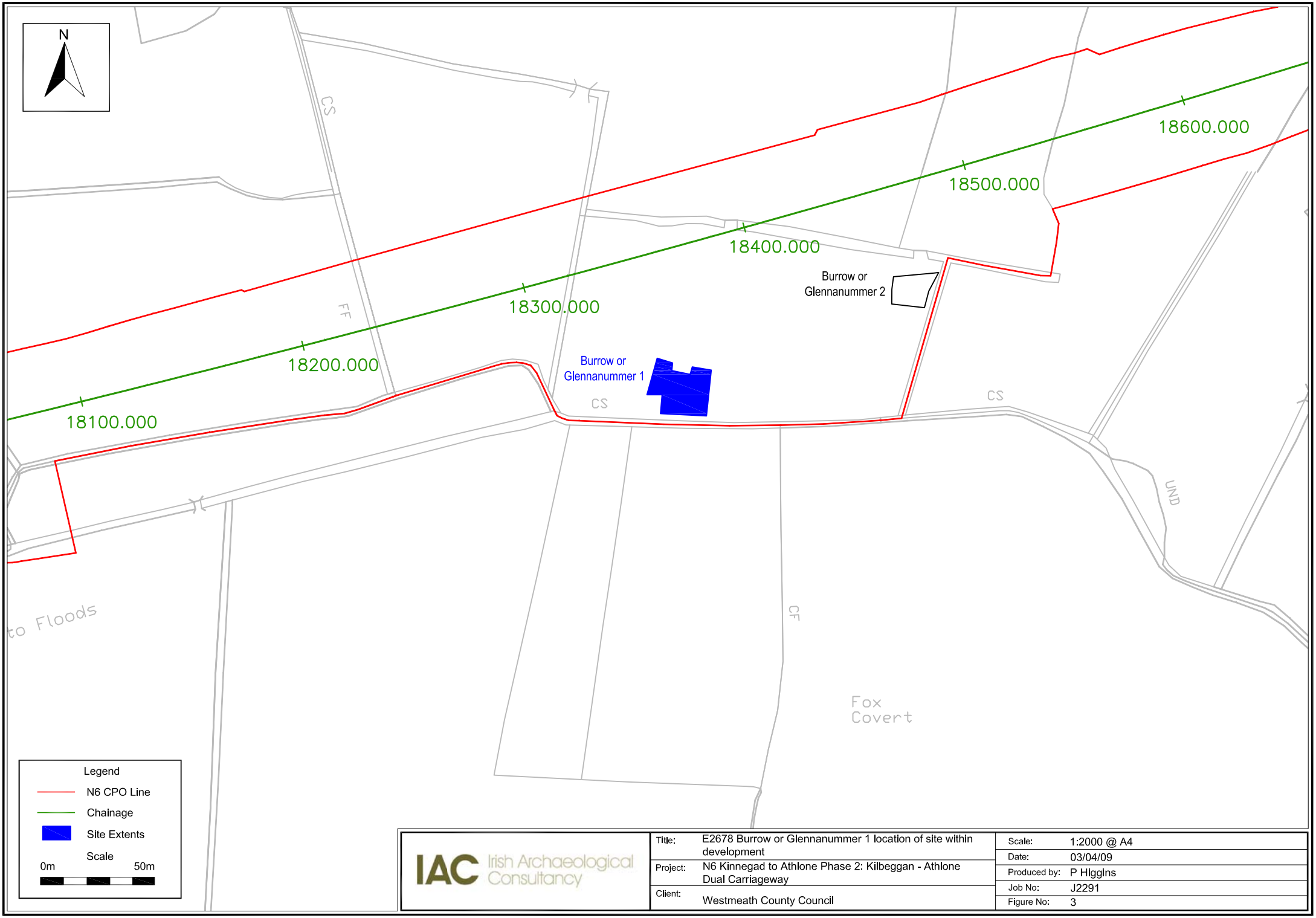
TULLY
An Tulaigh
ED GORTEEN
An Gort-tín

OF002-015

Legend
N6 CPO Line
RMPs
Scale
0m 250m

Title:	E2678 Burrow or Glennanummer 1 showing RMPs with OS background		
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway		
Client:	Westmeath County Council		
Scale:	1:10000 @ A3	Job No:	J2291
Date:	03/04/09	Figure No:	2
Produced by:	P Higgins		

IAC Irish Archaeological Consultancy



IAC Irish Archaeological Consultancy

Title:	E2678 Burrow or Glennanummer 1 location of site within development
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:2000 @ A4
Date:	03/04/09
Produced by:	P Higgins
Job No:	J2291
Figure No:	3

N

Limit of excavation

2A

1A

1B

2B

61.593

Limit of burnt
mound material
C9 & C10

Wood

Drain
C12

Drain
C14

Pit
C8

61.072

Wood

61.273

223355E
237912N

Trough
C6

61.247

Wood

61.478

61.575

Limit of burnt
spread C17 & C18

61.163

223340E
237896N

61.538

223355E
237896N

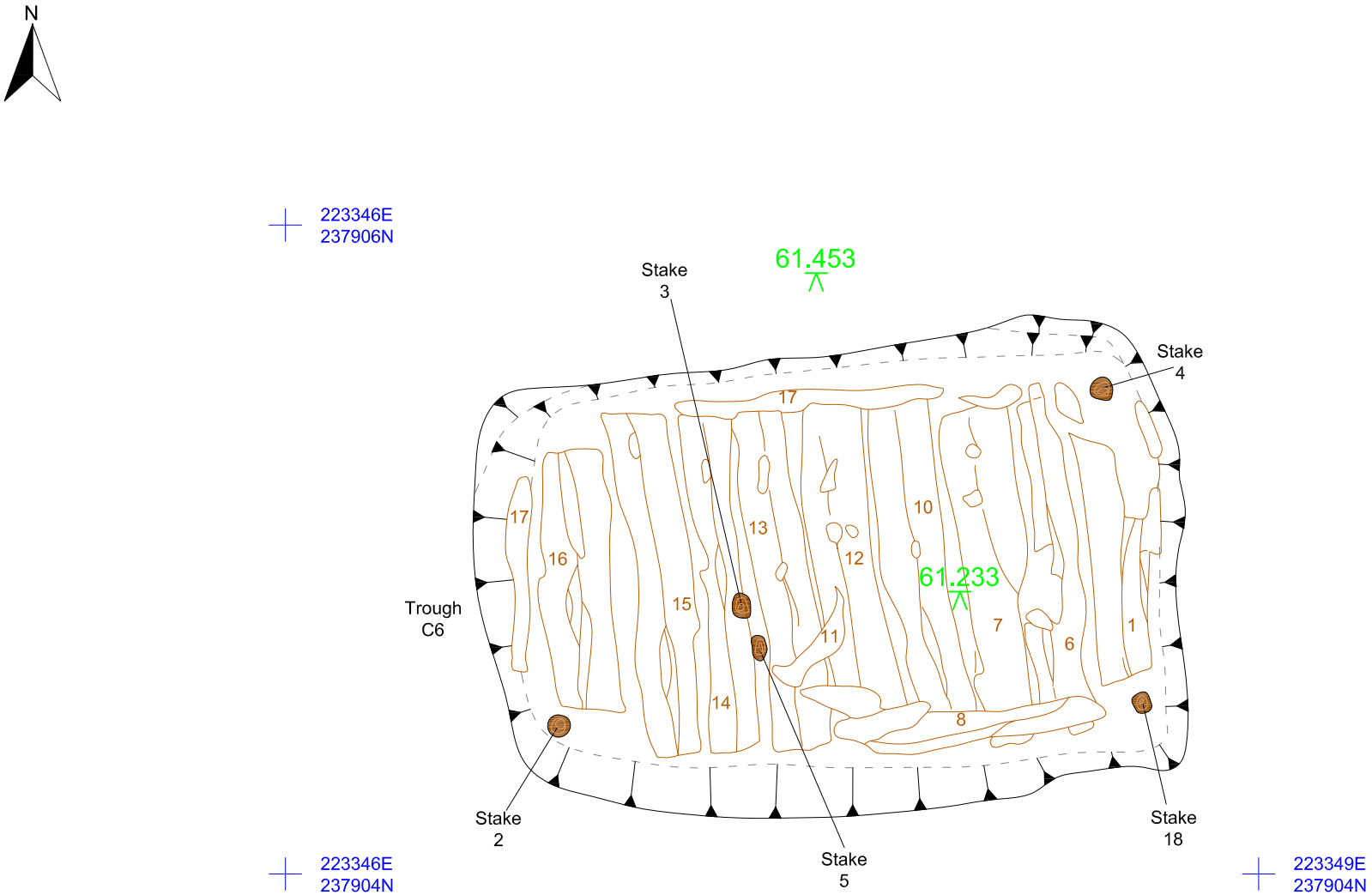
Scale

0m 5m

Legend

- Break of slope
- Sections
- Limit of Excavation
- C## Cut numbers
- C## Fill numbers
- Stone
- 0.00 Levels

Title:	E2678 Burrow or Glennanummer 1 site plan	
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway	
Client:	Westmeath County Council	
Scale: 1:100 @ A3	Job No: J2291	IAC Irish Archaeological Consultancy
Date: 03/04/09	Figure No: 4	
Produced by: G Kearney		



Legend

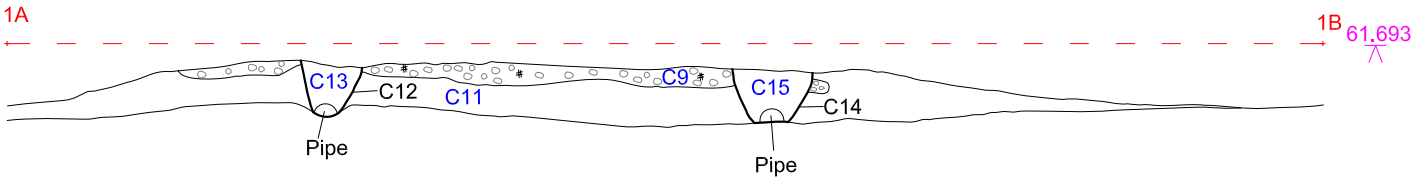
——	Timber detail
– –	Break of slope
C##	Cut numbers
0.00	Levels

IAC Irish Archaeological Consultancy

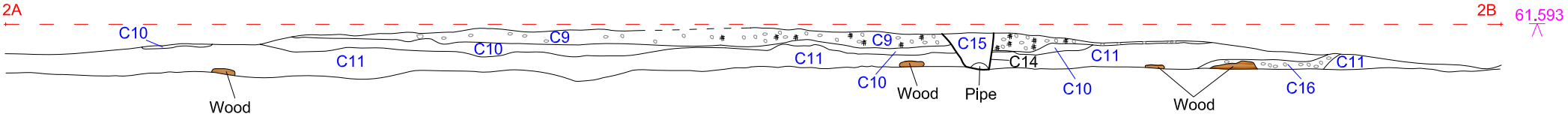
Title:	E2678 Burrow or Glennanummer 1 detail of trough C6
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:20 @ A4
Date:	03/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	5

Burrow or Glennanummer 1
South facing section burnt mound C9



Burrow or Glennanummer 1
West facing section burnt mound C9



Scale

0m 2.5m

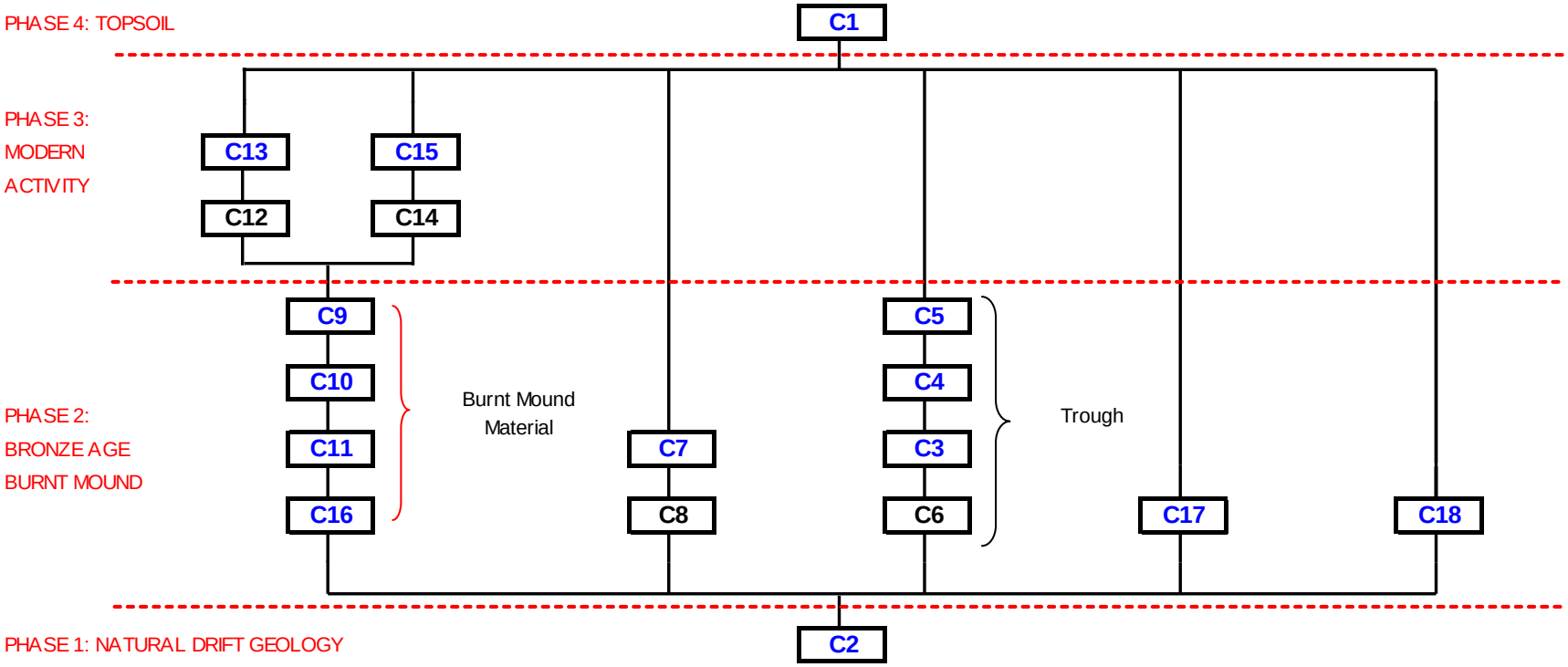
Legend

C##	Cut numbers
C##	Fill Numbers
	Stone
#	Charcoal
###.##	Reduced Levels

IAC Irish Archaeological Consultancy

Title:	E2678 Burrow or Glennanummer 1 sections
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	1:50 @ A4
Date:	03/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	6



CXXX = SPREADS AND FILL CONTEXTS
CXXX = CUT CONTEXTS

IAC Irish Archaeological Consultancy

Title:	E2678 Burrow or Glennanummer 1 matrix
Project:	N6 Kinnegad to Athlone Phase 2: Kilbeggan - Athlone Dual Carriageway
Client:	Westmeath County Council

Scale:	N.T.S.
Date:	03/04/09
Produced by:	G Kearney
Job No:	J2291
Figure No:	7