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## Archaeological Excavation Report E2432 - Kilshanny 3, Co. Cork

Burnt Mound







Archaeological Excavation Report  
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# Kilshanny 3

Co Cork

May 2011

Client: **Cork County Council**

Project: **N8 Fermoy Mitchelstown**

E No: **E2432**

Excavation Director: **James Lyttleton**

Written by: **James Lyttleton and Nick Garland**

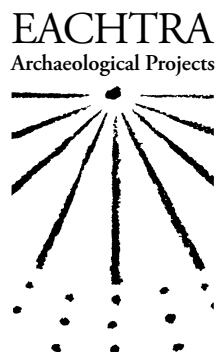




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## Summary

The excavation of the site at Kilshanny 3 comprised a burnt mound. The mound overlay a large rectangular trough, two pits and a post-hole. Two Late Bronze Age radiocarbon dates were returned from the fills of the trough and a pit. A small quantity of charred cereals and plant remains were recovered from the burnt mound.

## Project Details

Road project name	N8 Fermoy to Mitchelstown Bypass
Site name	Kilshanny 3
Ministerial Order no.	A040
E no.	E2432
Site director	James Lyttleton
Townland	Kilshanny
Parish	Brigown
Barony	Condons & Clangibbon
OS Map Sheet No.	CO020
National Grid Reference	183418 113013
Chainage	13160

## Acknowledgements

The senior archaeologist was John Tierney and the post-excavation managers were Penny Johnston and Jacinta Kiely. Administration of the project was by Choryna Kiely and Fiona Greene. Illustrations are by Ben Blakeman and Maurizio Toscano. Photographs are by John Sunderland, Hawkeye and Eachtra Archaeological Projects. Specialist analysis was carried out by Mary Dillon, Penny Johnston, and the 14 Chrono Centre at Queen's University Belfast. The project was funded by the Irish Government under the National Development Plan 2007-2013 and was commissioned by Cork County Council on behalf of the National Roads Authority. The project archaeologist was Ken Hanley.

## 1 Scope of the project

The archaeological works associated with the N8 Fermoy to Mitchelstown Bypass was carried out on behalf of Cork County Council, National Road Design Office, Richmond, Glanmire, Co. Cork. The project was funded by the Irish Government under the National Development Plan 2007-2013. The total archaeological cost was administered by the National Roads Authority through Cork County Council as part of the Authority's commitment to protecting our cultural heritage. The purpose of the archaeological services project was to conduct archaeological site investigations within the lands made available, to assess the nature and extent of any potential new sites uncovered and to preserve by record those sites of agreed archaeological significance, as approved by the Department of Environment, Heritage and Local Government in consultation with the National Museum of Ireland.

Phase 1 of the project (archaeological testing of the route) was carried out in October 2005 under licence 05E1150 issued by Department of the Environment Heritage and Local Government (DoEHLG). The principal aim of this phase of the project was to test for any previously unknown sites by a programme of centreline and offset testing and to test sites of archaeological potential identified in the EIS and geophysical surveying. Five Cultural Heritage Sites were tested under individual excavation licences 05E1122-05E1126.

Phase 2 of the project (resolution) involved the resolution of all archaeological sites identified within the proposed road corridor prior to commencement of the construction of the bypass. This phase of the project was carried out from September 2006 to September 2007 and excavations were conducted under the management of a Senior Archaeologist. A total of 28 sites were excavated during this phase of works under separate licences issued by DoEHLG.

A post-excavation assessment and strategy document was prepared in Phase 3 of the project to present a management strategy for dealing with post-excavation work arising from archaeological works along the route of the new N8 Fermoy to Mitchelstown Bypass. It included a proposal for post-excavation and archiving work and a budget for the works. The document detailed the location of the route, the receiving environment, the archaeological and historical background, the scope of the project and the circumstances and scope of fieldwork. The document presented a scheme-wide summary of the archaeological findings, a research framework within which the findings were dealt with and a publication plan and dissemination strategy for the end results.

## 2 Route location

The route of the N8 Fermoy to Mitchelstown road is located in the rich pastureland of North Cork (Figure 1). The project involves the construction of c. 16 km of the N8 from Gortore north of Fermoy to Carrigane north-east of Mitchelstown. The N8 Fermoy to Mitchelstown road passes through the townlands of Gortore, Ballynacarriga, Glenwood, Ballinglanna North, Ballinrush, Caherdrinny, Gortnahown, Ballybeg, Turbeagh, Glana-



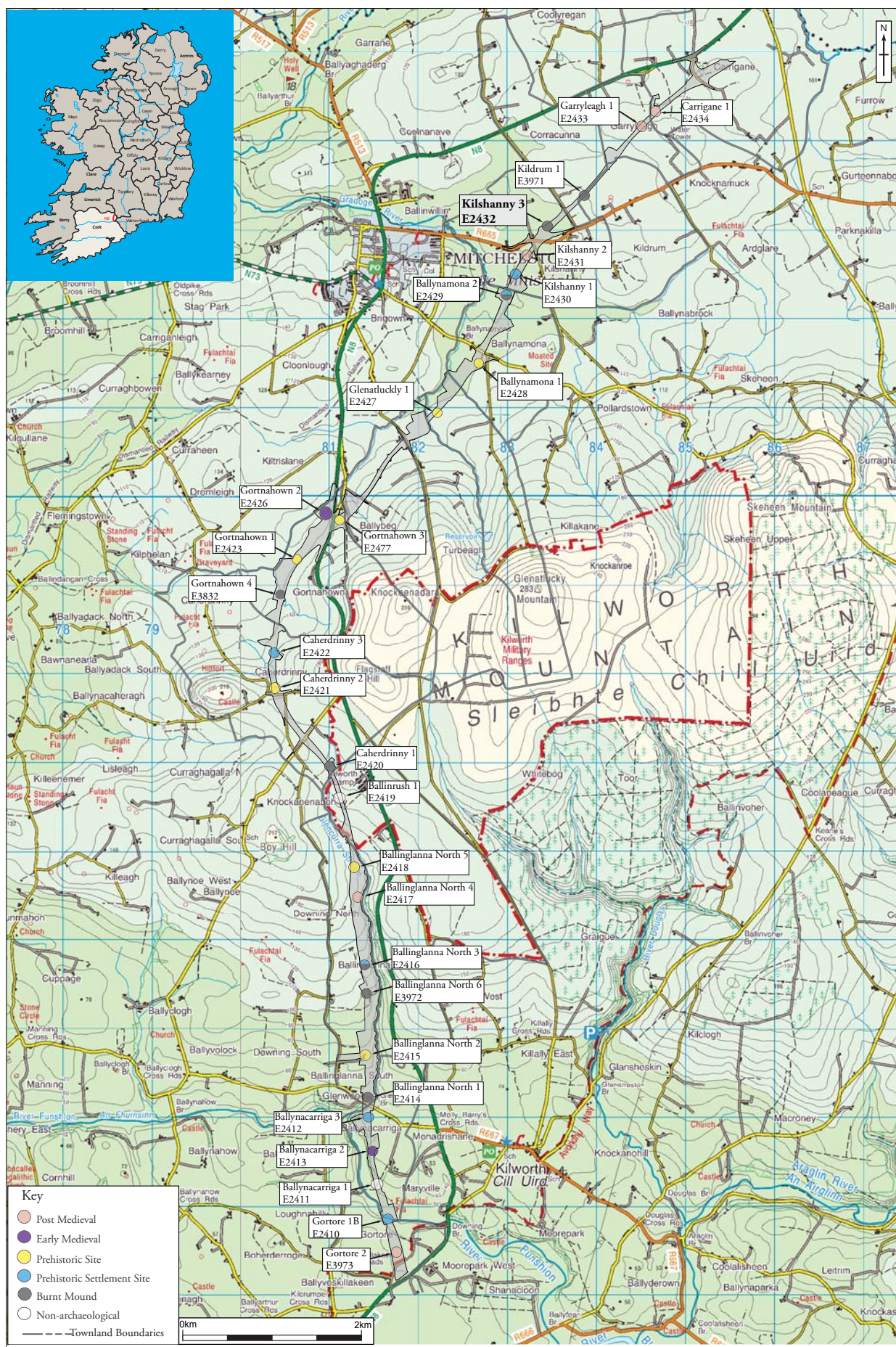


Figure 1: The route of the N8 Fermoy to Mitchelstown Bypass overlain on the Ordnance Survey Discovery Series map.



tlucky, Ballynamona, Kilshanny, Corracunna, Kildrum, Garryleagh, and Carrigane. The townlands are located in the parishes of Kilcrumper, Glanworth and Brigown and Barony of Condons & Clangibbon, with the exception of Gortore, and Glenwood, which are located in the Barony of Fermoy.

The route begins at the northern end of the Fermoy Bypass at Gortore, c. 2km north of Fermoy, and continues northwards across the River Funshion, and to the west of the Glencorra Stream, a tributary of the Funshion, for 4 km. At Caherdrinny, it crosses over the western extremities of the Kilworth Mountains. From there it descends north-eastwards onto the broad plain that extends east and north-eastwards from Mitchelstown. It crosses the existing N8 at Gortnahown and passes to the east of Mitchelstown, crossing the R665 Mitchelstown-Ballyporeen road and links up with the N8 Cashel Mitchelstown Road at Carrigane south of Kilbeheny and 2 km west of where the borders of the Cork, Limerick and Tipperary counties meet.

### 3 Receiving environment

The topography of East Cork and Waterford consists of east/west valleys separated by intervening ridges. The ridges consist of sandstones and mudstones of the Devonian Period (Old Red Sandstone) laid down 355-410 million years ago and the valleys of Carboniferous limestones laid down 290-355 million years ago. The sediments covering many of the rocks are mainly of glacial origin deposited by glacial ice or meltwater (Sleeman and McConnell 1995, 1).

The landscape of the area is dominated by the Galtee Mountains to the north, the Ballyhoura Mountains to the north-west, the Kilworth Mountains to the east and the Nagles to the south. The landscape is drained by the Blackwater River, the Funshion River (which flows into the Blackwater River c. 2 km north-east of Fermoy), and the Glencorra Stream, a tributary of the Funshion River. The largest population centres in the area, Fermoy and Mitchelstown, have developed on the banks of the River Blackwater and Gradoge (a tributary of the Funshion), respectively.

The route begins at Gortore, c. 2 km north of Fermoy, at an elevation of c. 40 m OD. At Caherdrinny, it rises to its maximum elevation of c. 180 m OD as it crosses over the western extremities of the Kilworth Mountains, before descending onto the broad plain that that extends east and north-eastwards from Mitchelstown, at an elevation of 100-120 m OD.

The soils on the southern portion of the route are characterised by acid brown earths derived from mixed sandstone and limestone glacial till. These soils occur generally in the valleys of Cork and Waterford (Gardiner and Radford 1980, 61), and have a wide use range, being suitable for tillage and grass production. The soils on the western limits of Kilworth Mountains are characterised by brown podzolics derived from sandstone. The soils on the northern portion of the route are characterised by brown podzolics derived from sandstone and shale glacial till. They have a wide range of potential uses and are well

suited to arable and pastoral farming (ibid., 67). Land use along the route was almost entirely grassland devoted to intensive dairying and cattle-rearing, with only an occasional tillage field.

## 4 Archaeological and historical background

Archaeological sites of numerous periods were discovered along the route of the new road (Figure 2). The periods are referred to as follows: Mesolithic (c. 8000 to 4000 BC), Neolithic (c. 4000 to 2000 BC), Chalcolithic (Beaker) (c. 2500-2000 BC), Bronze Age (c. 2000 to 500 BC), and Iron Age (c. 500 BC to AD 500), early medieval period (c. AD 500 to 1100), medieval period (c. AD 1100 to 1650), post-medieval period (c. AD 1650 to the present).

A number of Giant Irish Deer (*Megaloceros giganteus*) skulls, large antlers, antler fragments and various long-bones were retrieved from the clay sediments, c. 1.5 m below the peat stratum at Ballyoran Bog (04E1014) on the route of the N8 Rathcormac Fermoy. A radiocarbon date of cal BC 11201-10962 was returned for the Giant Irish Deer. Giant Irish Deer are extinct but are known to have inhabited Ireland during two separate periods in the Pleistocene (from 37,000-32,000 BP and 11,750-10,950 BP), with examples from lake deposits beneath peat bogs frequently dating to the period between 11,750 BP and 10,950 BP (Woodman et al. 1997). The Ballyoran Bog examples were found in this typical location of lacustrine (lake) sediments beneath peat and they therefore pre-date the beginnings of bog formation and the first human settlement of the area.

### Mesolithic (c. 8000 to 4000 BC)

The earliest known human settlement in Ireland dates from the Mesolithic period (c. 8000 BC - 4000 BC). In Munster, the majority of the evidence (flint scatters) for Mesolithic occupation has 'come from the Blackwater valley in Co. Cork' (Woodman 1989, 116). Flint scatters were recorded in the townlands of Kilcummer Lower (CO034-060) on the northern bank of the Blackwater c. 13 km to the south-west of the route and in Ballynamona (CO018-099) and Wallstown (CO018-100) on the northern and southern sides of the Awbeg river respectively c. 20 km to the west of the route (Power et al. 2000, 2). Mesolithic sites and find spots were recorded on other road schemes in Co. Cork, these included; Rath-healy 3 03E1678 and Curraghprevin 3 03E1138 (N8 Rathcormac Fermoy Bypass), Ballynacarriaga 1 01E0567 (N25 Youghal Bypass), Ballinaspig More 5 01E0546 (N22 Ballincollig Bypass) and Carrigrohane 3 02E0431 (N22 BG).

Mesolithic activity was recorded on the route of the N8 Fermoy-Mitchelstown at Gortore E2410 and at Caherdrinny 3 E2422 and Mesolithic stone tools were recovered from Ballinglanna North 1 E2414, Ballinglanna North 3 E2416 and Ballinglanna North 6 E3972.

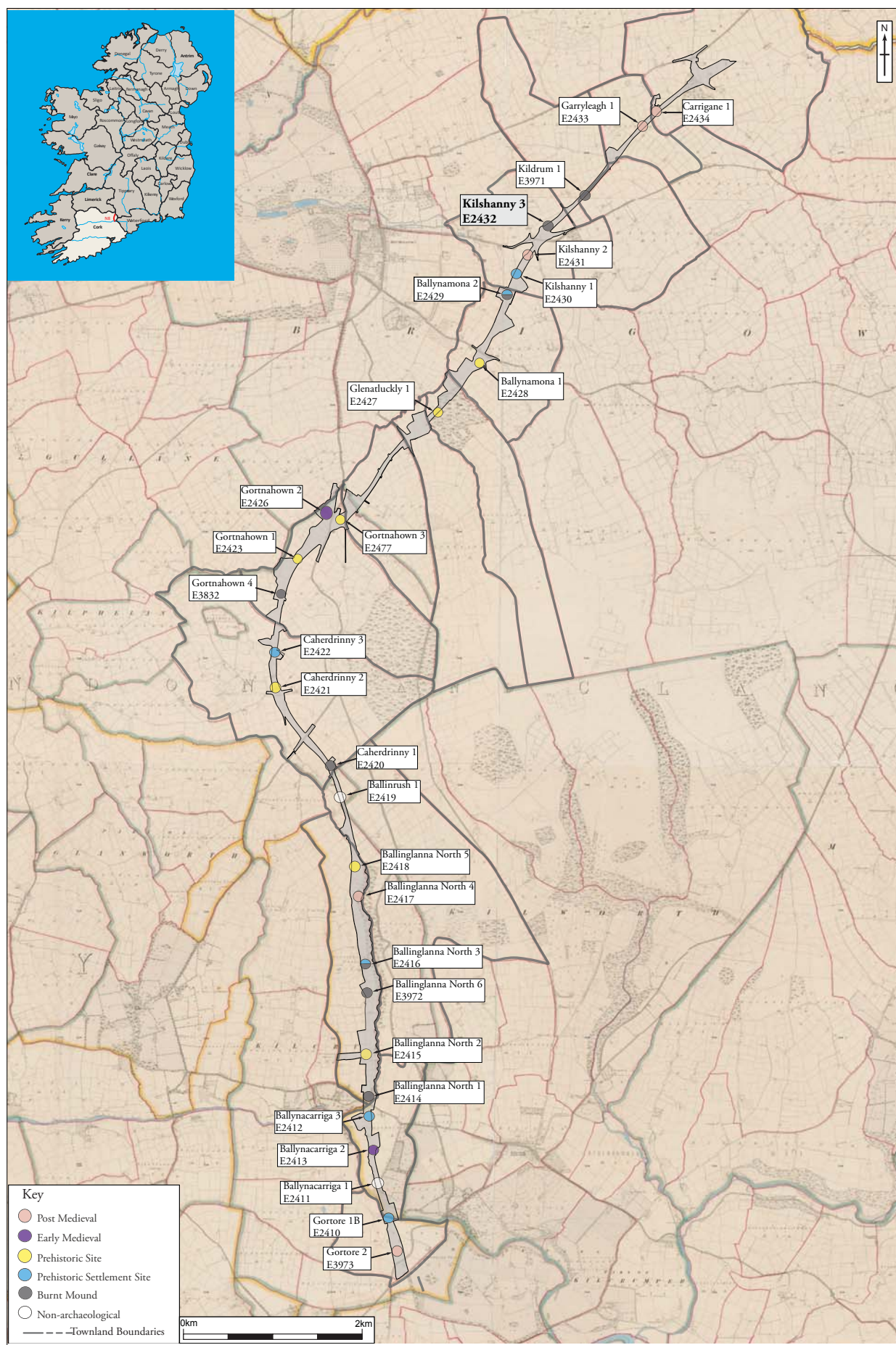


Figure 2: The route of the N8 Fermoy to Mitchelstown Bypass overlain on the first edition Ordnance Survey map CO010, 011, 019, 020, 027 and 028.



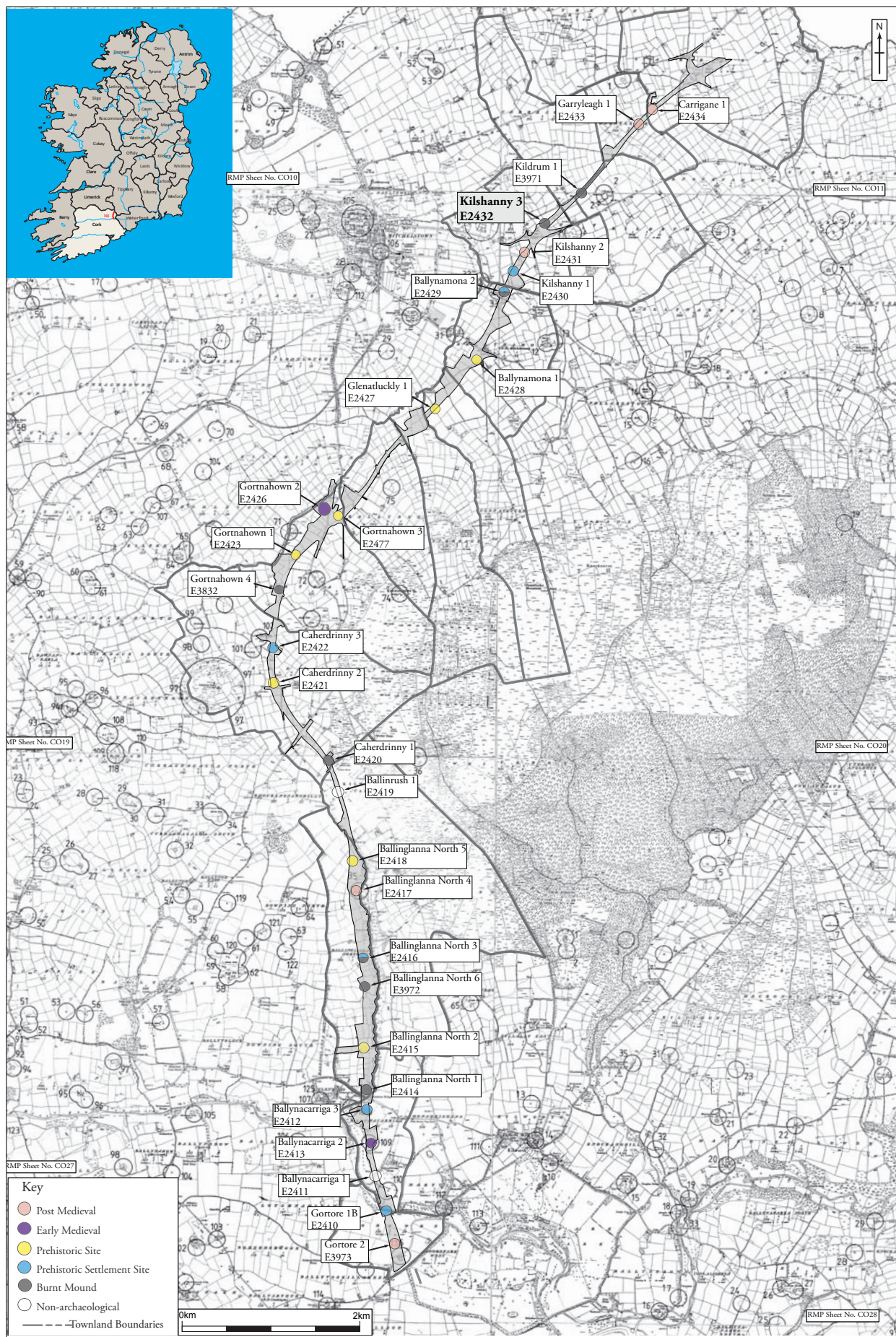


Figure 3: The route of the N8 Fermoy to Mitchelstown Bypass overlain on the RMP map CO010, CO11, CO19, CO20, CO27 and CO28. The map is based on the second edition Ordnance Survey maps.



## Neolithic (c. 4000 to 2000 BC)

The Neolithic Period is characterised by the introduction of agriculture and the beginnings of the clearance of the woodlands. The population increased and became more sedentary in nature. A substantial Neolithic settlement site has been recorded at Lough Gur, Co. Limerick. Previously the nearest known Neolithic house was located in Pepperhill (CO016-226/01) c. 30 km to the northwest of the route. It was recorded during the construction of the Bruff-Mallow gas pipeline (Gowen 1988, 44-51).

The material culture includes the manufacture of pottery, flint and stone arrowheads, scrapers, axes etc. The range of monuments types includes Megalithic tombs, single burial graves and stone circles. Megalithic tombs can be sub-divided into court tombs, portal tombs, passage tombs and wedge tombs. There are few wedge tombs or stone circles known from north or east Cork. Two of the exceptions are wedge tombs located at Lab-bacallee (CO027-086), which is one of the largest wedge tombs in the country, and at Manning (CO027-091) both located c. 4 km west of the N8.

Recent infrastructural work on the N8 Rathcormac to Fermoy and the Ballincollig Bypass have added significantly to the number of Neolithic sites in the county. A Neolithic house was excavated at Gortore (E2119), on the N8 Rathcormac to Fermoy road and another Neolithic house was excavated at Barnagore (02E0384), along the route of the Ballincollig Bypass. Both of these Cork examples produced essentially the same radiocarbon results (cal BC 3940-3620 at Barnagore and cal BC 3928-3655 from Gortore) and they represent the oldest known houses in the county. A single pit at Fermoy townland (05E0078), located c. 3 km to the south of Gortore, produced 12 sherds of a Middle Neolithic Globular bowl, and another site at Curraghprevin (c.12 km south of Gortore) produced Western Neolithic (Early Neolithic) pottery and a radiocarbon date of 3090-2580 BC (Late Neolithic).

Rectangular Neolithic houses were recorded on the route of the N8 FM at Gortore 1b (E2410), Ballinglanna North 3 (E2416) and Caherdrinny 3 (E2422). A large enclosure containing several structures associated with Late Neolithic pottery was excavated at Ballynacarraiga 3 (E2412). Activity dating to the Neolithic was also recorded at Ballynamona 1 (E2428), Ballynamona 2 (E2429), and Gortnahown 2 (E2426) and Gortore 2 (E3973).

## Bronze Age (c. 2000 to 500 BC)

The Bronze Age is characterised by the introduction of metallurgy and an increase in settlement and burial sites. Copper ores were mined and copper, bronze and gold items manufactured. The range of burial site types includes cist graves, pit and urn burials, cremation cemeteries, barrows, ring-ditches and wedge tombs. Stone circles and standing stones also date to the Bronze Age. Both enclosed and unenclosed settlement sites are known. The most prolific Bronze Age site type is the *fulacht fiadh*; over 2,000 examples have been recorded in County Cork alone. These monuments survive as low mounds of charcoal rich black silt, packed with heat-shattered stones, and generally situated close to a water source. *Fulachta fiadh* are generally classified as 'cooking places', whereby stones

were heated in a hearth and subsequently placed in a trough of water, the water continued to boil with the addition of hot stones and wrapped food was cooked within the hot water. The trough eventually filled with small stones, ash and charcoal that were removed, forming the basis of the familiar mound.

The Bronze Age cemetery site at Mitchelstowndown West, c. 16 km to the north of Mitchelstown, contains 53 small barrows. The Discovery Programme Report 1 (Daly and Grogan 1992, 44) selected four of this group for excavation.

Until recently, Bronze Age settlement sites were a rarity in North Cork. A Bronze Age occupation site was recorded underlying the medieval ringfort Lisleagh I (CO027-158) c. 2.5 km to the west of the N8 (Power et al. 2000, 210). A house site was excavated at Killydonoghoe on the route of the N8 Glanmire-Watergrasshill Bypass (Sherlock 2003). Three circular houses dating to the Middle Bronze Age were excavated at Mitchelstown (04E1072) on the N8 Mitchelstown Relief Road. A large Bronze Age settlement site consisting of three circular enclosures and three circular houses was excavated in 2003 at Ballybrowney (03E1058), on the route of the N8 Rathcormac-Fermoy (Cotter 2005, 40).

Bronze Age round houses were recorded on the route of the N8 Fermoy – Mitchelstown at Kilshanny 1 (E2432) and Ballynamona 2 (E2429). Burnt mounds/*fulachta fiadh* sites were recorded at Ballinglanna North 1 (E2414), Ballinglanna North 3 (E2416), Ballinglanna North 6 (E3972), Ballynamona 2 (E2429), Caherdrinny 1 (E2420), Kilshanny 3 (E2432) and Kildrum 1 (E3971). Two ring ditches and associated cists and pits burials were recorded at Ballynacarriga 3 (E2412). Portions of several encrusted urns and food vessels dating to the Early Bronze Age were recorded in association with the burials. A cremation burial and associated Early Bronze Age urn were also recorded at Glenatlucky (E2427).

## Iron Age (c. 500 BC to AD 500)

Until the last decade there was little evidence of a significant Iron Age presence in the Cork region. Settlement sites are few and far between as well as being difficult to identify (Woodman, 2000) while the material culture of this period is limited. Linear earthworks, believed to have marked tribal boundaries, and hillforts are two of the most visible monuments of the period. Recent infrastructural work on the N22 Ballincollig Bypass, the N8 Glanmire Watergrasshill Bypass and the M8 Rathcormac Fermoy has altered the picture considerably.

Three separate stretches of a linear boundary, the Claidh Dubh, have been recorded in County Cork. The longest stretch, c. 24 km in length extends from the Nagle Mountains, across the Blackwater valley and into the Ballyhoura Hills. Radiocarbon dating following excavation of a section of it revealed it dated to some time before AD100 (Doody 1995, 23).

Two of the four hillfort sites in Cork are located in North Cork (Power et al. 2000, 205). Caherdrinny (CO019:97/01&03) is located at the western end of the Kilworth Mountains, c. 700 m to the west of the N8, Corrin (CO035:49/01) is located at the east-

ern end of the Nagle Mountains, overlooking a pass between the Blackwater and Bride river valleys just south of Fermoy.

Iron Age dates were returned from a roundhouse at Ballinaspig More 5 01E0546, a possible bowl furnace at Curraheen 1 01E1209 and the fulacht fiadh at Curraheen 4 02E1297 on the N22 Ballincollig Bypass; the Iron Age structure at Muckridge 1 01E0429 on the N25 Youghal Bypass; iron working sites at Kilrussane 01E0701 and Trabstown 01E0501 on the N8 Glanmire Watergrasshill Bypass; the iron working site at Lisnagar Demesne 1 03E1510, the pit at Maulane East 1 03E1286, the pit at Scartbarry 3 03E1800, the corn-drying kiln at Rath-healy 1 03E1139, the burnt mound at Fermoy Wood 04E1014 and the ring ditch at Ballybrowney Lower 3 05E0233 all on the M8 Rathcormac Fermoy.

Activity dating to the Iron Age was recorded on the route of the N8 Fermoy – Mitchelstown at Ballinglanna North 3 E2416, Ballinglanna North 4 E2417, Ballynacariaga 3 E2412, Gortnahown 1 E2423, Gortnahown 3 E2477 and Caherdrinny 3 E2422. The sites, with the exception of a single fire pit at Ballinglanna North 4 E2417, did not date exclusively to the Iron Age.

## 5 Site Location and Topography

Kilshanny 3 was located on low poorly drained ground, 80 -100 m OD, c. 1.5 km east of Mitchelstown. A fulacht fiadh, dating to the Early Bronze Age was excavated at Kildrum E3971, 500 m to the north of the site, and a fulacht fiadh and settlement site, dating to the Middle Bronze Age was excavation at Ballynamona 2 E2429, 700 m to the south.

## 6 Excavation methodology

The excavation was carried out under E-Number E2432 and complied with the method statement approved by the Department of Environment, Heritage, and Local Government, in consultation with the National Museum of Ireland. The site was mechanically stripped of topsoil under strict archaeological supervision. Stripping was done with a tracked machine with a flat toothless bucket. Where appropriate mini-diggers were used, and in the larger areas to be stripped multiple large tracked machines were used; all stripping operations involved the use of multiple dumpers for topsoil mounding. Topsoil stripping commenced in the areas of identified archaeology and continued radially outward until the limit of the road take was reached or until the limit of the archaeological remains was fully defined. A grid was set up in the excavation area(s) and all archaeological features were sufficiently cleaned, recorded and excavated so as to enable an accurate and meaningful record of the site to be preserved. The excavation, environmental sampling, site photographs, site drawings, find care and retrieval, on-site recording and site archive was as per the Procedures for Archaeological works as attached to the licence method statements for excavation licences.

The site was excavated over a 6 week period from 7 November 2006 to 15 December 2006 by a crew of six people. Only areas within the CPO were resolved. The full extent of the area of excavation measured 1088 m<sup>2</sup>. The full record of excavated contexts is recorded in the context register (Appendix 1) and the stratigraphic matrix (Appendix 2). Detailed stratigraphic descriptions are found in the groups and sub-groups text (Appendix 3).

## 7 Excavation results

The full record of excavated contexts is recorded in the context register (Appendix 1) and the stratigraphic matrix (Appendix 2). Detailed stratigraphic descriptions are found in the groups and sub-groups text (Appendix 3).

This site comprised a mound of burnt mound material which overlay a trough, two pits and a post-hole (Figure 4, plate 1). The mound was disturbed by modern agricultural activities.

### The burnt mound layers

The burnt mound (C.5) consisted of a large area of dark black stony silt measuring 19.9 m in length, 19.4 m in width and 0.3 m in depth (Plate 2). Modern pottery and fragments of iron nails were recovered from the main layer demonstrating the level of disturbance on this fulacht fiadh. Four additional layers (C.41, C.42, C.43 and C.45) underlay the main layer of the mound. Three of these were associated with the earliest use of the mound. Layer C.41 was re-deposited natural. It may have been deposited as a result of the construction of the pit C.14.

Two smaller isolated patches of burnt mound material were recorded (C.38 and C.50) outside the main extent of the mound. The spread found to the north of the mound (C.38) measured 0.3 m and 0.2 m in depth and the spread found to the south of the mound (C.50) measured 1.6 m in length and 0.2 m in depth. These spreads were probably a continuation of the main mound, disrupted by modern activities.

### The Trough

The trough (C.24) was recorded underneath the burnt mound material (C.5) at the centre of the fulacht fiadh. It measured 2.54 m in length, 1.6 m in width and 0.56 m in depth (Figure 5, Plate 3). It was rectangular in shape with a step into the trough at the south west end (Plate 4). The total capacity was 2.28 m<sup>3</sup>. It was filled by four deposits, all of which were similar in colour and composition to the burnt mound material (C.5). These deposits originated from the trough itself as waste material and have been either re-deposited within the trough after it was abandoned, or were the result of silting in the trough while it was in use.

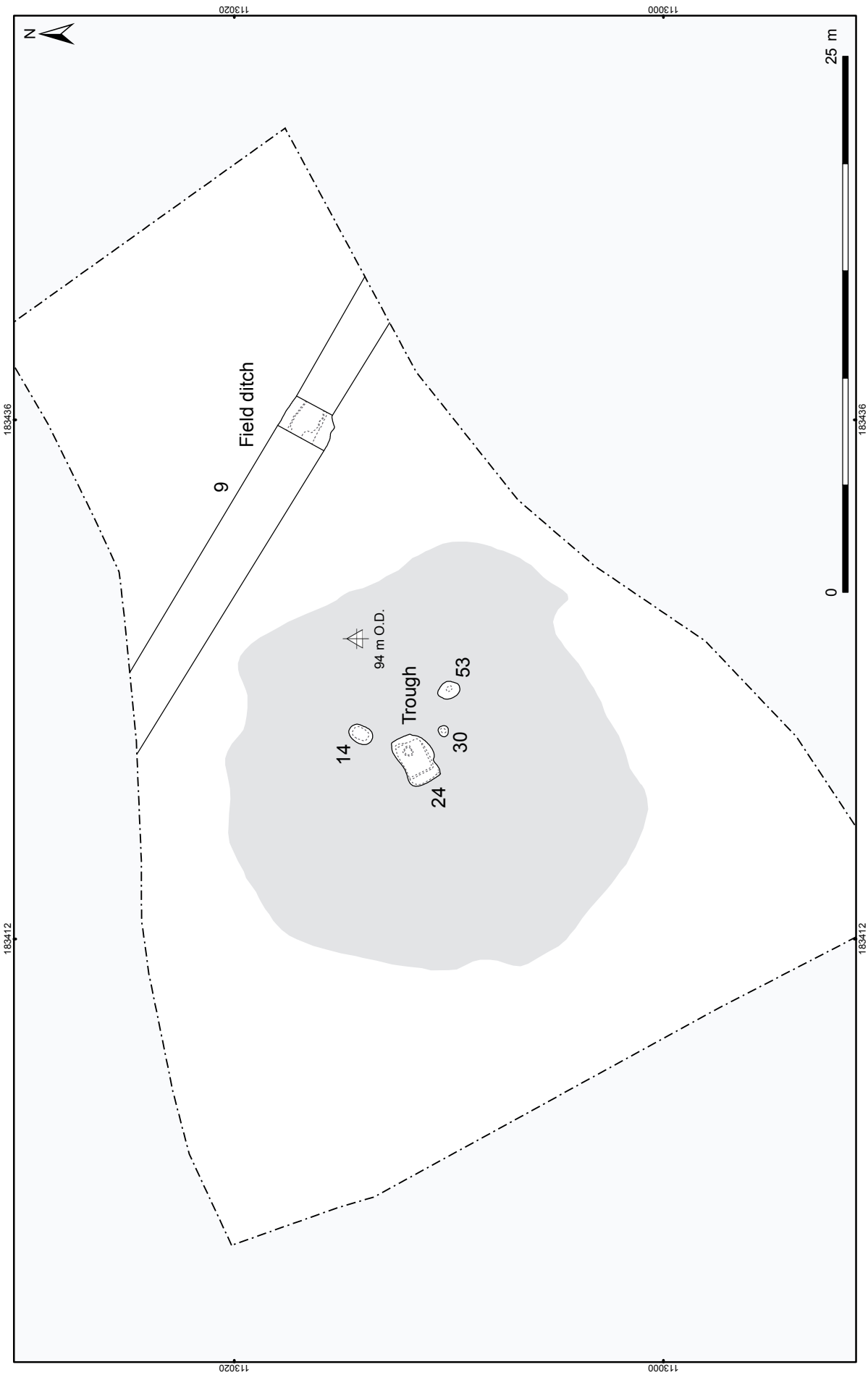


Figure 4: Post-excavation plan of Kilshanny 3.

Kilshanny 3  
E2432  
South facing section of C.24

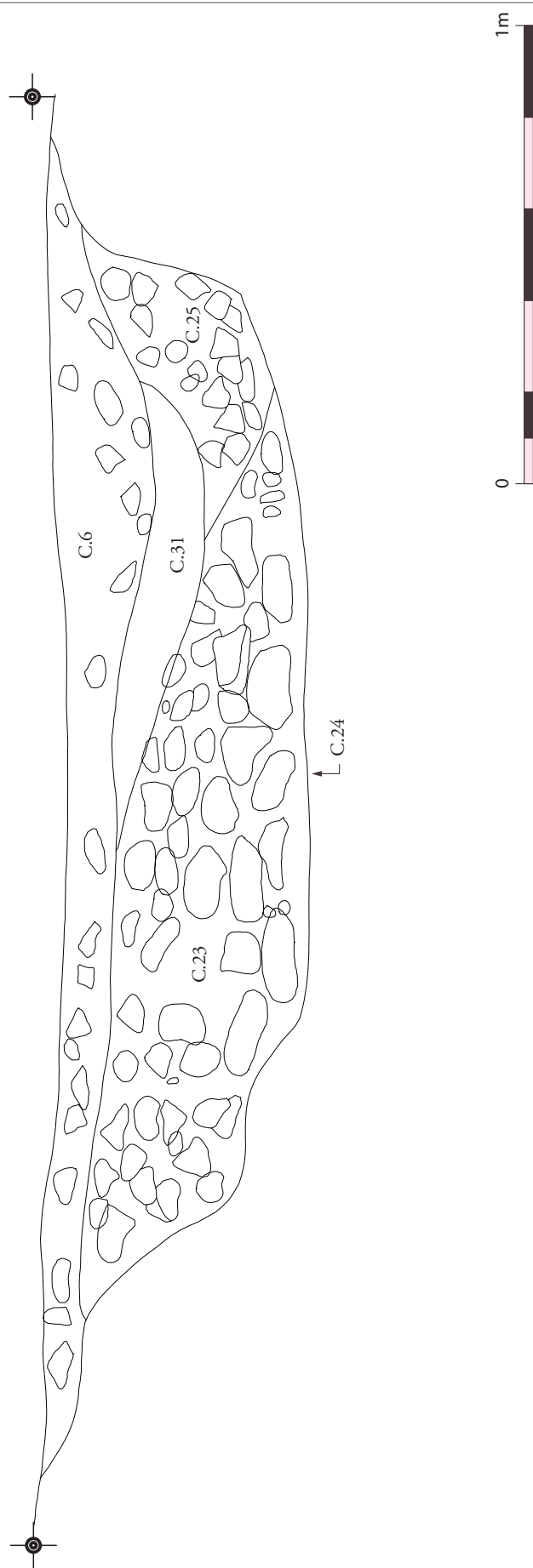


Figure 5: Section of trough C.24





Plate 1: View of layers of burnt mound material at Kilshanny 3.



Plate 2: Mid-excavation of the layers of burnt mound material from south-east.





Plate 3: Mid-excavation of the trough C.24 from south.

There was no water source in the immediate vicinity of the site but rising ground water would have served as a water source for the trough. The underlying subsoil was a yellow clay which is suitable for water retention.

## The Associated Features

Two pits (C.14 and C.53) were located to the east of the trough and a post-hole (C.30) to the south. The larger of the two pits (C.14) was located 0.2 m to the north-east of the trough and was heat-scorched on the sides of the cut. This indicates that this was most probably the source of burnt stones that were used in the main trough. The smaller pit was located 2.1 m to the south-east of the trough and was filled by burnt mound material (Plate 5).

Context	Length (m)	Width (m)	Depth (m)	Volume (m <sup>3</sup> )
14	1.4	1.05	0.25	0.36
53	1.24	0.94	0.14	0.16
30	0.58	0.52	0.11	

Table 1 Dimensions of pits and post-hole.

A large post-hole was located 0.7 m south of the trough.





Plate 4: Post-excavation of the trough C.24 from west.



Plate 5: Mid-excavation of the pit C.53 from west.

## Modern Disturbance

Two field drains (C.26 and C.57) and a modern pit and truncated the layers of the burnt mound material. The field drains did not share the same orientation. A field ditch C.9 was located to the east of the mound and was orientated north-west/south-east.

## Plant remains

The plant remains were examined by Penny Johnston (Appendix 5). Charred seeds were found in samples from the burnt mound (C.5) and within a fill (C.6) of the trough and in a disturbed deposit (C.3). The cereals included small amounts of wheat, indeterminate cereal grains and weed seeds.

## Charcoal

The charcoal from the site was examined by Mary Dillon (Appendix 6). A total of nine samples, from the burnt mound layers (C.5, C.28 and C.50), fill of the trough (C.24), post-hole (C.30) and pit (C.52), were submitted for charcoal analysis. Most of the samples were abundant in charcoal but it was dominated by vitrified charcoal (47%/53%). This suggests that the wood was burnt at extremely high temperatures. A further 10% was affected by iron pan. Oak (17%/19%) hazel (15%/11%) and alder (9%/5%) dominated the assemblage. Ash, Prunus and willow/poplar were present in small amounts.

## Radiocarbon dates

Radiocarbon analysis was carried out by the 14 Chrono Centre in Queen's University Belfast. Dates were calibrated using Calib Rev 5.0.2 (©1986-2005 M. Stuiver & P.J. Reimer) and in conjunction with Stuiver & Reimer 1993 and Reimer et al. 2004.

Lab code	Context	Material	Un-calibrated date	$\delta^{13}\text{C}$	2 sigma calibration	1 sigma calibration	Period
UB-12988	52	Hazel/alder from pit C.53	2822 $\pm$ 25	-27.6	cal BC 1044-911	cal BC 1006-969 962-931	Late Bronze Age
UB-12989	25	Pomoideae from trough C.24	2758 $\pm$ 29	-23.6	cal BC 978-829	cal BC 926-888 883-843	Late Bronze Age

Table 2: Radiocarbon dates

## 8 Discussion

A fulacht fiadh was recorded on low marginal ground. The layers of burnt mound material overlay a trough and two pits. Many theories speculate as to the actual use of burnt mound/fulacht fiadh sites (e.g. O’Kelly 1954; Ó Drisceoil 1988). We recognise the sites archaeologically by the remains of charcoal and heat shattered stones but as Ó Néill (2004) points out, these are the remains of a technology (the use of hot stones known as ‘pyrolithic technology’), rather than specific indications of the aims of the process. The large trough and smaller pits indicate that there was extensive use of hot stone technology at this site and that it was probably used for heating water.

Burnt mounds are the most common Bronze Age sites found in Ireland. Estimates suggest that at least 4,500 examples are known, over 3,000 in Co. Cork and an usual high density specifically in North Cork (Power 2000). The characteristic site-type is found in low-lying and damp ground and consists of a mound of charcoal-rich black sediment that is packed with heat shattered stones and forms a horse-shoe shape around a pit or trough that filled with water. In many cases all that survives to the present day are black charcoal rich deposits with fragments of shattered stones visible in ploughed fields.

These sites are associated with the process of roasting stones to heat water. The remains of these ‘pyrolithic technologies’ (terminology follows Ó Néill 2004) produce the tell-tale deposits rich in charcoal and heat-affected stone. Debate continues about their use, as hot water is required for many processes including cooking, brewing, washing, dyeing and, most recently it has been argued that some burnt mounds were primarily used to boil and cure meat for long term storage (Roycroft 2006).

Traditionally these sites have been interpreted as ancient cooking places, where large stones were heated in fires and then added to the water filled trough the extreme heat of the stones eventually heating the water in the trough until it reached boiling point. Experimental cooking at reconstructed sites such as Ballyvourney (O’Kelly 1954) has demonstrated that meat wrapped in straw and placed into a boiling trough can be cooked quite effectively. The perceived lack of any animal bones from these excavated sites has been used as an argument against this theory. More recently however there is a growing corpus of sites which have produced animal bone (Tourunen 2008).

The traditional perception of the burnt mound site is that they are isolated features on the landscape situated on marginal ground away from settlement. Recent studies however are requiring a re-evaluation of this perception. It can be regarded as certain that the settlement sites and associated burnt mounds are only one part of a wider prehistoric landscape which also includes lithic production and metalworking sites as well as burial sites (Sternke 2009).

The inventory for North Cork lists over 1600 burnt mounds located in North Co. Cork. (Power 2002) (Figure 6). Many more have been recorded since the inventory was published. A total of seven burnt mounds including Kilshanny 3 were excavated on the N8 Fermoy to Mitchelstown. Three burnt mound sites were excavated on the N8 Mitchelstown Relief Road, and 12 on the N8 Mitchelstown to Cashel.



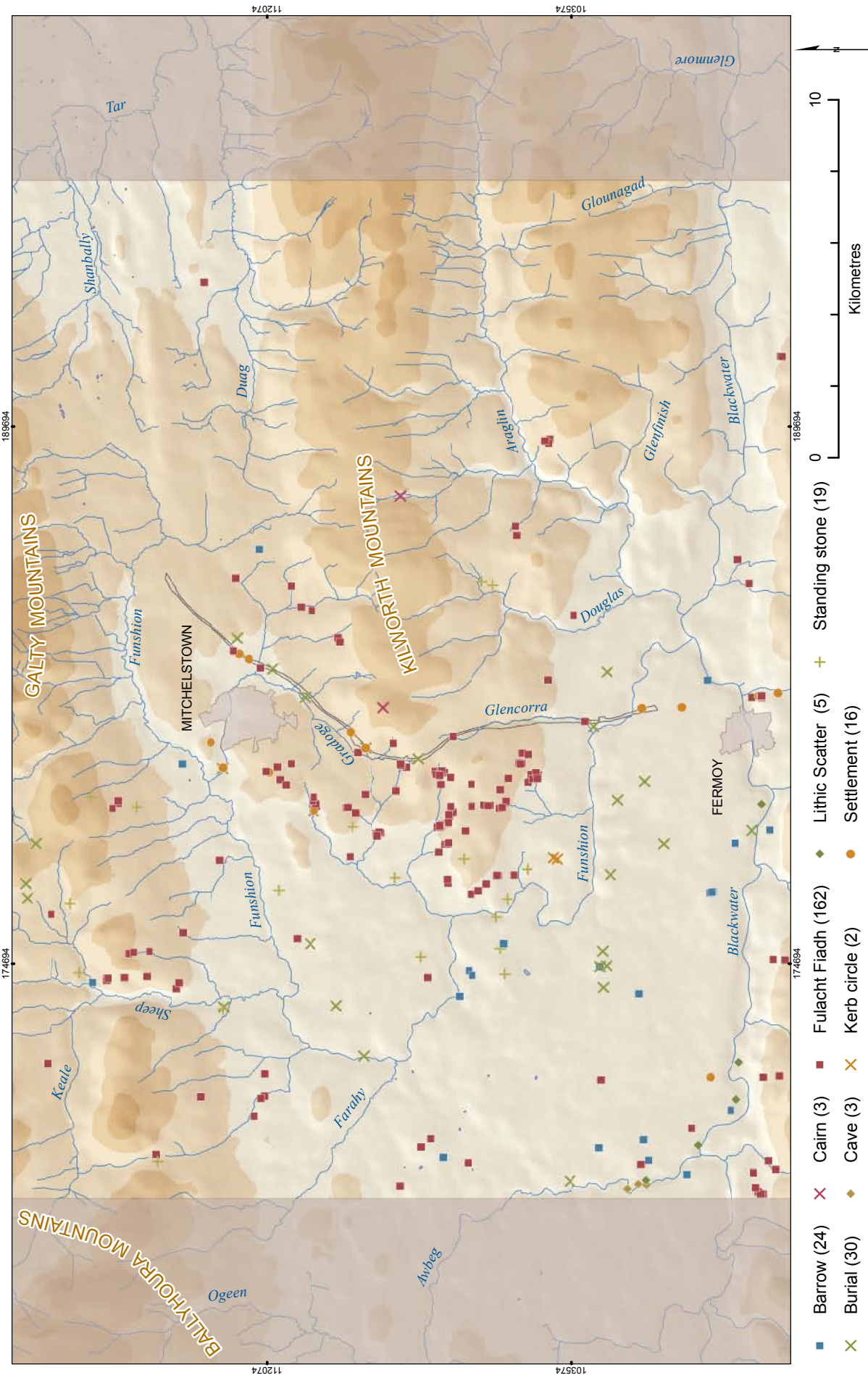


Figure 6: Bronze Age sites on and in the environs of the N8 Fermoy Mitchelstown.

Site Name	E No.	Radiocarbon date (2 sigma) cal BC	Period
Ballinglanna North 1	E2414	cal BC 766-537 529-524	Late Bronze Age
Ballinglanna North 3	E2416	cal BC 2293-2140	Early Bronze Age
Ballinglanna North 3	E2416	cal BC 1750-1628	Early Bronze Age
Ballinglanna North 3	E2416	cal BC 1740-1627	Early Bronze Age
Ballinglanna North 6	E3972	cal BC 1902-1737 1710-1696	Early Bronze Age
Ballynamona 2	E2429	cal BC 1393-1209 1198-1196 1138-1135	Middle Bronze Age
Ballynamona 2	E2429	cal BC 1492-1476 1460-1371 1346-1316	Middle Bronze Age
Kildrum	E3971	cal BC 2138-2011 2000-1978	Early Bronze Age
Kildrum	E3971	cal BC 2434-2421 2404-2379 2349-2199	Early Bronze Age
Kilshanny 3	E2432	cal BC 978-829	Late Bronze Age

Table 3: Radiocarbon dates from the burnt mound sites on the N8 Fermoy to Mitchelstown

Most dated burnt mound sites have a focus of activity in the Middle to Late Bronze Age (Brindley and Lanting 1990; and see graph of dates in Ó Néill 2003/2004). In all ten radiocarbon dates were obtained from the burnt mound sites on the route of the N8 Fermoy Mitchelstown Bypass. The majority of the sites are Early Bronze Age in date. The site at Kilshanny 3 is dated to the Late Bronze Age.

There are six main types of archaeological features encountered at burnt mound sites; wells/springs, layers/deposits, hearths, trough/boiling pits, smaller pits, and stakeholes/postholes. Five of the six feature types were recorded at Kilshanny 3. There is no obvious water source in proximity to the site. It is likely that rising ground water provided the necessary raw material of water. A number of land drains were recorded in the area of the excavation.

The mound at Kilshanny 3 was well preserved. It survived to a height of 0.3m. It was composed of layers of heat shattered stone mixed with charcoal.

There was one substantial trough recorded at the site. It was rectangular in plan. There was no evidence that the trough was lined. The other two possible pits had a limited capacity for boiling water, less than 1 m<sup>3</sup>. If a trough was too small the water would boil off very quickly. They may have held containers made from organic material such as baskets or wooden buckets and one may have functioned as a hearth.

A small quantity of charred cereals and seeds were recovered from the main layer in the mound of burnt material and the fill of the trough. The cereals included small amounts of wheat, indeterminate cereal grains and weed seeds. Plant remains from fulachta fiadh are generally poor and studies of plant remains from 132 burnt mound sites indicate that cereal remains were recorded at less than 8% of examined sites. The remains were always preserved by charring and were recorded in very small quantities (IADG 2007). Plant remains were not recorded at any of the other burnt mound sites on the route of the N8, with the exception of Ballinglanna North 1 E2414 where it is likely they were introduced in the early medieval period.

Hazel, oak, and alder wood were the most common wood types identified at Kilshanny 3 burnt mound site. Ash, Prunus and willow/poplar were also recorded in small amounts. This suggests that these were the most common trees growing in the area at the time. A similar range of species were identified at burnt mound sites at Kildrum E3971 and

Ballinglanna North 6 E3972. The wood assemblages at Ballinglanna North 3 E2416 and Ballynamona 2 E2429 were dominated by oak and smaller amounts of alder and hazel, pomoideae, ash, willow/poplar and prunus were also represented. The differences in the charcoal assemblages would suggest that the wood was selected on the basis of what was growing nearby.

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## Appendix 1 Stratigraphic Index

Context #	Context Type	Fill of	Filled with	Strat Above	Strat Below	Short Description	Dimensions (m)
1	Topsoil				4, 8, 19, 21	Dark brown clayey silt, soft in compaction. Occasional angular small, medium and large sized stones.	
2	Subsoil			17, 15, 7, 43, 45, 30, 14, 53, 24		Mid orangish yellow to light grey clay, firm in compaction. Occasional angular, small, medium and large sized stones.	
3	Spread			33	28, 27, 50, 38, 47, 56, 48	Dark brown silty clay, firm. Occasional inclusions of small angular stones.	13 x 13 x 0.2
4	Fill	33		1	20, 35	Mid greyish brown silty clay, soft in compaction.	
5	Layer			28, 27, 50, 38, 49, 58, 57	17, 16, 7, 41, 45, 29, 13, 52, 6	Burnt Mound material - Dark black clayey silt, firm in compaction. Frequent small angular stones.	? X ? X 0.30
6	Fill	24		5	31	Dark black sandy silt. Frequent small angular stones.	1.94 x 1.56 x 0.20
7	Subsoil			5	2	Light greyish yellow clay, firm in compaction. Moderate flecks and small pieces of charcoal.	? X ? X 0.02
8	Fill	9		1	10	Mid brown sandy clay, firm in compaction. Moderate small angular stones.	? X 3.7 x 0.40
9	Cut		8, 10, 11	11	2	Linear ditch. Gradual break of slope top. Sides gentle in slope and smooth. Gradual break of slope base. Shape of base flat in profile.	? X 2.20 x 0.40
10	Fill	9		8	11	Mid grey sand clay, firm in compaction.	? X ? X 0.06
11	Fill	9		10	9	Layer of mid grey stones, medium sized.	? X 0.74 x 0.05
12	Fill	26		47	26	Light yellow sand, compact.	0.30 x ? X 0.14
13	Fill	14		5	14	Dark black silty stony clay.	1.4 x 1.05 x 0.25

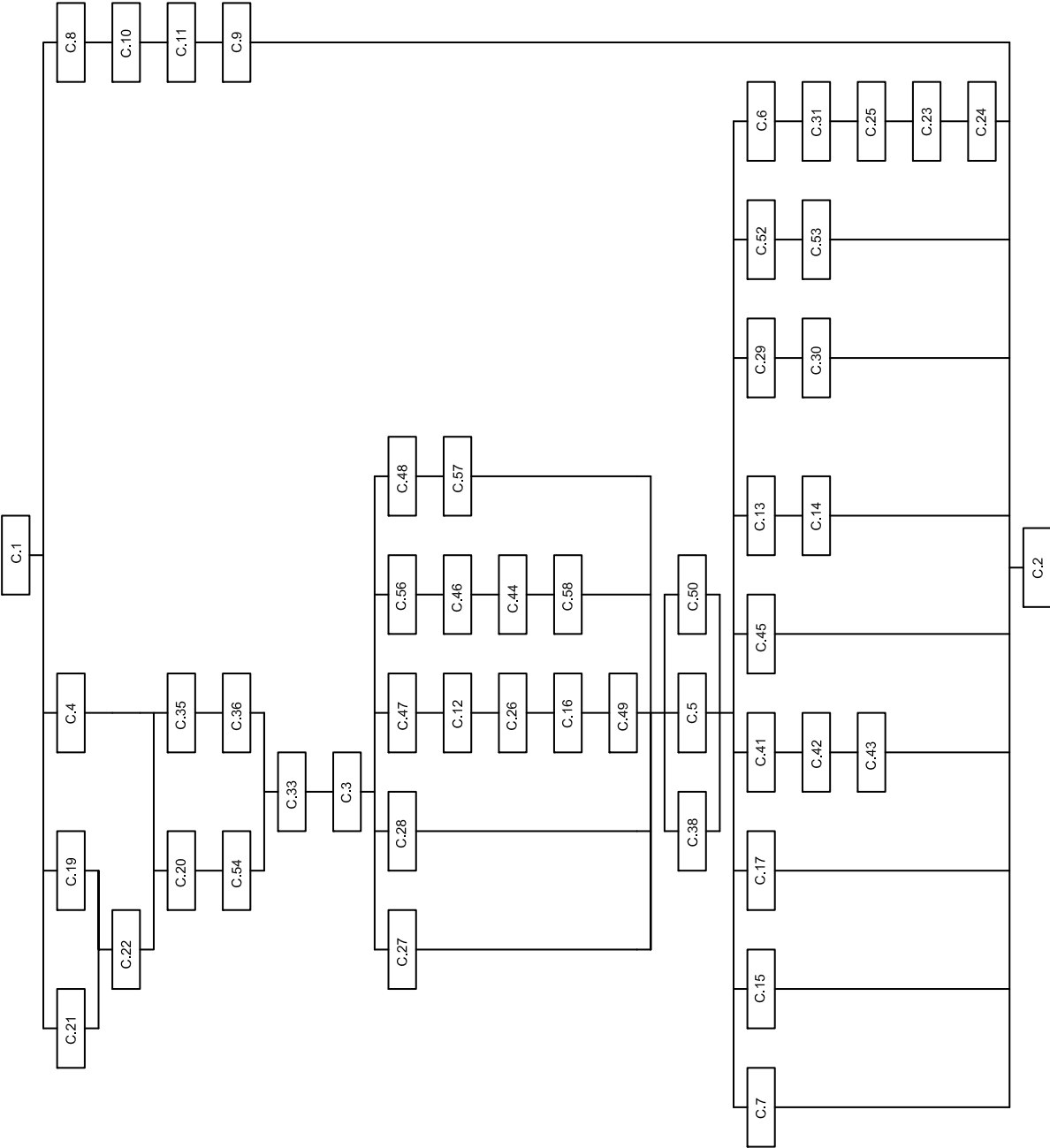
Context #	Context Type	Fill of	Filled with	Strat Above	Strat Below	Short Description	Dimensions (m)
14	Cut		13	13	2	Oval pit. Break of slope top varies from gradual to sharp. Sides steep and moderately sloping, largely smooth except for SE side which is irregular. Break of slope base varies from gradual to sharp. Shape of base is oval in plan and flat in profile.	1.40 x 1.05 x 0.25
15	Subsoil		15	5	2	Light orangish yellow clay, firm in compaction.	? X 0.50 x 0.25
16	Spread			26	49	Mid brownish grey sandy clay, firm in compaction.	? X ? X 0.07
17	Subsoil			5	2	Mid orangish yellow clayey sand, firm in compaction.	
19	Fill	33		1	22	Mid brown sandy clay, soft in compaction.	? X 0.86 x 0.17
20	Fill	33		4, 22	54	Dark brown sandy clay, soft in compaction.	? X 1.30 x 0.26
21	Fill	33		1	22	Dark brown silty clay, firm in compaction.	? X 1.14 x 0.20
22	Fill	33		19, 21	20, 35	Mid yellowish brown sandy clay, soft in compaction.	? X 1.30 x 0.15
23	Fill	24		25	24	Dark brownish black sandy silt, soft in compaction. Moderate small angular stones.	1.90 x ? X 0.44
24	Cut		6, 23, 25, 31	23	2	Sub-rectangular trough with rounded corners. Gradual break of slope top. N and S sides steeply sloping and smooth in shape. E and W sides steep and concave. Gradual break of slope base. Base sub-rectangular in plan, flat in profile.	2.54 x 1.60 x 0.56
25	Fill	24		31	23	Dark black sandy silt, soft in compaction. Frequent inclusions of small angular stones.	0.52 x ? X 0.30
26	Cut		12, 47	12	16	Linear ditch. Drain was not excavated.	? X 0.30 x ?
27	Spread			3	5	Light yellowish grey clay and stones, hard in compaction. Moderate medium angular stones.	0.56 x 0.40 x 0.02
28	Spread			3	5	Light yellowish grey clay and stones, hard in compaction. Moderate medium angular stones.	0.62 x 0.44 x 0.02
29	Fill	30		5	30	Dark black sandy clay, firm. Moderate small angular stones (burnt).	0.55 x ? X 0.10
30	Cut		29	29	2	Circular pit. Gradual to sharp break of slope top. N and W sides gently sloping and convex in shape. S and E sides moderately sloping and convex. Base break of slope imperceptible to gradual. Base circular in plan, concave in profile.	0.58 x 0.52 x 0.11

Context #	Context Type	Fill of	Filled with	Strat Above	Strat Below	Short Description	Dimensions (m)
31	Fill	24		6	25	Dark black silt, soft in compaction. Frequent small angular stones.	0.90 x ? X 0.12
33	Cut		4, 19, 20, 21, 22, 35, 36, 54	36, 54	3	Liner cut. Sharp break of slope top. Sides steeply sloping, smooth in shape. Imperceptible break of slope base. Flat in profile.	? X 1.0 x 0.20
35	Fill	33		4, 22	36	Mid grey clayey sand, compact.	
36	Fill	33		35	33	Mid greyish orange clay.	? X 0.90 x 0.14
38	Spread			3	5	Dark brownish black stony clay, stiff in compaction. Moderate coarse sub-angular pebbles. Occasional small sub-angular stones. Moderate flecks and small pieces of charcoal.	0.3 x ? X 0.20
41	Spread			5	42	Light grey stony sand, compact.	2.5 x ? X 0.40
42	Spread			41	43	Dark black silty sand, compact.	1.0 x ? X 0.04
43	Spread			42	2	Dark black silty sand, compact.	1.50 x ? X 0.08
44	Fill	58		46	58	Dark brown silt, soft in compaction.	0.60 x ? X 0.25
45	Spread			5	2	Mid greyish black stony sand, compact.	0.40 x ? X 0.16
46	Fill	58		56	44	Light yellowish brown silt, soft in compaction.	0.20 x ? X 0.08
47	Fill	26		3	12	Dark greyish black silty sand, compact. Frequent fine sub-angular pebbles.	0.22 x ? X 0.06
48	Fill	57		3	57	Dark black sandy clay, soft in compaction. Occasional fine sub-rounded pebbles.	1.70 x ? X 0.40
49	Spread			16	5	Light grey sand, compact.	0.95 x ? X 0.10
50	Spread			3	5	Dark black clayey sand, compact. Frequent small sub-angular stones.	1.60 x ? X 0.20
52	Fill	53		5	53	Dark black silty sand, compact. Occasional small angular stones.	1.00 x 0.96 x 0.11
53	Cut		52	52	2	Circular pit. Gradual break of slope top. Sides sloping gently, smooth in shape. Gradual break of slope base. Shape of base circular in plan, concave in profile.	1.24 x 0.94 x 0.14
54	Fill	33		20	33	Light yellowish brown sandy clay, soft in compaction. Frequent fine sub-angular pebbles.	0.70 x ? X 0.18

Context #	Context Type	Fill of	Filled with	Strat Above	Strat Below	Short Description	Dimensions (m)
56	Fill	58		3	46	Dark brown sandy silt, soft in compaction. Occasional fine sub-rounded pebbles.	0.70 x ? X 0.40
57	Cut		48	48	5	Linear ditch. Sides are gently sloping, smooth in shape. Base irregular in plan, flat in profile.	1.70 x 0.40 x ?
58	Cut		44, 46, 56	44	5	Sub-rectangular pit caused by modern disturbance, steeply sloping sides and a flat base.	0.7 x ? x 0.17

Appendix 2 Site matrix

Kilshanny 3 - E2432 Stratigraphic Matrix



## Appendix 3 Groups and subgroups

### Group 1 Natural Deposits

This group describes the natural geological deposits identified across the area of excavation.

#### Subgroup 1 Natural Topsoil

List of Contexts; C. 1

##### *Description*

This subgroup describes the layer of topsoil covering the archaeological features on this site. It was a dark brown clayey silt. Post-medieval finds, including iron and ceramics, were recovered from this layer.

#### Subgroup 2 Natural Subsoil

List of Contexts; C. 2, 7, 15, 17

##### *Description*

This subgroup describes the natural sub-soils that have formed across the area of excavation. They are in general a mid orangish yellow clay.

### Group 2 The Burnt Mound Material

This group describes the burnt mound material produced by the use of the *fulacht fiadh*.

#### Subgroup 1 Main deposit of Burnt Mound material

List of Contexts; C.5, 38, 50.

##### *Description*

This subgroup describes the burnt mound material covering the features as described in groups 3 and 4.

Burnt mound material (5) measured 19.9 m in length, 19.4 m in width and 0.3 m in depth. It was a dark black stony silt with moderate flecks and occasional small pieces of charcoal inclusions. Post-medieval pottery and metal finds were recovered from this deposit.

Two further spreads of burnt mound material were uncovered to the north and south of the extent of layer (5). Layer (38) was located to the north of layer (5). It measured 0.3 m in length and 0.2 m in depth. It was a dark brownish black stony clay with moderate flecks and small pieces of charcoal inclusions. Layer (50) was located to the south of layer (5). It measured 1.6 m in length and 0.2 m in depth. It was a dark black clayey sand with frequent sub-angular small stones.

##### *Interpretation*

Layer (5) represents the industrial waste material produced from the use of the *fulacht fiadh* while it was occupied. The post-medieval finds associated with this layer indicate that it has been heavily truncated by later disturbances (see group 5). As a result layers (38)

and (50) have been separated from the burnt mound material but are most probably continuation of the main mound. These layers represent contemporary deposits of material.

## Subgroup 2 Layers associated with Burnt Mound material

List of Contexts; C. 27, 28.

### *Description*

This subgroup describes two deposits associated with the burnt mound material (5) lying to the south east of the *fulacht fiadh*.

Layers 27 and 28 are two basal spreads of material lying just to the south of the main mound of burnt material (5). Spread (27) measured 0.56 m in length, 0.4 m in width and 0.02 m in depth. Spread (28) measured 0.62 m in length, 0.44 m in width and 0.02 m in depth. Both layers were a light yellowish grey clayey stony layer with moderate angular stone inclusions.

### *Interpretation*

These layers appear to be spreads of burnt mound material which have been pressed into the natural subsoil underneath. This may have occurred while the *fulacht fiadh* was in use with steady foot traffic pressing the waste material from the trough into the ground underneath them.

## Subgroup 3 Early phase of Burnt Mound material

List of Contexts; C. 41, 42, 43, 45.

### *Description*

This subgroup describes four deposits of material that lay underneath the main burnt mound material (5).

Layer (45) measured 0.4 m in length and 0.16 m in depth. It was a mid greyish black stony sand. It was overlain by burnt mound material (5).

Layer (41) measured 2.5 m in length and 0.4 m in depth. It was a light grey stony sand with frequent fine angular pebble inclusions. It lay underlay burnt mound material (5) and overlay layer (42). Layer (42) measured 1 m in length and 0.04 m in depth. It was a dark black silty sand and in turn overlay layer (43). This layer measured 1.5 m in length and 0.08 m in depth. It was also a dark black silty sand.

### *Interpretation*

Layers (42), (43) and (45) represent early phases of deposition of burnt mound material, possibly deposited from the origins of use of the trough. This can be seen in the close similarity of colour and composition of this material and burnt mound material that overlies these layers. In contrast layer (41) appears to be redeposited natural material. This probably originates from the construction of either the nearby large pit [14] or the trough itself [24]. The fact that this layer overlies layers (42) and (43) tends to suggest that some of the features of the *fulacht fiadh* were constructed after its initial use.

## Group 3 The Trough

This group describes main trough located within the centre of the *fulacht fiadh* underneath burnt mound material (5).

List of Contexts; C. [24], 6, 23, 25, 31.

### *Description*

This group describes the trough of the *fulacht fiadh*, in which the main industrial activity took place.

The trough [24] measured 2.54 m in length, 1.6 m in width and was 0.56 m in depth. It was aligned north east to south west. It was rectangular in shape, with generally steep and smooth sides. An obvious step was seen in the trough to the south west end. The base was rectangular in shape and flat in profile. It was filled by four deposits. The primary deposit (23) was a dark brownish black sandy silt. This was overlain by a dark black sandy silt (25), the secondary deposit, which was only observed at the north eastern end. This was overlain by a dark black silt, deposit (31). The final deposit (6) was a dark black sandy silt. All four fills contains frequent amounts of burnt angular small stone inclusions.

### *Interpretation*

This feature represents the main area of activity for the *fulacht fiadh*. The trough was large in size and included the remains of a step into the southern end. While no water management system was discovered associated with the *fulacht fiadh*, the waterlogged nature of this area suggests that the trough itself was self-filling.

The fills of the trough appear to represent several phases of backfilled burnt mound material, probably originating from the trough itself. These fills may have been residues which built up within the trough after extensive use.

## Group 4 Associated Features

This group describes three features, two pits and a posthole, which were discovered underneath the burnt mound material (5).

### Subgroup 1 Pits

List of Contexts; C.13, [14], 52, [53].

#### *Description*

This subgroup describes two pits, located in close proximity to the trough [24], as described in group 3.

The larger of the two pits, [14], was located 0.2 m to the north of the trough. It measured 1.4 m in length, 1.05 m in width and had a depth of 0.25 m. It was oval in shape with moderately steep sides and a flat base. It was filled by a dark black stony clay (13).

The smaller of the two pits [53] was located 2.1 m south east of the trough. It measured 1.24 m in length, 0.94 m in width and had a depth of 0.14 m. It was circular in shape with gentle sides and a concave base. It was filled by a dark black silty sand (52) with occasional small angular stone inclusions.

#### *Interpretation*



These pits represent features associated with the function of the *fulacht fiadh*. They were both filled by burnt mound material indicating that they were in use contemporarily with the main trough [24]. The smaller of these pits lay a good distance away from the main trough and may have been a rubbish pit associated with the use of the *fulacht fiadh*. The larger of the two pits, however, was close in proximity to the trough, at a distance of only 0.2 m. Orange scorching was noted on the sides of the cut of the pit probably indicating in-situ burning. This was therefore associated with a fire for the heating of stones for use in the main trough.

## Subgroup 2 Posthole

List of Contexts; C.29, [30].

### *Description*

This subgroup describes a single posthole discovered underneath the burnt mound material and in close proximity to the trough [24] as described in group 3.

Posthole [30] was located 0.7 m south east of the trough. It measured 0.58 m in length, 0.52 m in width and had a depth of 0.11 m. It was circular in shape with moderately steep sides and a concave profile. It was filled by a dark black sandy clay (29) with moderate amounts of angular small stone inclusions.

### *Interpretation*

This singular posthole may represent part of a series of structural features associated with the function of the *fulacht fiadh*. The fact that the posthole has been backfilled by burnt mound material indicates that it was contemporary with the use of the *fulacht fiadh*. However, the ephemeral nature of this feature may indicate that a structure built here was only in use temporarily. With only one posthole remaining it is impossible to extract any details about what function or what period a structure was built here.

## Group 5 Modern Disturbances

This group describes later modern features that have disturbed the *fulacht fiadh*.

### Subgroup 1 Disturbed Soil

List of Contexts; C. 3

#### *Description*

This subgroup describes a layer of soil that covered the burnt mound material (5). It measured 13 m in length, 13 m in width and 0.20 m in depth. It was a dark brown silty clay with occasional angular small stone inclusions. Post-medieval pottery and iron finds were recovered from this fill.

#### *Interpretation*

This layer of material represents disturbed burnt mound material that has been mixed with the topsoil that lay above it. This disturbance of the *fulacht fiadh* most likely occurred due to ploughing of this area since topsoil has formed over the burnt mound.

## Subgroup 2 Modern Pit

List of Contexts; C. [58], 44, 46, 56

### Description

This subgroup describes a pit which lies underneath the disturbed soil (3) as described in subgroup {5001}, and truncates the burnt mound material (5).

Pit [58] measured 0.7 m in width and 0.17 m in depth. It had steeply sloping sides and a flat base. Its primary fill was a dark brown silt (44). This was overlain by a light yellowish brown silt (46). The last fill was a dark brown sandy silt (56) with occasional sub-rounded fine pebbles.

### Interpretation

This pit represents a later modern phase of activity in this area. This pit was excavated long after the *fulacht fiadh* had gone out of use and has therefore truncated the burnt mound material (5), however, as no finds were recovered from its fill, its exact date or function is difficult to establish.

## Subgroup 3 Field Drains

List of Contexts; C.[9], 8, 10, 11, [26], 12, 16, 47, 49, [57], 48.

### Description

This subgroup describes three field drains located within the area of excavation.

Field Drain [9] was located to the north east of the *fulacht fiadh*. It measured 17.65 m in length, 3.7 m in width and 0.4 m in depth and was orientated east to west. Its primary fill was a mid grey stony layer (11) with frequent medium stone inclusions. It was overlain by a mid grey sandy clay (10) which was in turn overlain by a mid brown sandy clay (8) with moderate angular small stone inclusions.

Field Drain [26] truncated the *fulacht fiadh* to the north of the mound. It measured 16.35 m in length, 0.3 m in width and 0.3 m in depth and was orientated north west to south east. Its primary fill was a light yellow sand (12) while its secondary deposit was a dark greyish black silty sand (47) with frequent sub-angular fine pebble inclusions. Two layers were located to the north east of the cut. Layer (49) was a light grey sand with frequent angular fine pebbles which was overlaid by a mid brownish grey sand clay (16).

Field Drain [57] truncated the *fulacht fiadh* to south west of the mound. It measured 3.93 m in length, 0.4 m in width and 0.2 m in depth and was orientated north to south. It was filled by a dark black sandy clay (48) with occasional sub-rounded fine pebble inclusions.

### Interpretation

These three field drains represent the modern agricultural use of this area. Field Drains [26] and [56] truncate the *fulacht fiadh* through the burnt mound material (5) but lie underneath the disturbed soil layer (3) as described in subgroup {5001}. This indicates a modern date for these features but before this area was ploughed creating the disturbed layer (3). While field drain [9] did not truncate the *fulacht fiadh* we must assume that it is contemporary with the other two features.

## Subgroup 4 Test Trench

List of Contexts; C. [33], 4, 19, 20, 21, 22, 35, 36, 54.

### *Description*

This subgroup describes an archaeological test trench that runs through the *fulacht fiadh*, disturbing the burnt mound material (5). The trench truncated the fulacht in a north east to south west direction but appears only to have disturbed the burnt mound material rather than any of the features that lay underneath it. The trench contained eight fills, all of which were redeposited material from the excavation of the trench.

### *Interpretation*

This test trench appears to have further disturbed the already disrupted burnt mound but has not affected the archaeological features that lay underneath.

## Appendix 4 Finds register

Context #	NMI Find #	Category	Fabric	Artefact type	Short description	Date	Initials
1	1	Metal	Iron	Nail			
1	2	Metal	Iron	Horseshoe			
1	3	Ceramic	Pottery	Rim sherd	Glazed red earthenware (19th Century)	09/11/2006	
1	4	Ceramic	Pottery	Body sherds (x3)	Creamware (19th Century)	09/11/2006	
1	5	Ceramic	Pottery	Base sherd	Pearlware (19th Century)	09/11/2006	
3	1	Metal	Iron	Nail (poss)		14/11/2006	TW
3/5	1	Metal	Iron	Nail fragment		22/11/2006	
3/5	2	Metal	Iron	Nail		27/11/2006	
5	1	Metal	Iron	Nail		22/11/2006	
5	2	Ceramic	Pottery	Rim sherd	Pearlware (19th Century)	27/11/2006	
5	3	Ceramic	Pottery	Base sherd	Pearlware (19th Century)	21/11/2007	

## Appendix 5 Plant remains

By Penny Johnston

### Introduction

This short report details the results of plant remains analysis from Kilshanny 3, Co. Cork (E2432). The site comprised a trough, two pits and a post-hole, covered by a large area of burnt mound material.

### Methodology

The samples were collected on site as bulk soil and were processed using machine-assisted floatation (following guidelines in Pearsall 2000). The floating material (or 'flot') from each sample was collected in a stack of geological sieves (the smallest mesh size was 250mm). When all the carbonised material was collected the flot was then air-dried in paper-lined drying trays prior to storage in airtight plastic bags. The samples were scanned under low-powered magnification (x 10 to x 40) using a binocular microscope. Nomenclature and taxonomic order follows Stace (1997).

### Results

The results of preliminary scanning are presented in Table 1. A total of 15 samples were scanned. Of these, only 4 contained plant remains: C.3 (S.4), C.5 (S.5), C.5 (S.8) and C.6 (S.10).

Sample	Context	Charcoal	Seeds	% scanned
4	3	High	Low	100
5	5	High	Low	100
8	5	Medium	Low	100
9	6	High	Absent	100
10	6	High	Low	100
11	6	Low	Absent	100
13	21	Medium	Absent	100
14	52	Low	Absent	100
15	29	Low	Absent	100
16	18	Low	Absent	100
17	56	High	Absent	100
18	39	High	Absent	100
19	6	High	Absent	100
20	25	Low	Absent	100
25	28	Medium	Absent	100

Table 1: Scanned samples from Kilshanny 3, Co. Cork (E2432)

Where plant material was found, it was retrieved only in small quantities. The identified material is presented in Table 2.

Context	3	5	5	6
Sample	4	5	8	10
Cleavers ( <i>Galium aparine</i> L.)				1
Wheat grains ( <i>Triticum</i> L. species)	2	1		
Indeterminate cereal grains			1	

Table 2: Plant material in samples from Kilshanny 3, Co. Cork (E2432)

The cereals included small amounts of wheat, indeterminate cereal grains and weed seeds. The plant remains were found in samples from the burnt mound (C.5) and within the fill of a trough (C.6) and in a disturbed deposit (C.3). Most of the archaeological features from this site were associated with a burnt mound/*fulacht fiadh* site and the recovery of cereals and seeds from the deposits are relatively unusual, although not unknown. Plant remains from *fulachta fiadh* are generally poor and studies of plant remains from 132 burnt mound sites indicate that cereal remains were recorded at less than 8% of examined sites. The remains were always preserved by charring and were recorded in very small quantities (IADG 2007).



## References

- IADG (Irish Archaeobotanists Discussion Group) 2007. Brewing and *fulachta fiadh*, *Archaeology Ireland* 21 (7).
- Pearsall, D. 2000 *Paleoethnobotany: a Handbook of Procedures*. New York, Academic Press.
- Stace, C.A. 1997 *New Flora of the British Isles*. (2nd edition) Cambridge, Cambridge University Press.

## Appendix 6 Charcoal Analysis

By Mary Dillon

### Introduction

A total of nine samples were submitted for charcoal analysis. Most of the samples were abundant in charcoal. The samples came from a burnt mound site from the following features: burnt mound layer (C5, C28 and C50), trough fill (C24), posthole fill (C30), and pit fill (C52). The results are considered in relation to past woodland environment, woodland exploitation and wood-type selection. Suitable charcoal was selected from the nine samples for radiocarbon dating. Charcoal from trees with a short life span are suitable for dating while charcoal from trees with a long life span are not.

### Methodology

Bulk soil samples were collected on site and were processed by the client. Charcoal fragments of 2mm or greater can be identified. Up to fifty fragments from each sample were analysed. Each fragment was prepared for microscopic examination by fracturing it by hand and thereby exposing a clean surface along transverse, radial and tangential planes. All three planes were examined at a range of magnifications (x5 to x 150) under a Nikon stereo microscope. For reference literature Schweingruber was consulted (1990). The number and weight of fragments were recorded for each wood type. .

### Results

In total, 253 fragments were analysed from nine samples. All samples except sample 14 from C52 contained charcoal. Abundant charcoal is normally present at burnt mound sites because of the amount of wood that was burnt.

In Figs. 1 and 2, the percentage fragment frequency and percentage weight of the various wood types are given.

These samples were dominated by vitrified charcoal (47%/53%). Vitrification takes place when wood is burnt at very high temperatures, and when oxygen is more limited than in normal charcoal production. This charcoal becomes very solid and takes on a glass-like appearance. It is difficult to break and usually impossible to identify. Five of the eight samples had a large amount of vitrified charcoal. A further 10% of the charcoal was affected by an orange substance, which filled the vessels and made the charcoal unidentifiable. This is caused by iron pan in the soil (a layer of iron oxide accumulation) which has been washed into the charcoal. One sample in particular (Sample 15, Context 29, fill of posthole) was particularly badly affected. Iron panning seems to predominantly affect charcoal from burnt mound sites.

Oak (17%/19%) hazel (15%/11%) and alder (9%/5%) dominated the assemblage. Ash, *Prunus* and willow/poplar were present in small amounts. The results are given as percentage fragment frequency and percentage weight respectively.

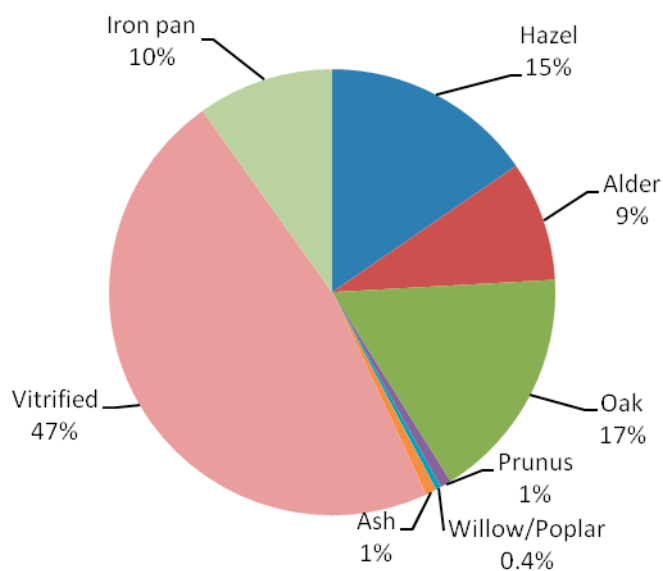


Fig 1. Pie chart illustrates the percentage fragment frequency of the various wood types

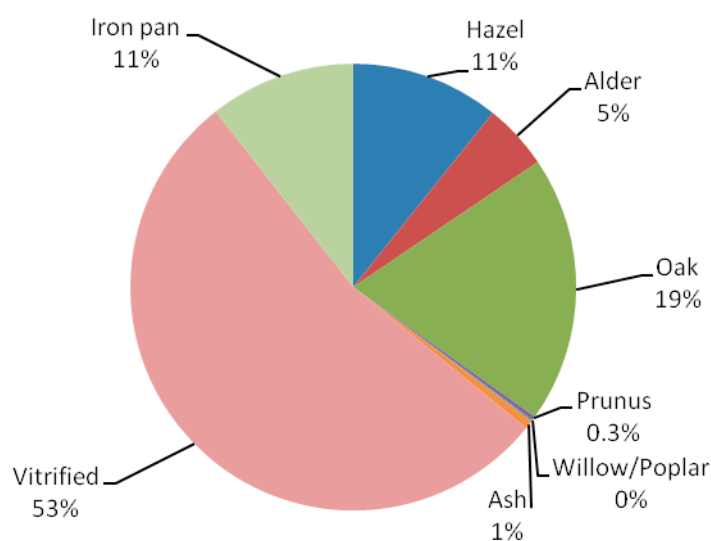


Fig 2. Pie chart illustrates the percentage weight of the various wood types

## Discussion

*Quercus* (oak). *Quercus* makes up 19% of the assemblage, making it the most commonly used wood. It was present in the majority of the samples. Oak is slow burning and gives out substantial heat as it burns which would have made it a natural choice for a fire. There are two native species of oak in Ireland, namely *Q. petraea* and *Q. robur*. Unfortunately, it is difficult to distinguish these species on the basis of wood anatomy (Grosser 1977). Oak is commonly found on burnt mound sites, and it dominates the assemblage of nearby sites of Ballinlanna North 3 and Ballynamona 2 (Dillon 2009a, 2009b).

*Corylus* (hazel; *C. avellana*). Hazel accounts for 11% of all charcoal fragments identified. It was present in most of the samples but to a lesser extent than oak. Hazel was widely exploited in both prehistory and historical times for its nutritious nuts and supple rods which were widely used for building. Its coppice-like growth form makes it relatively easy to cut and there are normally substantial quantities of dead wood available near ground level. Pollen analytical studies indicate that hazel was of great importance in Ireland for most of the Holocene. Hazel is commonly found on burnt mound sites and dominates the assemblage from nearby burnt mound Kildrum 1 (Dillon 2009c).

*Alnus* (alder; *A. glutinosa*). *Alnus* is represented at 9%. Alder was probably largely confined to damp/wet areas. It should be noted, however, that alder wood does not burn particularly well but is commonly found in samples from burnt mound sites (Dillon forthcoming). This may be because it grows well in damp areas and even waterlogged areas and it is in such areas that burnt mound sites are often located.

While there were differences in the size of the samples and the amount of charcoal per sample, there was little difference in the charcoal analysis results. This would suggest that all of the charcoal originated from the burnt spread, which filled the troughs, post holes and stakeholes.

The wood burnt at this site (mostly oak, hazel and alder) was burnt at extremely high temperatures. This can be seen from the large amount of vitrified charcoal present in the samples. It is unusual to have such a high incidence of vitrified charcoal.

The charcoal analysis suggests the users of the burnt mound had oak, hazel and alder charcoal at their disposal. Like the other burnt mound sites excavated nearby, ash was totally absent from this assemblage. This suggests that it was not growing in the environs, or, if it was, that it was avoided for some reason. Ash has been commonly found at burnt mound sites, elsewhere in the country (Dillon, forthcoming).

## Wood for radiocarbon dating

A total of seven of the nine samples submitted had charcoal suitable for dating. Only S14 from C52 produced no charcoal. Charcoal from S15 from C29 was affected by iron pan in the soil and no charcoal could be identified. Where possible, hazel was selected for dating because of its short life span.

## Conclusion

Many of the samples contained vitrified charcoal suggesting that the wood burnt at this site was burnt at extremely high temperatures. Oak, hazel and alder were the most commonly used woods here, which is very similar to the assemblage from nearby burnt mound Kildrum I.

Context	Sample	Hazel	Alder	Oak	Prunus	Willow/ Poplar	Ash	Pomoideae	Vitrified	Iron pan
6	10	15	22	11	2					
5	5	1		19					30	
50	17	3		10					27	
29	15									25
28	25	4				1			12	
6	19	10		3			2		35	
5	8	3							15	
5	12	3								
52	14									

Table 1. Charcoal fragments from the nine samples

## References

- Dillon, M. 2009a. Charcoal analysis from Ballinglanna North 3. Technical report for Eachtra Archaeological Services.
- Dillon, M. 2009b. Charcoal analysis from Ballynamona 2. Technical report for Eachtra Archaeological Services.
- Dillon, M. 2009c. Charcoal analysis from Kildrum 1. Technical report for Eachtra Archaeological Services.
- Dillon, M. (forthcoming) Various sections in J. O'Sullivan (ed) *The Quiet Landscape: Excavations on the N6, Galway*. NRA Monograph.
- Grosser D. 1977. *Die Hölzer Mitteleuropas*. Springer, Berlin.
- Schweingruber, F.H. 1990. *Mircoscopic Wood Anatomy*. Swiss Federal Institute for Forest, Snow and Landscape Research, Birmensdorf.



## Appendix 7 Finds catalogue

### Metal Finds

#### Iron

##### Nails

**Nail** (E2432:5:1) *Fe.* L. 98.86 mm, D. (of shank) 10.8 mm., D. (of head) 14.15 mm. Complete but very corroded. Shank straight, circular in section. Elongated head circular in section.

**Nail** (E2432:3:1) *Fe.* L. 83.1 mm, D. (of shank) 10.1 mm., D. (of head) 13.85 mm. Complete but very corroded. Shank straight, circular in section. Flat circular head.

**Nail** (E2432:3/5:1) *Fe.* L. 47.9 mm, D. (of shank) 6.33 mm. Incomplete. Headless. Shank straight, circular in section. Corroded.

**Nail** (E2432:1:1) *Fe.* L. 79.92 mm, Th. (of shank) 4.42 mm., D. (of head) 8.65 mm. Complete. Shank straight, rectangular in section. Flat circular head.

**Nail** (E2432:3/5:2) *Fe.* L. 47.21 mm, Th. (of shank) 4 mm., D. (of head) 8.84 mm. Incomplete. Shank straight, rectangular in section. Flat circular head. Corroded.

##### Other Objects

**Horseshoe** (E2432:1:2) *Fe.* L. 60 mm, W. 57 mm, Th. 4.9 mm. Incomplete. One end missing. Rectangular in section. Very corroded.

### Modern Pottery

A total of seven sherds of modern pottery were found on site. They can all be dated to 19<sup>th</sup> Century.

#### Pearlware

One base sherd from Topsoil (C.1). One rim sherd and one base sherd from C.5. They presumably all belong to a serving plate/bowl.

#### Glazed red earthenware

One bowl rim sherd from C.1.

#### Creamware

Three body sherds from C.1, probably part of a small pot.

Co. No.	Find No.	Type	Dating	Form
1	3	Glazed Red Earthenware	19 <sup>th</sup>	Bowl
	4	Creamware (x3)	19 <sup>th</sup>	Pot?
	5	Pearlware	19 <sup>th</sup>	Plate/Bowl
5	2, 3	Pearlware (x2)	19 <sup>th</sup>	Plate/Bowl

## Bibliographic References

Carroll&Quinn 2003. Carroll M. & Quinn A., Ferrous and non-Ferrous Artefacts, in “Excavations in Cork City, 1984-2000”, Cork 2003 (pages 257-298).

Scully 1997. Scully O.M.B., Ferrous and non-Ferrous Metal Artefacts, in “Skiddy’s Castle and Christ Church, Cork – Excavations 1974/77”, Cork 1997 (pages 165-190).