

N18 Gort to Crusheen Road Scheme



Site Name: Curtaun 1 and 2

Ministerial Direction No.: 044
Excavation Registration No.: E3721

Burnt Mounds and Kilns

Final Report

On behalf of Galway County Council

Site Director: Shane Delaney

January 2010

PROJECT DETAILS

Project Reference No.	A044
Project	N18 Gort to Crusheen Road Scheme
Ministerial Direction Reference No.	A044
NMS Registration Number	E3721
Excavation Director	Shane Delaney
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Client	Galway County Council
Site Name	Curtaun 1
Site Type	Burnt Mound and
Townland	Curtaun
Parish	Beagh
County	Galway
NGR Curtaun 1	142125/195440
NGR Curtaun 2	142070/195370
Chainage	10050 / 10140
Height m OD	25 m OD
RMP No.	GA 128-043
Excavation Dates	13 November 2007 – 14 January 2008
Excavation Duration	35 Days
Report Type	Final
Report Date	22 January 2010
Report By	IAC Ltd

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The excavation was carried out in accordance with the Directions issued to Galway County Council by the Minister for Environment, Heritage and Local Government under Section 14A (2) of the National Monuments Acts 1930–2004 and the terms of the Contract between Galway County Council and Irish Archaeological Consultancy Ltd.

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ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by Galway County Council and the National Roads Authority (NRA), undertook the excavation of burnt mounds and a kiln under Ministerial Directions at the site of Curtaun 1 and 2 along the proposed N18 Gort to Crusheen road scheme (Figure 1). The following report describes the preliminary results of archaeological fieldwork at that site. The area was fully excavated by Shane Delaney under Ministerial Directions A044 and NMS Registration Number E3721 issued by the Department of Environment, Heritage and Local Government (DEHLG) in consultation with the National Museum of Ireland. The fieldwork took place between October 2007 and January 2008.

The Curtaun site lies at 25 m Ordnance Datum (OD) and is located below the summit of a ridge which trends northeast to southwest. The site is located on its east-facing slope on well-drained land which was under pasture at the time of excavation. It overlooks bog to the east and southeast. The area of the site was a narrow strip of land between the existing railway and an upstanding bivallate ringfort (GA 128-043), the bank and outer ditch of which were partly truncated on its eastern side by the road scheme. The exposed fills were inspected and found to be sterile mineral soils with no significant deposits or artifacts.

Excavations at Curtaun revealed three areas of activity: two burnt mounds and one early medieval kiln. Area 1 consisted of a burnt mound, associated trough and stakeholes. The positioning of the stakeholes around the trough indicated that it had been timber lined. Area 2 consisted of burnt mound material, four pits and a possible shallow well. Both burnt mounds were disturbed by post-medieval agricultural activity. Two of the pits may have functioned as troughs but the function of the other pits is unknown. The burnt mound at Area 2 has been dated to 3256±21 BP (UBA 12708). The 2 Sigma calibrated result for this was 1608–1459 BC placing it in the middle Bronze Age period.

Area 3 was comprised of three phases of distinct kiln construction and associated foundation gullies with postholes and stakeholes for superstructures over the drying chambers. The kilns have produced a date range for the main activity between 1252±37 BP (UBA 12710) and 790±20 BP (UBA12709). The 2 Sigma calibrated result for the kilns has the main period of activity at the site occurring between AD 674–870 to AD 1218–1270, spanning the early medieval period to medieval periods.

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1 INTRODUCTION

1.1 General

This report describes excavations at Curtaun 1 and 2 (Figure 1), in the townland of Curtaun, undertaken by Shane Delaney of IAC Ltd, on behalf of Galway County Council and the NRA. It was carried out as part of the archaeological mitigation programme of the N18 Gort to Crusheen road scheme. The excavation was undertaken to offset the adverse impact of road construction on known and potential archaeological remains in order to preserve the site by record. Two Bronze Age burnt mounds and an early medieval kiln complex were recorded adjacent to a standing ringfort that was partly truncated by the scheme.

A geophysical survey was carried out in this area by RSKENSR (Bartlett 2004) prior to testing and failed to show any indication of the kilns. The site was specifically tested during phase 1 works by Dave Bayley in 2007 (Ministerial Direction No. A044, NMS Licence No. 07E0458) as it was adjacent to a bivallate ringfort (GA 128-043). All features identified during the assessment phase were subsequently investigated and recorded during the full excavation phase of the site which took place between 13 November 2007 – 14 January 2008 with a team of 1 director, 1 supervisor and 15 assistant archaeologists.

The site was located approximately 500 m east of the Gort to Tubber road and c. 1.8 km northeast of Tubber crossroads (Galway OS sheets 128).

The site was assigned the following identification data: Site Name: Curtaun 1; Ministerial Direction No.: A044; NMS Registration No.: E3721; Route Chainage (Ch): 10050 and 10140; NGR: 142125/195440 and 142070/195370.

1.2 The Development

The N18 Gort to Crusheen scheme involves the construction of a total of 44 km of road to include mainline roadworks (22 km), associated side roads (10 km) and access tracks (12 km). The road will have twin 7 m carriageways, 2.5 m hard shoulders adjacent to the verges and a median with a minimum width of 2.6 m which includes two 1 m hard strips. The selected route bypasses the town of Gort to the east and the village of Crusheen to the west.

1.3 Archaeological Requirements

The archaeological requirements for the N18 Gort to Crusheen road scheme were defined in the Ministerial Directions issued to Galway 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 Galway County Council and Irish Archaeological Consultancy Ltd. These instructions formed the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract were located between the townlands of Glenbrack, Co. Galway, and Carrowdotia, Co. Clare.

The proposed N18 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Babbie Pettit Ltd in 2006. The Record of Monuments and Places, the Sites and Monuments Record, Topographical files of the National Museum of Ireland, aerial photography, and documentary sources were all consulted. Two phases of geophysical survey were conducted. The main phase was by RSKENSR (Bartlett 2004) during the preparation of the EIA (Babbie Pettit Ltd 2006). A supplementary survey was carried out in Ballyboy by Target Geophysics Ltd (Target Geophysics Ltd 2007). As a result of the paper survey, field inspections, geophysical survey, archaeological testing and

archaeological monitoring, a total of 22 fully recorded manual excavations were carried out on this section of the overall route alignment. In some cases where a number of sites of similar type were located together in a single townland, the sites were excavated under one excavation number.

Phase 1 archaeological testing was completed by IAC Ltd and Phase 2 excavation of the sites identified during testing was conducted by IAC Ltd on behalf of Galway County Council and the NRA.

1.4 Methodology

The area between the ringfort and the railway was intensively trenched as part of the phase 1 archaeological investigations as the area was situated beside a known monument. The cereal drying kilns and burnt spreads were identified during this test excavation phase of the works. During the phase 2 excavation works the topsoil was reduced to the interface between topsoil and natural subsoil 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 excavations. Features exhibiting large amounts of carbonised material were targeted. Animal bone, unburnt wood and stone samples were all retrieved through both hand and bulk collection and retained for specialist analysis wherever they were encountered during the excavations. Bulk soil samples were also taken and sieved for palaeoenvironmental analysis.

In the instances where artefacts were uncovered on site they were dealt with in accordance with guidelines issued by the National Museum of Ireland (NMI) and where warranted in consultation with the relevant specialists. All artefacts, ecofacts and paper archive are currently stored in IAC offices, Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

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 DEHLG and the National Museum of Ireland.

2 EXCAVATION RESULTS

The archaeological activity recorded at Curtaun 1 and 2 was middle Bronze Age burnt mound activity and early medieval/medieval cereal drying kilns.

Detailed descriptions of all excavated features and deposits are listed in Appendix 1.

2.1 Phase 1: Natural Drift Geology

The subsoil at Curtaun was an orange sandy clay silt till. The site was located on an east-facing slope below the summit of a ridge. The land was well-drained and was under pasture. It overlooked bog to the east and southeast (Figure 2).

2.2 Phase 2: Bronze Age Activity

The Bronze Age activity on the site consisted of the remains of two truncated burnt mounds.

2.2.1 Burnt Mound and Associated Features

2.2.2 Area 1 Trough and Stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
89		2.45	1.9	0.4	Oval pit with gradually sloping sides	Cut of pit/trough
90	C89	2.45	1.9	0.15	Brown silt top fill of C89	Top fill of pit/trough
95	C89	2.1	1.6	0.18	Black brown clay silt	Third fill of pit/trough
96	C89	2	1.4	0.04	Charcoal rich layer (lens)	Lens within fill C97
97	C89	2	1.4	0.12	Light grey sand	Basal fill of trough
103		0.12	0.1	0.19	Cut of oval pit, vertical sides	Cut of a stakehole
104	C103	0.12	0.1	0.19	Grey clay sand	Fill of a stakehole
105		0.1	0.08	0.16	Cut of shallow oval pit	Cut of a stakehole
106	C105	0.1	0.08	0.16	Grey clay sand	Fill of a stakehole
108		0.1	0.1	0.16	Cut of stakehole concave base	Cut of a stakehole
109	C108	0.1	0.1	0.16	Grey clay sand	Fill of a stakehole
110		0.1	0.1	0.15	Cut of stakehole concave base	Cut of a stakehole
111	C110	0.1	0.1	0.15	Black grey clay sand	Fill of a stakehole
115		0.08	0.08	0.09	Cut of stakehole with flat base	Cut of a stakehole
116	C115	0.08	0.08	0.09	Black grey sandy silt	Fill of a stakehole
117		0.1	0.1	0.12	Cut of stakehole with concave base	Cut of a stakehole
118	C117	0.1	0.1	0.12	Grey sandy silt	Fill of a stakehole
119		0.09	0.09	0.06	Cut of stakehole with flat base	Cut of a stakehole
120	C119	0.09	0.09	0.06	Grey sandy silt	Fill of a stakehole

Finds: None

Interpretation

The above contexts represent a large pit/trough, C89, with a stakehole in each of its four corners and a further three stakeholes around its edge (Figure 3 and 4; Plate 1 and 2). The positions of the stakeholes suggest that the trough was timber-lined with the stakes holding wicker or plank lining in place. The primary fill of the pit contained a lens of charcoal-rich material and heat-affected stone (C97) which was very similar to the burnt mound material C194 (Figure 6). This was likely to have functioned as a trough associated with the burnt mound activity.

The fill (C111) from stakehole C110, within the trough C89, produced birch and ash charcoal (Cobain, Appendix 2.2).

2.2.3 Area 1 Burnt Spread

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
194		10	7	0.08	Irregular truncated burnt spread	Burnt spread

Finds: None

Interpretation

This spread of burnt mound material sealed the trough and stakeholes (Section 2.2.2) (Figure 4). The mound material had been badly disturbed by post-medieval/modern agriculture. It was directly related to the trough activity.

2.2.4 Area 2 (Curtaun 2) Pits / Troughs

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
3		2.5	1.15	0.3	Oval cut, shallow, gradual sides	Cut of a shallow pit
4	C3	2.5	1.15	0.3	Black peat fill	Fill of pit C3
7		2.2	1.6	0.58	Cut of sub-oval pit steep sides	Cut of an irregular pit
8	C7	1.35	1.2	0.27	Dark brown coarse sand	Top fill of pit
9		2.1	1.3	0.38	Cut of irregular pit.	Cut of pit
10	C9	1.4	0.5	0.18	Dark brown peat	Top fill of pit C9
11	C9	1.9	1.3	0.1	Dark grey silt clay	Middle fill of pit C9
12	C9	1.7	1.2	0.1	Charcoal rich silt	Lower fill of pit C9
13	C9	1.9	1.2	0.06	Orange grey brown clay sand	Base fill of pit C9
14		2.2	1.05	0.3	Irregular steep sided pit	Possible shallow well
15	C14	3.1	1.05	0.2	Peat with charcoal inclusions	Top fill of C14
16		2.3	1.46	0.64	Sub-oval pit steep sides	Cut of a pit/possible trough
17	C16	2.3	1.3	0.48	Mid brown peat	Peat top fill of C16
18	C16	1.95	1.2	0.15	Soft black silt clay	Charcoal rich fill
19	C16	1.7	1.1	0.58	Soft grey black silt 50% stones	Stony bottom fill of C16
20	C7	0.35	0.35	0.28	Black sandy clay	Tertiary fill of pit
21	C7	1.52	1.2	0.22	Grey/white stoney sandy soil	Secondary fill of pit
22	C7	1.1	1.1	0.1	Light grey coarse sand	Basal fill of pit

Finds: None

Interpretation

This area contained four pits and one possible shallow well or sump (Figure 3 and 5). Four of the pits contained heat-shattered stone with charcoal. The two largest pits, C7 and C16 (Plate 5), may have been used as troughs (Figure 6). The other two pits, C3 and C9, were both very shallow and their purpose was unclear, perhaps dry cooking pits. The pit C14 was tapered and not suitable in shape for use as a trough: it may have functioned as a shallow well or sump for easy access to water for use in the adjacent troughs. It was located on the east side of the site next to the bog and filled up with water constantly during excavation.

One AMS date was obtained from deposit C12, the charcoal-rich basal fill of pit C9. A fragment (2.8g) of hazel (*Corylus avellana*) charcoal was identified (Cobain, Appendix 2.2). This charcoal returned an AMS result of 3256±21 BP (UBA 12708). The 2 Sigma calibrated result for this was 1608–1459 BC (Appendix 2.1).

A pig tusk was recovered from the fill (C8) of the trough C9. The size of the tusk would indicate that it was the tusk of a wild boar (Geber, Appendix 2.3). A charcoal

sample from C12 (the lower fill of the trough C9) produced alder, hazel and ash charcoal.

2.2.5 Area 2 Burnt Spread

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
6		10	9	0.16	Burnt spread silt 50% stone inclusion	Burnt stone spread

Finds: None

Interpretation

This spread of burnt mound material sealed three of the four associated pits in section 2.2.5 (Figure 5; Plate 3). The mound material had been badly disturbed by post-medieval agriculture.

2.2.6 Discussion of Area 1 and 2 burnt mounds

The possible Bronze Age features in Area 1 consisted of a burnt mound, pit/trough and associated stakeholes. The associated stakeholes indicating that it may have been timber-lined. The primary fill of the pit consisted of burnt mound material and indicates that the trough and the burnt spread were contemporary. Area 2 consisted of four pits and one possible shallow well or sump. Two of these pits may have been used as troughs. The burnt mound material was disturbed by later agriculture and was found covering all of the pits.

2.3 Early Medieval Cereal-Drying Kilns

The early medieval / medieval features on this site consisted of three kilns, associated slot trenches, postholes and stakeholes (Figure 3 and Figure 7). The area of the site was a narrow strip of land between the existing railway and an upstanding bivallate ringfort (GA 128-043), the bank and outer ditch of which were partly truncated on its eastern side by the road scheme. The exposed fills were inspected and found to be sterile mineral soils with no significant deposits or artifacts.

2.3.1 Kiln 1

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
27	-	1.40	1.25	1.2	Cut of chamber kiln 1	Cut of chamber
28	C27	3.8	1.2	0.6	Light yellow brown silt sand	Redeposited natural
33	C195	0.65	0.55	0.09	Charcoal rich silt	Charcoal-rich fill
34	C195	2.2	1.3	0.2	Dark brown silt top fill	Mottled top fill
65	C195	-	0.2	0.2	Redeposited subsoil packing	Packing on west
66	C195	2.2	0.4	0.22	Grey brown silt	Fill in SE end of flue
75	C195	-	0.96	0.19	Charcoal rich silt	Charcoal-rich fill
91	C195	0.5	0.45	0.07	Grey pink silt sand , similar to C185	Fill of chamber/flue
92	C195	0.3	0.7	0.1	Pink grey ashy silt	Fill of chamber/flue
121	C27	0.5	0.1	0.04	Soft brownish black silt. within C28	Backfill
144	C195	1.2	0.7	0.5	Stone lining of chamber and flue	Stones lining of kiln
185	C27	3.92	1.18	0.44	Mottled brown light grey sandy silt	Basal fill of chamber
195	-	3.2	1.5	0.62	Linear cut. Gradual sides, flat base	Cut of flue

Finds: None

Interpretation

Kiln 1 was the earliest of three kilns found on the site (Figure 3, 7 and 8; Plate 6 and 7). It consisted of a chamber C27 and a flue C195. It was orientated on a north–south alignment. The cut formed an oblong pit which appeared to widen at the drying

chamber end forming a keyhole shape in plan. The overall length of the kiln would have been approximately 5 m (the majority of the drying chamber was cut away through the construction of Kiln 3). The primary fill of the chamber, a sandy silt layer C185, lay along the base of the cut. This may have functioned as a support fill for the stone lining of the kiln wall, C144, which was set out on top of it. Not much of the stone lining remained and it is likely that the stones were robbed out and used for the construction of the later kiln(s). C65 located along the western wall was a redeposited subsoil material and may have been packing for the wall on the side. A number of 'use-fills' C33, C66, C75, C91 and C92 indicating *in situ* burning were found within the chamber C27 and along the flue. The kiln was later backfilled with sterile soils C28, C121 and C34. Occasional inclusions of stone from the kiln wall C144 were found within the backfill material C28. It would have been dry stone walled.

One AMS date was obtained from deposit C33, a use fill within the chamber. A fragment (0.2 g) of wild/bird cherry (*Prunus avium/padus*) charcoal was identified (Cobain, Appendix 2.2). This charcoal returned an AMS result of 1252±37 BP (UBA 12710). The 2 Sigma calibrated result for this was AD 674–870 (Appendix 2.1). This context also produced evidence for sessile oak, hawthorn/rowan/oak and charcoal/sloe charcoal inclusions. Charcoal recovered from the chamber/flue (C91) represented oak, blackthorn and yew

Cattle bone was recovered from C28, the backfill material (Geber, Appendix 2.3). Caprovine bones were identified from C28 and use-fill C33. Bones from field mice were identified from C91 use-fill of the kiln (*Apodemus sylvaticus*) and represent burrowing activity within the kiln.

2.3.2 Kiln 2

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
35		5.5	1.1	0.5	Cut of flue of Kiln 2	Cut of flue
36	C35	4.34	0.35	0.18	Brown sand top fill of Kiln 2	Main top fill of flue
37	C35	0.5	0.28	0.06	Brown yellow sandy silt fill of Kiln 2	Top fill of flue
72	C35	3.45	0.48	0.15	Brown / black silt clay charcoal-rich	Fill of flue
73	C35	0.38	0.38	0.11	Grey white silt sand with ash	Fill of C192
99	C35	2.3	0.72	0.1	Yellow grey sandy silt	Lower fill of flue
100	C35	0.95	0.71	0.18	Firm yellow grey white silt	Fill of flue
107	C35	1.42	0.48	0.1	Layer of burnt clay and charcoal	Fill of flue
112	C192	0.38	0.35	0.08	Grey silt sand	Fill of C192
114	C192	0.3	0.3	0.25	Brown yellow clay silt	Fill of C192
132		1.5	1.3	1	Cut of chamber for Kiln 2	Cut of chamber
133	C132	1.4	1.15	0.15	Grey brown silt clay	Top fill of chamber
134	C132	1.4	1.15	0.35	Dark brown silt sand	Fill of chamber
138	C35	0.8	0.45	0.12	Brown sandy silt	Intentional backfill
140	C35	2.1	0.6	0.35	Grey/orange/brown/yellow sandy clay	Intentional backfill
178	C132	0.95	0.9	0.06	Red yellow burnt clay	Fill of chamber
179	C132	0.95	0.9	0.07	Black grey charcoal-rich silt	Fill of chamber
192		0.85	0.4	0.3	Irregular re-cut from clean out of flue	Rake out of flue
193	C35	1.1	0.36	0.4	Remains of stone lining in Kiln 2	Stone lining kiln 2

Finds: None

Interpretation

Kiln 2 was the second kiln constructed on site (Figure 3, 7 and 9; Plate 7 and 8). The flue C35 and chamber C132 were still lined with some drystone walling at the base

(C193). The cut formed a long and narrow oblong pit which widened at the drying chamber end to 1.50 m to form a keyhole shape in plan. The overall length of the kiln was 7 m. It was oriented on a northwest – southeast alignment. As with Kiln 1, some of the stone lining may have been removed and reused in the construction of Kiln 3. The chamber of the kiln was subject to *in situ* burning as evidenced by heat-affected clay (C178) and a charcoal-rich fill (C179). A sterile fill C99 was found above these ‘use-fills’ within the chamber and running into the flue which may represent a period of inactivity. A layer of charcoal and burnt clay C107 lay over this sterile fill within the flue. C107 contained fragments of *Hordeum vulgare* (barley), *Triticum dicoccum* (emmer wheat) and *Poaceae* (indeterminate grain).

An irregular cut, C192, at the southern end of the flue may represent a recessed fire setting for the kiln, which would have prevented burning fuel from entering the flue. It contained silt fills C112 and C114. Above this a layer of charcoal (C72) and ash (C73) showed the final stages of use. The kiln then appeared to have been backfilled through a series of deliberate deposition and natural silting (C36, C37, C100, C133, C134, C138 and C140).

One AMS date was obtained from deposit C72, a use fill within the chamber. A fragment (0.4 g) of charred hulled barley (*Hordeum vulgare*) was identified (Cobain, Appendix 2.2). This charcoal returned an AMS result of 1165±18 BP (UBA 12712). The 2 Sigma calibrated result for this was AD 779–947 (Appendix 2.1). This context also produced alder, hazel, oak, ash and crab apple charcoal and *Hordeum vulgare* (Barley), *Triticum aestivum/durum* (free threshing wheat), *Triticum dicoccum* (emmer wheat), *Poaceae* (indeterminate grains) and hazelnut shell.

Cattle bone was recovered from C99 and C100, both lower fills of the flue (Geber, Appendix 2.3). Caprovine bones were identified from the uppermost sandy fill C36. A fragment of pig mandible was recovered from C140, a backfill of the chamber; this context also produced a fragment of bone from an adult horse.

2.3.3 Kiln 3

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
29		5	Max 3.2	> 1	Cut of flue and fire bowl	Flue & fire bowl
30	C29	3	0.11	0.2	Topsoil fill due to collapse of lintels	Top fill of kiln 3
31		1.9	1.9	0.94	Cut of chamber	Cut of chamber
32	C31	1.3	1.2	0.6	Collapsed stone roof	Upper fill chamber
67	C29	0.4	0.8	0.11	Orange brown clay silt	Fill of flue
68	C29	1	1	0.2	Light brown charcoal-rich silt clay	Fill of flue
69	C29	0.7	0.6	0.1	Orange brown silt clay	Backfill of flue
70	C29	2	1.1	0.5	Dark brown silt clay	Collapse material
71	C29	0.4	0.5	0.1	Orange charcoal-rich clay sand	Fill of flue
74	C31	1.3	1.2	0.6	Mid brown clay sand in chamber 1	Basal fill
76	C29	1.4	0.53	0.4	Brown clay silt	Collapsed roof
93	C31	< 0.6	< 0.5	< 0.3	Chamber wall stone lining	Chamber-wall lining
94	C29	< 0.7	< 0.4	< 0.4	Lintels	Lintels
98	C29	0.6	0.3	0.15	Grey gravelly silt sand	Fill of passage flue
101	C29	1	0.8	0.03	Light grey brown sandy clay	Fill of C29
102	C29	1	0.5	0.18	Light brownish grey sandy clay	Fill of C29
113	C29	2.52	1.75	0.87	Grey brown sandy clay loam	Fill of C29
122	C29	0.27	0.5	0.09	Grey brown sandy clay	Fill of C29
123	C29	0.45	0.38	0.06	Grey brown sandy clay	Fill of C29
124	C29	0.44	0.4	0.05	Grey white sandy clay	Fill of C29
131	C29	3.6	0.2	0.4	Jamb stones Kiln 3 supporting lintel	Jamb stones in flue

135	C29	0.2	0.6	0.1	Mid-brown silt clay	Silt clay deposit
136	C29	3	0.5	0.08	Yellow orange course sand	Intentional backfill
137	C29	0.6	0.3	0.19	Orange sandy clay loam	Fill of C29

Finds

Context	Find No	Material	Period	Description
C30	E3721:30:1	Clay	Post-medieval	Clay pipe
C32	E3721:32:1	Pottery	Post-medieval	Modern
C32	E3721:32:2	Pottery	Post-medieval	Modern

Interpretation

Kiln 3 was the final kiln to be constructed on site. It was orientated on a northeast – southwest alignment (completely opposite alignment to the previous two kilns) (Figure 3, 7, 10 and 11; Plate 8 and 9). It was a much more substantial construction than Kilns 1 and 2 and comprised a large fire bowl, C29, and stone-lined flue leading to a stone-lined chamber C31. The fire-bowl was not stone lined but was a large bowl-shaped pit. The chamber walls were built with unmortared stones C93 and the flue was lined with stones C131. The stone lining in the flue was then topped with lintels C94. The stone-work was very well preserved and the stones used in the lining are likely to have been robbed from the two earlier kilns (1 and 2) on site. Although the cut for the kiln is an oblong pit of approximately 7 m x 2 m the stone structure within it is a classic keyhole shape kiln in plan.

The fire-bowl (at the northeast end of the kiln) contained five layers with evidence of burning: three of ash (C122, C123 and C124) and two of charcoal (C101 and C102). The flue also contained three layers of ash and charcoal (C98, C71, and C67) and some probable trample layers (C135 and C136). It had then been partly backfilled with charcoal-rich silty clay C68 when some of the lintels fell in. It then became filled by a number of silt fills C30, C70 and C69. Apart from stone lining C93, the chamber contained only two layers, C74 and C32; both appeared to be deliberate in-fills sealed by a loam C137. Post-medieval ceramic material (clay pipe and pottery sherds) was found in both C30 and C32. The modern pottery was identified as pearlware and is intrusive (McCutcheon, Appendix 2.6).

One AMS date was obtained from deposit C74, the basal layer of the chamber. A fragment (0.2 g) of hazel charcoal (*Corylus avellana*) was identified (Cobain, Appendix 2.2). This charcoal returned an AMS result of 790±20 BP (UBA 12709). The 2 Sigma calibrated result for this was AD 1218–1270 (Appendix 2.1). This context also produced charcoal from alder, birch, oak, ash crab apple, wild/bird cherry and yew. C74 also produced seed and grain fragments of *Anthemis cotula* (stinking chamomile), *Avena* spp (oats), *Triticum* spp (wheat) and *Triticum aestivum/durum* (free threshing wheat). The fill C113 produced *Avena* spp (oats), *Hordeum* spp (barley), *Hordeum vulgare* (naked barley), *Triticum* spp (wheat), *Triticum monococcum* (einkorn wheat) and *Poaceae* (indeterminate grain).

Cattle bone was recovered from C68, C76 and C113, all back-fills and collapse material (Geber, Appendix 2.3). *Caprovine* bones were identified from C68, C69, C76, C113 and C185. A large number of fox (*Vulpes vulpes*) bones were identified from C68, C74 and C78, all collapse material, representing two adults and one immature fox and may indicate that for a time the chamber had been used as a fox den that accidentally, or was deliberately, collapsed. A number of hare (*Lepus timidus*) bones were also identified from the collapse and backfill material C68 and C76 and are probably associated with the fox activity. Bones from field mice (*Apodemus sylvaticus*) were identified from C74; the basal fill of the chamber, and represent burrowing activity within the kiln. Fragments of common frog (*Rana*

temporaria) bone were also identified from this context but as it is generally accepted that they are an introduced species and that frogs burrow to hibernate it is likely that the bones are a recent intrusion.

2.3.4 Foundation Trenches

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
42		1.8	0.13	0.12	Curvilinear slot-trench / wind break	Cut of slot trench
43	C42	1.8	0.13	0.12	Brown silt with charcoal inclusions	Fill of slot trench
44		6.5	0.25	0.35	Curvilinear slot-trench / wind break	Cut of slot trench
45	C44	6.5	0.22	0.09	Mottled orange brown sandy silt	Top fill of slot trench
50		2	0.8	0.12	Shallow irregular cut	Irregular pit
51	C50	2	0.8	0.12	Brown grey silt	Fill of irregular pit
52		2.7	0.15	0.2	Curvilinear slot-trench	Cut of slot trench
53	C52	2.7	0.15	0.1	Charcoal rich silt	Fill of slot trench
141	C52	0.15	2.7	0.1	Brown sandy silt	Fill of slot trench
160	C44	6.5	0.23	0.3	Grey brown sandy silt	Basal fill slot trench
169		0.6	0.29	0.18	Cut of shallow possible slot trench	Possible slot trench
170	C169	0.6	0.29	0.18	Orange brown sandy silt	Fill poss. slot trench
173		5	0.5	0.44	Curvilinear slot-trench / wind break	Cut of slot trench
174	C173	3.5	0.65	0.44	Brown orange sandy silt clay loam	Fill of slot trench
175	C173	3	0.2	0.12	Brown silt clay	Fill of slot trench
177	C173	2	0.15	0.1	Orange brown silt clay	Fill of slot trench
181	C173	9	0.5	0.02	Orange brown sandy clay (lower fill)	Fill of slot trench

Finds: None

Interpretation

A series of curvilinear slot trenches were located on a level area to the immediate northwest and upslope of the kilns (Figure 3, 7 and 12; Plate 9 and 10). These possibly supported structural walls for a roofed building over the drying chamber. The earliest of the foundation trenches (C173) was cut away by Kiln 2 at its south end and may have been contemporary with Kiln 1, which was at the centre of its arc. Foundation trench C52 may represent a repair/ reinforcement for trench C173. It cut through a shallow pit C50 which may have been associated with the earlier kilns.

Foundation trench C44, located the furthest away to the northwest, may have functioned as a shelter for Kiln 2. It is possible that the shallow sub-oval pit C169 on the southeast side of Kiln 3 may be a continuation of trench C44 and that Kiln 3 truncated it. The short trench C42 was truncated by Kiln 3 on its east extent and so may have been related to the activity in Kilns 1 and 2.

In purely spatial terms, the foundation trenches appear to be more logically aligned on Kilns 1 and 2 than on Kiln 3.

One AMS date was obtained from deposit C53, the fill of a curvilinear slot trench. A fragment (2.9g) of hazel charcoal (*Corylus avellana*) was identified (Cobain, Appendix 2.2). This charcoal returned an AMS result of 1211±24 BP (UBA 12711). This date is contemporary with Kiln 1. The 2 Sigma calibrated result for this was AD 717–888 (Appendix 2.1). Oak was also identified from the sample as well as the carbonised seeds of *Avena* spp (oat), *Hordeum* spp (barley) and *Triticum aestivum/durum* (free threshing wheat) and *Poaceae* (indeterminate cereal) grains.

2.3.5 Surrounding Postholes and Stakeholes

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
38		0.31	0.26	0.53	Steep sides tapered base	Possible posthole
39	C38	0.31	0.26	0.53	Grey brown silt 30% stones	Fill poss. posthole
40		0.31	0.31	0.5	Steep sides flat base	Possible posthole
41	C40	0.31	0.31	0.5	Grey brown sandy silt 20% stones	Fill poss. posthole
142		0.3	0.3	0.38	Cut of posthole with flat base	Cut of posthole
143	C142	0.3	0.3	0.38	Grey brown sandy silt	Fill of posthole
148		0.08	0.07	0.19	Cut of stakehole tapered base	Cut of stakehole
149	C148	0.08	0.07	0.19	Brown sandy silt	Fill of stakehole
150		0.09	0.09	0.25	Cut of stakehole with flat base	Cut of stakehole
151	C150	0.09	0.09	0.25	Brown sandy silt	Fill of stakehole
152		0.16	0.12	0.1	Cut of posthole with concave base	Possible posthole
153	C152	0.16	0.12	0.1	Brown silt sand	Fill poss. posthole
154		0.06	0.06	0.13	Cut of stakehole with flat base	Cut of stakehole
155	C154	0.06	0.06	0.13	Brown sandy silt	Fill of stakehole
156		0.06	0.06	0.12	Cut of stakehole with flat base	Cut of stakehole
157	C156	0.06	0.06	0.12	Brown sandy silt	Fill of stakehole
158		0.06	0.06	0.17	Cut of stakehole with pointed base	Cut of stakehole
159	C158	0.06	0.06	0.17	Brown sandy silt	Fill of stakehole
161		0.35	0.3	0.08	Shallow oval pit on end of C42	Shallow oval pit
162	C161	0.35	0.3	0.08	Black brown charcoal-rich silt	Fill of shallow pit
163		0.27	0.2	0.15	Cut of posthole with concave base	Cut of a posthole
164	C163	0.27	0.2	0.15	Brown sandy silt	Fill of a posthole
165		0.14	0.12	0.37	Cut of stakehole with pointed base	Cut of stakehole
166	C165	0.14	0.12	0.37	Orange brown silt sand	Fill of stakehole
167		0.32	0.25	0.19	Cut of posthole with concave base	Cut of posthole
168	C167	0.18	0.18	0.14	Post pipe in posthole	Post pipe
171	C167	0.32	0.23	0.22	Yellow brown silt sand	Post packing
172	C167	0.19	0.19	0.06	Grey brown silt	Post packing
186		0.18	0.22	0.22	Circular with tapered round base	Cut of posthole
187	C186	0.18	0.22	0.22	Orange brown sandy clay	Possible post-pipe

Finds: None

Interpretation

Postholes C38, C40, C148, C150, C156, C158, C161 and C163 may all represent supports for the structure associated with foundation trench C42. Alternatively they may have been related to postholes C154 and C186 and stakehole C165 and have made up some form of structure, the rest of which had been cut away by the kilns. Posthole C152 may represent a repair to the structure based on foundation C173. Posthole C167 may have held a support post for the same feature at its northeast end with C142 performing a similar task at its south end.

2.3.6 Surface Deposits

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
63		0.64	0.5	0.1	Scorched clay in kiln 2	Burnt clay deposit
176		0.98	-	0.06	Mottled grey silt with ash / charcoal	Deposits

Finds: None

Interpretation

A deposit of burnt material C63 was recorded on the top fill of Kiln 2 and may represent redeposited material from one of the kilns. An ash and charcoal spread, C176, was located to the east of Kiln 1 and to the south of Kiln 3 and may represent waste material from either kiln.

2.3.7 Discussion of early medieval/medieval activity

The early medieval features on site consisted of three successive cereal-drying kilns and associated features. Four curvilinear slot trenches located to the west of the kilns were likely to have supported the walls of a roofed superstructure covering the drying chamber. It is possible that each slot trench was built for a corresponding phase of kiln activity; however only Kiln 1 and the slot trench C173/52 have dates proving contemporaneity. A number of possibly associated postholes and stakeholes, particularly near Kiln 3, were also recorded. These may have functioned as support posts for the later structure.

The kilns were earth cut and stone built and conform in plan to the keyhole type. The unusual aspect of the kiln is that the first two were aligned with their entrances (fire-bowl) to the southeast while the final kiln was built with its entrance or fire-bowl to the northeast. The final kiln appears to have been built a lot later, possibly after the earlier kiln had been abandoned for some reason. Prevailing westerly winds would have blown the smoke and any potential fire hazards east and away from the site of the ringfort which presumably was serviced by the kiln.

2.4 Post Medieval Agriculture

The post-medieval agricultural activity on this site consisted of six wide spade dug furrows and some isolated features of unknown function.

2.4.1 Furrows

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
77		-	1.4	0.18	Linear cut, concave base	Cut lazy bed furrow
78	C77	-	1.4	0.18	Mid brown, silty clay	Fill lazy bed furrow
79		-	-	-	Linear cut, concave base	Cut lazy bed furrow
80	C79	-	-	-	Mid brown, silty clay	Fill lazy bed furrow
81		-	1.68	0.2	Linear cut, concave base	Cut lazy bed furrow
82	C81	-	1.68	0.2	Mid brown, silty clay	Fill lazy bed furrow
83		-	1.46	0.28	Linear cut, concave base	Cut lazy bed furrow
84	C83	-	1.46	0.28	Mid brown, silty clay	Fill lazy bed furrow
85		-	0.97	0.12	Linear cut, concave base	Cut lazy bed furrow
86	C85	-	0.97	0.12	Mid brown, silty clay	Fill lazy bed furrow
87		-	0.64	0.05	Linear cut, concave base	Cut lazy bed furrow
88	C87	-	0.64	0.05	Mid brown, silty clay	Fill lazy bed furrow

Finds

Context	Find No	Material	Period	Description
C80	E3721:80:1	Clay	Post-medieval	Pipe
C80	E3721:80:2	Clay	Post-medieval	Pipe
C80	E3721:80:3	Clay	Post-medieval	Pipe

Interpretation

These six hand-dug furrows represent post-medieval spade-dug tillage. Furrow C83 cut through the top fill of Kiln 3. The furrows represent drainage channels that ran between the raised ridges where the crops were grown. The ridges were produced by mounding the topsoil and subsoil dug out of the channels to create growing

nutrient-rich and well-drained ridges. The Curtaun furrows were between 1.5 and 2 m in width and the ridges appear to have been between 2 to 4 m in width which would have allowed for a distance of approximately 4 m from crest to crest. They would have been used for growing cereals or potatoes.

2.4.2 Isolated Features

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
125		8.6	0.95	0.19	Cut of linear feature	Linear feature
126	C125	8.6	0.95	0.19	Brown sandy silt	Shallow linear cut
127		0.25	0.25	0.15	Cut of posthole with concave base	Posthole
128	C127	0.25	0.25	0.15	Dark brown silt	Fill poss. posthole
188		0.42	0.4	0.1	Cut of sub-circular features	Poss. feature
189	C188	0.42	0.4	0.1	Brown black silt clay	Fill of poss. feature
190	C125	8.6	0.76	0.06	Light brown silt	Fill of linear C125

Finds: None

Interpretation

The above contexts represent a number of features recorded in an area stripped to the north of the main site. These comprised of linear gully feature C125, a pit C188 and a possible posthole C172. The linear feature cut the pit and contained a fragment of a post-medieval clay pipe. The other two features are undated and their function is unknown.

2.4.3 Interpretation

The post-medieval agriculture on this site consisted of six hand-dug furrows traversing the slope of the hill and running through the length of the site (Figure 3; Plate 10). One of them C83, cut through Kiln 3.

2.5 Topsoil

Context	Fill of	L (m)	W (m)	D (m)	Basic Description	Interpretation
1	Site	Site	Site	0.5	Mid brown clay silt	Topsoil

Finds

Context	Find No	Material	Period	Description
C1	E3721:1:1	Glass	Early medieval?	Bead
C1	E3721:1:2	Glass	Early medieval?	Bead fragment
C1	E3721:1:3	Metal	Post-medieval (1691)	Gun money

The topsoil across the site was a loose clay silt loam to a depth of up to 0.5 m. It sealed all of the archaeological deposits and features at Curtaun 1 and 2. Find E3721:1:3 is a copper-alloy halfpenny of James II dating to 1691 and was minted in Limerick (Mac Dermott, Appendix 2.4). Although the two beads (Plate 12) are from topsoil it is likely that they are related to the early medieval ringfort and kilns, however specialist analysis suggests that it is just a likely that the beads may be from the Iron Age (Carroll, Appendix 2.5).

3 SYNTHESIS AND DISCUSSION

3.1 Landscape Setting

Most of the low-lying areas along the route were associated with poorly drained bog and wet marshland which have developed within glacially formed depressions and seasonal lakes known as turloughs. The higher ground generally comprised well-drained, gently undulating pastureland with some uneven hummocky ridges, formed either of limestone epikarst or glacial features such as drumlins. The two dominant rock types of the region were Carboniferous Limestone, which underlay the entire length of the N18 Gort to Crusheen scheme, and the Devonian Old Red Sandstone, which formed the Slieve Aughty Mountains to the east of the project. The road alignment was predominantly underlain by either limestone and sand derived till deposited during the last glaciation or organic peat which has generally formed since then in the low-lying, poorly drained areas where standing water and slow percolation caused thin layers of peaty soil to accumulate.

The Curtaun site lies at 25 m Ordnance Datum (OD) and is located below the summit of a ridge which trends northeast/southwest. The site was located on its east-facing slope on well-drained ridge. It overlooked bog to the east and southeast. The site consists of three main areas of activity, the kilns, an isolated trough and a burnt spread with some pits. The sites were located at NGR 142093/195405 (21m OD).

The excavated area is overlooked by a large bivallate ringfort (RMP GA128-043). This is mostly outside the footprint of the road scheme but part of the earthwork lies within the roadtake. The site is sub-circular and measures 62 m from north to south by 60 m from east to west externally and 43 m by 38 m internally. The inner bank of earth and stone construction is 5.7 m wide and stands 0.9 m above the interior and 1.9 m above the external ditch. The ditch is U-shaped in profile and is 1.7 m wide at the bottom. The external bank, also of stone and earth construction survives from the SSW through NNE. It measures 3.4 m wide and stands 1.3 m above the internal ditch and 0.7 m above the surrounding field. There is no trace of an external ditch from the WSW through NNE arc. There is a possible entrance to the SSW, although this has been widened and the material pushed into the ditch. The interior is flat and featureless.

3.2 Archaeological Landscape

3.2.1 The Bronze Age Landscape

Following the test-excavation phase of the project it was apparent that most of the archaeological sites identified were located to the south of the scheme in County Clare. This trend appears to have resulted from landscape management in the recent past where the better drained lands to the north have been improved and the fields enlarged which would have had a negative effect on any buried archaeological sites. However the area to the south, which coincides with crossing the county border, was of more marginal land prone to flooding and in this area the route of the new road tended to follow wet valley floors and steep valley slopes. The landscape encountered in County Clare was much the same as it was depicted on the first edition Ordnance Survey maps (1842).

As with the transition from the Mesolithic to Neolithic periods, the transition to the early Bronze Age period brought with it many changes to society. In County Clare and particularly in the northwest of the county in the Burren where there is a highly visible prehistoric landscape due to the exposed bare rock nature of the terrain the large number of prehistoric sites including c. 80 wedge tombs (Jones 2004, 65) indicates a well organised late Neolithic/early Bronze Age landscape. The transition

from the Neolithic to the Bronze Age reflects a continued and somewhat intensified population in north and east Clare. It is during this period that megalithic monuments were abandoned in favour of individual cist or pit burials, either located in isolation or in small cemeteries. Different forms of barrow monuments were also being constructed during the period, as well as ceremonial monuments such as circular henges, standing stones, stone rows and stone circles. A current research project in the Burren has also recorded middle and late Bronze Age ritual funerary deposition in Glencurran Cave, Co. Clare (Dowd 2007).

In recent years Bronze Age habitation sites have come more to the fore as they have been uncovered as part of development-led or infrastructural projects. They are well documented elsewhere but two interesting, recently excavated sites include Bronze Age roundhouses at Tober 1, County Offaly (Walsh 2009) and Barnhill, Dromoland, Co. Clare (Moore Group 2009). An important academic study of the spatial organisation of Bronze Age society and landscape has been undertaken of the north Munster area and in county Clare this is defined by the work undertaken by Grogan on the Bronze Age trivallate hillfort at Mooghaun (Grogan 2005). This study identified and mapped a Bronze Age landscape dominated by the hillfort which may have influenced a catchment area of up to 450 km sq (Grogan 2005, 95). Identified within the area of influence were ceremonial monuments, house sites, burnt mound sites and other more mundane features such as fish traps and trackways in the Fergus estuary (O'Sullivan and Dillon 2005). The Mooghaun study area is outside the sphere of influence of sites identified on the Gort to Crusheen scheme but indicates nonetheless that a similar societal organisation of the landscape may have existed for them too. A hoard of gold objects discovered at Mooghaun during the construction of the Limerick – Ennis railway in 1854 is one of the largest single discoveries of Bronze Age gold in Europe (Grogan 2005, 70). Another significant gold find from the north of the county was the Gleninsheen gorget, a large collar of hammered gold discovered by a farmer in 1932 (Jones 2004, 74).

The most widespread domestic sites from the Bronze Age are burnt mounds (also known as *fulachta fiadh*). They survive as low mounds of charcoal-rich soil mixed with heat-shattered stones. They are usually horseshoe shaped, located in low-lying areas near a water source and are often found in clusters. While it is generally thought that they were probably used as cooking places (Ó Drisceóil 1988), finds from excavated examples where there is a noteworthy absence of animal bone does not easily support this theory. Lucas (1965) suggested that burnt mounds might have been utilised for processes such as bulk washing, dying and leather working while Barfield and Hodder (1987) have suggested that such sites were covered by light structures and used as sweat houses. Radiocarbon dates for this monument type have generally placed them in the Bronze Age (Brindley et al. 1990, 55) though evidence from early Irish texts (Ó Drisceóil 1988) suggests use of this type of site up until the 16th century AD.

Burnt mounds make up a significant number of the Recorded Monuments within the immediate vicinity of the Gort to Crusheen road scheme and following examination of a one kilometre wide corridor, using the road as the centreline, of the scheme, these classic elements of the Bronze Age landscape became apparent. Within this defined corridor there were no recorded burnt mounds in south County Galway, whereas north County Clare was rich in the monument-type: RMP sites CL018-069, CL018-071, CL018-072, CL018-077, CL018-084, CL018-082, CL018-083, CL018-086, CL026-143, CL026-130, CL026-131, CL026-136, CL026-138, CL026-137, CL026-134, CL026-135, 02E1284 partly excavated as part of Bord Gáis Éireann pipeline to the west at Bearnafunshin (Dennehy 2002a), 02E0342 excavated as part of the Bord Gáis Éireann's pipeline to the west at Bearnafunshin (Halpin 2002), CL026-149,

CL026-150, CL026-151, CL026-156, CL026-157, CL026-158, CL026-165, CL026-164, and Site AR25 Carrowdotia (Taylor 2006a). There appeared to be a tendency in the sites identified for clustering, often within 100 m or less of each other.

Single upright standing stones are a common feature of the Irish landscape and, though they may date to different periods and serve different functions, excavation has shown that some may mark prehistoric burials, while some may signify a route-way, a boundary, or serve a commemorative role. Generally speaking, it is likely that a large number date to the Bronze Age. The orientation of a stone may have had significance, with their long axes aligned to another stone or toward a cairn on a mountain top, although the latter is difficult to prove. A standing stone (RMP CL026-035) has been identified c. 150 m southeast of the southern end of the route.

Ring barrows consist of a low, usually circular mound or level area enclosed by a fosse and external bank, the diameter of the earthwork usually ranging between 4 m and 12 m and rarely exceeding 1 m in height or depth. Excavation has demonstrated that they usually sealed a burial deposit, often a cremation. Such forms of burial have a long tradition and individual examples have been assigned to the Neolithic, Bronze and Iron Ages. A ring barrow (Dennehy 2002b) was identified during monitoring of Bord Gáis Éireann's pipeline at Cloonagowan, Co. Clare. The archaeological remains represented a cremation pit with a ring ditch. Pits, stakeholes and a slot trench were identified within the ring ditch, with some pits indicating a probable domestic function. A second cremation pit was identified c. 75 m to the northeast, with an isolated posthole, which may have acted as a marker for the cremation pits, located further to the northeast. A single thumbnail scraper was recovered from the site, enabling the rough dating to the late Neolithic/early Bronze Age period (Dennehy 2002c). A single possibly Bronze Age cremation pit and industrial pits were identified during the monitoring of Bord Gáis Éireann's pipeline in Gortaficka (Dennehy and Sutton 2002). A wedge tomb (CL026-015) is located less than 500 m northeast of a concentration of burnt mounds and spreads which surround a peat bog, and were excavated as part of the N18 Gort to Crusheen road scheme, in Caheraphuca townland. The wedge tomb is also likely to date to the late Neolithic or early Bronze Age.

Our appreciation of the wider Bronze Age landscape in counties Clare and Galway is continually being expanded as more sites are being uncovered during research, development-led and infrastructural projects such as the N18 road scheme. Excavations connected with construction of the N18 to the north (Gort to Oranmore) which is entirely within county Galway has also recently produced evidence for the Bronze Age with eight burnt mound sites identified, one at Ballyglass West, a cluster in Caherweelder townland and further examples in Moyveela and Coldwood (Eachtra 2009).

Excavations undertaken by TVAS (Ireland) Ltd in 2003 in advance of construction of the N18 Ennis Bypass and N85 Western Relief Road, which terminated at the southern end of the N18 Gort to Crusheen road scheme revealed similar archaeological sites. This area was generally better drained and the variety of Bronze Age sites encountered during that project reflects the change in terrain. The marginal lands and areas closest to wetlands, rivers and streams produced evidence for burnt mounds such as the four burnt mound sites identified at Clare Abbey (Hull 2006a and b, Taylor 2006c and d) close to the Ardsollus river (a tributary of the Fergus). Burnt mound sites were also excavated at Killow (Taylor 2006b), Cahircalla More (Taylor 2006e) and Carrowdotia (Taylor 2006a) just to the very south of the Gort to Crusheen project. Apart from the burnt mound sites a number of funerary sites were also identified on the N18 Ennis Bypass and N85 Western Relief Road. Two cremation cemetery sites were identified in Manusmore townland (Hull 2006c

and 2006d) both were located on slightly elevated free draining gravel ridges. A third site with cremation pits was identified at Killow (Taylor 2006b) in close proximity to a burnt mound; it was located on a low but well-drained gravel drumlin.

The landscape of County Clare is rich in sites dating to the Bronze Age, indicating that the area was widely inhabited during that period. Burnt mounds are the most frequent site of Bronze Age date encountered in this area of Clare, with twenty seven identified within the immediate area of the road scheme. There are no burnt mounds recorded within the tight constraints of the study area for Co. Galway but there are examples in the wider surrounding area and they were also located in the excavations on the N18 contract further to the north. The archaeological evidence to date indicates that the study area and indeed its wider landscape was inhabited throughout the entire Bronze Age period.

Bronze Age Curtaun 1 and 2

Archaeological evidence for two Bronze Age burnt mounds was recorded at Curtaun 1 and 2. Area 1 was an example of a Bronze Age burnt mound with trough. It was located on marginal land beside a bog which was probably a lake. The site consisted of a layer of burnt and heat-shattered stone which sealed a single trough, which would have been wood lined. Area 2 was located approximately 130 m to the south on a similar location at 25 OD. It consisted of two troughs, two pits and a possible well (it was round and tapered and appeared to be unlikely to be a trough) sealed by a spread of heat-shattered stone. This site returned a 2 sigma date range of 1608–1459 BC (UBA 12708) (Appendix 2.1).

Similar sites in terms of morphology and Bronze Age date were identified and excavated across the project. Sites excavated across the scheme were generally identified as simple spreads or mounds of burnt and heat-shattered stone, while some of these like the one at Drumminacloghaun 1 (McNamara 2009c) had evidence for a simple earth-cut trough other sites such as those at Gortavoher 1 (Delaney 2009a) and Caheraphuca 10 (Bayley 2009c) were represented simply by spreads of heat-shattered stone.

Isolated burnt mounds sites identified along the project were Drumminacloghaun 1 (McNamara 2009c), Rathwilladoon 4 (Lyne 2009) and Clooneen 1 (Bayley 2009a). As the route travelled further south it tended to follow marginal wetland and stream valleys and the burnt mounds appeared to become more clustered. This clustering of sites was identified at Curtaun 1 and 2, Gortavoher/Monreagh (Delaney 2009 a and b, McNamara 2009a), Derrygarriff (Nunan 2009a), Sranagalloon/Gortaficka (Nunan 2009b, 2009c and 2009d), Caheraphuca (Bayley 2009b and 2009c) and Ballyline (McNamara 2009b). A similar pattern of clustered burnt mounds to the south in County Clare and a paucity of examples of burnt mounds in County Galway was also encountered during the construction of Bord Gáis Éireann's pipeline (Grogan et al. 2007). The AMS dating indicates however that the sites were not necessarily contemporary but rather spanned the entire Bronze Age period and extended into the Iron Age illustrating how the process of this pyrolithic technology remained the same across thousands of years.

More elaborate examples of troughs and pits from across the project (though serving the same function) displayed evidence for timber lining through the identification of stakeholes for upright supports as at Curtaun, Caheraphuca 1 (Bayley 2009b) and Gortaficka 1 and 2 (Nunan 2009d) and in some cases the actual remains of timber lining as at Clooneen 1 (Bayley 2009a), Caheraphuca 4 (Bayley 2009c) and Sranagalloon 3 (Nunan 2009c). Although the primary function of these sites was to heat water through the use of hot stones the actual purpose remains unknown. The

sites at Caheraphuca 1 and Gortaficka 2 both displayed evidence for numerous troughs, drains, hearths and possibly preparation areas with stake-lined pits suggesting that they may have been used for some more formal industrial function than the other sites.

A review of the RMP records indicates a burnt mound at Fiddaun approximately 2 km to the northwest (GA 128–91) of Curtaun and a cluster a further 2 km to the northwest at Rockvale in County Clare (CL011–34 and CL011–35). There is a cluster of burnt mound sites around the lakes on the eastern slopes of Mullagh More in the Burren (approximately 7 km to the west). Drumminacloghaun 1 (McNamara 2009c) a burnt mound excavated as part of this project was located approximately 6 km (McNamara 2009c) to the north. Situated approximately 2 km to the south was Rathwilladoon 4 (Lyne 2009) which was an intact horseshoe-shaped burnt mound located on the edge of a seasonal lake (it was only partially excavated as most of it lay outside the CPO area) with the Gortavoher and Monreagh sites further to the south.

The Curtaun burnt mounds were identified on the lower slopes of a ridge on the edge of a bog (former wetland). They were situated beside a much later enclosure dating to the early medieval period. It is reasonable to expect that those that used the burnt mounds had a settlement on the higher ground overlooking this wetland and they would have exploited the well-drained ridge much the same as the later enclosure builders in the early medieval period. This area of the route has been intensively farmed as it is good land surrounded by wetland. The poor representation of Bronze Age monuments in the immediate vicinity may reflect the destruction and levelling of monuments during land improvements and field enlargement in the twentieth century rather than an actual absence of similar sites within the landscape.

3.2.2 The Early Medieval Landscape

Early medieval ringforts and enclosures make up a significant number of the Recorded Monuments within the immediate vicinity of the Gort to Crusheen road scheme and following examination of a one kilometre wide corridor of the scheme, using the new N18 as the centreline, a clear early medieval landscape can be mapped.

In the early medieval period Ireland was not a united country but rather a patchwork of petty kingdoms all scrambling for dominance, with their borders ever changing as alliances were formed and battles fought. Kingdoms were a conglomerate of these petty kingdoms with the basic territorial unit known as a *túath*. Byrne (1973) estimates that there were at least 150 kings in Ireland at any given time during this period, each ruling over his own *túath*.

The portion of the study area which lies within County Galway was located within a *túath* known as *Aidhne* or *Uí Fhiachrach Aidhne*. This territory was bound to the east by the Slieve Aughty Mountains, to the south by County Clare and to the west by the Burren and Galway Bay. This territory corresponded roughly with the later medieval diocese of Kilmacduagh which included the parishes of Kiltartan, Kilmacduagh and Beagh (amongst others); within which the study area is located. The town of Gort takes its names from Guaire Aidhneach (*Gort Inse Guaire*), the 6th-century King of Connacht, who built a stronghold there. The *Uí Fhiachrach* claimed descent from Fiachrae, an older half-brother of Niall Noigiallach (Niall of the Nine Hostages) (McNamara & Madden 1996, 51-52).

The southern end of the study area was controlled by a number of different peoples during the early medieval period. Before the 8th century the area around modern Co.

Clare was inhabited by two main groups: the *Corcú Modruadh* and the *Corcú Baiscinn*. Around this time, the Munster area was controlled by a federation known as the *Eoghanacht*. A branch of the *Eoghanacht*, the *Deis Tuaisceart*, began to push their way into the territories of the *Corcú Modruadh* and the *Corcú Baiscinn* and by the middle of the 8th century had succeeded in forcing both out. The *Deis Tuaisceart* grew in power here throughout the early medieval period and later became known as the *Dál gCais*, the most influential power in the Munster region (O' Murchadha, 1992, 6).

During the turbulent early medieval period roughly circular defensive enclosures, also known as ringforts, cahers, cashels and *lios*, were constructed as simple farmsteads and afforded limited protection against raiders. These sites were the most common form of settlement during the early medieval period and are usually defined as a broadly circular enclosure delimited by a bank and ditch. Ringforts can be divided into three broad categories - univallate sites with one bank or ditch, multivallate sites with as many as four levels of enclosing features (though bivallate sites are the most numerous) and platform or raised ringforts where the interior of the ringfort has been built up. When the radiocarbon and dendrochronological dates from ringfort excavations are compared not only is the ringfort clearly an early medieval phenomenon, but a strong case emerges for dating the phase of ringfort construction to a period between the 7th and 9th centuries AD (Stout, 1997, 22–31). The most commonly recorded structures found within ringforts include souterrains, as evident at a site in Rathwilladoon townland close by (GA128–070).

There are 13 ringforts located within a 1 km corridor centred on the centre line of the N18 Gort to Crusheen scheme (GA122–014, GA122–079, GA122–021, GA128–012, GA128–014, GA128–073, GA128–078, GA128–016 GA128–017, GA128–018 GA128–005, GA128–043, GA128–070). Additionally there are 21 enclosure sites (Sites GA128–013, GA128–015, GA128–074, GA128–019, CL018–021, CL018–018, CL018–019, CL018–017, CL018–085, CL018–041, CL026–131, CL026–043, CL026–047, CL026–040, CL026–048, CL026–041, CL026–042, CL026–036, CL026–038, CL026–037, and CL026–031). Enclosure sites belong to a classification of monument whose precise nature is unclear. Often they may have been ringforts, which have either been damaged to a point where they cannot be positively recognised, or which are smaller or more irregular in plan than the accepted range for a ringfort. An early medieval date is generally likely, though not a certainty.

Cashels are the stone equivalent of ringforts and are normally found in the west of the country with dry-stone walls built to enclose farmsteads instead of the excavated earthen defences of ringforts. They have the same circular or roughly circular plan as ringforts and the walls can be quite massive. The outer and inner faces of the walls were carefully built, often with noticeably larger stones in the lower courses, with the core of the wall of rubble dump construction. Archaeological excavations have shown the same general layout and range of finds for cashels as for ringforts, however, the internal structures were built of stone with stone footings. A cashel has been recorded in the townland of Caheraphuca, Co. Clare (CL026–013) c. 150 m west of the route. A further cashel was identified by TVAS Ltd during excavations to the south of the southern end of the new route in the townland of Carrowdotia, Co. Clare (Taylor, 2006a). Two cashels were also excavated to the north as part of the Gort to Oranmore section of the N18 road scheme at Dumharsna North and Drumharsna South and a cashel with associated burials was excavated at Owenbristy (Eachtra 2009).

As briefly mentioned above, souterrains or artificial underground passages are frequently found in association with ringforts or cashels and occasionally occur within

ecclesiastical enclosures. They consist of a concealed narrow entrance at ground level leading into a passage, which opens into a single chamber or series of chambers. They probably functioned as places of refuge and/or for storage of dairy produce. Four souterrains (GA122-079, GA128-014, GA128-005 and GA128-070) have been recorded within proximity to the N18 Gort to Crusheen Scheme.

The introduction of Christianity to Ireland in the early 5th century brought about not only cultural change but also a reorganisation of the existing landscape. The new religion was accepted and it spread throughout the country over the 5th and 6th centuries providing a catalyst for change. The early Church was an episcopal one, however during the second half of the 6th century monasticism began to spread through Ireland and from the 8th or 9th century the Irish church was dominated by a monastic tradition.

The earliest churches would have been wooden and do not survive, (stone structures were not widely built until the 10th century), and thus little is known about early church architecture. It was customary for early ecclesiastical sites to be surrounded by curvilinear enclosures. These are often difficult to trace on the ground, but can sometimes be traced in street layouts or as hedge-lines and cropmarks, visible from the air. A number of sites developed into full-scale monasteries and major *foci* of social organisation. Where towns and villages later grew on these sites, the old circular plan might be incorporated into the street pattern. Many enclosures were abandoned, while some continued as churches and graveyards into modern times. Ecclesiastical enclosures are characteristically associated with church buildings, existing or disused burial grounds and holy wells.

There is little evidence of early ecclesiastical activity within the study area, but there is some evidence within the surrounding area. St Colman, son of Duagh established the monastery of Kilmacduagh in the 7th century on land granted to him by King Guaire, after whom Gort is named. The townlands of Ballylennan, Drumminacloghaun, Ballyhugh, Ballysheedy, Ballybaun and Sheeaun all lie within the parish of Kilmacduagh. Again, lying outside the study area is the former location of a small church founded by St Cronan in the 6th century. This lies just 1 km north of Crusheen village and lies within the parish of Inchicronan. The site of Kilawinna burial ground, indicated on the Ordnance Survey map was thought to have been the location of this former church, although there is no evidence of the church now. It was also thought locally that the site was used as a children's burial ground (Coffey, 1993, 69). The site was re-used in the 12th century when the lands were granted to the Augustinians by King Donald More O' Brien (O' Murchada 1992).

A children's burial ground (GA128-069) is situated in the townland of Rathwilladoon c. 60 m west of the new route and is located beside an oval enclosure which also contains a souterrain (GA128-070).

The veneration of wells was a very widespread and ancient tradition in Ireland. Many holy wells can be found associated with early ecclesiastical sites. At least some holy wells in Ireland were important venues of pre-Christian ritual activity. Most wells are springs but occasionally other water sources, or hollowed stones that collect water, are treated as holy wells. There is an example of a holy well (GA122-003) situated on the Corofin Road (R460) in Ballyhugh townland just outside of Gort. The name of this well was recorded as *Cloghannack Well* on the Ordnance Survey map editions and also as *Tobermacduagh Well*, the later dedication being to St Colman Mac Duagh.

This brief archaeological background has been included to demonstrate the visible early medieval background in the study area. It is interesting to note that ringforts dominate the early medieval landscape and are second to Bronze Age burnt mounds with regard to numbers of monuments identified throughout the project. They are particularly numerous along the Galway section of the route, becoming less frequent as the route moves southwards into County Clare. This may be related to the decrease in the quality of the land as it becomes more prone to bogs and areas under peat and reflects an opposite pattern to the Bronze Age sites which become far more numerous in County Clare.

3.3 Archaeological Site Typology

3.3.1 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 been 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 agriculture and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserve the underlying associated features intact, such as troughs, pits and gullies.

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 component 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 mound sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in troughs 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; Ó

Drisceóil 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 specialist environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie et al. 2007).

3.3.2 Cereal Drying-Kilns

Drying kilns were used for a variety of purposes, but were mostly related to the drying of cereals and other crops, and in Ireland the two basic purposes for which they were constructed seem to have been to dry grain and to harden it prior to grinding (O'Sullivan and Downey 2005, 32). Cereal-drying kilns are generally classified as dumb-bell, figure-of-eight and keyhole-shaped. A basic kiln would comprise four main structural components: a stokehole, flue, bowl and drying platform/chamber.

A fire would have been set at the stokehole (which was either a natural depression or cut feature) at the mouth of the flue to separate the fire from the commodity to be dried. The flue extended from the stokehole to the bowl and drying chamber/platform. The drying platform would most likely have consisted of heavy timber supports overlain with wattles, carrying a layer of straw and/or straw mat, through which the heat was able to pass from below to the grain/cereal (ibid.). Blocking or baffle stones were effective in shorter flues to prevent sparks from the fire reaching the drying chamber. For the effective drying of grain a superstructure was required over the drying chamber. This is often represented by the presence of postholes or stakeholes or by foundation gullies. An example at Rathbane South, Co Limerick (Monk and Kelleher 2005, 84) was enclosed by a curvilinear feature that may have represented a structure similar to that at Curtaun. Monk and Kelleher's (2005) record excavated keyhole kilns between 1.2 m to 8.5 m in length, with an average length between 1.2 m and 4 m, with flues generally ranging between 1.2 m to 5 m with an average length 1 m to 3 m. The average diameter recorded for drying chambers was 0.5 m to 2 m. All three phases of the kilns at Curtaun fall within this range of dimensions.

The orientation of keyhole kilns appears to have been influenced by local factors such as topography, wind direction and the proximity of settlement. As fire was a hazard they were normally sited away from and downwind of any settlement. Monk and Kelleher (2005, 83) demonstrated that the majority of kilns appear to have been primarily aligned either north/south or east/west. The kilns at Curtaun were stone built and conformed in plan to the keyhole type. The unusual aspect of the kiln is that the first two were aligned with their entrances (fire-bowl) to the southeast while the final kiln was built with its entrance or fire bowl to the northeast. Monk and Kelleher (ibid.) demonstrated that the temperature could be controlled through the regular opening of the roof on the kiln superstructure and that the fire could be made safer by placing it within a pit at the mouth of the flue. A similar pit to this was identified at the mouth of the second phase kiln at Curtaun. It may be significant that the flue of this kiln is the longest of the three also; both elements combined would indicate an attempt to prevent fire.

It was also noted (ibid., 84) that many kilns were set into slopes, with the chambers upslope, or in boundaries such as ditches or field fences, and it was not unusual for the kilns to be cut into a slope or prepared terrace as at Curtaun. Examples have been noted at Brooklodge, Co. Cork, Mullagharlin/Haggardstown, Dundalk and Gortroe II, Co. Mayo.

Kilns where analysis has taken place generally produce evidence for the carbonised grains of oats, barley and wheat and with later dated ones producing evidence for the drying of pulses. At Curtaun the main grain represented was oats. This, however, is a reflection of grain that has been carbonised and does not necessarily mean that oats were the main crop, as barley and wheat were also recovered.

Monk and Kelleher (2005) and Kinsella (2007) have all suggested that keyhole kilns became widely used in the ninth/tenth centuries. Excavated kilns have indicated their use into the later medieval period as at Kilferagh, Co. Kilkenny and Ballysimon, Co. Limerick, dating to the 13th and 14th centuries (Collins and Cummins 2001). AMS dating of the Curtaun kilns indicates use and rebuilding long period from the 7th to 13th centuries.

3.4 Discussion

Curtaun 1 consisted of three main areas of activity: two areas of prehistoric burnt mound activity and the remains of three successive early medieval kilns with associated trenches and post/stakeholes. Six post-medieval hand-dug furrows also traversed the slope of the hill and ran through the length of the site. One of these cut through Kiln 3.

3.4.1 Phase 1: Natural Deposits

This phase represents the natural subsoil, which was cut or sealed by all subsequent archaeological features. The site was located on an east-facing slope below the summit of a ridge. The archaeological features were cut into an orange sandy clay till. As the features were located on a slope it was well drained. A substantial area of peatland was located to the east in the basin of a former lake.

3.4.2 Phase 2: Bronze Age Activity

Two separate areas of Bronze Age activity were identified at Curtaun 1 and 2. These were both the remains of burnt mounds. Both were very badly disturbed with only fragmentary spreads of heat-shattered stone left *in situ*.

In Area 1 the remains of an earth-cut trough had been timber lined as there was evidence for four corner posts. No other features associated with the burnt mound were identified in this area.

Ninety metres to the southeast another burnt spread was excavated at Area 2. Five pits were found under or around the spread of which three were part filled with heat-affected stone. The remaining two, one of which was under the spread and the other next to it, were filled with peat. The two peat-filled pits may have acted as shallow wells while the three pits containing heat-shattered stone acted as troughs for heating the water. The burnt mound at Area 2 has been dated to 3256±21 BP (UBA 12708). The 2 Sigma calibrated result for this was 1608–1459 BC placing it in the middle Bronze Age period.

Lab code	Context / sample	Sample material	Years BP	1 sigma	2 sigma
UBA 12708	C12 / S6	Hazel charcoal	3256±21	Cal 1604-1495 BC	Cal 1608-1459 BC

The charcoal assemblage from Areas 1 and 2 indicates that woodland close to the site during the Bronze Age period would have contained alder, hazel, birch and ash trees. The evidence for alder indicates a more damp environment, possibly indicating that the present-day bog land to the east of the site existed during the Bronze Age period. The hazel, birch and ash are all indicative of a drier environment and an oak-ash woodland further upslope, closer to the site. The hazel sample recovered from pit C9 contained a high proportion of items with curved growth rings

which Cobain (Appendix 2.2) suggests indicates evidence that this particular wood was being coppiced, as coppicing produces a higher proportion of small roundwood branches.

3.4.3 Phase 3: Early Medieval And Medieval Activity

The remains of three phases of kiln construction were found southeast of the ringfort. All three had been stone lined and showed internal signs of *in situ* burning. The earliest of the kilns returned an AMS result of 1252±37 BP (UBA 12710). The 2 Sigma calibrated result for this was AD 674–870 (Appendix 2.1). The kilns were built into a prepared and levelled platform on the slope. There was also evidence for a structure above the kiln that would have protected the grain/produce that was being dried over the drying chamber. Clear evidence for a curvilinear slot trench (which appears to have been repaired or propped with the construction of a second one) was recorded with a similar AMS date to indicate contemporaneity. It was dated to 1211±24 BP (UBA12711) which produces a 2 Sigma calibrated date range of AD 717–888. Although the evidence from this kiln is limited it would appear that the primary fuel used was oak (Cobain, Appendix 2.2). This was supplemented with kindling and brushwood from alder, hazel, birch, Maloideae (hawthorn, rowan, crab apple), wild/bird cherry, blackthorn/sloe, poplar/willow and yew. Although no carbonised grains were identified from the kiln, oats, wheat and barley were recovered from the slot trench C52 which appeared to be contemporary with Kiln 1.

Lab code	Context / sample	Sample material	Years BP	1 sigma	2 sigma
UBA 12710	C33 / S42	Wild Cherry charcoal	1252±37	Cal AD 685–803	Cal AD 674–870
UBA 12711	C53 / S91	Hazel charcoal	1211±24	Cal AD 776–867	Cal AD 717–888

Kiln 2 was situated almost parallel with Kiln 1. It was longer and narrower and had a fire pit at the entrance to the flue. Kiln 2 returned an AMS result of 1165±18 BP UBA 12712). The 2 Sigma calibrated result for this was AD 779–947 (Appendix 2.1). A charcoal-rich use-fill within the kiln, C72, produced carbonised alder, hazel, oak, ash and Maloideae (hawthorn/rowan/crab apple) charcoal inclusions, carbonised barley and wheat cereal grains and carbonised hazelnut shells.

Lab code	Context / sample	Sample material	Years BP	1 sigma	2 sigma
UBA 12712	C72 / S30	Charred Hulled Barley	1165±18	Cal AD 783–935	Cal AD 779–947

Kiln 3 was situated to the north of Kilns 1 and 2 and its construction cut across the two. It was oriented in the opposite direction with its fire-bowl to the northeast. It was the best preserved with drystone walling along its flue and in the drying chamber. Some lintels of the flue remained intact but the drying chamber had been deliberately backfilled with rubble and contained some modern finds. Charcoal from the basal layer in the drying chamber contained alder, hazel, birch, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry and yew charcoal inclusions, carbonised oat and wheat grains and carbonised stinking chamomile herbaceous taxa. This charcoal returned an AMS result of 790±20 BP (UBA 12709). The 2 Sigma calibrated result for this was AD 1218–1270 (Appendix 2.1) C113 a fill from the flue contained a similar assemblage including alder, hazel, birch, oak, ash and Maloideae (hawthorn/rowan/crab apple) charcoal inclusions and carbonised oat, barley and wheat cereal grains.

Lab code	Context / sample	Sample material	Years BP	1 sigma	2 sigma
UBA 12709	C74 / S24	Hazel	790±20	Cal AD 1225–1261	Cal AD 1218–1270

The fuel from Kilns 1, 2 and 3 indicate that woodland close to the site at Curtaun 1 and 2 during the early medieval phase of activity would have consisted of alder, hazel, birch, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry, blackthorn/sloe, poplar/willow and yew. The alder and willow are suggestive that a marshy/more waterlogged environment existed close to the site; this again indicates that the present day bog land to the south and south-east of the site also existed during the early medieval period. The dominance of dryland species such as hazel, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry, blackthorn/sloe and yew does, however, indicate rich oak-ash woodland located close to the site, with a large assemblage of hazel also indicating woodland management by coppicing in the area. The main fuel in all three kilns was oak and ash. The majority of the ash and oak charcoal fragments did not show any obvious curved growth rings implying the wood was derived from larger branches or trunk wood which would have been deliberately cut with the intention of burning (Cobain, Appendix 2.2). Evidence from Kilns 2 and 3 for roundwood hazel branches indicates that this may have been coppiced in the immediate area during the early medieval period.

The kilns were part of the activity associated with the neighbouring ringfort (GA128-043). The carbonised evidence indicates that oats, barley and wheat were being processed and presumably grown locally for the inhabitants of the ringfort and possibly for trade in the wider community. These three staple foods would have been important for the production of bread, porridge, soups, stews and beer. The non-grain element of the crop would also have been used for fodder and thatching. The dating of the kilns indicates that the kilns were in use in the eight and ninth centuries but then one was built and used in the 13th century. This may reflect a continuity of use at the site or the abandonment and reoccupation of the ringfort during the Norman period.

A number of animal bones were recovered from the kilns; however, these mainly appear to be natural in origin and also may have been introduced at a time when Kiln 3 was possibly used as a fox den (Geber, Appendix 2.3).

3.4.4 Phase 4: Post-Medieval Activity

The post-medieval agriculture on this site consisted of six hand-dug furrows. Furrow C83 cut through the top fill of Kiln 3. The furrows represent drainage channels that ran between the raised ridges where the crops were grown. The ridges were produced by mounding the topsoil and subsoil dug out of the channels to create growing nutrient-rich and well-drained ridges. The Curtaun furrows were between 1.5 and 2 m in width and the ridges appear to have been between 2 to 4 m in width which would have allowed for a distance of approximately 4 m from crest to crest. They would have been used for growing cereals or potatoes.

The topsoil across the site was a loose clay silt loam to a depth of up to 0.5 m. It sealed all of the archaeological deposits and features at Curtaun 1 and 2. Find E3721:1:3 is a copper alloy halfpenny of James II dating to 1691 and was minted in Limerick (Mac Dermott, Appendix 2.4). Although the two beads are from topsoil it is assumed that they are related to the early medieval activity at the Curtaun, however specialist analysis suggests that it is just a likely that the beads may be from the Iron Age (Carroll, Appendix 2.5).

4 CONCLUSIONS

The Bronze Age features in Area 1 consisted of a burnt mound and associated trough with stakeholes indicating that it had been timber lined. The primary fill of the pit consisted of heat-shattered stone and indicates that the trough and the overlying burnt spread were contemporary. Area 2 consisted of a disturbed spread of heat-shattered stone. Five pits were found under or around the spread three were part-filled with heat-affected stone. The remaining two, one of which was under the spread and the other next to it, were filled with peat. Both burnt mounds had been heavily disturbed by post medieval agricultural activity.

The area of the site was a narrow strip of land between the existing railway and an upstanding bivallate ringfort (GA 128-043), the bank and outer ditch of which were partly truncated on its eastern side by the road scheme. The exposed fills were inspected and found to be sterile mineral soils with no significant deposits or artifacts. Three early medieval cereal-drying kilns and associated features were excavated at the site. Four curvilinear slot trenches located to the northwest of the kilns were likely to have supported the walls of the roofed superstructure covering the drying chamber. Although there were four slot trenches, it is possible that each slot trench was built for a corresponding phase of kiln activity. A number of associated postholes and stakeholes, particularly near Kiln 3, were also recorded. These probably represent structural supports for the buildings. AMS dating of the kilns indicates that they were used over a long period from the seventh to thirteenth centuries although not necessarily continuously. Oats, barley and wheat were identified with all three phases of kiln activity. This produce would have been used and traded by the community living in the ringfort to the northwest. Oak and ash were identified as the main fuel used in the kilns supplemented with coppiced hazel, alder, birch, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry, blackthorn/sloe, poplar/willow and yew. The drying chamber of the final phase kiln was backfilled after use and was used as a fox den following abandonment.

Post-medieval agricultural features on this site consisted of six, wide, spade-dug furrows and a land drain. It has been used in the recent past for pasture.

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PLATES



Plate 1: Northwest-facing section of trough C89 Area 1, facing southeast



Plate 2: Post-excavation view of trough C89 and stakeholes, facing west



Plate 3: Pre-excitation view of burnt mound C6 Area 2, facing south



Plate 4: East-facing section of burnt mound C6, facing west



Plate 5: North-facing section of trough C16 Area 2, facing south



Plate 6: Post-excavation view of Kiln 1 (C27, C195) with stone-lined chamber of kiln 3 behind, facing northwest

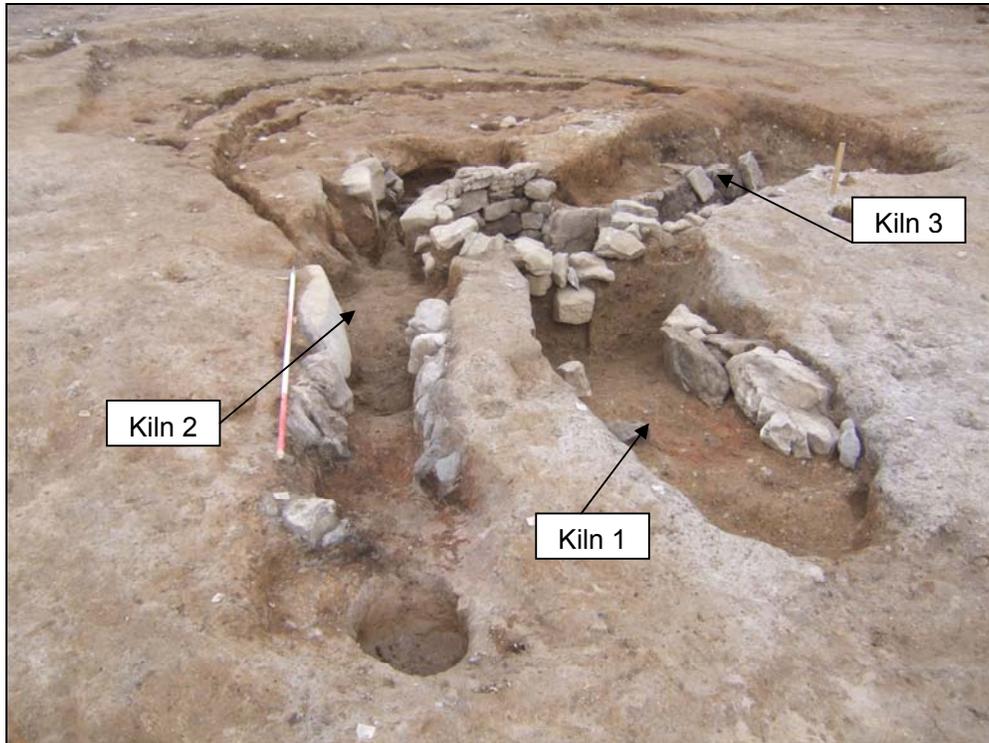


Plate 7: Mid-excavation view of Kiln 2 (C35, C132) and Kiln 1, facing north

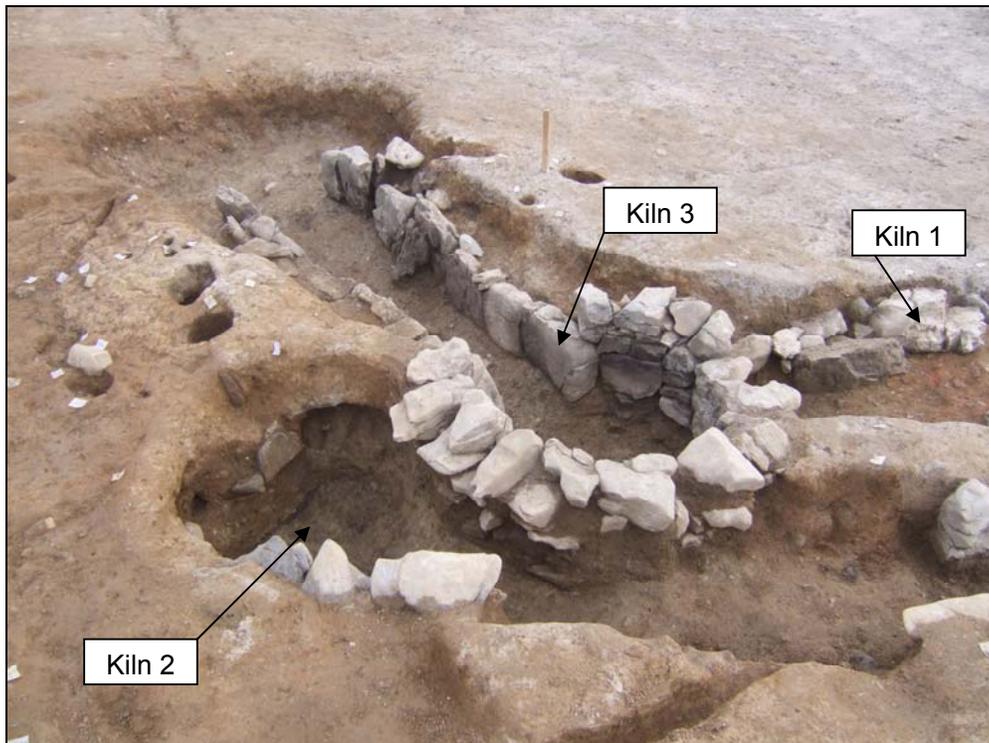


Plate 8: Post-excavation view of Kiln 3 (C29, C31), facing east



Plate 9: Post-excavation view of site, facing southeast



Plate 10: Post-excavation view of site with ringfort in background, facing northwest (AirShots Ltd.)



Plate 11: Site Director inspecting a clean section face in the ditch fills at Curtaun



Plate 12: Image of beads E3721:1:1 and E3721:1:2

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Findings	Context Above	Context Below
1					Topsoil	Topsoil	Glass (1 bead/ 1 bead fragment), Metal (coin)	None	All
2					Natural/Subsoil	Natural Subsoil		All	None
3		2.5	1.15	0.3	Cut of a shallow pit.	Oval cut in plan. Sharp break of slope at top. Moderate sides. Gradual break of slope at base. Oval base.		2	4
4	C3	2.5	1.15	0.3	Fill of pit 3.	Soft black peat. Few stone inclusions.		3	1
5					Non-archaeological	Non-archaeological		N/A	N/A
6		10	9	0.16	Burnt stone spread.	Loose black charcoal rich silt. 50% burnt stones.		8,10,15	1
7		2.2	1.6	0.58	Cut of an irregular pit	Oval/square shaped cut in plan. Sharp break of slope at top. Steep sides, except the S where they are moderate. Gradual break of slope at base. Flat concave base.		2	22
8	C7	1.35	1.2	0.27	Charcoal rich fill of irregular pit	Firm black dark brown coarse sand. 30% stones. Charcoal inclusions.		20	6
9		2.1	1.3	0.38	Cut of one of 3 pits under the burnt spread	Irregular cut in plan. Sharp break of slope at top. Moderate sides. Gradual break of slope at base. Concave base.		2	13
10	C9	1.4	0.5	0.18	Top fill of pit 9	Firm dark brown well sorted peat.		11	6
11	C9	1.9	1.3	0.1	Middle fill of pit 9	Dark grey silt clay with moderately sorted pebbles.		12	10
12	C9	1.7	1.2	0.1	Lower fill of pit 9	Compact black charcoal rich silt.		13	11
13	C9	1.9	1.2	0.06	Base fill of pit 9	Compact orange light grey brown well sorted clay sand.		9	12
14		2.2	0.52-1.05	0.18-0.3	Possible shallow well	Irregular cut in plan. Sharp break of slope at top to E and S, slightly gradual break of slope at top to N and W. Vertical to moderate sides. Gradual break of slope at base. Irregular uneven base.		2	15
15	C14	3.1	0.52-1.05	0.08-0.2	Top fill of possible well	Soft mid brown peat and silt. Decomposing organic material inclusions. Charcoal flecks.		14	6

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Findings	Context Above	Context Below
16		2.3	1.46	1.04 stepping up to 0.64	Cut of a pit, possible trough.	Sub oval cut in plan. Sharp break of slope at top. Sharp sides. Gradual break of slope at base. Stepped base to E with a further hole.		2	19
17	C16	2.3	1.3	0.48	Peat top fill of c16.	Medium soft mid brown peat. Decomposing organic material inclusions.		18	1
18	C16	1.95	1.2	0.15	Charcoal rich fill.	Soft black silt clay. 2% burnt stone and 10% charcoal.		19	17
19	C16	1.7	1.1	0.58	Very stony bottom fill of c16.	Soft grey black silt. 50% stone (possibly burnt).		16	18
20	C7	0.35	0.35	0.28	Fill of pit c7.	Loose black sandy clay. Charcoal, stones and pieces of bone inclusions.		21	8
21	C7	1.52	1.2	0.22	Fill of pit c7.	Hard compaction mid grey white sandy soil. 90% stones.		22	20
22	C7	1.1	1.1	0.1	Fill of pit c7.	Hard compaction light grey coarse sand. 5% stones.		7	21
23		3.15	0.5-0.9	0.38	Non-archaeological			N/A	N/A
24	C23	3.15	0.5-0.9	0.38	Non-archaeological			N/A	N/A
25		2.4	1.3	0.16	Non-archaeological			N/A	N/A
26	C25	2.4	1.3	0.16	Non-archaeological			N/A	N/A
27		4.6	1.45	1.2	Construction part of a kiln.	Linear cut in plan. Sharp break of slope at top. Steep sides. Sharp break of slope at base. Gradual break of slope at base to NE and in shaft part. Concave to flat base.		2	144, 185
28	C27	3.8	1.3	0.6	Re-deposited natural in C27.	Compact/firm light yellow brown silt sand. 2% pebble inclusions. 1% charcoal.		75	34,29
29		5 approx.	3.2 max.	>1	Cut of Kiln 3	Keyhole cut in plan. Gradual break of slope at top. Steep sides. Sharp break of slope at base. Rough base.		2	131, 93, 124
30	C29	3 approx	0.11	0.2	Possibly natural slumping or silting.	Loose light brown silt clay. Charcoal flecks.	Clay pipe bowl	70	1
31		1.9	1.9	0.94	Cut of chamber kiln 3	Circular cut in plan. Not recorded as was lost with the excavation of c35 and the removal of the wall stones c93.		2	
32	C31	1.3	1.2	0.6	Uppermost fill from the collapsed roof of chamber	Soft mid brown clay sand. Lintel and stones (roof) inclusions. Charcoal.	2 sherds of modern pot	74	1

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
33	C195	0.65	0.55	0.09	Carbon rich fill.	Soft black silt charcoal. <1% burnt bone inclusions.		92	66
34	C195	2.2	1.3	0.2	Secondary mottled fill on top of activity layer.	Soft grey brown (darkening to SE) silt. 20% charcoal. <1% burnt bone.		28	1
35		5.5	1.1	0.5	Cut of the flue.	Linear cut in plan. Gradual break of slope at top. Irregular-steep sides. Gradual break of slope at base. Sharp break of slope at base to S.		2	193
36	C35	4.34	0.35	0.18	Main top fill of c35.	Firm mid brown sand. Burnt bone inclusions.		37, 100, 140	138
37	C37	0.5	0.28	0.06	Smaller top fill of c35.	Soft mid brown yellow sandy silt.		72	36
38		0.31	0.26	0.53	Cut of a possible posthole.	Sub circular cut in plan. Sharp break of slope at top. Steep/vertical sides. Gradual break of slope at base. Pointed/tapered base.		2	39
39	C38	0.31	0.26	0.53	Fill of a possible posthole.	Soft grey brown silt. 30% stone inclusions. 5% charcoal.		38	1
40		0.31	0.31	0.5	Cut of a possible posthole.	Sub circular cut in plan. Sharp break of slope at top. Steep sides. Sharp break of slope at base. Flat concave base. Pointed hole to NE.		2	41
41	C40	0.31	0.31	0.5	Fill of a possible posthole.	Soft mid greyish brown sandy silt. 20% stones. 1% charcoal.		40	1
42		1.8	0.06-0.13	0.12	Cut of a curvilinear.	Linear cut in plan. Sharp break of slope at top. Gradual sides. Concave break of slope at base.		2	43
43	C42	1.8	0.06-0.13	0.12	Fill of a curvilinear.	Soft dark brown silt. Charcoal inclusions.		42	29
44		6.5	0.25	0.35	Cut of a curvilinear.	Curvilinear cut in plan. Gradual to sharp break of slope at top. Gradual to vertical sides. Gradual to imperceptible break of slope at base. Irregular concave base.		174	160
45	C44	6.5	0.22	0.09	Top fill of a curvilinear.	Loose mid to dark brown, mottled with orange brown sandy silt. Charcoal flecks.		160	29
46					Non-archaeological	Non-archaeological		N/A	N/A
47					Non-archaeological	Non-archaeological		N/A	N/A
48					Non-archaeological	Non-archaeological		N/A	N/A
49					Non-archaeological	Non-archaeological		N/A	N/A
50		2	0.7-0.8	0.12	Cut of a shallow spread.	Irregular cut in plan. Shallow cut in plan for spread with an irregular base.		174	51
51	C50	2	0.7-0.8	0.12	Fill of a spread.	Compact dark brownish grey silt. Pebble inclusions.		50	52

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
52		2.7	0.15	0.2	Possible windbreak for earlier kiln.	Linear cut in plan. Sharp break of slope at top. Varying sides. Mostly concave break of slope at base. Concave linear base.		51	141
53	C52	2.7	0.1	0.1	Fill of linear.	Soft black charcoal rich silt.		141	1
54					Non-archaeological	Non-archaeological		N/A	N/A
55					Non-archaeological	Non-archaeological		N/A	N/A
56					Non-archaeological	Non-archaeological		N/A	N/A
57					Non-archaeological	Non-archaeological		N/A	N/A
58					Non-archaeological	Non-archaeological		N/A	N/A
59					Non-archaeological	Non-archaeological		N/A	N/A
60					Non-archaeological	Non-archaeological		N/A	N/A
61					Non-archaeological	Non-archaeological		N/A	N/A
62					Void	Void			
63		0.64	0.5	0.1	Burnt clay deposit	Firm hard red yellow clay		133	1
64					Non-archaeological	Non-archaeological		N/A	N/A
65	C195		0.2	0.2	Packing on west	Redeposited subsoil packing		92	28
66	C27	2.2	0.4	0.22	Fill in SE end of cut.	Soft dark grey brown silt. <1% burnt bone, 5% charcoal and 2% redeposit natural inclusions.		33	75
67	C29	0.4	0.8	0.11	Fill of flue	Loose orange brown charcoal rich clay silt.		136	68, 76
68	C29	1	1	0.2	Fill of flue.	Loose light brown charcoal rich silt clay. Articulated bone and 1 lintel stone were found within this fill.		135, 67	69
69	C29	0.7	0.6	0.1	Possible backfill of flue, pre-collapse.	Loose orange brown silt clay. Charcoal inclusions.		68, 76	70
70	C29	2	1.1	0.5	Caused by collapse.	Loose dark brown silt clay. Charcoal and shell inclusions.		69	30
71	C29	0.4	0.5	0.1	Flue of kiln.	Loose, very soft orange charcoal rich clay sand. Ash inclusions.		94	136
72	C35	3.45	0.48	0.15	Charcoal rich fill of C35.	Firm to soft dark brown black silt clay. Burnt bone and charcoal inclusions.		73	37, 100, 140
73	C35	0.38	0.38	0.11	S fill of C192	Firm to hard mottled grey white silt sand ash.		112	72
74	C31	1.3	1.2	0.6	Basal fill of chamber 1.	Soft to firm mid brown clay sand. Charcoal rich. Animal bone and small stone inclusions.		32	131
75	C27	-	0.96	0.19	Charcoal rich fill in SE part of C27.	Soft black charcoal rich silt. 75% charcoal. 5% redeposit natural. <1% burnt bone.		65	28

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Findings	Context Above	Context Below
76	C31	1.4	0.53	0.4	Result of collapsed roof.	Soft mid brown clay silt. Pebble, stone, charcoal and animal bone inclusions.		135, 67	69
77		Across site	1.4	0.18	Cut of agricultural furrow	Linear cut in plan. Break of slope at base and top varies across site. Concave base.		2	78
78	C77	Across site	1.4	0.18	Fill of agricultural furrow.	Mid-brown silty clay		77	1
79		Across site	-	-	Cut of agricultural furrow	Linear cut in plan. Gradual break of slope at top. Irregular sides. Gradual break of slope at base. Concave base.		2	80
80	C79	Across site	Unknown	Unknown	Fill of agricultural furrow	Mid-brown silty clay	3 fragments of clay pipe	79	1
81		Across site	1.68	0.2	Cut of agricultural furrow	Linear cut in plan. Sharp break of slope at top to SE. Gradual break of slope at top to NW. Smooth sides. Gradual break of slope at base. Concave base.		2	81
82	C81	Across site	1.68	0.2	Fill of agricultural furrow	Mid-brown silty clay		81	1
83		Across site	1.46	0.28	Cut of agricultural furrow	Linear cut in plan. Sharp break of slope at top mainly but varies across site. Gradual break of slope at base. Concave base.		113	84
84	C83	Across site	1.46	0.28	Fill of agricultural furrow	Mid-brown silty clay		83	1
85		Across site	0.97	0.12	Cut of agricultural furrow	Linear cut in plan. Gradual break of slope at top mainly, varies across site. Gradual break of slope at base. Concave base.		2	86
86	C85	Across site	0.97	0.12	Fill of agricultural furrow	Mid-brown silty clay		85	1
87		Across site	0.64	0.05	Cut of agricultural furrow	Linear cut in plan. Gradual, imperceptible break of slope at top. Imperceptible break of slope at base. Concave base.		2	88
88	C87	Across site	0.64	0.05	Fill of agricultural furrow	Mid-brown silty clay		87	1
89		2.45	1.9	0.4	Trough	Oval cut in plan. Gradual break of slope at top. Undercut in plan sides to W. Gradual sloping sides to N, E and S. Sharp break of slope at base to W. Gradual break of slope at base to N, E and S. Oval base.		2	103, 105, 108, 110

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
90	C89	2.45	1.9	0.15	Fill of a pit.	Firm mid brown silt.		95	1
91	C195	0.5	0.45	0.07	Fill in base	Soft dark grey pink silt sand. 5% charcoal. 5% burnt clay/natural.		144, 185	92
92	C27	0.3 (cut in testing)	0.7	0.1	Ashy fill under c33.	Very soft light pink grey silt. 5% charcoal. 5% burnt clay/natural.		91	33
93	C31	<0.6	<0.5	<0.3	Intact chamber wall stones.			29	94
94	C29	<0.7	<0.4	<0.4	Lintels			93,131	98, 71, 74
95	C89	2.1	1.6	0.18	Fill of a pit.	Firm blackish brown clay silt.		96, 97	90
96	C89	2	1.4	0.04	Charcoal rich layer in pit c89.	Soft black charcoal rich layer.		104, 106, 109, 111	95
97	C89	2	1.4	0.12	Base fill of pit c89.	Soft light grey sand. Some charcoal and burnt stone inclusions.		104, 106, 109, 111	95
98	C29	0.6	0.3	0.15	Fill of passage flue of kiln.	Loose light grey silt sand. Charcoal, gravel and stone inclusions.		94	136
99	C35, C132	2.3	0.72	0.1	Lower fill of c35.	Firm/hard yellowish grey sandy silt.		178, 193	107, 134
100	C35	0.95	0.71	0.18	Fill of flue	Firm/hard mixed yellow grey white silt. Bone inclusions.		72	36
101	C29	1	0.8	0.03	Fill of c29.	Soft to firm light greyish brown sandy clay. Rare sub angular stone inclusions. Charcoal flecks.		122	113
102	C29	1	0.5	0.18	Fill of cut c29.	Soft light brownish grey sandy clay. Occasional small stones, ash and charcoal inclusions.		122	113
103		0.12	0.1	0.19	Cut of a stakehole.	Oval cut in plan. Gradual break of slope at top to N. Sharp break of slope at top to S and E. Vertical sides. Sharp break of slope at base. Flat sub oval base.		89	104
104	C103	0.12	0.1	0.19	Fill of a stakehole.	Soft grey clay sand.		103	96, 97
105		0.1	0.08	0.16	Cut of a stakehole.	Oval cut in plan. No break of slope at top to W and S. Gradual break of slope at top to N and E. Gradual sides. Gradual break of slope at base. Flat oval base.		89	106
106	C105	0.1	0.0	0.16	Fill of a stakehole.	Soft grey clay sand.		105	96, 97
107	C35	1.42	0.48	0.1	Burnt clay and charcoal fill.	Firm reddish, yellow black clay. Charcoal inclusions.		99	192

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
108		0.1	0.1	0.16	Cut of a stakehole.	Circular cut in plan. No break of slope at top to S. Gradual; break of slope at top to N, E and W. Vertical sides. Concave circular base.		89	109
109	C108	0.1	0.1	0.16	Fill of a stakehole.	Soft grey clay sand.		108	96, 97
110		0.1	0.1	0.15	Cut of a stakehole.	Circular cut in plan. Sharp break of slope at top. Vertical sides. Concave base.		89	111
111	C110	0.1	0.1	0.15	Fill of a stakehole.	Soft blackish grey clay sand. Charcoal inclusions.		110	96, 97
112	C192	0.38	0.35	0.08	Fill of C192	Firm to hard grey silt sand.		114	73
113	C29	2.52	1.75	0.87	Fill of C29.	Soft and firm light greyish brown sandy clay loam. High amounts of stone and charcoal inclusions. Rare burnt bone.		137, 101, 102	83
114	C192	0.3	0.3	0.25	Fill of C192.	Firm brownish yellow clay silt. Pebble inclusions.		192	112
115		0.08	0.08	0.09	Cut of a stakehole.	Circular cut in plan. Sharp break of slope at top. Gradual sides from N. Vertical sides to S and E. Sharp break of slope at base. Flat circular base.		2	116
116	C115	0.08	0.08	0.09	Fill of a stakehole.	Soft blackish grey sandy silt. Charcoal rich.		115	1
117		0.1	0.1	0.12	Cut of a stakehole.	Circular cut in plan. Sharp break of slope at top to E, N and S. Gradual break of slope at top to W. Almost vertical sides. Concave base.		2	118
118	C117	0.1	0.1	0.12	Fill of a stakehole.	Soft grey sandy silt. Small amount of charcoal inclusions.		117	1
119		0.09	0.09	0.06	Cut of a stakehole.	Circular cut in plan. Sharp break of slope at top. Vertical sides. Sharp break of slope at base. Flat base.		2	120
120	C119	0.09	0.09	0.06	Fill of a stakehole.	Soft grey sandy silt.		119	1
121	C27	0.5	0.1	0.04	Lens of charcoal	Soft brownish black silt. Within C28		28	28
122	C29	0.27	0.5	0.09	Fill of C29.	Soft and firm light greyish brown sandy clay. Occasional stone inclusions. Charcoal flecks.		123	137, 101, 102
123	C29	0.45	0.38	0.06	Fill of C29.	Soft firm mid greyish brown sandy clay with rare stone inclusions and abundant charcoal flecks.		124	122
124	C29	0.44	0.4	0.05	Fill of C29.	Soft firm light greyish white sandy clay. Rare sub rounded stones and charcoal fleck inclusions.		29	123
125		8.6	0.95	0.19	Cut of a linear feature.	Linear cut in plan. Gradual break of slope at top. Gradual sloping sides. Gradual break of slope at base. Linear base.		189	190

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
126	C125	8.6	0.9	0.19	Fill of shallow linear cut.	Firm mid brown sandy silt. Small to medium pebble inclusions.		190	1
127		0.25	0.25	0.15	Cut of posthole.	Circular cut in plan. Sharp break of slope at top. Steep to vertical sides. Sharp break of slope at base. Flat, slightly concave base.		2	128
128	C127	0.2m	0.25	0.15	Fill of posthole.	Soft to very soft dark brown silt. 2% pebble inclusions.		127	1
129					Non-archaeological	Non-archaeological		N/A	N/A
130					Non-archaeological	Non-archaeological		N/A	N/A
131	C29	3.6	0.2	0.4	Facing jamb stones. Supporting lintels.			29	94
132		1.5	1.3	1	Cut of chamber for kiln 2.	Sub circular cut in plan. Gradual break of slope at top. Undercut in plan and steep sides. Sharp break of slope at base. Flat base.		2	179
133	C132	1.4	1.15	0.15	Top fill of C132.	Firm greyish brown silt sand.		138	62
134	C132	1.4	1.15	0.35	Fill in C132.	Firm dark brown silt sand. Charcoal inclusions.		99	140
135	C29	0.2	0.6	0.1	Silt clay deposit in C29.	Soft mid brown silt clay. Charcoal flecks.		136	68, 76
136	C29	3	0.5	0.8	Intentional backfill.	Firm yellowish orange coarse sand.		98,71	135, 67
137	C29	0.6	0.3	0.19	Fill of C29.	Hard mid orange sandy clay loam. Abundant stones and charcoal inclusions.		122	113
138	C35	0.8	0.45	0.12	Intentional backfill.	Firm mid brown sandy silt. Small to medium pebble inclusions.		36	133
139					Non-archaeological			N/A	N/A
140	C35	2.1	0.6	0.35	Intentional backfill.	Firm mottled grey orange brown yellow sandy clay.		134, 72	36
141	C52	0.15	2.7	0.08-0.1	Fill of linear feature.	Soft mid brown sandy silt. Charcoal inclusions.		52	53
142		0.3	0.3	0.38	Cut of posthole.	Angled cut in plan. Uncut in plan sides. Sharp break of slope at base. Flat base.		2	143
143	C142	0.3	0.3	0.38	Fill of posthole.	Soft greyish brown sandy silt.		142	35
144	C27	1.2	0.7	0.5	Stones from stone construction.	Remains of stone lining in Kiln 1		27	91
145					Non-archaeological	Non-archaeological		N/A	N/A
146					Non-archaeological	Non-archaeological		N/A	N/A
147					Non-archaeological	Non-archaeological		N/A	N/A

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
148		0.08	0.07	0.19	Cut of a stakehole.	Sub oval cut in plan. Sharp break of slope at top. Vertical sides. Tapered break of slope at base. Tapered base.		2	149
149	C148	0.08	0.07	0.19	Fill of a stakehole	Soft mid brown sandy silt.		148	1
150		0.09	0.09	0.25	Cut of a stakehole.	Circular cut in plan. Sharp break of slope at top. Vertical sides. Sharp break of slope at base. Flat base.		2	151
151	C150	0.09	0.09	0.25	Fill of a stakehole	Soft mid brown sandy silt.		150	1
152		0.16	0.12	0.1	Cut of posthole.	Circular cut in plan. Sharp break of slope at top. Steep sides. Gradual break of slope at base. Concave base.		2	153
153	C152	0.16	0.12	0.1	Fill of a posthole.	Loose mid brown silt clay. Charcoal flecks.		152	1
154		0.06	0.06	0.13	Cut of a stakehole	Circular cut in plan. Sharp break of slope at top. Vertical sides. Sharp break of slope at base. Flat base.		2	155
155	C154	0.06	0.06	0.13	Fill of a stakehole	Soft brown sandy silt.		154	1
156		0.06	0.06	0.12	Cut of a stakehole	Circular cut in plan. Sharp break of slope on top. Vertical sides. Sharp break of slope at base. Flat base.		2	157
157	C156	0.06	0.06	0.12	Fill of a stakehole	Soft mid brown sandy silt.		156	1
158		0.06	0.06	0.17	Cut of a stakehole	Circular cut in plan. Sharp break of slope at top. Vertical sides. Tapered break of slope at base. Pointed base.		2	159
159	C158	0.06	0.06	0.17	Fill of a stakehole	Soft mid brown sandy silt.		158	1
160	C44	6.5	0.23	0.3	Basal fill of curvilinear c44	Loose light greyish brown sandy silt. Stone and charcoal inclusions.		44	45
161		0.35	0.3	0.08	Cut of a shallow feature on end of C42	Sub oval cut in plan. Gradual to imperceptible break of slope at top. Gradual to imperceptible sides. Gradual to imperceptible break of slope at base. Concave base.		43	162
162	C161	0.35	0.3	0.08	Fill of shallow feature c161	Soft blackish brown charcoal rich silt.		161	1
163		0.27	0.2	0.15	Cut of a posthole	Sub oval cut in plan. Sharp break of slope at top. Gradual sides. Gradual break of slope at base. Concave base.		2	164
164	C163	0.27	0.2	0.15	Fill of a posthole	Soft mid brown sandy silt.		163	1

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
165		0.14	0.12	0.37	Cut of a stakehole	Sub circular cut in plan. Sharp break of slope at top. Steep to vertical sides. Tapered break of slope at base. Pointed base.		2	166
166	C165	0.14	0.12	0.37	Fill of a stakehole	Soft mid orange brown silt sand.		165	1
167		0.32	0.25	0.19	Cut of a posthole	Oval cut in plan. Sharp break of slope at top. Steep to vertical sides. Sharp break of slope at base. Concave, slightly stepped base.		2	172
168	C167	0.18	0.18	0.14	Post pipe in a posthole	Soft dark brown sandy silt. 5% charcoal, <1% pebbles, <1% burnt clay, 2% natural inclusions.		172	171
169		0.6	0.29	0.18	Cut of a possible double posthole	Sub oval cut in plan. Gradual to steep break of slope at top. Steep to gradual sides. Gradual break of slope at base. Sub oval base.		2	170
170	C169	0.6	0.29	0.18	Fill of double posthole	Firm light orange brown sandy silt. Small sub angular pebbles.		169	29
171	C167	0.32	0.23	0.22	Post packing material	Compact light yellow brown silt sand. <1% charcoal inclusions.		168	1
172	C167	0.19	0.19	0.06	Post packing material	Soft light grey brown silt. <1% charcoal.		167	168
173		5	0.5	0.44	Cut of foundation for a windbreak	Curvilinear in plan. Sharp to gradual break of slope at top. Vertical to irregular sides. Gradual to sharp break of slope at base. Concave, irregular base.		2	174
174	C173	3.5	0.65	0.13-0.44	Fill of C173	Hard light brownish orange sandy, silt clay loam. Occasional charcoal and stone inclusions.		173	181, 50, 44
175	C173	3	0.2	0.05-0.12	Fill of C173	Loose light brown silt clay. Charcoal inclusions.		177	35
176		0.98		0.06	Ash and charcoal spread	Firm compact mottled grey silt. 2% charcoal. 2% redeposited natural.		2	1
177	C173	2	0.06-0.15	0.1	Fill of C173.	Stiff orangy brown silt clay. Charcoal flecks.		181	175
178	C132	0.95	0.9	0.06	Burnt clay layer in chamber.	Firm reddish yellow clay.		179	99
179	C132	0.95	0.9	0.07	Charcoal rich silt in chamber.	Soft black grey charcoal silt.		132	178
180		0.16	0.1	0.02	Non-archaeological	Soft dark brown black silt. 70% charcoal.		N/A	N/A
181	C173	9	0.5	0.02	Lower fill of C173.	Stiff light orange brown sandy clay. Charcoal flecks.		174	177
182	C173	0.5	0.35	0.14	Non-archaeological	Soft to hard mid brownish black silt clay loam. Charcoal flecks, ash and burnt clay inclusions.		N/A	N/A

Context	Fill of	L (m)	W (m)	D (m)	Interpretation	Description	Finds	Context Above	Context Below
183		5	1.5	0.08-0.3	Natural subsoil.	Cemented light brownish orange clay loam. Very abundant stone inclusions.		N/A	N/A
184					Non-archaeological	Non-archaeological		N/A	N/A
185	C27	3.92	1.18	0.44	Primary fill of kiln C27.	Hard mottled brown with light grey sandy silt. Moderate charcoal flecks.		27	91
186		0.18	0.22	0.22	Cut of a posthole.	Sub oval cut in plan. Sharp break of slope at top. Steep sides. Gradual break of slope at base. Tapered rounded base.		2	187
187	C186	0.18	0.22	0.22	Fill of posthole.	Loose orange brown sandy clay. Shells and charcoal flecks.		186	29
188		0.42	0.4	0.1	Possible feature at base of linear c125.	Circular cut in plan. Gradual break of slope at top. Moderate sides. Imperceptible break of slope at base. Irregular base.		2	189
189	C188	0.42	0.4	0.1	Possible feature at base of linear C125.	Soft dark brown black silt clay. Stone and charcoal inclusions.		188	125
190	C125	8.6	0.76	0.0	Deposit of linear C125.	Firm light brown silt.		125	126
191					Natural subsoil.	Hard orange brown sandy clay.		N/A	N/A
192		0.85	0.4	0.3	Re-cut for rake out of flue.	Irregular cut in plan. Sharp to gradual break of slope at top. Steep sides. Sharp break of slope at base. Flat base.		107	114
193	C35	1.1	0.36	0.4	Remains of stone construction in linear 2.			35	99
194		10	7	0.08	Burnt spread	Irregular heavily truncated burnt spread, black charcoal rich clay silt with 20% heat affected stones.		90	1
195		3.2	1.5	0.62	Cut of flue for kiln 1	Linear cut. Sharp break of slope at top to gradual sides which break gently to a flat base		2	91

Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	No. of Parts	Description
E3721:1:1	1	1	Glass bead	Glass bead.	Glass	1	Black and red glass bead
E3721:1:2	1	2	Glass bead	Glass bead fragment	Glass	1	Half blue glass bead
E3721:1:3	1	3	Coin	Irish halfpenny, James II, 1691	Copper alloy	1	Over stamped gun money
E3721:30:1	30	4	Clay pipe	Clay pipe bowl	Ceramic	1	Post-medieval
E3721:32:1	32	1	Pottery	Pearlware	Ceramic	1	Post-medieval pearlware
E3721:32:2	32	2	Pottery	Pearlware	Ceramic	1	Post-medieval
E3721:80:1	80		Clay pipe	Clay pipe bowl	Ceramic	1	Post-medieval
E3721:80:2	80		Clay pipe	Clay pipe stem	Ceramic	1	Post-medieval
E3721:80:3	80		Clay pipe	Clay pipe stem	Ceramic	1	Post-medieval

Appendix 1.3 Catalogue of Ecofacts

These results relate to the processed samples taken at the excavation. A full list of these samples was supplied with the preliminary reports lodged with Galway NRDO. A total of 114 bulk soil samples were taken during the course of excavation at this site. Of these 10 of these were processed by means of flotation and sieving through a 250/300µm mesh. The resulting retrieved samples of this process are listed below. In addition to this, a total of 22 animal bone samples and two samples of shell were hand retrieved on site.

1.3.1 Animal bone

Sixteen samples of animal bone were retrieved.

Context number	Sample number	Feature	Sample weight (g)
28	23	Re-deposited natural in kiln 1	3.8g
28	141	Re-deposited natural in kiln 1	34g
32	25	Fill of kiln 3 chamber	9.4g
68	36	Fill of flue	25.3g
68	64	Fill of flue	57.3g
69	35	Backfill of flue	4.9g
74	24	Fill of kiln chamber	1.6g
74	28	Fill of kiln chamber	3.9g
76	29	Collapsed kiln roof	93.6g
76	89	Collapsed kiln roof	132.4g
99	127	Fill of flue	8.3g
100	86	Fill of flue	3.9g
113	75	Fill of kiln 3	4.8g
126	136	Fill of linear gully	85.5g
140	110	Fill of flue	76.3g
185	132	Fill of kiln 1	11.3g

1.3.2 Burnt bone

Five burnt bone samples were recovered.

Context number	Sample number	Feature	Sample weight (g)
32	25	Fill of kiln chamber	2.7g
36	73	Fill of flue	15.5g
69	35	Fill of flue	6.5g
72	33	Fill of flue	5.6g
113	75	Fill of kiln 3	3.8g

1.3.3 Charcoal

Twelve charcoal samples were recovered following flotation.

Context number	Sample number	Feature	Sample weight (g)
12	6	Fill of pit	215g
33	42	Fill of kiln chamber	36.4g
53	91	Fill of slot trench	22.7g
71	55	Fill of flue	1.8g
72	30	Fill of flue	38.6g
74	24	Fill of kiln chamber	21.3g
91	47	Fill of flue	2.6g
107	65	Fill of flue	9.5g
111	67	Fill of kiln chamber	0.6g
113	45	Fill of flue/fire bowl	33.6g

5	1	Base of burnt spread	18.0g
11,12,9	21	Trough	5.3g

1.3.4 Charred seeds

Five samples produced charred seeds and one produced hazelnut shell.

Context number	Sample number	Feature	Sample weight (g)
53	91	Fill of slot trench	0.1g
72	30	Fill of flue	0.4g
72	30	Fill of flue	4.2g
74	24	Fill of kiln chamber	1.2g
107	65	Fill of flue	0.1g
113	45	Fill of flue/fire bowl	0.4g

Appendix 1.4 Archive Checklist

Project: N18 Gort to Crusheen Road Scheme	Irish Archaeological Consultancy Ltd	
Site Name: Curtaun 1		
NMS Registration No.: E3721		
Site director: Shane Delaney		
Date: June 2008		
Field Records	Items (quantity)	Comments
Site drawings (plans)	18	Digitised
Site sections, profiles, elevations	79	Digitised
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	0	
Site registers (folders)	1	
Survey/levels data (origin information)		Reduced
Context sheets	195	Digitised
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	539	On IAC server
Photographs (print)	0	
Photographs (slide)	0	
Finds and Environ. Archive		
Flint/chert	0	
Stone artefacts	0	
Pottery (specify periods/typology)	2 sherds	Post-medieval
Ceramic Building Material (specify types eg daub, tile)	0	
Metal artefacts (specify types - bronze, iron)	1 coin	
Glass	2 glass	1 early medieval bead; 1 fragment of glass bead
Other find types or special finds (specify)	4 clay pipe fragments	
Human bone (specify type eg cremated, skeleton, disarticulated)	0	
Animal bone	21 samples	Including 5 burnt bone samples
Metallurgical waste	0	
Enviro bulk soil (specify no. of samples)		Processed
Enviro monolith (specify number of samples and number of tins per sample)	0	
Security copy of archive	Yes	IAC Digitised

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Radiocarbon Dating – QUB Laboratory

Appendix 2.2 Charcoal and Plant Remains – Sarah Cobain

Appendix 2.3 Animal Bone – Jonny Geber

Appendix 2.4 Metal Small Finds – Jacqueline Mac Dermott

Appendix 2.5 Glass Beads – Judith Carroll

Appendix 2.6 Medieval and Post-Medieval Pottery – Clare McCutcheon

Appendix 2.7 Catalogue of Clay Pipe – Maeve Tobin

RADIOCARBON DATING RESULTS
CURTAUN 1 & 2, CO. GALWAY, E3721

CHRONO LABORATORY, QUEENS UNIVERSITY BELFAST

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



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

Radiocarbon Date Certificate

Laboratory Identification: UBA-12708
Date of Measurement: 2009-10-09
Site: E3721 Curtaun 1 & 2
Sample ID: C12S6
Material Dated: charcoal
Pretreatment: AAA
Submitted by: IAC

¹⁴C Date: 3256±21
AMS δ¹³C: -28.6

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

C12S6		
UBA-12708		
Radiocarbon Age BP	3256 +/- 21	
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 1604- 1587	0.190
	1535- 1495	0.810
95.4 (2 sigma)	cal BC 1608- 1492	0.938
	1477- 1459	0.062

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.

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Radiocarbon Date Certificate

Laboratory Identification: UBA-12709
Date of Measurement: 2009-10-16
Site: E3721 Curtaun 1 & 2
Sample ID: C74S24
Material Dated: charcoal
Pretreatment: AAA
Submitted by: IAC

¹⁴C Date: 790±20
AMS δ¹³C: -30.1

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 - cl4res.csv

C74S24		
UBA-12709		
Radiocarbon Age BP	790 +/- 20	
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 AD 1225- 1261	1.000
95.4 (2 sigma)	cal AD 1218- 1270	1.000

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
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Radiocarbon Date Certificate

Laboratory Identification: UBA-12710
Date of Measurement: 2009-10-09
Site: E3721 Curtaun 1 & 2
Sample ID: C33S42
Material Dated: charcoal
Pretreatment: AAA
Submitted by: IAC

¹⁴C Date: 1252±37
AMS δ¹³C: -24.0

Information about radiocarbon calibration

RADIOCARBON CALIBRATION PROGRAM*
CALIB REV5.0.2

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*To be used in conjunction with:

Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.

Annotated results (text) - -

Export file - c14res.csv

C33S42		UBA-12710			
Radiocarbon Age BP		1252 +/- 37			
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 AD 685- 779			0.932	
	793- 803			0.068	
95.4 (2 sigma)	cal AD 674- 870			1.000	

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:

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0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

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Radiocarbon Date Certificate

Laboratory Identification: UBA-12711
 Date of Measurement: 2009-10-16
 Site: E3721 Curtaun 1 & 2
 Sample ID: C53S91
 Material Dated: charcoal
 Pretreatment: AAA
 Submitted by: IAC

¹⁴C Date: 1211±24
 AMS δ¹³C: -30.3

Information about radiocarbon calibration

RADIOCARBON CALIBRATION PROGRAM*
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 *To be used in conjunction with:
 Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.
 Annotated results (text) - -
 Export file - cl4res.csv

C53S91		
UBA-12711		
Radiocarbon Age BP	1211 +/- 24	
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 AD 776- 829	0.648
	838- 867	0.352
95.4 (2 sigma)	cal AD 717- 743	0.077
	768- 888	0.923

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:
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 ** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
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 where ^2 = quantity squared.
 [] = calibrated range impinges on end of calibration data set
 0* represents a "negative" age BP
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Radiocarbon Date Certificate

Laboratory Identification: UBA-12712
 Date of Measurement: 2009-10-16
 Site: E3721 Curtaun 1 & 2
 Sample ID: C72S30
 Material Dated: seed or nutshell
 Pretreatment: AAA
 Submitted by: IAC

¹⁴C Date: 1165±18
 AMS δ¹³C: -30.2

Information about radiocarbon calibration

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

C72S30		UBA-12712	
Radiocarbon Age BP 1165 +/- 18		Calibration data set: intcal04.14c	
% area enclosed	cal AD age ranges	# Reimer et al. 2004 relative area under probability distribution	
68.3 (1 sigma)	cal AD 783- 788	0.043	
	815- 843	0.307	
	859- 895	0.572	
	927- 935	0.079	
95.4 (2 sigma)	cal AD 779- 794	0.075	
	800- 899	0.788	
	919- 947	0.136	

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.
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THE CHARCOAL AND PLANT REMAINS
CURTAUN 1 & 2, CO. GALWAY, E3721
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Introduction

The survival of seed and charcoal macrofossils from dryland archaeology sites is usually dependant on the water table being high enough to keep the archaeological features in damp/wet and anoxic conditions. This does not usually occur on archaeological sites in Ireland, unless they are located on riverine flood plains or close to lakes. Seeds and charcoal are however preserved abundantly in the form of charcoal and carbonised plant remains as a result of burning activities in features such as hearths, kilns, furnaces, burnt structures and as waste material disposed in ditches and pits.

The site at Curtaun 1 and 2, Co Galway was a multi-period archaeological site consisting of Bronze Age and early medieval activity. There were two areas of Bronze Age activity – Area 1 consisted of a burnt mound spread and trough with basal stakeholes and area 2 contained a burnt mound spread, four pits and a possible well. The early medieval activity consisted three phases of cereal drying kiln construction, associated slot trenches and post holes which have been interpreted as a structure covering the kiln drying chamber (Delaney, 2009:11-12).

Plant macrofossil and charcoal remains provide valuable information to indicate socio-economic activity on archaeology sites. It is the aim of this report to identify the seed and charcoal species recovered from the site at Curtaun 1 and 2 and to use this information to:

- 1) provide additional information regarding the function of features sampled
- 2) interpret the diet and living conditions of the occupants of the site
- 3) interpret socio-economic and industrial activities on the site
- 4) infer the composition of the local flora and woodland

Methodology

There were 10 samples to be analysed for plant macrofossil and charcoal remains from Curtaun 1 and 2 - two from Bronze Age features and eight from the early medieval phase. The following methodology was used to identify the plant macrofossil and charcoal remains.

Charcoal

The number of charcoal fragments to be identified is dependent on the diversity of the flora. A study by Keepax (1988:120-124) has indicated that depending on the location of the archaeology site, 100–400 fragments of charcoal would need to be identified in order to obtain a full range of species diversity. As Britain and Ireland have a narrow flora diversity in comparison to that of mainland Europe, an identification limit of 100 fragments has been deemed sufficient for samples from either of these two countries (Keepax, 1988 cited in Austin, 2005:1). As the majority of the samples contained more than 100 fragments, in accordance with Keepax (1998), a maximum of 100 fragments were identified. Of the samples which contained greater than 100 fragments these were sieved through a 10 mm, 4 mm and 2 mm sieve and an equal proportion of each sieve were identified. This is to prevent any bias that may occur if only larger pieces are identified (thereby ensuring any potential smaller species are equally represented).

Each charcoal fragment was fractured by hand to reveal the wood anatomy on radial, tangential and transverse planes. The pieces were then supported in a sand bath and identified under an epi-illuminating microscope (Brunel SP400) at magnifications from x40 to x400. The sand bath allowed the charcoal pieces to be manipulated into the flattest possible position to aid identification. As fragments less than 2 mm in size cannot be accurately identified (it is not possible to get a wide enough field of vision

to encompass the necessary anatomical features for identification) only fragments above this size were examined.

During identification, any notable growth ring characteristics, evidence of thermal and biological degradation and any other unusual microscopic features were recorded. Identifications were carried out with reference to images and descriptions by Cutler and Gale 2000 and Heller et al. 2004 and Wheeler et al. 1989. Nomenclature of species follows Stace (1997).

Plant macrofossils

Plant macrofossil remains were retrieved by standard flotation procedures by IAC Ltd using 1 mm and 250 micron sieves. The floated material was sorted and seeds identified using a low-power stereo-microscope (Brunel MX1) at magnifications of x4 to x40. Identifications were made with reference to Cappers et al. 2006, Berggren 1981 and Anderberg 1994. Nomenclature follows Stace (1997).

Results

The plant macrofossil and charcoal results are fully tabulated in Figures 1 and 2 in Appendix 1 at the end of the report.

Charcoal identification notes

The anatomical similarities between (a) the Maloideae (hawthorn, rowan, crab apple); (b) alder/hazel; (c) sessile/pedunculate oak; (d) wild/bird cherry and (e) poplar/willow mean that it was not possible to identify these taxa to species level (Cutler and Gale, 2000).

Bronze Age Activity – Area 1

Stakehole C110

Sample 67 was retrieved from the primary and only fill (C111) of stakehole C110 which was located in the base of trough C89. This fill contained birch and ash charcoal inclusions.

Bronze Age Activity – Area 2

Pit, C9

The lower, charcoal rich fill (C12) of pit C9 was sampled (sample 6) and contained alder, hazel and ash charcoal inclusions.

Early Medieval Activity – Area 3

Kiln 1, C27 and kiln flue, C195

Sample 47 was retrieved from *in situ* burning layer C91 within the chamber/flue of Kiln 1, C27/C195. This sample contained oak, blackthorn/sloe and yew charcoal fragments. A charcoal rich layer, C33, was retrieved from the kiln's flue, C195. This was recovered as sample 42 and contained oak, Maloideae (hawthorn/rowan/crab apple) and blackthorn/sloe charcoal inclusions.

Foundation trench, C52

Foundation trench C52 has been interpreted as repair/reinforcement for trench C173 which was associated with activity in Kiln 1, C27 (Delaney 2009, 7). Fill C53 from the foundation trench was recovered as sample 91 and contained oak and hazel charcoal inclusions and carbonised oat, barley and wheat cereal grains.

Kiln 2, C35

Two samples were retrieved from the flue of Kiln 2, C35. Sample 30 was recovered from charcoal rich fill C72 and contained alder, hazel, oak, ash and Maloideae (hawthorn/rowan/crab apple) charcoal inclusions, carbonised barley and wheat

cereal grains and carbonised hazelnut shells. Fill C107 was a layer of burnt clay and charcoal, which was recovered as sample 65. This sample contained hazel, alder/hazel, oak ash and poplar/willow charcoal fragments and carbonised wheat cereal grains.

Kiln 3, C31 and kiln flue/fire bowl, C29

Three samples were recovered from Kiln 3, C31. Sample 24 was recovered from the basal fill, C74 of the chamber of Kiln 3, C31. This fill contained alder, hazel, birch, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry and yew charcoal inclusions, carbonised oat and wheat cereal grains and carbonised stinking chamomile herbaceous taxa. Fill 113 (sample 45) was a fill within kiln flue/fire bowl, C29 and contained alder, hazel, birch, oak, ash and Maloideae (hawthorn/rowan/crab apple) charcoal inclusions and carbonised oat, barley and wheat cereal grains. Charcoal-rich fill, C71 was also a fill of kiln flue/fire bowl, C29 and contained hazel charcoal inclusions.

Discussion

Bronze Age Activity – Area 1

The palaeobotanical evidence recovered from stakehole, C110, within the base of trough C89, does not give any further evidence for the function of the stakehole. The charcoal accumulated within fill C111 most likely silted into the stakehole cut once the stake had been removed. There were insufficient charcoal fragments recovered to determine whether the stake had burnt *in situ*, although given the nature of the fill composition and the evidence of two different species within the stakehole fill, burning of the stake is unlikely.

Bronze Age Activity – Area 2

Pit C9 has been interpreted as a possible dry cooking pit (Delaney, 2009:4). The charcoal inclusions and burnt stone within this fill could represent firing debris used to heat stones, which were then transferred into the cooking pit (C9) to cook the meat/fish/other vegetables. It is also possible that this pit purely represents a waste pit, however the usual method of disposal of waste firing debris on burnt mound sites is to pile up the waste material into a horseshoe shaped mound, of which there is evidence of remains of this type of spread (C6) within Area 2, therefore a cooking pit is a valid possible interpretation for this feature.

Early medieval Activity – Area 3

The plant macrofossil remains recovered from Kilns 2 and 3 indicate a cereal drying function for the kilns (C27, C29 and C35).

Kiln 1, C27 and slot trench C52

Fill C91 and fill C33 of flue/stoking pit C195 were both *in situ* burning layers recovered from kiln, C27. These fills did not contain any carbonised cereal remains, however, the shallow depths of these fills and truncation by later activity suggest that only minimal original material remains and as Kilns 2 and 3 both contained carbonised cereal remains, it is likely this kiln had the same function. The charcoal and *in-situ* burning remains from these two layers indicates that these fills represent burning events within the main stoking/fire pit of the kiln. The charcoal and plant macrofossils from slot trench C52 are indicative of a dump of rake-out waste from the fire bowl of the kiln into the slot trench to dispose of waste.

Kiln 2, C35

Fills C72 and C107 were both charcoal-rich fills associated with *in situ* burning in the fire pit/flue within Kiln 2 (C35). These fills both contained high quantities of charcoal,

carbonised barley and wheat cereal grains and carbonised hazelnut shells which suggests that this area would have been part of the main fire pit for the kiln.

Kiln 3, C29

Charcoal rich fills C113 and C71 are both associated with burning *in situ* within the fire pit/flue of Kiln C29. The high quantity of charcoal and carbonised oat and wheat cereal grains confirms the interpretation that this area would have been the main stoking/fire pit for kiln C29. Fill C74 was retrieved from the drying chamber (C31) of the kiln and also contained high concentration of charcoal. Care would usually be taken to avoid any potential flammable material entering the drying chamber as there is a high risk that sparks from the fire pit could ignite this material and set fire to and destroy the grain on drying racks. The charcoal within this chamber therefore may represent silting of material from the fire pit into the drying chamber or rake-out waste from the fire pit after its final use, before abandonment of the kiln.

Economic and Industrial Activities

Burnt Mound Activity

Bronze Age Activity – Areas 1 and 2

The palaeobotanical evidence from the samples recovered from burnt mound activity in Areas 1 and 2, did not provide any definitive explanation for the use of these features. Pit C6 in area 2 has been identified as a possible dry cooking pit, however, whilst the charcoal and burnt stones within the fill indicate the use of heat, there were no other palaeobotanical remains to confirm this function.

Cereal production and processing

Bronze Age Activity – Areas 1 and 2

There was no evidence of cereal production during the Bronze Age phase of activity within Areas 1 and 2.

Early Medieval Activity – Area 3

Wheat and barley were commonly cultivated cereals from the Neolithic period and the cultivation of oats began during the Iron Age. These cereals have continued to be farmed through the medieval period up until the present day. Crop husbandry played an important part in early medieval society in regards to both use and consumption within the local community and as an economic resource for trade. The prevailing damp climate during the medieval period meant that the grain would have been damp when harvested, so needed to be dried before any further processing could take place. This drying halted any possible germination of the grain, prevented decay and hardened the grain making it easier to mill (Gibson 1989, 219). Cereal-drying kilns would therefore have been essential to arable farmers during this time.

The grain within the fire-pits would usually have become carbonised due to grains accidentally falling into the fire pit area while being laid out on racks for drying and become carbonised. Alternatively grains could have been swept up with waste accumulated during the threshing and winnowing stage and burnt on the fire. It cannot be confirmed at which stage the grain within the slot trench (C52) became burnt however it is assumed that it silted into the trench from residual waste from the stoking areas of the kilns. There were also some charred hazelnut fragments found within a fill (C72) of Kiln 2, C35. These were most likely deposited by workers who were consuming them while manning the kilns.

Once the grain was dried, there were several stages of processing that had to be undertaken before it was ready to be used:

- 1) threshing – to break the ears of grain from the straw
- 2) winnowing – throwing grain into the air to allow the breeze to blow away lighter chaff (paleas, lemmas, awns)
- 3) coarse, medium, fine sieving and final hand-picking of the grain (Stevens and Wilkinson 2003, 196-7).

There is no evidence of a working area for the threshing, winnowing and sorting stages of cereal production, however it is possible that the dried grain was taken inside the nearby ringfort for safe storage and processing.

Trade

Bronze Age Period

The palaeobotanical remains did not indicate any evidence of trade during the Bronze Age phase of activity.

Early Medieval Period

The location of the three kilns, close to the ringfort (GA128-043), suggests that they were used to process and dry the cereal crops for use of the community living within and nearby the ringfort. However cereal crops were also a valuable product to use for trade for other foodstuffs and commodities, therefore it is possible that a percentage of the cereal grains processed within these cereal drying kilns were transported elsewhere for trade.

Fuel use

Bronze Age – Area 1

There is little information that can be obtained from the occasional charcoal fragments recovered from stakehole C111. The birch and ash fragments most likely silted into the stakehole after the stake was removed from burnt mound material deposited into trough C89. Both ash and birch are good fuel woods so would have been suitable for heating stones, however a larger assemblage would be required to provide more information about the dominant fuels used.

Bronze Age – Area 2

Pit C9 contained alder, hazel and ash charcoal fragments. The dominant fuel wood represented within the pit appears to be ash and hazel. The reason for this is because the ash does not exhibit any obvious curved growth rings, suggesting it was derived from larger branches or stem wood. The hazel dominates the charcoal assemblage within this pit, suggesting that it was also an important fuel. Both ash and hazel would be excellent fuels to use within a hearth for heating stones as they are anatomically dense grained woods and burnt for a long time at relatively high temperatures (Cutler and Gale 2000, 34, 120). Only a single fragment of alder was recovered from pit C9. As alder is recorded as a poor fuel wood (Stuijts 2005, 141), this fragment is most likely remains from kindling material within the hearth.

Early Medieval Period – Area 3

The main fuels used to fire the cereal-drying kiln during the first phase of early medieval kiln activity (Kiln 1 C27) was oak and during the second and third phases (Kiln 2, C35 and Kiln 3, C29) was oak and ash. The reason for this is because the majority of the ash and oak charcoal fragments did not show any obvious curved growth rings, therefore it is likely the wood was derived from larger branches or stem

(trunk) wood which would have been deliberately cut with the intention of burning (rather than opportunistic gathering of brushwood). Ash and oak would have been chosen as they both have dense heartwood, and if dried properly, are long-lasting fuels. This, together with good ventilation as there would have been in a cereal drying kiln, meant the wood would burn slowly and maintain an even temperature (Cutler and Gale 2000, 120, 205). This is ideal for fuel in a corn-drying kiln, which would require a constant heat for relatively long periods of time in order to dry out the grain.

The remaining charcoal recorded from the three kilns consisted of alder, hazel, birch, Maloideae (hawthorn, rowan, crab apple), wild/bird cherry, blackthorn/sloe, poplar/willow and yew. Most of the charcoal from these species exhibited curved growth rings, which suggests they derived from smaller roundwood lateral branches rather than stem/trunk wood. It is therefore most likely that these branches were collected as deadwood and used within brushwood bundles as kindling for the fire. Alder, poplar and willow are all species that are ideal to use for kindling. They are all anatomically less dense than for example, oak and ash and burn quickly at relatively high temperatures (Cutler and Gale 2000, 34, 236-41). This property makes them good to use as kindling, as the high temperatures produced by all these species would encourage the oak and ash to start to burn. The Maloideae (hawthorn, rowan and crab apple, the *Prunus* species (wild/bird cherry and blackthorn/sloe) and yew have a closer grain anatomical structure, as a result make excellent firewoods (Grogan et al. 2007, 30-31; Cutler and Gale 2000, 196; Stuijts 2005, 144). However the majority of charcoal from these species originated from small twigs which indicates that rather than being the dominant fuels, these were kindling used to ignite the oak and ash.

Management of the local environment

Fuel wood has been a valuable commodity throughout history and has been systematically cleared from the Neolithic period onwards. During the Bronze Age, communities would have been aware of the impact of deforestation and coppicing would have been introduced to manage and retain this valuable resource. This type of woodland management would have been undertaken by cutting the tree to a stump every five to seven years and allowing it to re-generate. The new stems produced were harvested and used for fuel and construction of wooden structures. This management ensured that the woodland resource was maintained for future generations (Van der Verf 1991, 97; Rackham 1980, 103). Despite this early management, by the early medieval period vast areas of woodland had continued to be chopped down to use for fuel wood, to clear areas for settlement and for clearance for arable and pastoral land (Brown et al. 2005, 88). As a result coppicing practices continued throughout this period.

There is evidence of coppicing provided from the hazel charcoal retrieved from Curtaun. The hazel from within pit C9 (Bronze Age, burnt mound activity in area 2) and also within Kilns 2 and 3 (area 3 - C35 and C29 respectively) show curved growth ring evidence on the majority of the hazel charcoal which indicates that the hazel wood originated from small round wood branches. As coppicing produces roundwood branches it is likely the hazel trees used for this fuel were being coppiced in the local woodlands during both the Bronze Age and early medieval periods in order to provide a constant supply of fuel wood.

Diet and socio-economic activities

Cereal consumption

Bronze Age Period

There is no evidence to determine diet during the Bronze Age occupation of this site.

Early Medieval Period

During early medieval period the remaining grain which was not transported and traded would have been consumed by the local community. The *Bretha a Déin* (Judgements of Dían Décht) - a law tract/medical treatise used throughout the medieval period specified that oat, barley and wheat (as found at Curtaun 1 and 2) were all cultivated in Ireland and all formed a staple part of the early medieval diet. (Hannon et al. 1991, 72-73). This legal text also demonstrates that there was a difference in the types of grain that was consumed by those of different status in society: it was asserted that wheat was consumed by high status members of society and the barley and oats but those of lower status (Edwards 2000, 60). The reason wheat was reserved for the higher status members of society was that the mild damp climate resulted in poor wheat harvests compared to those of oat and barley (Edwards 2005, 267-268). The more nutritious wheat was therefore reserved for the kings, bishops and wealthy landowners. The cereal grains recovered from Curtaun 1 and 2 consisted predominantly of oat with occasional barley and wheat. This suggests that a preference for weather-resistant crops such as oat, in order to maximise the harvest.

Once dried and processed, grain would be used to make a variety of foods including porridges, bread and cakes. Wheat would have been milled and the flour used to make bread, cakes, tarts and pies. It was also used as a thickener in sauces and soups, as stuffing for various meat dishes and also in the production of sausages (Adamson 2004, 2). Oats were easy to grow and were considered 'poor man's food' by the rich. They were used to make *littiu* (a porridge made with oats combined with water, buttermilk or new milk), unleavened bread or oat cakes (Sexton 1991, 76). Barley produced a heavier, denser bread which was considered 'inferior' to wheat bread by those of higher status; therefore it was more commonly consumed by lower status members of society. It was also ground down and made into porridge (Adamson 2004, 3).

Barley would also have been used to brew beer. Dyer (1983) cited in O'Keefe (2001, 68) suggests that up to one gallon (3.79 litres) of beer would be consumed per person per day. A reason for this is because of poor water sanitation during the medieval period, which meant beer would have been consumed in preference to water to avoid contracting water borne diseases (e.g. cholera and dysentery). Beer would also have been consumed for social reasons and would also have been an added source of vitamins and calories (Galloway 1991, 87). Both barley and oats would also have been used as animal fodder and the by-products of grains (e.g. straw) were also put to use. For example wheat straw was often used for thatching and barley straw was used as a winter feed and bedding for livestock (Pearson 1992, 3).

Hazelnut shells were also recovered in the early medieval plant macrofossil assemblage from Curtaun 1 and 2. Hazelnut would have provided a valuable source of vitamins and minerals and would be eaten raw or could be crushed and added to stews and cakes (Pearson 1997, 13).

Local flora - Evidence from plant macrofossils

Bronze Age Period

There were no plant macrofossils recovered from the Bronze Age; therefore it is not possible to provide any reconstruction of local flora

Early Medieval Period

Other than cultivated oats, barley and wheat, the only herbaceous taxon recovered from Curtaun 1 and 2 (kiln 3, C31) was a single carbonised stinking chamomile seed. This is a dryland species which often grows in cultivated arable areas and was most likely inadvertently brought to the site with the cereal crops that were being processed (Kay 1971, 623).

Local woodlands – Evidence from charcoal remains

As asserted by Scholtz (1986) cited in Prins and Shackleton (1992, 632), the “Principle of Least Effort” suggests that communities of the past collected firewood from the closest possible available wooded area. This suggests that the woodland surrounding the site would consist of oak-ash woodland during both the Bronze Age and early medieval periods. Whilst this can be used as the basic theory, other variables affecting wood collection must be taken into account (Prins and Shackleton, 1992:632). These include:

1) *Selection of particular species in favour of others within the woodland*

Oak and ash were likely to have been selected for use in a corn-drying kiln/a hearth to heat stones as they are considered long-lasting and effective fuels (Stuijts 2005, 141 and 143) so it is likely they were preferentially searched for and harvested and may have a higher percentage representation within the charcoal assemblage.

2) *Deliberately cultivated species*

The evidence of hazel coppicing during the Bronze Age and early medieval phases of activity is another variable which, by altering and managing the environment, would have increased the amount of available wood and therefore its representation within the charcoal assemblages.

3) *Differential preservation of charcoal/non-uniform survival of charcoal over time*

Preservation rates of charcoal can be affected by a number of variables:

a) mechanical abrasion on a site with stony subsoil may cause the charcoal fragments to be broken into smaller unidentifiable fragments and b) two identical pieces of wood may fragment into different numbers of charcoal fragments when burnt. Some, all or none of these may be recovered from the archaeological record which would affect possible woodland reconstructions and c) the overall heat of the fire may cause the wood to turn to ash and not be represented at all in the archaeological record (Asouti and Austin 2005, 1-5).

As a result of these variables it is not possible to use the fragment counts obtained to infer the percentages/numbers of each of these species within the local environment. However based on the assumption that communities will collect wood from the closest possible source (Scholtz, 1986) and in particular the collection of economically less important kindling fuel wood (which was most likely obtained from the area close to the site), the charcoal assemblage does suggest that the local vegetation would have consisted of:

Bronze Age Period

The charcoal assemblage from Areas 1 and 2 indicates that the woodland close to the site during the Bronze Age would have contained alder, hazel, birch and ash trees. The evidence of alder indicates a more waterlogged environment, possibly indicating that the present-day bog land to the south and south east of the site existed during the Bronze Age period. The hazel, birch and ash are all indicative of a drier environment and an oak-ash woodland further upslope, closer to the site. The large amount of hazel within pit C9 is also indicative of coppicing of hazel to produce fuel wood as described earlier.

Early Medieval Period

The fuel from Kilns 1, 2 and 3 indicate that woodland close to the site at Curtaun 1 and 2 during the early medieval phase would have consisted of alder, hazel, birch, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry, blackthorn/sloe, poplar/willow and yew. The alder and willow suggest that a marshy/more waterlogged environment existed close to the site; this again indicates that the present day bog to the south and south east of the site also existed during the early medieval period. The dominance of dryland species such as hazel, oak, ash, Maloideae (hawthorn/rowan/crab apple), wild/bird cherry, blackthorn/sloe and yew does however indicate rich oak-ash woodland located close to the site, with a large assemblage of hazel also indicating a continuation of woodland management by coppicing in the area.

Conclusion

The archaeological features excavated have provided a rich assemblage of plant macrofossil and charcoal material which has allowed an interesting insight into the industrial activities of the Bronze Age community and the diet and socio-economic and industrial activity of the early medieval occupants of the site at Curtaun.

The samples retrieved from burnt mounds allowed an interesting insight into the use of fuel in burnt mound sites. The charcoal remains identified from pit C9 and stakehole C110 were likely to have originated from charcoal produced from firing debris used to heat up stones. These stones would then have been used either to boil water within troughs on site (C89 – area 1) or used in dry cooking pits (C9 – Area 2). The fuel used to heat the stones appears to have been exploited from oak-ash woodland consisting of alder, hazel, ash and birch species. The ash and possibly hazel would most likely have provided the main fuels for the fire as they provide long lasting heat at relatively high temperatures. The remaining species were likely to have been used as kindling material for the fire. As the wood is usually selected from local woodlands these charcoal remains have also made it possible to suggest that the woodland close to the site at Curtaun 1 and 2 would have consisted of both alder-carr fen in boggy areas away from the site and oak-ash climax community woodland up slope closer to the site.

The charcoal and plant macrofossil material obtained from samples from the early medieval kilns confirm that they were used for cereal drying function, most likely to process grain for use within the nearby ringfort (GA128-043). The carbonised oat, barley and wheat cereal grains obtained indicate a variety of crops being cultivated and processed possibly for trade and for consumption within the local community. Oats, barley and wheat would have been made into bread, porridge, soups, stews, cakes, tarts and beer, but oats and barley may have been fodder and wheat supplies useful thatching material.

The charcoal remains included ash, oak, hazel, alder, poplar/willow, wild/bird cherry, blackthorn/sloe, Maloideae (hawthorn, rowan, crab apple) and yew. While some of

the ash and oak may have been brought or traded the remaining species were probably obtained from the local environment. This would indicate oak-ash woodland existing on drier land and an alder-carr fen in more boggy waterlogged areas towards the south and southeast of the site.

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Appendix 1

Table 1: Charcoal species identified from E3721 Curtaun 1 and 2, Co Galway.

Sample Number	6	67	42	47	30	65	24	45	55	91		
Fill Number	12	111	33	91	72	107	74	113	71	53		
Cut Number	9	110	195	27	35	35	31	29	29	52		
Family	Species	Common Name										
Betulaceae	<i>Alnus glutinosa</i>	Black/common alder	1			3		8	2			
	<i>Corylus avellana</i>	Hazel	94			12	4	37	14	37		
	<i>Alnus glutinosa / Corylus avellana</i>	Alder/hazel				14	2	19				
Fagaceae	<i>Betula spp</i>	Birch		6				3	4			
	<i>Quercus robur/ petraea</i>	Pedunculate/ sessile oak			62	33	7	81	9	48		
Oleaceae	<i>Fraxinus excelsior</i>	Common/ European Ash	5	1		61	9	8	29			
Roseaceae	<i>Maloideae spp (Crateagus monogyna/ Sorbus spp/ Malus sylvestris)</i>	Hawthorn/rowan crab apple			30		3		8	3		
	<i>Prunus avium/padus</i>	Wild/bird cherry			6				7			
	<i>Prunus spinosa</i>	Blackthorn/sloe			2	1						
Salicaceae	<i>Populus spp/Salix spp</i>	Poplar/Willow					4					
Taxaceae	<i>Taxus baccata</i>	Yew				1		1				
		Indeterminate	8		9	2	1	5	3	1		
Total fragments identified			100	7	100	35	100	100	100	100	37	100

Table 2: Plant macrofossil species identified from E3721 Curtaun 1 and 2, Co Galway.

Sample Number			24	65	45	30	91
Fill Number			74	107	113	72	53
Cut Number			31	35	29	35	52
Family	Species	Common Name					
Asteraceae	<i>Anthemis cotula</i>	Stinking chamomile	1				
Betulaceae	<i>Corylus avellana</i>	Hazelnut shell				36	
Poaceae	<i>Avena</i> spp	Oat	247		91		3
	<i>Hordeum</i> spp	Barley			1		3
	<i>Hordeum vulgare</i>	Barley – hulled 6-rowed				6	
	<i>Hordeum vulgare</i>	Barley – naked		1	1		
	<i>Triticum</i> spp	Wheat	1		1		
	<i>Triticum aestivum/ durum</i>	Wheat – naked/free threshing	1			3	1
	<i>Triticum dicoccum</i>	Wheat - emmer		1		2	
	<i>Triticum monococcum</i>	Wheat - einkorn			1		1
	<i>Poaceae</i>	Indeterminate grain (whole grains)		1			
	<i>Poaceae</i>	Indeterminate grain (grain fragments)			2	13	2
Total macrofossils fragments			251	3	97	60	10

NB All plant macrofossil remains are carbonised, unless otherwise stated.

OSTEOLOGICAL REPORT ON FAUNAL REMAINS
CURTAUN 1 & 2, CO. GALWAY, E3721

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1 Introduction

1.1 The archaeological excavations along the N18 Gort to Crusheen road scheme discovered animal bone on ten sites: Curtaun 1 and 2, Rathwilladoon 2 in Co. Galway, and Caheraphuca 1, Caheraphuca 4, Caheraphuca 6, Gortaficka 1, Gortaficka 2, Sranagalloon 2, Sranagalloon 3, Monreagh 2 in Co. Clare. The majority of these sites are of Bronze Age date, and were burnt mounds or *fulacht fiadh* sites. A settlement site with Neolithic, Bronze Age and Iron Age period dates is represented by Rathwilladoon 2 and 3, an early medieval and medieval kiln features were identified at Curtaun 1 and 2 and the early modern enclosure at Sranagalloon 2 has also produced a Bronze Age date.

1.2 The total animal bone assemblage consisted of only 1847 fragments, at a weight of about 4 kg. The osteological analysis will therefore only reveal the variety of species identified and the anatomical distribution of the bones on these sites. Not enough data are available for any assessment of husbandry economy or age-at-slaughter strategies. The largest bone quantities by weight were found at Caheraphuca 4, Caheraphuca 1, and Curtaun 1 and 2 (Table 1).

Table 1 - The quantity of the animal bone samples from the archaeological excavations of the N18 Gort to Crusheen road scheme by site. Abbreviation: NISP = Number of Identified Specimens

Site	Type	NISP	Weight (g)
Rathwilladoon 2, Co. Galway	Multi period settlement	1216	383.95
Caheraphuca 1, Co. Clare	Burnt mound	27	956.72
Caheraphuca 4, Co. Clare	Burnt mound	126	1533.90
Caheraphuca 6, Co. Clare	Burnt mound	13	121.37
Gortaficka 1, Co. Clare	Burnt mound	1	25.80
Gortaficka 2, Co. Clare	Burnt mound	10	60.47
Monreagh 2, Co. Clare	Burnt mound	32	9.64
Sranagalloon 3, Co. Clare	Burnt mounds	1	8.32
Curtaun 1 and 2, Co. Galway	Kilns	418	619.18
Sranagalloon 2, Co. Clare	Enclosure	3	9.49
<i>Total</i>		<i>1847</i>	<i>3728.84</i>

2 Osteological methodology

2.1 The bone and shell fragments were identified to species, element, and body side with the aid of an osteological reference collection (Margaret Gowen & Co. Ltd. and the Natural History Museum of Ireland), and reference atlases (Iregren 2002; Răduleț 2007 and 2008; Schmid 1972). Traces of slaughter, butchery and food preparation were also examined, as well as post-depositional taphonomic changes on bones such as erosion and animal gnawing.

2.2 Mammal bone fragments not identifiable to species were assigned to a category of animal based on the size of the fragment if possible. These categories were large mammal (LM), which primarily would include bones from cattle and horses; medium mammal (MM), which includes for example caprovines (sheep/goat), pigs and large dogs; and small mammal (SM), which would include small dogs, cats, hares and rabbits. These categories were however not considered in the interpretative analysis of the data.

2.3 The bones were counted and weighed on a digital weight scale with an accuracy of 0.01 g (OHAUS Scout Pro SPU402). Only fragments that could be identified to species are regarded as identified in this analysis (NISP = Number of Identified Species). In addition to fragment count and weight, the assemblage was also quantified by MNI (Minimum Number of Individuals). Size, side and sex characteristics were taken into consideration when the total MNI was estimated (see Chaplin 1971), and a zone recording system (Serjeantson 1996) was employed when identifying the fragments.

2.4 Measurements were taken following the metric standards by von den Driesch (1976) using an osteometric board and a measuring tape with 0.50 mm accuracy, as well as a digital calliper with 0.01 mm accuracy (BILTEMA 16-105). The most important post-cranial measurements are available in Appendix 2. A complete and comprehensive register of all the measurements, including the cranial metrics, is available with the author. Shoulder height of horse was calculated using the equations by May (1985).

The descriptions given by Boessneck et al. (1964) and Prummel and Frisch (1986) were consulted when attempting to distinguish between sheep and goat bones in caprovine remains. The estimation of age-at-slaughter and death was conducted by assessing the degree of mandibular dental wear (Grant 1982; Payne 1973; 1987), and by examining the stage of fusion of the epiphyseal ends of the long bones (Habermehl 1961; 1975; Silver 1969).

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3 Early Medieval Kilns

3.1 Curtaun 1 and 2, Co. Galway

The excavations at Curtaun were taken place in three areas, two with burnt mounds and one with an early medieval kiln. Animal bones from Curtaun 1 and 2 were found almost exclusively in kiln related features.

A total of 418 animal bones (619.18 g) were recovered from this site, deriving from eight species. The only bones not found in kiln-related features were the proximal portions of a cattle tibia found in the fill (C126) of a linear feature (C125), and a pig boar canine tooth (tusk) found in the fill (C8) of irregular pit feature C7. The large size of the tusk would suggest that it derive from wild boar rather than a domestic pig.

A total of nine cattle bones (62.32 g) were identified in features associated with the kilns (Kiln 1: C28; Kiln 2: C99; Kiln 3: C68, C76, C100, C113). The bones identified included three rib fragments, the proximal end of a left mature ulna, the right juvenile metacarpal, a metapodial fragment and three phalanges. Evidence of butchery was noted on the ulna fragment, where axial knife cut marks were noted on the medial surface of the olecranon, just posterior of the articulation. The same bone also displayed evidence of carnivore gnaw-marks, probably caused by a dog or a fox.

Sixteen caprovine bones were identified (38.74), of which one right astragalus could be identified as goat (*Capra hircus*) and a right calcaneus as sheep (*Ovis aries*). The bones represented a minimum of two adults and one juvenile animal, found in features associated with all three kilns (Kiln 1: C28, C33; Kiln 2: C36; Kiln 3: C68,

C69, C76, C1 13, C185). Four rib fragments, a coxae and an astragalus had been burnt. No traces of slaughter or butchery were noted.

A fragment of a pig mandible (34.48 g) was found in C140, which was a backfill in a flue associated with Kiln 3. No cut marks were present on the fragment.

Only one horse bone was identified (39.44 g); a fragment of a right metacarpal found in the backfill (C140) of a flue (C35) associated with Kiln 3. The bone derived from an adult animal. Due to incompleteness, the shoulder height could not be estimated. Several bones identified as red fox (*Vulpes vulpes*) were found in the fill of a flue (C68) and basal fill and collapsed chamber roof (C74; C76) of Kiln 3. A total of 124 bones (245.63 g) were identified, deriving from a minimum of two adult (older than 8 months) and one immature animal (2-6 months). Considering the amount of fox bones, it seems likely that the animals had used the abandoned kiln as a den, and might therefore reflect be a relatively recent natural disturbance.

The left ulna in one of the adult animals displayed active porous and proliferated new bone formation (periostitis) on the medial margin of the proximal diaphysis (34 x 4 mm), which suggests that the animal had succumbed to some sort of injury to the front leg.

Sixteen bones (21.80 g) identified as hare (*Lepus timidus*) were identified in the rubble of the collapsed chamber roof (C76) and the fill (C68) of a flue (C29) associated with Kiln 3. A minimum of one individual was identified, from which the right maxilla and mandible, the right coxae, femur, tibia, calcaneus and left and right foot remained. Considering the anatomical distribution, it appears as if a majority of the bones are the remains of a meat cut, although no evidence of butchery was noted on the elements. These bones are likely to represent a meal brought into the den by one of the foxes (see above). This suggestion can be further argued from the carnivore gnaw marks identified on a hare coxae fragment.

A patch of fine active new bone formation (periostitis) was noted on the posterior surface of the diaphysis of the left fifth metacarpal. This pathology indicate inflammation of the periosteum of the bone, possibly caused by an infection due to injury to the paw.

Thirty-two bones (0.49 g) from field mice (*Apodemus sylvaticus*) were identified in the basal fills of Kiln 1 (C91) and Kiln 3 (C74). These derived from a minimum of six animals. The wood mouse is a burrowing animal, and the presence of bones from this specie in these kiln features is probably a recent intrusion and not archaeological in origin.

Three amphibian bone fragments (0.07 g) identified as common frog (*Rana temporaria*) were found in the basal fill (C74) of the chamber (C31) of Kiln 3. The elements identified included a left humerus and two long bone fragments. As with the field mouse, the frog is a burrowing animal, and these bones are likely the result of a relatively recent intrusion and disturbance.

3 Conclusions

The majority of the bones from early medieval features at Curtaun appear to be more a reflection of nature rather than human intervention.

Kiln 3 at Curtaun was likely used as den by a group of red foxes. These animals could also have brought the additional animal bones found on that site. Additionally,

bones from burrowing animals such as the wood mouse and common frog were also identified, and are indicative of possibly recent natural disturbances.

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Appendix 1**Table A1.1 - Identified animal taxa and skeletal elements from Curtaun 1 and 2, Co. Galway**

Element	Cattle	S/G	Pig	Horse	Red fox	Hare	Wood mouse	Common frog	LM	MM	SM	Indet.
Cranial	-	-	-	-	2	1	1	-	-	-	-	-
Mandible	-	1	1	-	3	1	5	-	-	-	-	-
Teeth	-	-	1	-	1	-	6	-	-	-	-	-
Vertebrae	-	-	-	-	38	-	-	-	1	-	1	-
Sacrum	-	-	-	-	2	-	-	-	-	-	-	-
Ribs	3	5	-	-	23	-	-	-	-	-	-	-
Scapula	-	-	-	-	5	-	-	-	-	1	-	-
Humerus	-	-	-	-	5	-	1	1	-	-	-	-
Radius	-	-	-	-	4	-	-	-	-	-	-	-
Ulna	1	-	-	-	4	-	-	-	-	-	-	-
Metacarpal	1	-	-	1	8	-	-	-	-	-	-	-
Coxae	-	1	-	-	2	1	-	-	-	-	-	-
Femur	-	-	-	-	5	1	6	-	-	-	-	-
Tibia	1	2	-	-	4	1	1	-	-	-	-	-
Fibula	-	-	-	-	1	-	-	-	-	-	-	-
Calcaneus	-	2	-	-	2	1	-	-	-	-	-	-
Astragalus	-	3	-	-	2	-	-	-	-	-	-	-
Metatarsal	-	1	-	-	12	8	-	-	-	-	-	-
Metapodial	1	-	-	-	1	-	-	-	-	-	-	-
Ph1Mp	-	1	-	-	-	2	-	-	-	-	-	-
Ph2Mp	3	-	-	-	-	-	-	-	-	-	-	-
Indet.	-	-	-	-	-	-	12	2	2	1	-	208
Total:	10	16	2	1	124	16	32	3	3	2	1	208
%NISP:	2.39%	3.83%	0.48%	0.24%	29.67%	3.83%	7.66%	0.24%	0.24%	0.48%	0.24%	49.76%
Weight (g):	145.87	38.74	60.28	39.44	245.63	21.80	0.49	0.07	14.62	2.37	0.05	49.82

Table A1. 2. Identified species (NISP) by sample at Curtaun 1 and 2, Co. Galway

Sample	Cattle	S/G	Sheep	Goat	Pig	Wild boar	Horse	Redfox	Hare	Wood mouse	Indet	Weight (g)	Comments
23	-	2	-	-	-	-	-	-	-	-	-	3.74	
24	-	-	-	-	-	-	-	-	-	-	5	1.64	Burnt
25	-	-	-	-	-	-	-	-	-	-	5	12.03	Burnt
28	-	-	-	-	-	-	-	1	-	-	-	2.82	
29	1	2	-	-	-	-	-	33	5	-	1	85.76	
30	-	-	-	-	-	-	-	-	-	-	116	14.20	Burnt
35	-	-	-	-	-	-	-	-	-	-	3	8.24	Burnt
36	3	-	-	-	-	-	-	2	-	-	-	24.50	
42	-	-	-	1	-	-	-	-	-	-	32	6.79	Burnt
45	-	-	-	-	-	-	-	-	-	-	4	0.50	Burnt
47	-	-	-	-	-	-	-	-	-	1	4	1.49	
64	-	1	-	-	-	-	-	31	4	-	2	55.67	
72	-	3	-	-	-	-	-	-	-	-	4	5.54	
73	-	2	-	-	-	-	-	-	-	-	27	15.43	
75	1	-	1	-	-	-	-	-	-	-	6	8.48	
86	2	2	-	-	-	-	-	57	7	-	1	127.83	
110	-	-	-	-	1	-	1	-	-	-	-	73.92	
127	1	-	-	-	-	-	-	-	-	-	-	8.23	
132	-	1	-	-	-	-	-	-	-	-	-	11.1	
136	1	-	-	-	-	-	-	-	-	-	-	83.55	
141	1	-	-	-	-	-	-	-	-	-	-	33.42	
142	-	-	-	-	-	1	-	-	-	-	-	25.80	

Appendix 2 – Metrics

Table A2.1. Cattle bone measurements (mm). Abbreviations: see von den Driesch 1976

Site	Period	Sample	Element	Side	Bp	Bfp	SD	CD	SLC	LG	BG	BPC	DPA	SDO
E3721	EM	136	Tibia	R	71.65	-	-	-	-	-	-	-	-	-
E3721	EM	141	Ulna	L	-	-	-	-	-	-	-	37.60	56.21	49.73

Table A2.2. Caprovine bone measurements (mm). Abbreviations: see von den Driesch 1976

Site	Period	Sample	Species	Element	Side	Bp	SD	GLI	SLC	LG	BG	GB	Bd
E3721	EM	23	S/G	Astragalus	R	-	-	-	-	-	-	-	15.43
E3721	EM	42	G	Astragalus	R	-	-	22.43	-	-	-	-	13.52
E3721	EM	73	S/G	Coxae	L	-	-	-	-	-	-	-	-
E3721	EM	75	S	Calcaneus	R	-	-	-	-	-	-	19.30	-
E3721	EM	132	S/G	Tibia	L	-	14.14	-	-	-	-	-	-

Table A2.3. Red fox bone measurements (mm). Abbreviations: see von den Driesch 1976

Site	Period	Sample	Element	Side	LO	SDO	DPA	BPC	Bp	DC	SD	GL	SD	Bd
E3721	EM	29	Humerus	L	-	-	-	-	22.66	-	6.91	116.74	-	19.05
E3721	EM	29	Humerus	R	-	-	-	-	-	-	-	-	6.86	17.92
E3721	EM	29	Mc IV	R	-	-	-	-	-	-	-	43.76	3.58	5.03
E3721	EM	29	Mt II	R	-	-	-	-	-	-	-	58.01	4.29	5.28
E3721	EM	29	Mt IV	L	-	-	-	-	-	-	4.08	63.12	-	5.55
E3721	EM	29	Radius	L	-	-	-	-	10.20	-	8.00	105.73	-	13.72
E3721	EM	29	Radius	R	-	-	-	-	10.41	-	8.60	-	-	13.93
E3721	EM	29	Ulna	L	19.42	12.84	15.75	8.92	-	-	-	-	-	-
E3721	EM	29	Ulna	R	17.11	11.40	13.88	7.70	-	-	-	-	-	-
E3721	EM	89	Calcaneus	L	-	-	-	-	-	-	-	28.61	-	-
E3721	EM	89	Femur	L	-	-	-	-	23.81	11.12	8.14	121.17	-	-
E3721	EM	89	Femur	R	-	-	-	-	23.88	10.93	8.15	120.14	-	20.22
E3721	EM	89	Mc II	L	-	-	-	-	-	-	-	38.43	3.86	5.64
E3721	EM	89	Mc III	L	-	-	-	-	-	-	-	48.34	3.95	5.54
E3721	EM	89	Mc IV	R	-	-	-	-	-	-	-	41.98	3.47	5.06
E3721	EM	89	Mc V	L	-	-	-	-	-	-	-	36.33	4.17	5.71
E3721	EM	89	Mc V	R	-	-	-	-	-	-	-	36.29	4.27	6.04
E3721	EM	89	Mt II	L	-	-	-	-	-	-	-	53.08	4.00	5.66
E3721	EM	89	Mt II	L	-	-	-	-	-	-	-	-	4.51	-
E3721	EM	89	Mt IV	L	-	-	-	-	-	-	-	-	4.00	-
E3721	EM	89	Mt IV	R	-	-	-	-	-	-	-	61.76	4.50	6.08

Site	Period	Sample	Element	Side	LO	SDO	DPA	BPC	Ep	DC	SD	GL	SD	Bd
E3721	EM	89	MtV	L	-	-	-	-	-	-	-	53.11	3.07	5.26
E3721	EM	89	MtV	R	-	-	-	-	-	-	-	53.52	3.06	5.10
E3721	EM	89	MtV	R	-	-	-	-	-	-	-	57.71	3.84	6.03
E3721	EM	89	Radius	L	-	-	-	-	-	-	7.62	-	-	15.91
E3721	EM	89	Tibia	L	-	-	-	-	20.19	-	7.47	123.57	-	14.00
E3721	EM	89	Tibia	R	-	-	-	-	-	-	7.59	123.68	-	13.98
E3721	EM	89	Ulna	L	19.55	13.10	-	9.32	-	-	-	-	-	-
E3721	EM	89	Ulna	R	17.61	11.38	-	8.80	-	-	-	-	-	-

Appendix 3 - Epiphyseal bone fusion and mandibular dental wear data

Table A3.1. Cattle bone epiphyseal fusion data. Abbreviations: UF = unfused; IF = infusion; F = fused.

<i>Fusion period</i>	<i>Period</i>	<i>UF</i>	<i>IF</i>	<i>F</i>	<i>%UF</i>
Early fusion (< 1 ¹ / _A years)	Neolithic	0	0	0	-
	Bronze Age	0	0	1	0.00%
	Early medieval	1	0	0	100.00%
	<i>Total:</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>50.00%</i>
Mid fusion (2-2 ¹ / _A years)	Neolithic	0	0	1	0.00%
	Bronze Age	0	0	0	-
	Early medieval	1	0	0	100.00%
	<i>Total:</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>50.00%</i>
Late fusion (> 3 years)	Neolithic	0	0	0	-
	Bronze Age	0	0	1	0.00%
	Early medieval	0	0	0	-
	<i>Total:</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0.00%</i>

Table A3.2. Caprovine bone epiphyseal fusion data. Abbreviations: UF = unfused; IF = infusion; F = fused

<i>Fusion period</i>	<i>Period</i>	<i>UF</i>	<i>IF</i>	<i>F</i>	<i>%UF</i>
Early fusion (< 1 years)	Neolithic	0	0	2	0.00%
	Bronze Age	0	0	1	0.00%
	Early medieval	1	0	1	50.00%
	<i>Total:</i>	<i>1</i>	<i>0</i>	<i>4</i>	<i>25.00%</i>
Mid fusion (1 - 2 ¹ / _{Vi} years)	Neolithic	0	0	0	-
	Bronze Age	0	0	0	-
	Early medieval	2	0	0	100.00%
	<i>Total:</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>100.00%</i>
Late fusion (> 3 years)	Neolithic	0	0	0	-
	Bronze Age	0	0	0	-
	Early medieval	0	0	1	0.00%
	<i>Total:</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0.00%</i>

Table A3.3. Pig bone epiphyseal fusion data. Abbreviations: UF = unfused; IF = infusion; F = fused

Fusion period	Period	UF	IF	F	%UF
Early fusion (< 1 years)	Neolithic	0	0	0	-
	Bronze Age	0	0	0	-
	Early medieval	0	0	0	-
	<i>Total:</i>	<i>0</i>	<i>0</i>	<i>0</i>	-
Mid fusion (1 - 2 ¹ / ₂ years)	Neolithic	0	0	0	-
	Bronze Age	0	0	0	-
	Early medieval	0	0	0	-
	<i>Total:</i>	<i>0</i>	<i>0</i>	<i>0</i>	-
Late fusion (> 3 years)	Neolithic	1	0	0	100.00%
	Bronze Age	0	0	0	0
	Early medieval	0	0	0	0
	<i>Total:</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>100.00%</i>

Table A3.6. Mandibular dental wear in pigs (method by Grant 1982). Abbreviation: EM = early medieval; L = left

Site	Period	Sample	Side	T.W.S					MWS
				m₄	P₄	M₁	M₂	M₃	
Curtaun 1 and 2	EM	110	L		f	j	f	d	34

THE METAL FINDS
CURTAUN 1 & 2, CO. GALWAY, E3721
JACQUELINE MAC DERMOTT

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Ringsend, Dublin 4
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Metal Finds: Coin

Find No: E3721:1:3

This is a copper-alloy halfpenny of James II, dating to 1691. This particular issue was minted in Limerick, struck over James' earlier 'gunmoney' shillings. Part of the original inscription can be seen on the reverse of the coin above Hibernia's head.

Find No: E3721:1:3

Irish halfpenny, James II, 1691. Copper alloy. Limerick besieged coinage. Obverse: Laureate and draped bust facing left. JACOBVS II DEI GRATIA. Reverse: Hibernia seated facing left, holding cross. HIBERNIA 1691. Originally a large shilling of James II gunmoney coinage, part of the inscription '...COBVS II...' is visible on the reverse. Diam (mm): 27. Thickness (mm): 1.5. Context 1. Topsoil.

Bibliography.

Seaby, P 1970 *Coins and tokens of Ireland*. Seaby. London.

Recommendations.

None.

Objects for illustration/photography.

None.

THE GLASS BEADS
CURTAUN 1 & 2, CO. GALWAY, E3721
JUDITH CARROLL

*Archaeological Consultants
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Temple Bar,
Dublin 2*

Introduction

The glass beads from Curtaun 1 & 2, Co. Galway, were found during excavation of the burnt mound and kiln site in Curtaun townland. The site was found during archaeological test-trenching and was excavated prior to construction of the N18 Gort to Crusheen routeway. The excavation was carried out by Shane Delaney for IAC Ltd under Ministerial Direction E3721. There were two glass beads from the site.

Description of the beads

E3721: 1:1 was an annular bead, 7.5 mm in diameter. It was lopsided, ranging from 2–4 mm in height. In diameter of perforation, it was 2 mm. It was opaque and black in base colour with a band of red glass fused over the outer surface.

E3721: 1:2 was a half part (broken along the line of perforation) of a perforated bead of turquoise blue opaque glass. It was 9 mm in diameter with a height of 5–6.5 mm and a perforation of 4 mm in diameter.

Context within the excavation

The beads were found unstratified in the topsoil layer, C001. The site comprised an area of two burnt mounds and an area of three kilns, along with stake-holes and foundation trenches suggesting a superstructure for the kilns. The site was overlooked by a large bi-vallate ringfort (GA128-043) and the kilns may have related to this (Delaney 2009, 9).

Discussion

Both the beads have been examined but no clear comparisons have been found. Glass beads are found in abundance on early medieval sites in Ireland. All colours and forms of intricate decoration were mastered by the glassworkers of the period. Beads are found widely in Irish Iron Age contexts as well, but are more limited in type and appear to have been mainly imports from Britain and the Continent.

Bead no. E3721: 1:1

No direct comparison has been found for this bead. It was a topsoil find, found in the region of much early medieval activity as suggested by the ringfort and the kilns. The glass type is very similar to a bead found in Balrothery, Co. Dublin (Ryan 2008, 115) though it does not compare to it in shape. The Balrothery bead was found in the context of an inhumation burial probably dating to between the 2nd and 4th centuries AD (Ryan 2008, 127). It could therefore date to the Late Iron Age but a date in the early medieval period is also very possible for this bead.

Bead no. E3721: 1:2

E3721: 1:2 is unusual both in glass type and colour. It is half an opaque turquoise bead. In form, it is a typical bead shape found in Iron Age and early medieval contexts as well as later. Such shapes would have resulted from the simple method of making glass beads which is practised up to the present day. A blob of molten glass is dropped around a very narrow, turning metal rod. The small, liquid rounded ring of glass quickly hardens and is shaken off the rod.

All colours of beads and other decorative glass types such as millefiori, glass mounts and glass bangles are found in early medieval contexts (Carroll 1995, 2000). However, the glass colour and type of this bead is not typical. Most Irish early medieval glasswork would tend to have been made in Ireland (e.g. Henderson 1988) and differs somewhat from earlier imports. The manufacture of the glass colour of this particular bead (E3721: 1:2) would have necessitated the use of antimony, e.g. lead or tin, in the glass mix. Antimonite usually results in some (even slight) deterioration, of Irish early medieval glass of opaque light blue/light green/yellow.

This bead does not show any sign of decay and there is no pitting evident. Though this bead could belong to an Irish early medieval context, its glass has a very industrial look.

A turquoise glass bead was found Iron Age contexts of Phase III at Navan fort, though it is much smaller than the bead of this report (Waterman 1997, 87). There is the possibility that bead E3721: 1:2 could date to the early centuries AD and be an import from the more industrialised factories of the Roman world. It is also possible that it could be a much later import dated to the early modern period or later. Coloured beads were extensively produced from the late 16th century, particularly in Dutch factories and were exported widely. The beads were usually multi-coloured but some plain turquoise examples are known (Sherr Dubin 1987, 238).

Summary

No comparisons have been found for either of the beads. They are unstratified but from their position on site in the region of some possible early medieval kilns, and the proximity of a large ringfort, it would be expected that they might be early medieval. The C14 dates from Curtaun 1 and 2 (three out of five of which date to between the 7th and 10th century) would further suggest that the beads belong in this context. However, earlier occupation is possible, particularly as one pit produced a middle Bronze Age date (C012). Later occupation is also suggested by a C14 date of the 13th century AD from the chamber of one of the kilns (C074). Bead E3721: 1:2 could, however, date to the early modern period or later.

Recommendations

It is recommended that the beads are professionally photographed for publication. The beads should be stored in sealed plastic bags in acid-free cardboard boxes.

References

Carroll, J 1995 Millefiori in the development of early Irish enamelling. In Bourke, C (ed.) *From the isles of the north - early medieval art in Ireland and Britain*. Belfast HMSO, 49-57.

Delaney, S 2009 Curtaun 1 and 2. Archaeological stratigraphic report carried out for the N18 Gort to Crusheen routeway. Ministerial Direction E3721. Unpublished report prepared by Irish Archaeological Consultancy Ltd for Galway County Council.

Henderson, J 1988 The nature of the early Christian glass-making industry in Ireland: some evidence from Dunmisk fort, Co. Tyrone. *Ulster Journal of Archaeology* 51, 115-126.

Ryan, F 2008 Excavation of Iron Age ring ditches, cist burials and features relating to habitation at Glebe South. In Carroll, J., Ryan, F. and Wiggins, K., *Archaeological excavations at Glebe South and Darcystown, Balrothery, Co. Dublin*. Dublin.

Sherr Dubin, L 1987 *The history of beads*. London.

Waterman, D M 1997 *Excavations at Navan Fort 1961-71* (Completed and edited by C.J. Lynn). Environment and Heritage Service. Department for the Environment, Northern Ireland. Belfast

Appendix 1

Table 1: Glass beads from Curtaun 1

Find Number	Context	Type/ Material	Description	Dimensions
E3721:1:1	1	Glass Bead	Annular bead. Black and red in colour, opaque, with black seeming to form the base colour, fused over by red on the surface. Quite roughly made with one side much lower in height than the other.	Diam.:7.5 mm; H:2-4 mm; Diam. of perforation: 2 mm
E3721:1:2	1	Glass Bead	Half part (section lengthways) of perforated bead. Bright blue, almost turquoise in colour, opaque.	Diam.:9 mm; H: 5-6.5 mm; Diam. of perforation: 4 mm



Plate 1: E3721:1:2



Plate 2: Bead E3721:1:1

THE MODERN POTTERY
CURTAUN 1 & 2, CO. GALWAY, E3721
CLARE MCCUTCHEON MA MIAI

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Introduction

A single sherd of modern pottery was presented for study. This is a fragment of pearlware, possibly from a plate.

Pearlware

Wedgwood's development of creamware was further refined as pearlware, with a harder-fired clay and a blue rather than a green tinge in the collected glaze (Savage & Newman 2000, 216). This formed the basis for many decorative forms of the later 18th and 19th centuries such as shell-edged, mochaware and transfer printed ware.

Bibliography

Savage, G & Newman, H 2000 *An illustrated dictionary of ceramics*. London. Reprint 1985 edn.

Note: A second sherd of modern pottery from the same context was discarded.

CATALOGUE OF CLAY PIPE
CURTAUN 1 & 2, CO. GALWAY, E3721
MAEVE TOBIN MA

*Irish Archaeological Consultancy Ltd
120b Greenpark Road, Bray, Co. Wicklow
www.iac.ie*

Find number	Object Type	Material	Description	Dimensions
E3721:30:1	Clay pipe bowl	Ceramic	A fragment of clay pipe bowl forming 1/3 of the entire bowl. Cream in colour on exterior and interior is blackened through use. Slight curve at base. Series of notches around the exterior rim of the bowl.	L 34mm, min W 19mm, D 2mm
E3721:80:1	Clay pipe	Ceramic	Incomplete clay pipe bowl attached to stand and stem, cream in colour with slight blackening due to use along exterior rim surface and within the bowl. Bowl curves slightly upwards but mostly splays outwards. The stem is circular in plan with central internal hole. The stand is broken but appears oval in section	L 59mm, L of bowl 33mm, min Diam. of bowl 22mm, diam. of stem 7mm, D of bowl wall 3mm, hole diam. 2mm
E3721:80:2	Clay pipe stem	Ceramic	A straight fragment of clay pipe stem, cream in colour. Circular in section with a central internal hole	L 31mm, diam. 6.5mm, hole diam. 2mm
E3721:80:3	Clay pipe stem	Ceramic	A tapering fragment of clay pipe stem, cream in colour. Circular in section with a central internal hole. One end splays where it originally met the bowl, attached to remains of oval stand	L 36mm, diam. 7mm, hole diam. 2mm

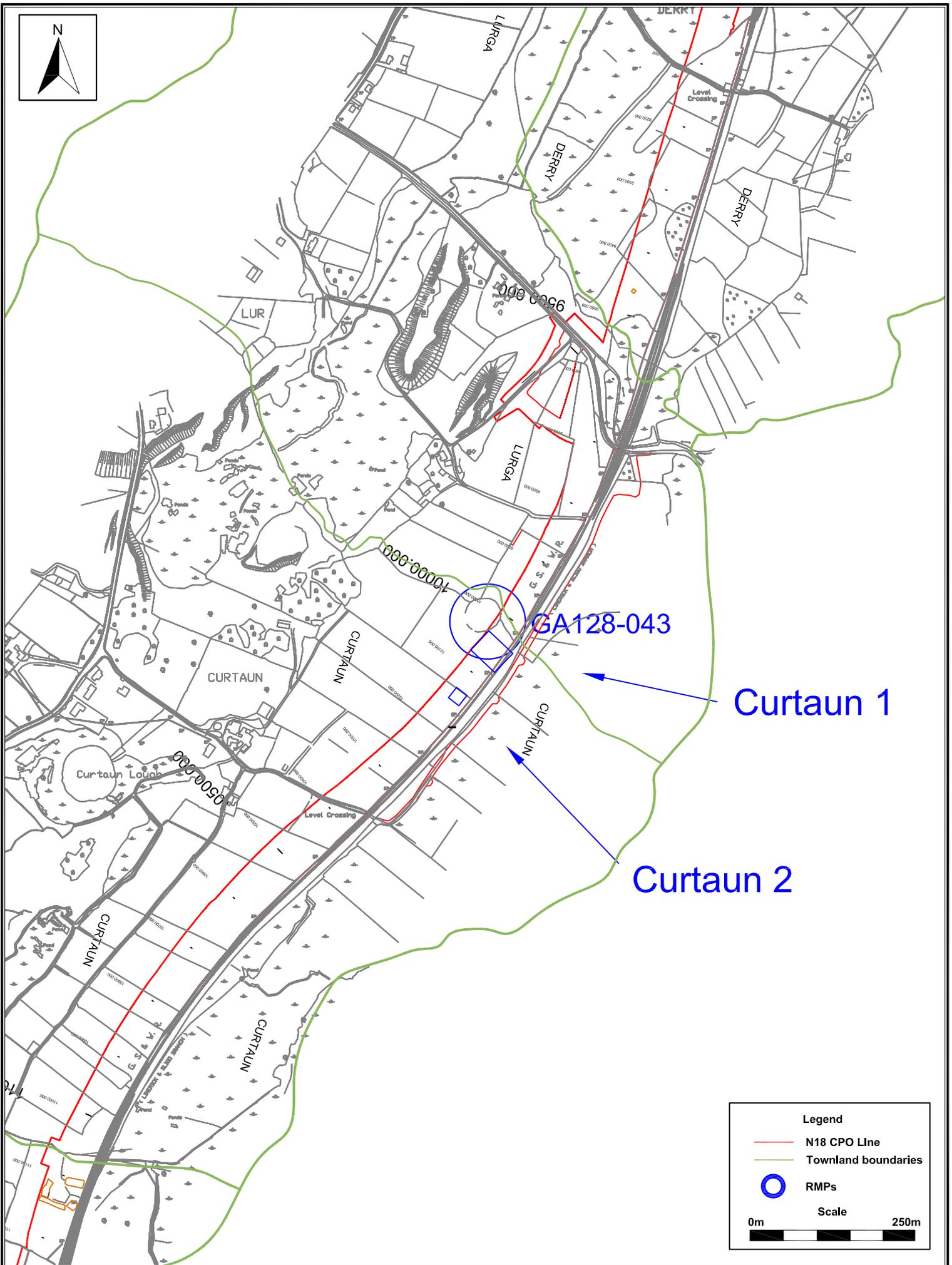
APPENDIX 3 LIST OF RMP SITES IN AREA

RMP No	Description
GA128-043	Ringfort

See Figure 2 for location.

APPENDIX 4 LIST OF N18 GORT TO CRUSHEEN SCHEME SITE NAMES

Site Name	Ministerial Direction No.	NMS Registration Number	Site Type
Drumminacloghaun 1	A044	E3720	Burnt mound
Ballyboy 1	A044	E3719	Ringditch
Ballyboy 2	A044	E3718	Ringditch
Curtaun	A044	E3721	Burnt mounds and early medieval cereal kilns
Rathwilladoon 2 & 3	A044	E3656	Prehistoric settlement
Rathwilladoon 4	A044	E3655	Burnt mound
Rathwilladoon 5	A044	E3657	Charcoal production kiln
Gortavoher 1	A044	E3904	Burnt mound
Monreagh 1 & 2	A044	E3712	Burnt mound
Monreagh 3	A044	E4037	Burnt mounds
Derrygarriff 1	A044	E3716	Burnt mound
Derrygarriff 2	A044	E3711	Metal production site
Derrygarriff 3	A044	E3710	Burnt mound
Sranagalloon 1	A044	E3713	Burnt mound
Sranagalloon 2/Site 146	A044	E3714	Enclosure
Sranagalloon 3	A044	E3897	Burnt mound
Gortaficka 1 & 2	A044	E3898	Burnt mounds
Clooneen 1	A044	E3722	Burnt mound
Caheraphuca 1	A044	E3654	Burnt mound
Caheraphuca 3 - 12	A044	E3653	Burnt mounds
Ballyline 1 & 2	A044	E3717	Burnt mounds
Ballyline 3	A044	E3715	Prehistoric pit

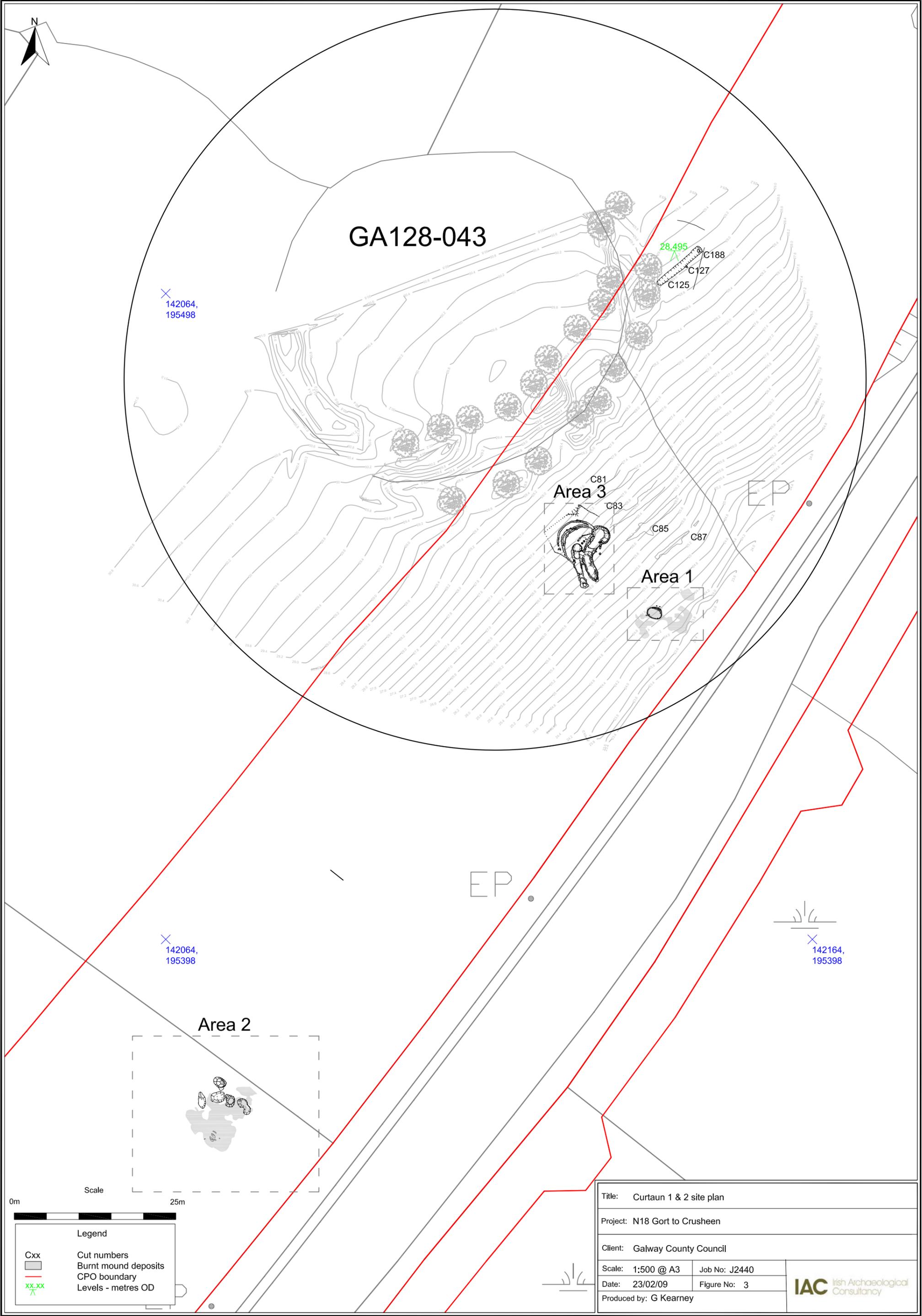


Legend

- N18 CPO Line
- Townland boundaries
- RMPs

Scale

0m 250m



GA128-043

142064,
195498

28.495
C188
C127
C125

Area 3

C81
C83

Area 1

C85
C87

EP

EP

142064,
195398

142164,
195398

Area 2

0m Scale 25m

Legend	
Cxx	Cut numbers
	Burnt mound deposits
	CPO boundary
xx.xx ^	Levels - metres OD

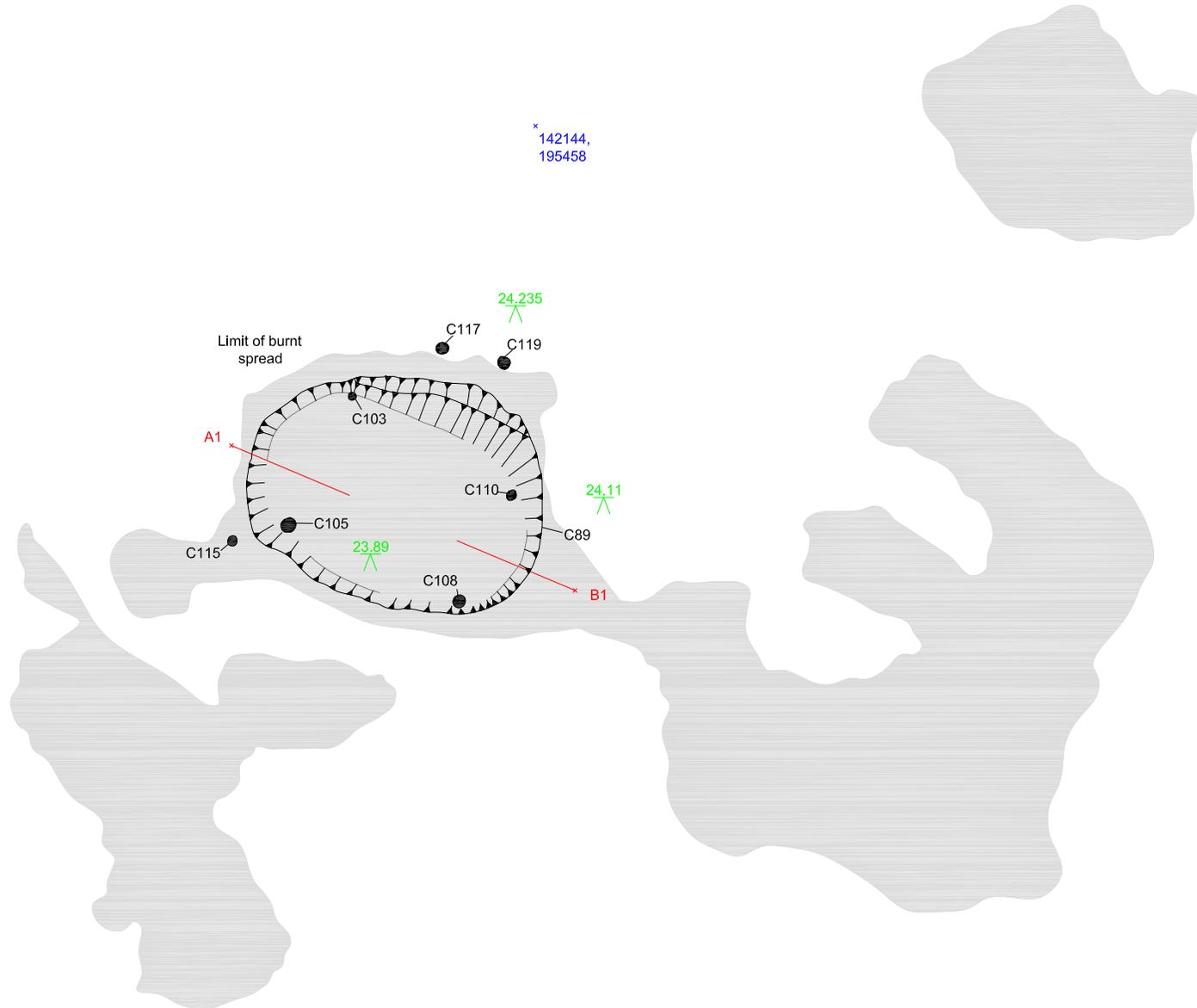
Title: Curtaun 1 & 2 site plan	
Project: N18 Gort to Crusheen	
Client: Galway County Council	
Scale: 1:500 @ A3	Job No: J2440
Date: 23/02/09	Figure No: 3
Produced by: G Kearney	





x 142139,
195458

x 142144,
195458



x 142139,
195453

0m Scale 2.5m

Legend	
---	Break of slope
- - -	Sections
Cxx	Cut numbers
■	Burnt mound deposits
●	Stakeholes
○	Stone
xx.xx ^	Levels - metres OD

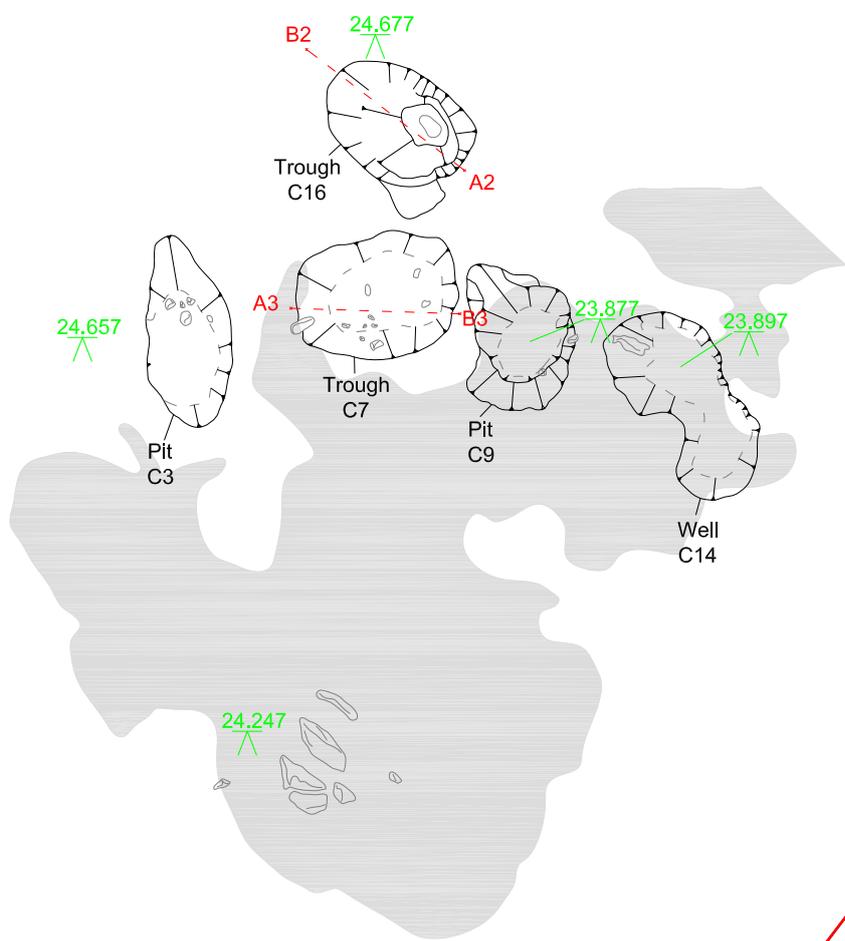


Title:	Curtaun 1 & 2 post-excavation plan Area 1 showing trough and stakeholes	Scale:	1:20 @ A4
Project:	N18 Gort to Crusheen	Date:	14/01/10
Client:	Galway County Council	Produced by:	G Kearney
		Job No:	J2440
		Figure No:	4

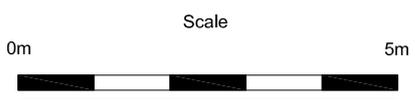


142127,
195447

142137,
195447



142127,
195437



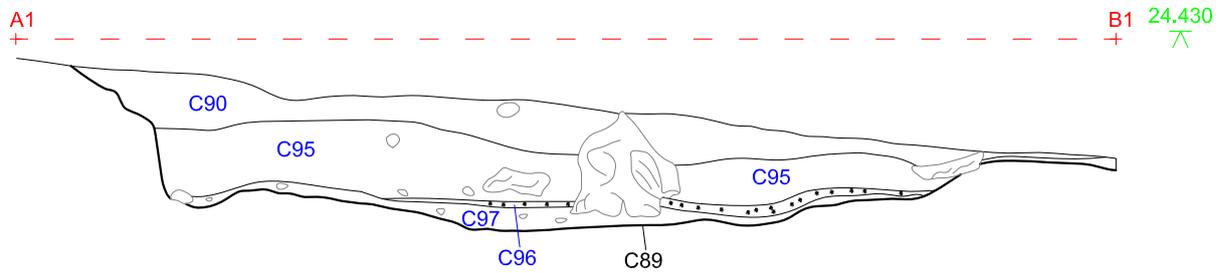
Legend	
---	Break of slope
---	Sections
Cxx	Cut numbers
■	Burnt mound deposits
○	Stone
—	CPO boundary
xx.xx ^	Levels - metres OD



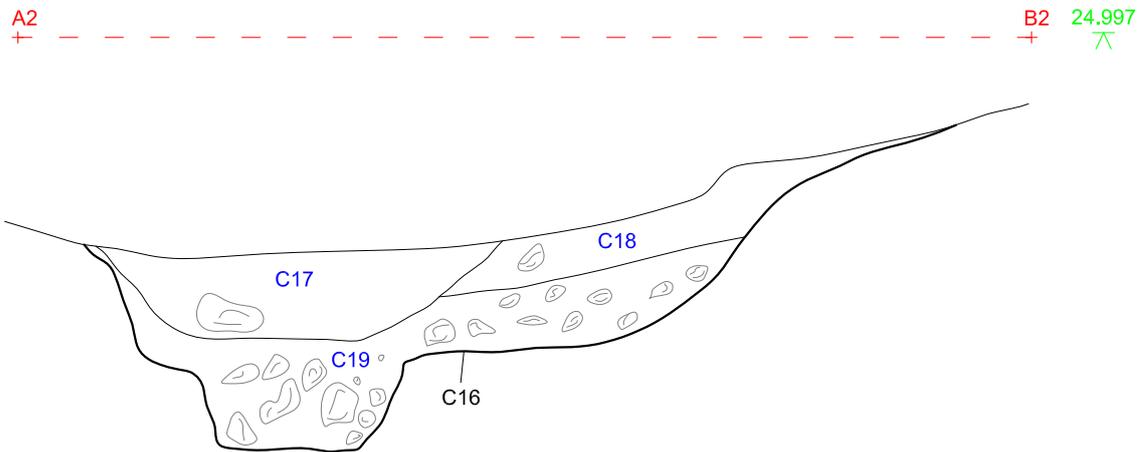
Title:	Curtaun 1 & 2 post-excavation plan Area 2 of troughs and well
Project:	N18 Gort to Crusheen
Client:	Galway County Council

Scale:	1:100 @ A4
Date:	14/01/10
Produced by:	G Kearney
Job No:	J2440
Figure No:	5

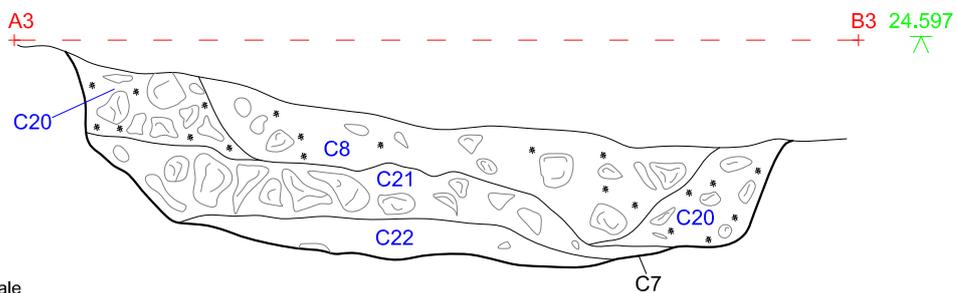
Southwest facing section of trough C89



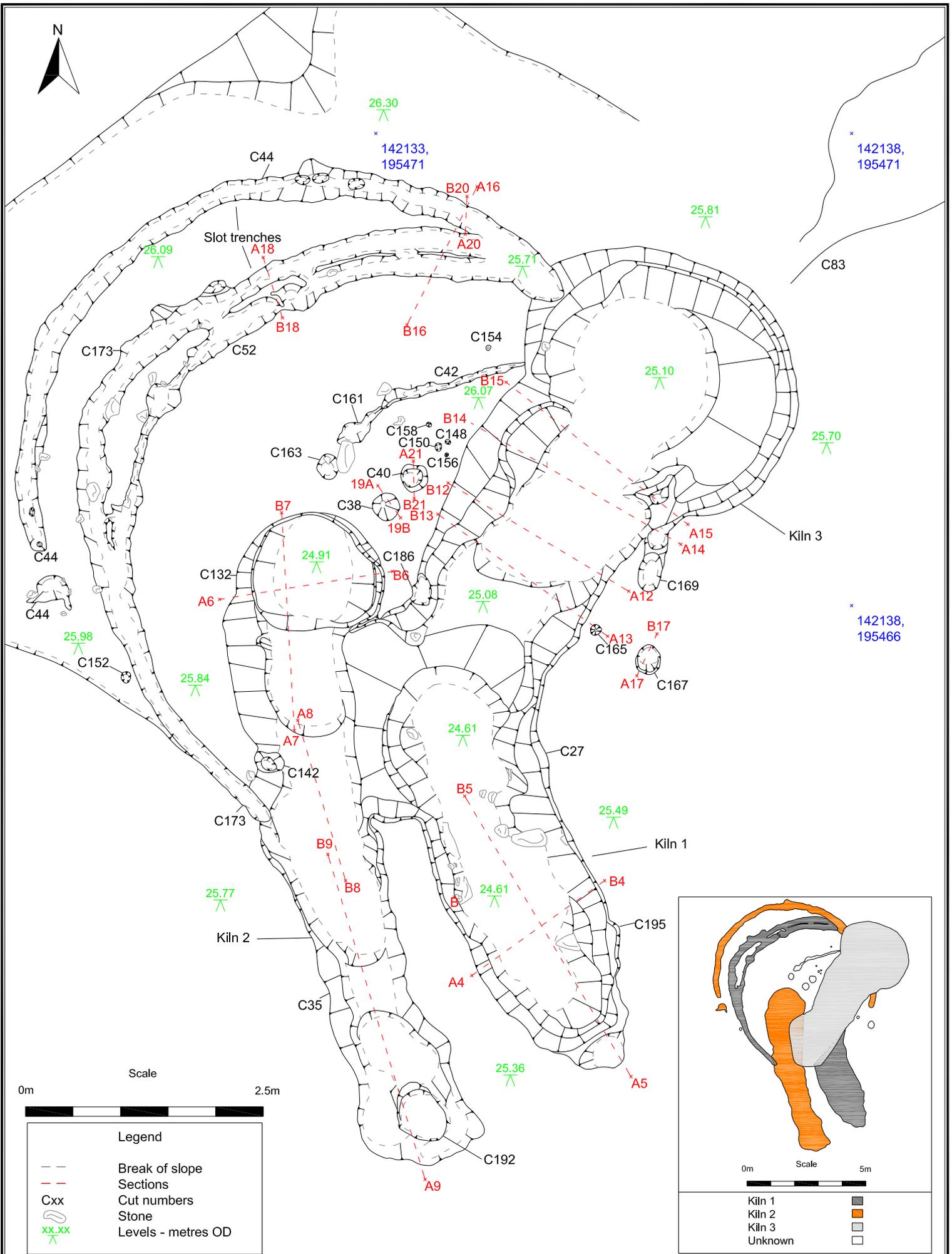
South facing section of trough C16



South facing section of trough C7

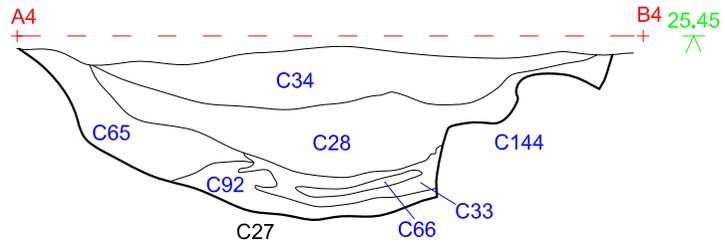


Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
#	Charcoal
xx.xx	Levels - metres OD

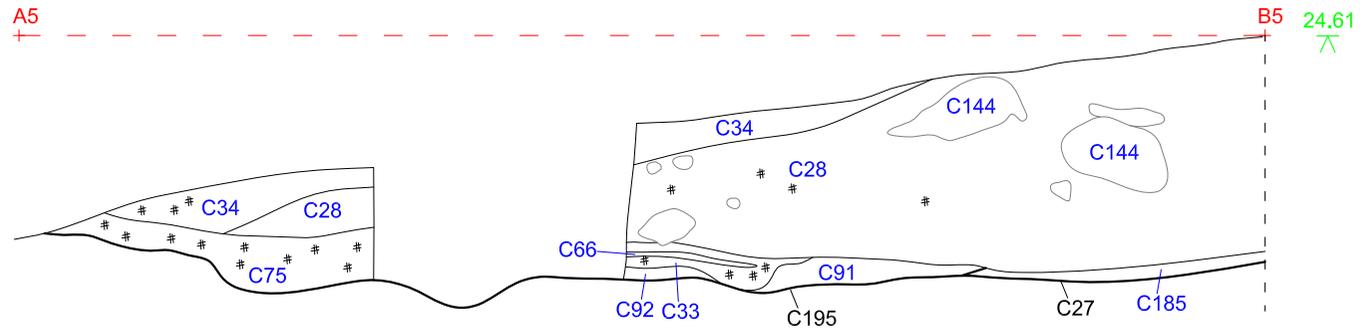


	Title:	Curtaun 1 & 2 post-excitation plan Area 3 showing slot trenches and kilns	Scale:	1:100 @ A4
	Project:	N18 Gort to Crusheen	Date:	23/02/09
	Client:	Galway County Council	Produced by:	G Kearney
			Job No.:	J2440
			Figure No.:	7

Southeast facing section of C27



Northeast facing section of kiln 1 C27 and C195



Scale

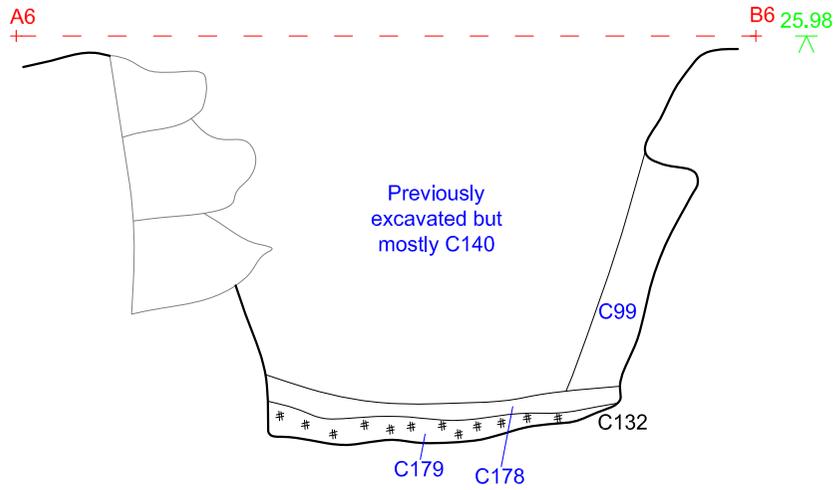


Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
	Charcoal
	Levels - metres OD

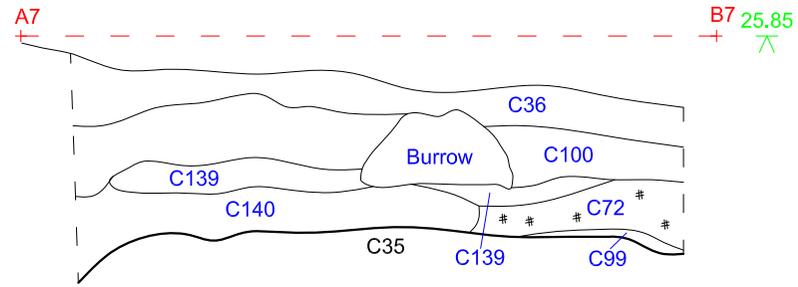
IAC Irish Archaeological Consultancy

Title:	Curtaun 1 & 2 sections of Kiln 1	Scale:	1:20 @ A4
Project:	N18 Gort to Crusheen	Date:	18/01/10
Client:	Galway County Council	Produced by:	G Kearney
		Job No:	J2440
		Figure No:	8

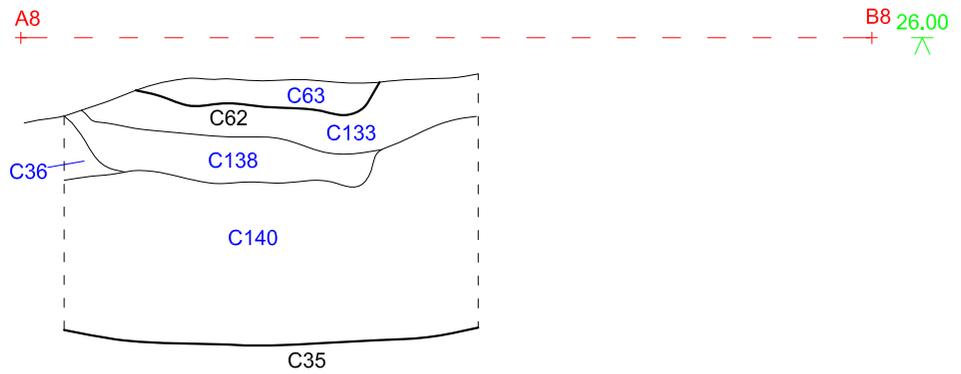
South facing section of C132



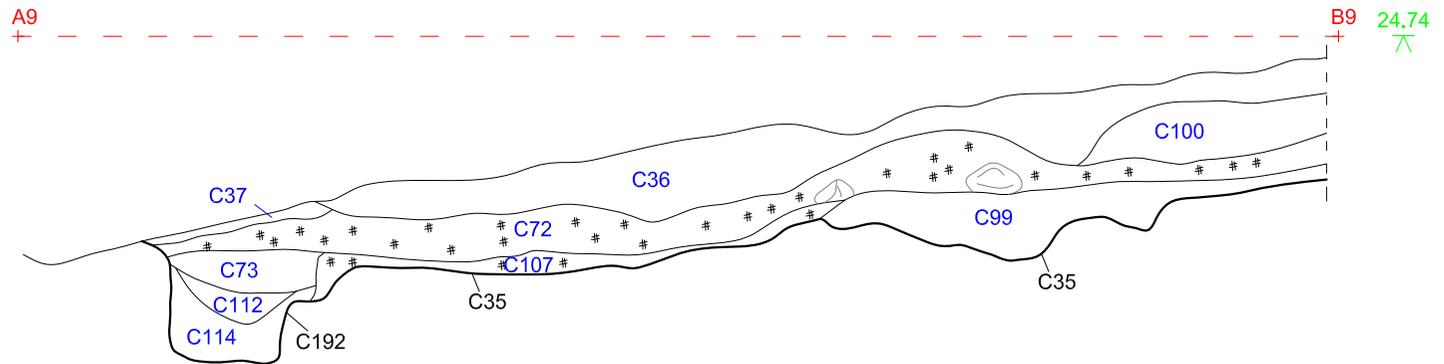
East facing section of C35



West facing section of C35 and C62



East facing section of kiln 2 C35, C192



Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
	Charcoal
xx.xx	Levels - metres OD



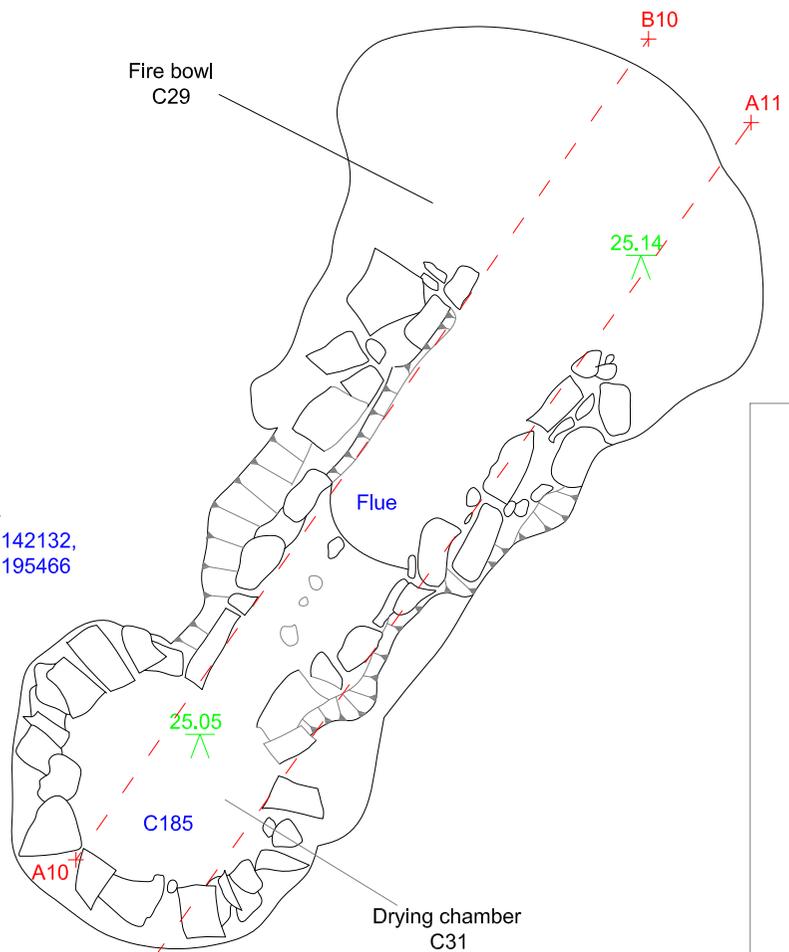
Title:	Curtaun 1 & 2 sections of Kiln 2	Scale:	1:20 @ A4
Project:	N18 Gort to Crusheen	Date:	18/01/10
Client:	Galway County Council	Produced by:	G Kearney
		Job No:	J2440
		Figure No:	9



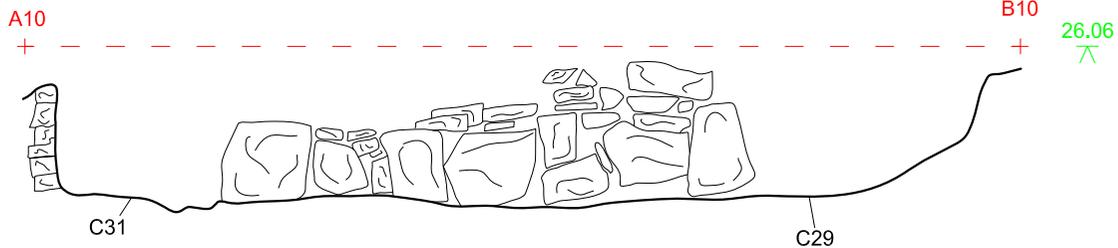
142132,
195471

142137,
195471

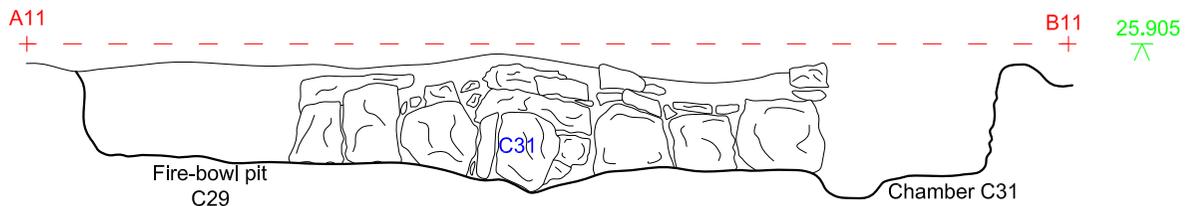
142132,
195466



Southeast facing section of kiln 3 C29, C31



Northwest facing section of C27



Scale

B11

2.5m

Legend

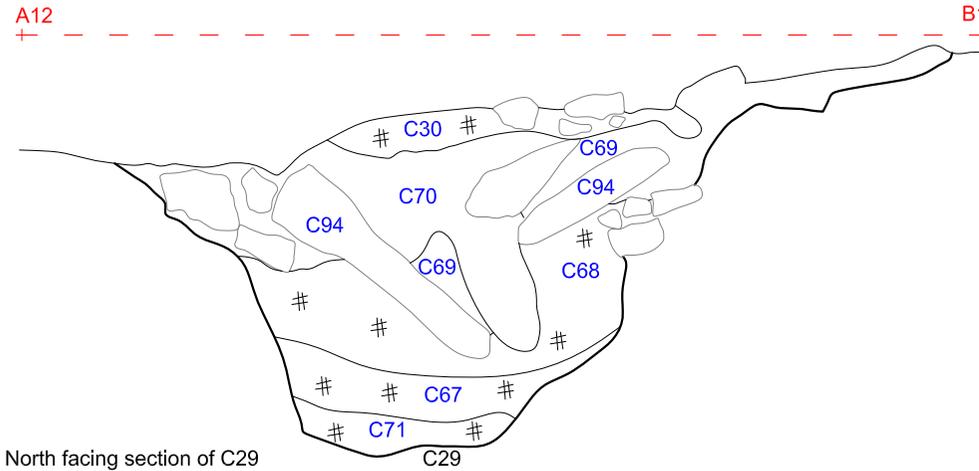
- Cxx Cut numbers
- Cxx Fill numbers
- Stone
- xx.xx Levels - metres OD

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Consultancy

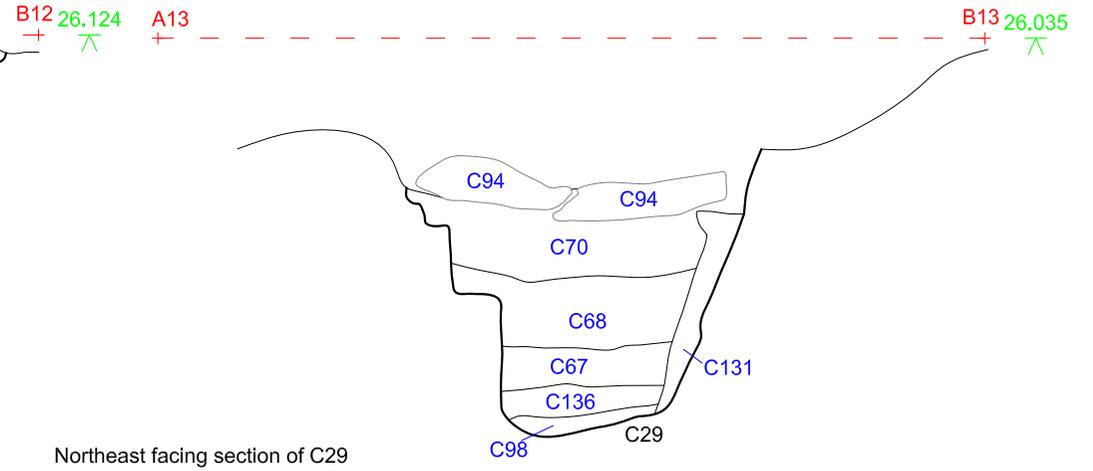
Title: Curtaun 1 & 2 mid excavation plan and elevations of Kiln 3
 Project: N18 Gort to Crusheen
 Client: Galway County Council

Scale: 1:50 @ A4
 Date: 14/01/10
 Produced by: G Kearney
 Job No: J2440
 Figure No: 10

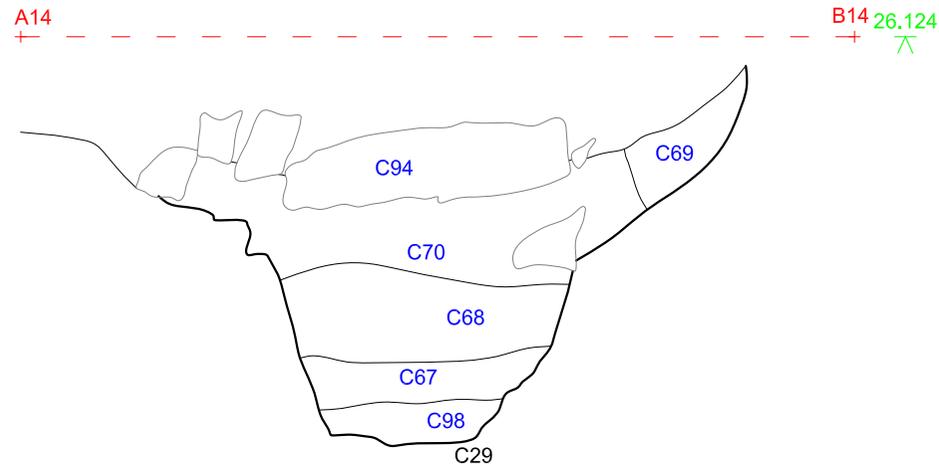
Northeast facing section of C29



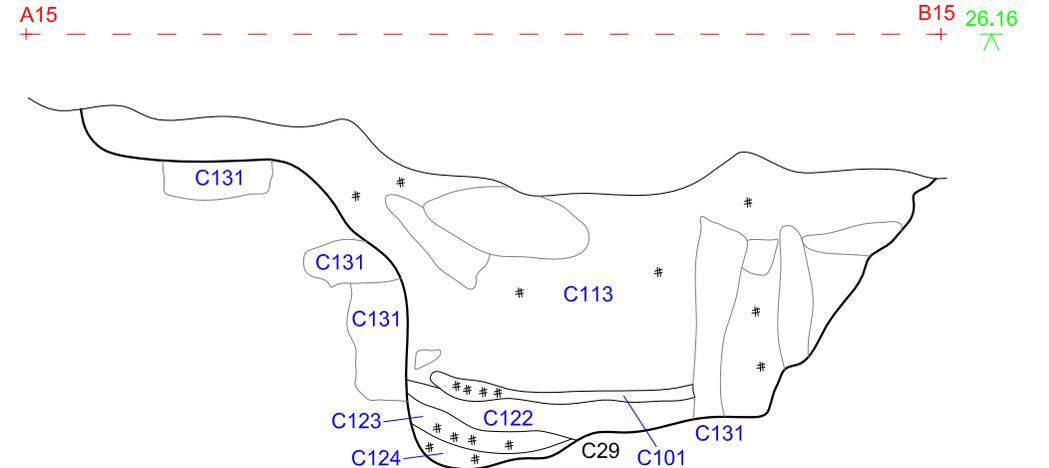
Northeast facing section of C29



North facing section of C29



Northeast facing section of C29

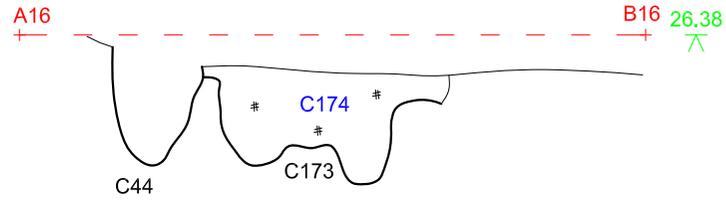


Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
#	Charcoal
xx.xx	Levels - metres OD

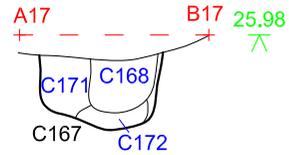


Title:	Curtaun 1 & 2 sections of Kiln 3	Scale:	1:20 @ A4
Project:	N18 Gort to Crusheen	Date:	18/01/10
Client:	Galway County Council	Produced by:	G Kearney
		Job No:	J2440
		Figure No:	11

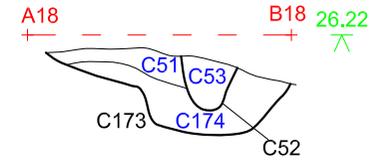
Northwest facing section of C44 and C173



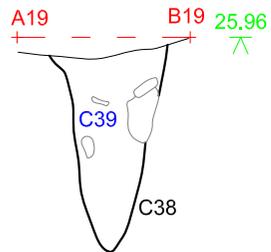
Southeast facing section of C167



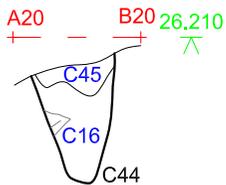
Southwest facing section of C173 and C52



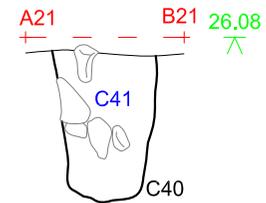
Southwest facing section of C38



East facing section of C44



West facing section of C44



Legend	
Cxx	Cut numbers
Cxx	Fill numbers
	Stone
#	Charcoal
xx.xx	Levels - metres OD

IAC Irish Archaeological Consultancy

Title:	Curtaun 1 & 2 sections of gully C173 and C44 and post holes C167, C38 and C40
Project:	N18 Gort to Crusheen
Client:	Galway County Council

Scale:	1:20 @ A4
Date:	18/01/10
Produced by:	G Kearney
Job No:	J2440
Figure No:	12